Utilization of Information and Communication Technology (ICT) in Prevention and Early Detection of Fatal Diseases among Female Staff in Tertiary Institutions in Osun State.

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Abstract
The study assessed the level of utilization of Information and Communication Technology (ICT) in early detection and prevention of medical condition of fatal consequences among female staff in Tertiary Institutions in Osun State, Nigeria. The study adopted a descriptive research design. Simple random sampling was used in selection of Four (4) Tertiary institutions, five (5) Faculties and Five (5) departments from each institution. A total number of six hundred (600) respondents were selected through a systematic random sampling, using departmental list. Data were collected through a validated self-designed instrument with a reliability Co-efficient of 0.79 obtained using a split-halve reliability procedure using Croabach Co-efficient alpha method and significant at 0.05 level. The questionnaire was made up of two sections. Section A dealt with respondent's personal information while section B consisted of information on utilization of ICT by the respondents. Findings revealed that availability of numerous health related information on the internet helped greatly in the early detection and prevention of many medical condition of fatal consequences among the respondents. Based on the findings, therefore, it was recommended that women generally should be exposed and encouraged to utilize the available current and correct health information to stay healthy all through their lives.

Key words: Information, Communication, Technology, utilization, fatal disease, signs and
symptoms, Health care

Introduction

Osun State is located at the South-Western part of Nigeria with the population of 4,435,800, 8,521km by 520.6km square Area and 1.6% Annual population change. Women, whose medical vibrant condition is highly required for political, economic, socio-cultural and educational sustainability of the State are considerably significant in this teeming population. (Osun State Population Statistics,2022).

Globally, the annual number of new cases of cancer is expected to increase to 70% by 2030 as a result of demographic changes alone. National Institute of Health (2024) affirmed that Breast Cancers made up of larger population of all cancers in developing countries where more than 50% of deaths resulting from breast cancer and 88% resulting from cervical cancer.

Nine of Ten cervical cancer deaths occur in less developed regions which are roughly 445,000 cases and 230,000 deaths annually. Breast cancer is the most frequent cause of death in less developed regions accounting for 324,000 deaths of the 883 cases. Overburdened health systems, gender discrimination, stigma and uneven access to care for women in developing countries create an equity issue.

Information and Communication Technology (ICT) according to Louis & Hololek (2025) are tools that facilitate communication processing transmits and sharing of knowledge and information through electronic means and can be used to gather, store, access, analyze, manipulate and disseminate a diverse set of information electronically via communication formats and platforms.

In case of screening and early detection, Sam (2025) affirmed that factors such as awareness of signs and symptoms, screening test performance, triage, care linkages, cost and coverage, specialists, diagnostics and treatment availability and quality as well as stigma can influence impact. Information and Communication Technology (ICT)

have the potential to influence these factors by helping to address female concerns and enhance the scalability and effectiveness of preventive programs.

Early disease detection is the identification of disease before they cause symptoms or complications while prevention is the actions taken to reduce the risk of developing diseases or to stop them from progressing. Technology plays significant roles in early detection and prevention. Jessica, M.D, Sricha Ran, G., Preet, K.D & Suneeta Krishnan (2016) ident ified reduced downstream treatment **costs**; lowering hospitalization rates and pressure on hospitals; prescription of right treatment, and avoiding unnecessary intervention; improving of quality of life and survival rates; initiating early treatment; minimized the progression of both Communicable and non-communicable diseases; and reversal of many disease like Diabetes, Cancer, obesity and Heart diseases with the use of Digital Portable Devices as some of the benefits of ICT.

A study conducted by Jessica, et al (2016) on information and communication technology (ICT) applications in the prevention of breast and Cervical Cancers in Low and Middle Income Countries to examine their potential to help in Cancer prevention efforts. Their findings revealed that ICT telemedicine has potentials to address both demand and supply side challenges to Cancer prevention, such as awareness, access, and Cost in Low-and-Middle Income Countries.

National Institute of health (2024) expressed that Technology can help in the collection, storage and analysis of large amounts of health-related data through electronic health records, genomic data, wearable devices, environmental sensors and social media. These data can be used to identify pattern, trends, risks and opportunities for early detection and prevention of diseases.

Louis & Hololek (2025) equally affirmed that Technology can also create new devices and methods for early detection and prevention. At ones convenience, Mobile phone can be used for connection, networking, education and monitoring of health conditions by sending reminders, alerts or feedback. Drones can be used to identify breeding places of disease vectors like mosquitoes. Full genome sequencing can provide information about a person's genetic makeup and predisposition to diseases.

Many lives according to Prochaska,Coughlin, Elizebeth & Lyons (2017), Radriques (2021), Hunter (2022) have been affected by cancer while great potential are imbedded in well-being through being correctly informed about lifestyle changes health care system, advocacy groups have digital solutions to enhance broaden detection and prevention efforts. Thousands of health- oriented mobile websites and apps have been developed with a majority focused upon lifestyle behaviours (e.g. exercise, diet and smoking).

Social media and m- health technologies according to Science Direct (2023) offer the ability to scale and engage entire populations at low cost, develop supportive social networks, connect patients and providers, encourage adherence with cancer care. Effective utilization of the available information and communication technology such as access to information, health care providers and specialist's quality care, and cost of services, especially in rural or resource- limited settings will go a long way in overcoming barriers to cancer and other diseases early detection and prevention.

Center for Disease Control and Prevention (2022), Hunter (2022) Science Direct (2023), reported that new cases of cancer in the United States number nearly 1.7million annually. With earlier detection and improved treatment, the 5- year cancer survival rate increased from 49% during 1975-1977 to 69% during 2005 to 2011. Tobacco use alone is estimated to cause 29% of all cancer death and more than one in five cancer

diagnosis are related to life-style factors of obesity, physical inactivity, alcohol consumption, dietary factors, sexual health and sun exposure.

Vaccinations and regular cancer screening according to Hunter (2022) are important for cancer prevention, early detection and intervention. Google's Artificial Intelligence Technology are used in learning complex features in mammograms that are likely to represent signs of cancer The system may spot signs of cancer that some specialists might not be able to see.

Lackland (2017), Jenifer (2020), National Institute of Health (2020) expressed that in early detection of hypertension people with very high blood pressure can experience severe headache, chest pain, dizziness, difficult breathing, nausea, vomiting blurred vision or other vision changes and anxiety. High blood pressure usually develops over time. National Institute of Health (2020), Krist (2021), Radrigues (2021), Dhunesana (2022),CNU (2023), Gulec (2023) identified unhealthy life-style choices such as lack of regular exercise, certain health conditions such as diabetes and obesity as predisposing factors to having high risk blood pressure.

Asthma has been identified as one of the diseases of fatal consequence if left unattended to. Centre for Disease Control and Prevention (2022) expressed that asthma often develop in children before five years of age and that asthma is not a disease that can be self-diagnosed. Being familiar with the most common symptoms such as wheezing, shortness of breath can alert for the possibility of having Asthma.

News-Medical (2022), explained that Asthma could be detected at home by the use of a stethoscope to listen to breathing. Wheezing- high pitched whistling sounds when breathing out is one of the main sign of Asthma and examining the skin for signs of allergic conditions such as eczema and hives. Dhunesana (2022), identified shortness of breath, chest tightness or pain, wheezing when exhaling, trouble sleeping caused by

shortness of breath, coughing attacks that are worsened by a respiratory virus, such as a cold or the flu.

National Institute of health (2024) affirmed that delayed identification of childhood Asthma results in an increased risk of long-term complications. Mizdrak (2022), Louis & Hololek (2025), reported that early diagnosis of Asthma is crucial to prevent the condition from worsening and causing more severe symptoms.

Chronic kidney disease is another medical condition with fatal consequence. News-Medical (2022) noted that simple blood and urine test is the only way through which chronic kidney disease could be detected. The blood test checks for the level of creatinine, a waste product produced by muscles to see how well the kidneys work. Undiagnosed Type 2 diabetes has become a common condition affecting more than 16million adults in the US, comprising one-third of all the cases of the disease.

The screening for detection is an important endeavour. Excessive thirst or urination, more hunger, Hyperglycemia, Numb or tingling feet, fatigue, weight loss or blurred vision are identified as some of the signs and symptoms of diabetes mellitus (Cleveland Clinic 2023). Sudden confusion, trouble speaking or difficulty understanding speech, sudden trouble seeing in one or both eyes, sudden trouble walking, dizziness, loss of balance or lack of coordination are identified by Centre for Disease Control and Prevention (2022), as the warning signs and symptoms of stroke.

Important steps to lower the risk of stroke itemized by National Institute of Health (2021), Gulec (2023), Cleveland Clinic (2023) such as keeping normal blood pressure, normal cholesterol level, normal blood sugar, no smoking, stay at a healthy weight and get active. People can have access to these valuable information through\ ICT.

HIV/AIDS is equally in the catalog of medical conditions that should be taken seriously. In the early stages, National Institute of Health (2020), Medical News Today

(2022) noted that symptoms may include: fever, fatigue, swollen lymph nodes or ulcer. Some symptoms, however, may resemble those of common illnesses such as flu. One must go through a rapid antigen/antibody test done with blood from a finger stick for early detection of HIV 18 to 19 days after exposure.

Statement of Problem

Many lives have been affected by cancer and other diseases while great potentials are imbedded in well-being through being correctly informed through ICT about lifestyle changes health care system, advocacy groups have digital solutions to enhance broaden early detection and prevention efforts. Thousands of health- oriented mobile websites and apps have been developed with a majority focused upon lifestyle behaviours.

Social media and m- health technologies offer the ability to scale and engage entire populations at low cost, develop supportive social networks, connect patients and providers, encourage adherence with cancer care. Effective utilization of the available information and communication technology such as access to information, health care providers and specialist's quality care, and cost of services, especially in rural or resource- limited settings are ways to overcoming barriers to disease early detection and prevention. The main focus of this study, therefore, was to examine the extent to which these ICT potentials have been explored in early detection and prevention of diseases of fatal consequences among Female staff in the Tertiary Institutions in Osun State.

Purpose of the Study.

The main purpose of the study was to examine the extent to which Information and Communication Technology potentials have been explored in early detection and prevention of diseases of fatal consequences among Female staff in the Tertiary Institutions in Osun State.

Research Question.

Is Information and Communication Technology (ICT) utilized for early detection and prevention of fatal diseases among female staff in Tertiary Institutions in Osun State?

Hypothesis

There is no significant relationship between availability of Information and Communication Technology (ICT) and the prevention/early detection of fatal diseases among female staff in Tertiary Institutions in Osun State, Nigeria.

Methodology

A descriptive research design was adopted for the study with the population composed of female staff in tertiary institutions in Osun State, Nigeria. Simple random sampling technique by balloting was used in the selection of four (4) Tertiary institutions, five (5) Faculties in each institution and five (5) Departments in each faculty. Systematic random sampling technique using departmental staff list was used in selecting the respondents. Through this process, a total number of six hundred (600) respondents were used for the study.

Data were collected through a validated self-designed instrument with a reliability Co-efficient of 0.79 obtained using a split-halve reliability procedure employing Croabach Co-efficient method and significant at 0.05 level. The questionnaire was made up of two sections. Section A dealt with respondent's personal information while section B consisted of structured items on utilization of ICT by the respondents in preventing and detecting medical conditions with fatal consequences. The instrument was administered with the assistance of Head of selected departments on the appointed date, time and venue. Data were analyzed using frequency count and percentages while Chi-Square was used in testing the formulated hypothesis.at 0.05 Alpha level of significance.

Results

Table 1: Respondent's Responses on Utilization of ICT in the Prevention and detection of Medical conditions with fatal consequences.

S\N	ITEMS	Agreed	Disagreed
1	Available information (ICT) and demonstrations on techniques to palpate the breast to detect formation of any lump can reduce cases of cancer of the breast.	545 (90.83%)	55 (9.17%)
2	Information on need for regular visit to the hospital for cervical examination and other preventive measures can reduce cases of cervical cancer.	556 (92.7%)	44 (7.3%)
3	Information on prevention and warning signs and symptoms of Hypertension can help in maintaining normal blood pressure.	570 (95%)	30 (5%)
4	Demonstration on the correct usage of blood pressure monitor may not yield better health outcome.	52 (8.67%)	548 (91.33%)
5	Information on causes of Asthma and its prevention are readily and accessible but are not practiced.	90 (15%)	510 (85%)
6.	Early signs and symptoms of Asthma are available in the Internet for its prevention.	585 (97.5%)	15 (2.5%)
7.	Information on early detection and prevention of Kidney diseases are available and accessible but many people may ignore them.	520 (86.7%)	80 (13.3%)
8.	The morbidity and mortality rate of Diabetes and other chronic disease cases has greatly reduced due to availability and utilization of correct and current information.	580 (96.67%)	20 (3.3%)
9.	Access to information, health care providers, specialist's quality care, and cost of services, especially in rural or resource-limited settings may not reduce cases of fatal diseases	80 (13.3%)	520 (86.7%)
10	Availability and accessibility of information on causes, mode of transmission, signs and symptoms of HIV/AIDs may not prevent promiscuity or early detection of infection,	30 (5%)	570 (95%)

The table above showed that majority (90.83%) of the respondents agreed that available information (ICT) and demonstration on techniques to palpate the breast to detect any formation of lumps in the breast has reduced the mortality rate of breast cancer while

92.7% equally agreed that information on the need for regular visit to the hospital for cervical examination and other cancer preventive measures has reduced cases of cervical cancer. Majority (95%) of the respondents agreed that information on preventive measures and warning signs/symptoms ot hypertension such as severe headache, chest pain, dizziness, difficulty breathing, nausea, vomiting blurred vision or other vision changes and anxiety helps in maintaining a normal blood pressure while 91.33%, however, disagreed with the statement that information on the correct usage of Blood Pressure Monitor may not yield positive health outcome.

Only 15% of the respondents agreed that information on conditions that can cause Asthma and its prevention are readily available and accessible but are not practiced while 97.5% agreed that quick response to early signs and symptoms of Asthma could save lives. Majority (86.7%) of the respondents agreed that information on early detection and prevention of kidney disease are available and accessible but may be easily ignored.

Majority (96.67%) of the respondents agreed that morbidity and mortality rate of Diabetes mellitus cases has greatly reduced due to availability and utilization of correct and current information on its prevention and early detection. Also 86.7% disagreed with the statement that access to information, health care providers, specialist's quality care, and cost of services, especially in rural or resource- limited settings may not reduce cases of fatal diseases, 95% equally disagreed with the statement that availability of information on the causes, mode of transmission, signs and symptoms of HIV/AIDS may not necessarily prevent promiscuity or early detection on infection.

Hypothesis Testing

Table 2: **X^2 Analysis of the relationship between Information and Communication Technology (ICT) and Prevention/early detection of fatal diseases among female staff in Tertiary Institutions in Osun State**.

Table Value	Level of Significant	Df.	Calculated	Decision
16.92	0.05	9	Value 4,147.63	Rejected

The table above revealed that the Calculated value of 4,147.63 is greater than the Table value of 16.92 and at the degree of freedom of 9. The null hypothesis was, therefore, rejected. This implies that significant relationship exist between utilization of Information and Communication Technology (ICT) and prevention/early detection of medical conditions with fatal consequences among female staff in Tertiary Institutions in Osun State, Nigeria.

Discussion of findings

The table above showed that majority (90.83%) of the respondents agreed that available information (ICT) and demonstration on techniques to palpate the breast to detect any formation of lumps in the breast has reduced the mortality rate of breast cancer while 92.7% equally agreed that information on the need for regular visit to the hospital for cervical examination and other cancer preventive measures has reduced cases of cervical cancer.

The above findings are in agreement with the reports made by Lackland (2017), Prochaska, Coughlin, Elizabeth & Lyons (2017), Radrigues 92021), Hunter (2022) and Science Direct (2023 who expressed that available information (ICT) and demonstration on techniques to palpate the breast to detect any formation of lumps in the breast has reduced the mortality rate of breast cancer and that regular visit to the hospital for cervical examination and other cancer preventive measures reduced cases of cervical cancer. Majority (95%) of the respondents agreed that information on preventive measures and warning signs/symptoms of hypertension such as severe

headache, chest pain, dizziness, difficulty breathing, nausea, vomiting blurred vision or other vision changes and anxiety helps in maintaining a normal blood pressure while 91.33%, however, disagreed with the statement that information on the correct usage of Blood Pressure Monitor may not yield positive health outcome.

These findings are in consonance with those of National Institute of Health (2020), Krist (2021), Dhuncana (2022), Centre for Disease Control and Prevention (2022), Gulec (2023) who reported that information on preventive measures and warning signs/symptoms of hypertension such as severe headache, chest pain, dizziness, difficulty breathing, nausea, vomiting blurred vision or other vision changes and anxiety helps in maintaining a normal blood pressure and that information on the correct usage of Blood Pressure Monitor yielded positive health outcome.

Only 15% of the respondents agreed that information on conditions that can cause Asthma and its prevention are readily available and accessible but are not practiced while 97.5% agreed that quick response to early signs and symptoms of Asthma could safe lives. Majority (86.7%) of the respondents agreed that information on early detection and prevention of kidney disease are available and accessible but may be easily ignored. These are equally in agreement with the affirmations made by New-Medical (2022), that quick response to early signs and symptoms of Asthma could save lives and that information on early detection and prevention of kidney disease are available and accessible but may be easily ignored.

Majority (96.67%) of the respondents agreed that morbidity and mortality rate of Diabetes mellitus cases has greatly reduced due to availability and utilization of correct and current information on its prevention and early detection. In the same vein, this was in line with the findings of Cleveland (2023), Mizdrak (2022) , who expressed that morbidity and mortality rate of Diabetes mellitus cases has greatly reduced due to

availability and utilization of correct and current information on its prevention and early detection.

Also 86.7% disagreed with the statement that access to information, health care providers, specialist's quality care, and cost of services, especially in rural or resource-limited settings may not reduce cases of fatal diseases. This was in consonance with the affirmations made by Science Direct (2023) that information on warning signs and symptoms of diseases may not necessarily prevent its occurrence if ignored. National Institute of Health (2021), Gulec (2023), Cleveland Clinic (2023) equally noted that failure to utilize the available information may worsen the situation. Majority (95%) of the respondents disagreed with the statement that availability of information on the causes, mode of transmission, signs and symptoms of HIV/AIDS may not necessarily prevent promiscuity or early detection of infection. This was also in line with the reports made by Medical News Today (2022), Center for Disease Control and Prevention (2022) that positive change in individual's behaviour is a very important factor in the prevention of HIV/AIDS and early detection of being infected.

Conclusion

Based on the findings of this study, it was concluded that Utilization of Information and Communication Technology (ITC) could help in the reduction of breast and cervical cancer. Utilization of information on preventive measures, warning signs and symptoms of hypertension could help in maintaining normal blood pressure while knowledge of conditions leading to Asthma could reduce cases of its occurrence. Availability and utilization of ICT on early detection and prevention could equally aided reduction of chronic kidney disease.

Morbidity and mortality rate of Diabetes cases could be greatly reduced with the availability and utilization of ICT while paying attention to the warning signs and

symptoms of stroke could safe many lives and that information on causes, mode of transmission, signs and symptoms of HIV could prevent promiscuity.

Recommendations

Based on the findings of this study, the following recommendations were made:

Government and Non-governmental agencies should intensify efforts in public enlightenment campaign on the importance of utilizing Information and Communication Technology for their health benefit.

Individuals are to take responsibility for their health.

Women especially should be exposed and encouraged to utilize the available current and correct health information to stay healthy all through their lives.

Government to ensure that Hospitals at the State and local levels are well staffed and equipped.

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