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AVAILABILITY AND UTILIZATION OF E-HEALTH AMONG PRIMARY HEALTH CARE WORKERS IN AWKA SOUTH, ANAMBRA STATE

[1]Onwurah, Chrysantus Chinyere; [2]Appah Princess Ifeyinwa; [3]Alozie, Isaiah Onyekachi; [4]Ikegulu Joy Ukanne & [5]Barnaby Jude

[1234]Department of Health Promotion and Public Health Education
Nnamdi Azikiwe University, Awka, Anambra State
[5]Department of Architecture
Nnamdi Azikiwe University, Awka, Anambra State
Corresponding Author
Onwurah, Chrysantus Chinyere;
cc.onwurah@unizik.edu.ng; +2348060375755

ABSTRACT

E-Health is the use of information and communication technology to support health and healthcare. The study determined the availability and utilization of E-Health in primary healthcare worker in Awka South, Anambra State. Four research questions guided the study. The cross-sectional survey research design was used for the study. The Multistage sampling technique was used to draw a sample of 108 out of 245 primary healthcare workers. The instrument for data collection was a researchers' designed questionnaire titled "Availability and Utilization of E-Health in Primary healthcare worker (AUEPHC)". The data collected were analyzed using frequency and percentages for research questions (1-4). The findings of the study revealed that E-Health devices available to the primary health workers were Computer, Mobile phone, Printer/scanner, E-mail, Electronic Health Record, Microsoft /Excel and Flash drives. Moreover, the study revealed that E-Health services utilized by primary health workers include: browsing the internet for health research, calling a patient on the telephone to make an appointment, assessing new disease management information online, monitoring patients using electronic health records, texting a patient, browsing the internet for self-health education, using Microsoft packages to type patients' information. Based on the findings, the researcher concluded that that there are factors that militate against the utilization of E-Health in primary healthcare workers in Awka South, Anambra State. These include: Lack of electricity, poor internet connection, Low technical expertise, Insecurity/ Patients' Confidentiality, Unavailability of ICT facility, obsolete (out of date) equipment, lack of proper software packages for work, nonchalant attitude of Primary Health workers and poor funding. The researcher recommends that digitalized E-Health devices and services should be made available to the primary health care workers for better health care delivery and Government should made internet services, electricity or Solar System available for the primary Health care Workers.

Keywords: E-Health, Health Care workers, Primary Health Care, ICT, Utilisation

Introduction

Primary health care (PHC) "is a whole-of-society approach to health that aims at ensuring the highest possible level of health and well-being and their equitable distribution by focusing on people's needs and as early as possible along the continuum from health promotion and disease prevention to treatment, rehabilitation and palliative care, and as close as feasible to people's everyday environment", World Health Organization (WHO) (2023). It was first recognized globally in 1978 as a veritable tool for achieving health for all peoples of the world and for addressing the main health problems in the community by providing promotive, preventive, curative and rehabilitative services to the populace (WHO 1978). It represents the first contact of individuals; families and the community make with the national health system in the health care spectrum. In 2008, WHO not only re-emphasized the importance of PHC as the benchmark for providing comprehensive health services globally and nationally in a safe, effective and socially productive manner but also echoed the need to adopt a people-oriented approach (WHO, 2008).

Health care may be construed as a right or as a commodity. On a rights perspective, society has on obligation to plan for and provide health care on an equitable basis to all its members; on a commodity perspective, access to health care is a matter of purchase power. Likewise, health care may be delivered on a directly interactive basis or in a mediated fashion using modern information technology known as electronic health (E-health). E-Health is the delivery of health care using modern electronic information and communication technologies when health care providers and patients are not directly in contact and their interaction is mediated by electronic means. Among other things, the services that are thus provided include physical and psychological diagnosis and treatment, telepathology, vital signs monitoring, electronic prescribing, teleconsultation, etc (Eike-Henner W. Kluge,2020). Also, according to Oloks, Yagos and Ovuga (2015), E-Health is the use of information and communication technologies (ICT) in the support of health in order to improve the efficiency and effectiveness of health care management delivery.

This approach to health care is increasingly being employed in geographically extended areas where the availability of health care is severely reduced or even non-existent, and when appropriately qualified medical personnel are available only in a centralized location. Çöme and Mevsim (2023), described various E-Health applications utilized in primary healthcare worldwide, with some countries using them extensively, while others use them sparingly. The range of E-Health applications utilized in primary healthcare is continually expanding and includes disease coding systems, clinical decision support systems, e-prescription, e-dispatch, digital imaging, disease monitoring software, remote measurement devices, and smart wearable technologies.

According to Owoeye, Nwaogwugwu and Ehinze (2022), E-Health has revolutionized the practice of medicine via three distinct functions; the use of E Technologies to study health parameters, and the use of E-Health to facilitate communications between all health care participants and data utilization including referrals and medical data sources to inform medical decision making and intervention

development. Neto and Flynn (2018) stated that E-Health has a broad areas of services such as electronic health records to ensure continuity of patient care across time, mobile health (m-Health) services, tele-Health, health research, consumer health informatics to support individuals in health decision making, eLearning by health workers Computerized physician order entry, E-Prescribing, Clinical decision support system, Telemedicine, Health knowledge management, Virtual health care teams, Medical research using grids, Health informatics/health care information systems. Graham et al (2011) stated in their study that, the wide areas of E-Health have enabled public health and medical practitioners to communicate with patients in both traditional and novel ways to address health concerns such as diabetes management, heart health, cancer prevention, smoking cessation, health promotion activities among others.

Communication between primary healthcare workers and patients can be achieved using some online strategies including adaptations of more traditional communication methods such as the delivery of tailored information and the creation of support networks, such as the implementation of Smartphone applications for disease prevention and management. These strategies have been identified to improve health care by strengthening the health system, supporting delivery of care, and improving communication without necessarily face-to-face contact among health care providers with patients. According to Fabienne, Sturm, Bouw, and Wouters(2019), Studies have observed that the use of E-Health care delivery is growing and has recorded a huge success in health care systems in developed countries. However, in a study conducted by Aleke et al (2020), it was shown that implementation of E-Health services have achieved little success with low utilization and availability in developing countries including Nigeria. Studies in developing countries have highlighted that factors such as lack of knowledge about ICT; unreliable ICT equipment; lack of availability of ICT equipment, high cost of ICT; low level of skills of potential users; technology compatibility; and limited access to ICT as challenges hindering E-Health use (United Nation Foundation, 2014). According to Woodward et al (2014), so many Studies also further highlighted lack of ICT infrastructure, access, skills and reluctance to use E-Health in healthcare services have been reported also as challenges in the use of ICT in health care delivery. It has been observed that the success of any new technology depends on many factors including the knowledge and understanding of the concept, skills, working environment and the effective utilization of the technology in health care delivery by the health care professionals. (Wickramasinghe and Schaffer, 2010).

Statement of the Problem

The application of Information Communication Technology (ICT) in healthcare is increasing rapidly in most developed and developing countries due to its various benefits such as, its enablement to timely access to health information like administrative and patients' records, diagnosis and treatment profile records and patients' health reports. In addition, the use of ICT enables health workers to easily capture, store, retrieve, analyze and transmit

large volumes of health information within and across care delivery points. E-Health has been found to be more cost-effective in promoting health education, self-management support and tele-monitoring in several domains of healthcare. Health workers are key stakeholders in the design, implementation and usage of E-Health. Thus, sustainability of E-Health in the health care is linked to its availability and the continuous utilization by the primary health care workers.

Given the economic situation of Nigeria, it is therefore not known if E-Health is made available to primary health care workers in Awka South, Anambra State and if they utilize it adequately. The researcher therefore wants to determine the availability and utilization of E-Health in primary health care workers in Awka South, Anambra State.

Purpose of the study

The main purpose of this study is to determine the availability and utilization of E-Health in primary healthcare worker in Awka South, Anambra State. Specifically, the study determined:

1. The types of the E-Health services available for primary health care workers in Awka South, Anambra State.
2. The type of E-Health services utilized by the primary health care workers in Awka South, Anambra State.
3. The factors that militate against the availability of E-Health in primary healthcare worker in Awka South, Anambra State.
4. The factors that militate against the utilization of E-Health in primary healthcare worker in Awka South, Anambra State.

Research Questions

The following research questions guided;

1. What types of E-Health services are available for primary health care workers in Awka South, Anambra State?
2. What type of E-Health services are being utilized by the primary health care workers in Awka South, Anambra State?
3. What are the factors militating against the availability of E-Health in primary healthcare worker in Awka South, Anambra State?
4. What are the factors militating against the utilization of E-Health in primary healthcare worker in Awka South, Anambra State?

Research Method

The Study employed Cross sectional survey design, the study was carried out in Awka South L.G.A, Anambra State. Awka South L.G.A is made up of nine (9) towns, namely, Amawbia; Awka; Ezinato; Isiagu; Mbaukwu; Nibo; Nise; Okpuno and Umuawulu. The population for this study consisted of 245 primary health care workers working at primary health centres in Awka south L.G.A. They include Nurses (midwives), Senior Community Health Extension Workers (CHEWs) and Junior CHEWs. The sample size for the study consisted of 108 primary health care workers in Awka south L.G.A. Multistage sampling was used to select the sample for the study. The instrument for data collection was researcher's designed questionnaire on Availability and Utilization

of E-Health in Primary healthcare worker (AUEPHC). The face and content validity of the research instrument was established by the judgment of three experts. The data was analysed using frequencies and percentages.

Presentation of Results

Research Question One: What types of E-Health devices are available for primary health care workers in Awka South, Anambra State?

Table 1: Frequencies and percentages on the types of E-Health devices are available for primary health care workers in Awka South, Anambra State.

	Yes	No
Available E-Health	Freq. (%)	Freq. (%)
Computer	81(75.0)	27(25.0)
Tel E-Health	50(46.3)	58(53.7)
Mobile phone	108(100.0)	0(0.0)
Internet	42(38.8)	66(61.1)
Social media platforms	24(22.2)	84(77.8)
Printer/Scanner	81(75.0)	27(25.0)
Email	69(63.8)	39(36.1)
E- book/journals	0(0.0)	108(100.0)
Electronic Health Records (EHRs)	81(75.0)	27(25.0)
M- health	0(0.0)	108(100.0)
Computerized sensor	0(0.0)	108(100.0)
Microsoft office/excel	81(75.0)	27(25.0)
Flash drives	72(66.6)	36(33.3)
CD/DVD ROMs	39(36.1)	69(63.8)

Results presented in Table 1 shows that out of the fourteen (14) E-Health devices, 7 were identified by over 50% of HCW to be available in the primary health centers. These included: Computer endorsed by 75% of the respondents, Mobile phone (100%), Printer/scanner (75%), E-mail (63.9%), Electronic Health Record (75%), Microsoft /excel (75%) and Flash drives (72%).

Research Question 2: What type of E-Health services are being utilized by the primary health care workers in Awka South, Anambra State?

Table 2: Frequencies and percentages on the types of E-Health services being utilized by primary health care workers in Awka South, Anambra State.

	Yes	No
E-Health utilized	Freq. (%)	Freq. (%)
Have you ever used electronic health services?	72(66.6)	36(33.3)
Do you browse the internet for health research?	70(64.8)	38(35.2)
Do you call a patient with telephone to give an appointment?	81(75.0)	27(25.0)

Do you assess new disease management information online?	68(63.0)	40(37.0)
Do you monitor patients using electronic health records?	58(53.7)	50(46.3)
Do you text a patient?	78(72.2)	30(27.8)
Do you email a patient?	36(33.3)	72(66.7)
Do you browse the internet for self-health education?	70(64.8)	38(35.2)
Do you make use of the e-Library in your facility?	0(0.0)	108 (100.0)
Do you conduct health education using social media platforms?	20(18.5)	88(81.5)
Do you use telE-Health to monitor patients' vital signs?	0(0.0)	108 (100.0)
Do you use Microsoft packages to type patients' information?	76(70.4)	32(29.6)
Do you use projector device to health educate patients?	0(0.0)	108(100.0)

Result presented in Table 2 shows that out of the thirteen (13) E-Health services listed, 8 services were identified to be utilized by over 50% of the respondents. These included: 66.6% of the respondents have used electronic health services, 64.8% have browsed the internet for health research, 75% call a patient with telephone to give an appointment, 63% assess new disease management information online, 53.7% monitor patients using electronic health records, 72.2% do text a patient, 64.8% browse the internet for self-health education, 70.4% use Microsoft packages to type patients' information.

Research Question 3: What are the factors militating against the availability of E-Health in primary healthcare worker in Awka South, Anambra State?

Table 3: Frequencies and percentages on the factors militating against the availability of E-Health in primary health care workers in Awka South, Anambra State.

	Yes	No
Factors	Freq. (%)	Freq. (%)
Lack of government support and funding	96(88.9)	12(11.1)
Low ICT education	39(36.1)	69(63.9)
Lack of public/ private partnership/NGOs	58(53.7)	50(46.3)
No free internet services within the facility	42(38.9)	66(61.1)
Poor infrastructure.	108(100.0)	0(0.0)
Poor organizational and management policies.	100(92.6)	08(7.4)
Lack of recognized standards for E-Health applications.	81(75.0)	27(25.0)
Resistance by healthcare workers	0(0.0)	108(100.0)

The result shows that out of eight (8) factors, five (5) were identified by over 50% of the respondents as factors militating against the availability of E-Health in primary healthcare worker in Awka South, Anambra State. These includes: Lack of government support and funding (88.9%), Lack of private/public partnership/NGOs (53.7%), Poor infrastructure (100%), Poor organization and management policies (92.6%), Lack of recognized standards for E-Health applications (75%).

Research Question 4: What are the factors militating against the utilization of E-Health in primary healthcare worker in Awka South, Anambra State?

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Table 4: Frequencies and percentages on the factors militating against the utilization of E-Health in primary health care workers in Awka South, Anambra State**.**

Factors	Yes Freq.%	No Freq.%
Lack of electricity.	96(88.9)	12(11.1)
Low participation from community member.	36(33.3)	72(66.7)
Poor internet connection.	84(77.8)	24(22.2)
Low technical expertise	78(72.2)	30(27.8)
Laziness	0(0.0)	108(100.0)
Insecurity/ patients' confidentiality.	66(61.1)	42(38.8)
Unavailability of ICT facility.	108(100.0)	0(0.0)
Obsolete (out of date) equipment.	89(82.4)	19(17.6)
Inadequate manpower	42(38.9)	66(61.1)
Poor funding	72(66.7)	36(33.3)
Lack of electronic health policy	30(27.8)	78(72.2)

The result shows that out of eleven (11) factors, seven (7) were identified by over 50% of the respondents as factors militating against the utilization of E-Health in primary healthcare worker in Awka South, Anambra State. These include: Lack of electricity (88.9%), Poor internet connection (77.8%), Low technical expertise (72.2%), Insecurity/ patients' confidentiality (61.1%), Unavailability of ICT facility (100%), obsolete (out of date) equipment (82.4%) and Poor funding (66.7%).

Discussion of the findings

Findings from the study showed that E-Health devices available to the primary health workers were Computer, Mobile phone, Printer/scanner, E-mail, Electronic Health Record, Microsoft /Excel and Flash drives. This finding is in line with Nukunu et al (2015) whose finding suggested that good resources for E-Health service delivery were available with association wards.

Findings from the study also showed that E-Health services utilized by primary health workers include: browsing the internet for health research, calling a patient with telephone to give an appointment, assessing new disease management information online, monitoring patients using electronic health records, texting a patient, browsing the internet for self-health education, using Microsoft packages to type patients' information. This in line with the study by Owoeye, Nwaogwugwu and Ehinze (2022), whose findings identified E- health services used by primary health care workers include: browsing the internet for health research, calling a patient with telephone to give appointments, access to new disease management information, monitoring patients' drug compliance, E-mailing a patient etc. This is also in line with Schwebel and Larimer (2018) who found out in their study that nearly all the SMS- reminder studies helped improve patient medical compliance and appointment reminders.

Findings from this study also showed that there are factors that militate against the availability of E-Health in primary healthcare worker in Awka South, Anambra State. These includes: Lack of government support

and funding, Lack of private/public partnership/NGOs, poor infrastructure, poor organization and management policies, Lack of recognized standards for E-Health applications.

Findings from this study also showed that there are factors that militate against the utilization of E-Health in primary healthcare worker in Awka South, Anambra State. These include: Lack of electricity, poor internet connection, Low technical expertise, Insecurity/ patients' confidentiality, Unavailability of ICT facility, obsolete (out of date) equipment, and poor funding. This is in line with the study by Famuyiwa (2019) which shows that all the hypotheses were rejected which indicate that factors such as: Shortage of Resources, Inadequate Manpower, Inadequate power supply, Poor Internet Network, Lack of Electronic Health Policy, and Poor Mastery of Electronic Health affect the adoption and utilization of electronic health among Health workers of University College Hospital, Ibadan.

Summary of Findings

The findings of the study were summarized as follows:

1. E-Health devices available to the primary health workers were Computer, Mobile phone, Printer/scanner, E-mail, Electronic Health Record, Microsoft /excel and Flash drives.
2. E-Health services utilized by primary health workers include: browsing the internet for health research, calling a patient with telephone to give an appointment, assessing new disease management information online, monitoring patients using electronic health records, texting a patient, browsing the internet for self-health education, using Microsoft packages to type patients' information.
3. Factors that militate against the availability of E-Health among primary healthcare worker in Awka South, Anambra State. These includes: Lack of government support and funding, Lack of private/public partnership/NGOs, poor infrastructure, poor organization and management policies, Lack of recognised standards for E-Health applications.
4. Factors that militate against the utilization of E-Health among primary healthcare worker in Awka South, Anambra State. These include: Lack of electricity, poor internet connection, Low technical expertise, Insecurity/ patients' confidentiality, Unavailability of ICT facility, obsolete (out of date) equipment, and poor funding.

Conclusion

Based on the findings of the study, it was concluded that the E-Health devices available to primary health workers were mainly analogue Computer, Mobile phone, Printer/scanner, E-mail, Electronic Health Record, Microsoft /excel and Flash drives.

It was also concluded that most primary health workers utilize some E-Health services while others do not utilize them. And among the factors that inhibits utilization are Lack of government support and funding, Lack of private/public partnership/NGOs, poor infrastructure, poor organization and management policies, Lack of recognised

standards for E-Health applications militates against the availability of E-Health in primary healthcare. Also, factors like Lack of electricity, poor internet connection, Low technical expertise, Insecurity/ patients' confidentiality, Unavailability of ICT facility, obsolete (out of date) equipment, and poor funding were found to militate against utilization of E-Health among primary healthcare worker in Awka South, Anambra State.

Recommendations

Based on the findings and conclusions of the study, the following recommendations were drawn:

1. Digitalized E-Health devices and services should be made available to the primary health care workers for better health care delivery.
2. Nigerian government at all level, through their various ministries of health should organize intensive ICT training and retraining of health workers regarding E-Health use in health care delivery.
3. Primary healthcare workers should be encouraged to utilize E-Health services available to them.
4. Factors that militate against the availability and utilization of E-Health among primary healthcare worker in Awka South, Anambra State should be looked into by the government and management.
5. Government should make Electronic Health Policies.
6. Health Management should make strict rules about confidentiality among healthcare worker in order to gain patients' trust.
7. Government should made internet services, electricity or Solar System available for the primary Health care Workers.

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