
**UTILIZATION OF INFORMATION AND COMMUNICATION
TECHNOLOGY AND HEALTH AWARENESS AMONG COMMUNITY
HEALTH WORKERS IN AKWA IBOM NORTH-WEST SENATORIAL
DISTRICT, NIGERIA**

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ABSTRACT

The integration of Information and Communication Technology (ICT) into healthcare delivery has become increasingly important in improving health awareness and service efficiency. This study investigated the influence of ICT utilization on health awareness among community health workers in Akwa Ibom North-West Senatorial District, Nigeria. The study adopted an ex-post facto research design. The population consisted of 1,431 community health workers across 174 primary healthcare facilities, from which a sample of 316 respondents was selected using a multi-stage sampling procedure. Data were collected using a researcher-developed instrument titled *Utilization of Information and Communication Technology and Health Awareness Questionnaire (UICTHAQ)*, which had a reliability coefficient of 0.86. Mean and standard deviation were used to answer research questions, while dependent t-test was used to test the hypotheses at the 0.05 level of significance. The findings revealed that the utilization of social media, internet services, and e-mail significantly influenced health awareness among community health workers in the study area. The study concludes that effective use of ICT tools enhances access to health information and improves health awareness and communication among community health workers. The study recommends the provision of adequate ICT infrastructure, regular training on digital technologies, and policies that support the integration of ICT in primary healthcare delivery to improve health education and community health outcomes.

KEYWORDS: Information and Communication Technology, Health Awareness, Community Health Workers, Digital Health Communication, Primary Healthcare, Nigeria, ICT Utilization

INTRODUCTION

Globally, healthcare systems are increasingly integrating digital technologies, which requires health professionals to strengthen their competence in the use of Information and Communication Technology (ICT). The application of ICT in healthcare has been widely recognized for supporting patient-centered care, improving access to health information, enhancing the quality of services, and reducing costs associated with service delivery and frequent patient travel. In several countries, including India, Ukraine, and the United States, community healthcare systems are regarded as essential components of public health infrastructure, particularly for responding to health emergencies and managing disease burdens. Studies have noted that the demand for more cost-effective and efficient healthcare delivery systems has led to the adoption of modern technologies such as ICT in healthcare practice (Ibode & Olamigoke, 2020). ICT encompasses a broad range of technological tools and innovations that facilitate the creation, storage, processing, and sharing of information, and these tools have significantly transformed many sectors, including healthcare (Rouleau et al., 2021). In community health services, ICT applications such as telemedicine, video conferencing, artificial intelligence, and access to online databases enable health workers to obtain up-to-date information on diseases, improve clinical decision-making, and strengthen communication with patients and other professionals. Furthermore, ICT provides access to electronic journals, textbooks, and current research findings, thereby supporting continuous learning and evidence-based practice among healthcare providers.

In many rural and remote regions across continents such as Europe, Asia, and America, attention has increasingly focused on how healthcare providers can maximize available technological resources to improve service delivery and outcomes. Although factors such as improved remuneration and better living conditions have been widely discussed as determinants of health worker retention in rural areas, limited research has examined the role of ICT utilization in influencing retention and effectiveness among healthcare providers (Bhattacharya & Ramachandran, 2020; Woodward et al., 2021). Consequently, there is a growing interest in understanding how access to ICT infrastructure and digital health tools may support health workers, reduce professional isolation, and encourage continued service in underserved communities. ICT is generally defined as electronic tools and systems that

enable the processing, storage, and communication of information (Chetley et al., 2020). The adoption of such technologies has been suggested as a strategy to improve communication networks, strengthen professional support systems, and enhance the dissemination of health information among rural health workers.

Effective utilization of ICT resources by community health workers can facilitate access to relevant and timely health information that can be applied in practice and shared with community members seeking healthcare services (Ekpeyong, 2020). In primary healthcare facilities, health workers from diverse professional backgrounds perform specialized roles and often rely on digital communication platforms such as the internet, social media, and Short Message Service (SMS) to obtain information relevant to their daily responsibilities. Access to online resources through devices such as mobile phones, laptops, or computers enables health workers to stay informed about current health developments and public health strategies, although disparities in ICT competence and accessibility still exist among practitioners. The use of electronic communication tools has also been identified as a rapid and effective means of promoting health awareness among both healthcare providers and community members (Bellow, 2020). For instance, email platforms allow health workers to obtain reliable information, communicate with colleagues, and disseminate health education messages within their communities, particularly among registered users of such services (Aquinede, 2020). Similarly, SMS, radio, and television health programs remain valuable channels for sharing important health information and promoting community awareness on health issues.

The motivation for the present study emerged from the researcher's professional observations as a registered health educator, which indicated limited health awareness initiatives among community health workers, partly attributed to inadequate utilization of ICT during health education activities within the study area. Given the importance of ICT in enhancing health communication and service delivery, it became necessary to investigate the extent to which ICT utilization influences health awareness among community health workers in Akwa Ibom North-West Senatorial District, Nigeria, with the aim of providing evidence that could inform strategies for improving health information dissemination and community health outcomes.

STATEMENT OF THE PROBLEM

The necessity for utilization of Information and Communication Technology among community health workers for effective health awareness is to enlighten healthcare workers. This is to capture, access, and share patients' information promptly across geographical and

health sector boundaries using information and communication technologies. The availability and quality of information and communication technology services are growing rapidly across Africa with mobile network coverage raising from 16percent in the late 1990s to over 90percent of its population in 2021. Growth in this sector has led to increased investment, decreased costs and rapid growth in technology-enabled service (Shekar and Otto, 2021). The report gave an insight about the application of Information and Communication Technology in health sector. This further stated that the use of ICT as a matter of fact is fast becoming popular in the health sector for effective and efficient health delivery in developed and technologically advanced countries.

Matters concerning enlightenment of health workers in our country Nigeria, despite her endowment with both natural and human resources, unfortunately, her health indices are embarrassing. One of the reports of the World Health Organization (WHO) available also negates the past and present administration avowed commitment to the fundamental rights of Nigerians' access to quality health care as enshrined in 1999 constitution. Information and Communication Technology in health awareness is challenged with the problem of poor utilization of social media, internet, e-mail, Short Message Service and mass media for health awareness. Despite the role of ICT in enhancing the health sector by providing adequate and timely information, many health facilities in Akwa Ibom North West Senatorial District are yet to utilize it for enlightenment programmes, concerning public health education.

The researcher being a registered health educator observed with dismay, some inattentive attitude against complying with the utilization of information technology and health awareness among community health workers. The present study therefore becomes very obligatory, in that it seeks to fill the gap of health workers who vary in utilization of social media, internet, e-mail, Short Message Service and mass media on health awareness and how the situation can be remedied to enhance health awareness for a productive health delivery in Akwa Ibom North West Senatorial District, Nigeria.

PURPOSE OF THE STUDY

The study aims at investigating how social media, the internet, e-mail, Short Message Service, and mass media influence health awareness among community health workers in Akwa Ibom North-West Senatorial District, Nigeria which would provide lasting solution to the problems at stake.

The study seeks to:

- 1 Determine how utilization of social media by community health workers influence health awareness in Akwa Ibom North-West Senatorial District, Nigeria.
- 2 Determine how utilization of internet by community health workers influence health awareness in Akwa Ibom North-West Senatorial District, Nigeria.
- 3 Determine how utilization of e-mail by community health workers influence health awareness in Akwa Ibom North-West Senatorial District, Nigeria.

1.5 Research Questions

Three research questions were formulated to guide this study, thus:

- 1 How does the utilization of social media by community health workers influence health awareness in Akwa Ibom North-West Senatorial District, Nigeria?
- 2 How does the utilization of internet by community health workers influence health awareness in Akwa Ibom North-West Senatorial District, Nigeria?
- 3 How does the utilization of e-mail by community health workers influence health awareness in Akwa Ibom North-West Senatorial District, Nigeria?

1.6 Research Hypotheses

Three null hypotheses were formulated to guide this study, and were tested at .05 level of significance.

- 1 Utilization of social media by community health workers does not significantly influence health workers awareness in Akwa Ibom North-West Senatorial District, Nigeria.
- 2 Utilization of internet by community health workers does not significantly influence health workers awareness in Akwa Ibom North-West Senatorial District, Nigeria.
- 3 Utilization of e-mail by community health workers does not significantly influence health workers awareness in Akwa Ibom North-West Senatorial District, Nigeria.

Theoretical Framework

Maslow's Needs Theory by Abraham Maslow (1954)

Maslow's Hierarchy of Needs theory was propounded in 1954 by Abraham Maslow. This theory is relevant to the present study in that it helps people to be motivated, to achieve certain needs and that some needs take precedence over others. Maslow subsequently extended the idea to include his observations of humans' innate curiosity. Maslow's theory assumed that as wanting beings, people's need can influence their behavior. The needs of

individuals are arranged in a hierarchy from the most basic or survival needs to the most complex. People can only move further in their need hierarchy when the lower needs are at least minimally satisfied. This theory has direct practical application to patient/client care. Human beings live on reliable and dependable information to enhance effective survival within their environment. Any misleading information could place man in a state of confusion as well as frustration. There is need for man to be exposed to a variety of fact (needs) in order to make life conducive in an environment.

The five needs, which an individual would want to satisfy include: physiologic needs (needs for air, food, water, shelter, rest, sleep, elimination, and temperature maintenance are crucial for survival); Safety and security needs (need for protection, familiarity, trust, job security, etc.) and Love and belonging needs (need for affection, approval, acceptance, etc); self-esteem needs (need for independence, competence, self-respect, recognition, appreciation, freedom, prestige, status, etc.) and self-actualization needs (need for self-fulfilment, excellence, recognition, achievement, etc.). Human needs are unlimited, most of those needs can be provided from natural sources such as food, air and water which are indispensable. Man's needs comprise both natural and artificial materials. Some are visible whereas others that are not, such as information can be obtained through social media, internet resources, e-mail networking, Short Message Service and mass media.

A combination of a variety of resources within human environment is capable of providing social, mental, physical and psychological balance in man. As an implication of Maslow's theory, it is necessary to point out that man desires variety of needs in their hierarchy (order of preference) such as air, food, shelter, and clothing. Others include a second hierarchy, bathing regularly, personal maintenance and hygiene practices, emission of waste, maintenance of habitable dwelling environment such as provision of clean and hygienic toilet system, cutting of nails, trimming of the hair, protection of feet with shoes, as well as cleaning of the home. Man needs clean air, and lighting at home as well as comfortable shelter. Other desires and needs include good sleep or rest, body exercises and avoidance of stress and overwork. This theory is relevant to this study in that it will motivate the community health workers to use Information and Communication Technology for effective and efficient health delivery through efficient and timely awareness, and to be sure that their needs are met.

2.1.2 Orem's Self Care Theory (1971)

The Orem's Self-Care Deficit Theory was propounded in 1971 by Doratheia Orem. Dorothea Orem's Self-Care Deficit Theory is relevant to the present study in that it helps individuals focus on the ability to perform self-care through the available information on Information and Communication Technology. It is defined as the practice of activities that individuals initiate and perform on their own behalf in maintaining life, health and well-being. This theory is based on the philosophy that human beings are responsible and self-reliant persons capable of self-care. He defined self-care as the practice of activities that individuals initiate and perform on their own behalf in maintaining life, health and well-being. Community dwellers have personal duty to perform in order to attain good health and live long. It is one of the responsibilities of community dwellers to keep their personal body such as the mouth, the teeth, the nails and hair clean and good looking without waiting for medical personnel to force them to do so. Self-care theory is based on four concepts: self-care, self-care agency, self-care requisites and therapeutic self-care demand.

Self-care refers to those activities an individual performs independently throughout life to promote and maintain personal well-being. Self-care agency is the individual ability to perform self-care activities. The assumption is that one's well-being is directly proportional to the level of self-care activities that a person engages in. Failure to practice essential healthy habits could lead to diseases and death. Similarly, health workers are expected to educate rural dwellers on essential health information which were not known earlier. It is therefore the responsibility of such dwellers to exert their interest and put whatever health information exposed to them by health personnel into effective practices in order to allow them live healthy and live long. Such health information or tips rendered by community health personnel could be obtained from online information services such as social media, internet resources, e-mail network, Short Message Service and mass media. This theory is relevant to this study in that it will help community health workers to gather adequate information through the awareness from Information and Communication Technology thereby helping community dwellers to stay healthy and live long if total compliance is given.

METHODOLOGY

This study adopted an ex-post facto research design to examine the utilization of Information and Communication Technology (ICT) and health awareness among community health workers, as the variables under investigation had already occurred and could not be experimentally manipulated. The study was conducted in Akwa Ibom North West Senatorial

District, Nigeria, which comprises ten local government areas, 129 political wards, over 560 villages, and 174 primary healthcare facilities, with its headquarters located in Ikot Ekpene. The population consisted of all healthcare workers employed in the 174 primary healthcare facilities across the district, totaling 1,431 workers according to records from the State Health Service Commission (2023). A sample of 316 health workers was selected using a multi-stage sampling procedure: first, 50% of the local government areas (five LGAs) were selected; second, 40% of the healthcare facilities in each selected LGA were chosen; and third, a census approach was used to include all health workers in the selected facilities. Data were collected using a researcher-developed instrument titled “Utilization of Information and Communication Technology and Health Awareness Questionnaire (UICHTAQ),” consisting of two sections with 41 items measured on a four-point Likert scale. The instrument was face-validated by five experts from the Faculty of Education, University of Uyo, and reliability was established through inter-item correlation using Cronbach’s Alpha, which yielded a coefficient of 0.86 after a pilot test involving 30 health workers who were not part of the main sample. Data collection was carried out by the researcher and five trained research assistants after obtaining permission from relevant health authorities and facility heads, and all 316 distributed questionnaires were correctly completed and returned. Data were analyzed using mean and standard deviation to answer research questions and dependent t-test to test hypotheses at the 0.05 level of significance, while a weighted mean cut-off point of 2.50 was used for decision making regarding variable influence. Ethical considerations were observed through prior notification to facility heads, voluntary participation, assurance of confidentiality and anonymity, and the use of collected data strictly for academic purposes.

RESULTS

Answers to research questions and hypotheses testing are done in this section:

Research Question One

How does utilization of social media by community health workers influence health awareness in Akwa Ibom North – West Senatorial District, Nigeria?

Table 1: Summary of Descriptive Statistics on Utilization of Social Media by Community Health Workers influence on Health Awareness (n=316).

Variables	N	Mean	SD	Difference
Utilization of Social Media	316	3.26	1.34	0.72
Health Awareness	316	2.54	1.07	

Source: Researcher’s Fieldwork (2023)

The summary of the result presented in Table 1 indicates that the mean influence of utilization of social media is 3.26 and that of health awareness is 2.54. The mean difference between the two variables is 0.72. Hence, utilization of social media by community health workers has a mean influence of 3.26 on health awareness.

Research Question Two

How does utilization of the internet by community health workers influence health awareness in Akwa Ibom North – West Senatorial District, Nigeria?

Table 2: Summary of Descriptive Statistics on Utilization of Social Media by Community Health Workers influence on Health Awareness (n=316).

Variables	N	Mean	SD	Difference
Utilization of Internet	316	3.19	1.34	0.65
Health Awareness	316	2.54	1.07	

Source: Researcher's Fieldwork (2023)

The summary of the result presented in Table 2 indicates that the mean influence of utilization of the internet is 3.19 and that of health awareness is 2.54. The mean difference between the two variables is 0.65. Hence, utilization of internet by community health workers has a mean influence of 3.19 on health awareness.

Research Question Three

How does utilization of e-mail by community health workers influence health awareness in Akwa Ibom North – West Senatorial District, Nigeria?

Table 3: Summary of Descriptive Statistics on Utilization of E-Mail by Community Health Workers influence on Health Awareness (n=316).

Variables	N	Mean	SD	Difference
Utilization of E-Mail	316	3.28	1.54	0.74
Health Awareness	316	2.54	1.07	

Source: Researcher's Fieldwork (2023)

The summary of the result presented in Table 3 indicates that the mean influence of utilization of e-mail is 3.28 and that of health awareness is 2.54. The mean difference between the two variables is 0.74. Hence, utilization of e-mail by community health workers has a mean influence of 3.28 on health awareness.

Hypothesis One

Utilization of social media by community health workers does not significantly influence health workers' awareness in Akwa Ibom North-West Senatorial District, Nigeria.

Table 4: Dependent t-test Analysis on Utilization of Mass Media by Community Health Workers influence on Health Awareness (n=316).

Variables	N	Mean	SD	t-value	t-critical	df	Decision
Utilization of Social Media	316	3.26	1.34	2.48	1.96	315	Significant
Health Awareness	316	2.54	1.07				

* Significant at 0.05 alpha level

Source: Researcher's Fieldwork (2023)

Table 4 shows that the calculated t-value of 2.48 at 315 degree of freedom and 0.05 alpha level of significance is greater than the critical t-value of 1.96. The null hypothesis is therefore rejected. Hence, utilization of social media by community health workers significantly influence health workers awareness in Akwa Ibom North-West Senatorial District, Nigeria.

Hypothesis Two

Utilization of internet by community health workers does not significantly influence health workers awareness in Akwa Ibom North-West Senatorial District, Nigeria.

Table 5: Dependent t-test Analysis on Utilization of internet by Community Health Workers influence on Health Awareness (n=316).

Variables	N	Mean	SD	t-value	t-critical	df	Decision
Utilization of Internet	316	3.19	1.34	2.74	1.96	315	Significant
Health Awareness	316	2.54	1.07				

* Significant at 0.05 alpha level

Source: Researcher's Fieldwork (2023)

Table 5 shows that the calculated t-value of 2.74 at 315 degree of freedom and 0.05 alpha level of significance is greater than the critical t-value of 1.96. The null hypothesis is therefore rejected. Hence, utilization of internet by community health workers significantly influence health workers awareness in Akwa Ibom North-West Senatorial District, Nigeria.

Hypothesis Three

Utilization of e-mail by community health workers does not significantly influence health workers awareness in Akwa Ibom North-West Senatorial District, Nigeria.

Table 6: Dependent t-test Analysis on Utilization of E-mail by Community Health Workers influence on Health Awareness (n=316).

Variables	N	Mean	SD	t-value	t-critical	df	Decision
Utilization of E-Mail	316	3.28	1.54	3.35*	1.96	315	Significant
Health Awareness	316	2.54	1.07				

* Significant at 0.05 alpha level

Source: Researcher's Fieldwork (2023)

Table 6 shows that the calculated t-value of 3.35 at 315 degree of freedom and 0.05 alpha level of significance is greater than the critical t-value of 1.96. The null hypothesis is therefore rejected. Hence, utilization of e-mail by community health workers significantly influence health workers awareness in Akwa Ibom North-West Senatorial District, Nigeria.

DISCUSSION OF FINDINGS

The findings of this study are discussed in this section. The discussion is organized under sub-headings that correspond to the major variables in the research questions and hypotheses of the study.

Utilization of Social Media by Community Health Workers and Influence on Health Awareness

The result of the first hypothesis revealed that the utilization of social media by community health workers significantly influences health awareness in Akwa Ibom North-West Senatorial District, Nigeria. This indicates that the use of social media platforms plays a positive role in enhancing health awareness among health workers. The observed influence may be attributed to the interactive and information-sharing nature of social media, which allows diverse health-related information to be disseminated and accessed across different locations. When community health workers actively engage with these platforms, they are more likely to obtain relevant and up-to-date information that can improve their professional knowledge and practice. Furthermore, social media platforms provide opportunities for health professionals and experts to share important health information that other health workers can access, exchange, and apply in addressing various health-related challenges. Information on healthy lifestyles, nutrition, disease prevention, and other public health issues is often circulated through these platforms, thereby supporting both health workers and community members in adopting better health practices. The findings of this study are consistent with the observation by Harerimana and Mtshali (2020), who noted that social media serves as an

important medium for disseminating health information and enhancing health awareness among healthcare workers.

Utilization of Internet by Community Health Workers and Influence on Health Awareness

The result of the second hypothesis revealed that the utilization of the internet by community health workers significantly influences health awareness in Akwa Ibom North-West Senatorial District, Nigeria. This indicates that effective use of internet resources enhances the level of health awareness among health workers. The influence may be attributed to the ability of the internet to provide access to a wide range of health-related information, enabling community health workers to remain informed about current health issues, preventive measures, and best practices in healthcare delivery. The internet also offers round-the-clock access to information services with relatively high levels of security and confidentiality. Furthermore, internet use benefits both health workers and patients by providing relevant information that supports healthy living and informed health decisions. In view of this, there is a need to ensure a consistent and reliable information network across different areas to facilitate easy access to internet services. The findings of this study are consistent with the observation made by Charterjee and Charkraborty (2021), who reported that internet utilization among community health workers significantly enhances health awareness in their study on internet usage and health awareness in Maidito Province, Kenya.

Utilization of E-mail by Community Health Workers and Influence on Health Awareness.

The result of the third hypothesis revealed that utilization of e-mail by community health workers significantly influences health workers' awareness in Akwa Ibom North-West Senatorial District, Nigeria. This means that the use of e-mails by health workers influences health awareness. This influence is possible because health awareness would be made known to the community dwellers when health workers optimally utilized e-mail health information and put such to practice. Information through e-mail will enable health workers to have information that is specific enough to enhance health awareness. On the other hand, the use of e-mail based health promotion awareness strategy would look very strange and unproductive in the rural communities, on this note, it is important for its benefit to be made known to the people to enhance its usage for health awareness. The findings of the study are

in agreement with the statement made by Britnell (2021) that e-mail should be used to enhance peoples' health awareness.

CONCLUSION

This study examined the utilization of Information and Communication Technology (ICT) and its influence on health awareness among community health workers in Akwa Ibom North-West Senatorial District, Nigeria. The findings revealed that ICT tools such as social media, internet services, and e-mail significantly influence the level of health awareness among community health workers. The statistical results indicated that the utilization of these digital platforms contributes positively to accessing health information, improving professional knowledge, and enhancing communication regarding health issues within communities.

The study therefore concludes that ICT has become an essential component in promoting health awareness and improving health education practices among community health workers. Increased utilization of digital communication tools enables health workers to obtain timely information, disseminate health messages effectively, and support better healthcare delivery, especially in rural and semi-urban communities. Consequently, strengthening ICT usage among community health workers can significantly improve public health awareness and contribute to better health outcomes in the study area and similar settings.

RECOMMENDATIONS

Based on the findings of the study, the following recommendations are made:

- 1 Government and health authorities should provide adequate ICT infrastructure such as reliable internet connectivity, computers, and mobile devices in primary healthcare facilities to enhance the effective utilization of digital tools by community health workers.
- 2 Capacity-building programmes should be organized regularly to train community health workers on the effective use of ICT platforms, including social media, internet resources, and e-mail for health education and information dissemination.
- 3 Health institutions and policymakers should integrate ICT-based communication strategies into public health awareness programmes to improve access to accurate and timely health information.

- 4 Professional development initiatives should encourage health workers to utilize online databases, digital health platforms, and virtual learning environments to remain updated on emerging health issues and best practices.
- 5 Collaboration between government agencies and telecommunication providers should be strengthened to improve digital access and affordability of internet services in rural and underserved communities.
- 6 Community sensitization programmes should be implemented to promote acceptance and use of ICT-based health information among community members.

SUGGESTIONS FOR FURTHER STUDIES

Future research may consider the following areas:

- 1 Conducting similar studies in other senatorial districts or states in Nigeria to compare findings.
- 2 Investigating the impact of advanced digital health technologies such as telemedicine and mobile health applications on healthcare delivery.
- 3 Examining the barriers to ICT adoption among community health workers in rural healthcare facilities.
- 4 Exploring the relationship between ICT utilization and patient health outcomes.

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