

Utilization of Consumer Health Informatics in Health Promotion among Staff of Tertiary Institutions in Rivers State.

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Abstract

Background: This study investigated the utilization of consumer health informatics in health promotion among the staff of tertiary institutions in Rivers state. **Subjects & Methods:** A cross-sectional descriptive research design was used. Two research questions guided this paper. The population of this paper comprised all the 13,046 staff of tertiary institutions in Rivers state. A sample of 1226 staff was drawn using multi-stage sampling techniques. An instrument titled, “Utilization of Consumer Health Informatics in Health Promotion Questionnaire” (UCHIHPQ) was adopted for data collection. The instrument was validated and reliability yielded an index of 0.80. Mean and Standard Deviation statistics were used to answer the research questions. The statistical analysis was performed with the use of SPSS v23. **Results:** The result revealed among others that to a very large extent, the respondents accepted that consumer health informatics was used to improve their nutritional and physical health status. **Conclusion:** It was therefore concluded and recommended among others that staff of tertiary institutions in Rivers state should regularly use intelligent informatics applications to attain a healthy balance between self-reliance and seeking professional help concerning nutritional and physical health matters.

Keywords: Consumer, Health, Informatics, E-Health, Promotion

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Introduction

The abstraction behind a large part of the current healthcare strategy's focus on consumer health informatics (CHI) can be described as the increasing demand for personal health management. Personal health management has been observed as a trending healthcare management strategy prevalent among key stakeholders in healthcare systems which cuts across different organisations all over the world to depict people's duty regarding their own health. It is a healthcare strategy putting the individual in control of their health. It is meant to keep individuals abreast of simple do-it-yourself techniques to keep fit at home, work and even while on vacation as observed in the works of Achalu. ^[1] Hence, those who subscribe to this healthcare service are referred to as consumers of health informatics. As a result, most of these consumers now do a lot of coordination, particularly in the aspect of nutrition and physical health, to adapt to the conventional but inadequate system of healthcare delivery. Thus, the basic supposition of CHI as a health management strategy for personal care is that people both need and should assume significantly greater

liability for and control of their own wellbeing at every point in time. ^[2]

CHI assumes a significant part in giving advice and guidance to patients, healthcare service providers and the general society, which encourages the advancement of self-care, ensuring that the right decision is made on the aspect of nutrition and physical health at every point in time thereby leading to the rapid advancement of healthy practices through proper health knowledge management among family and friends. ^[1] The concept of CHI in nutritional and physical health can as well be referred to as personal direction toward their health information and healthcare benefits just as their ability to participate in habits and behaviors that require continuous consideration with the utilization of electronic health (e-health) tools to engender healthy living in an ongoing basis as observed in the works of Halliday. ^[3] Notably, almost all available e-health tools provide access to health intervention on nutrition and physical health either as a range of accessible information, or specifically characterized content. Giving information is the principle or sole motivation behind a few nutritional and physical e-health tools. ^[3]

Furthermore, most identified nutritional and physical e-health tools have been observed to offer health information consumers a range of integrated interactive functions of nutritional and physical health to enable quick access to simple but proven techniques in keeping fit and active which has eased the health information burdens of a good number of health information consumers toiling day and night to gain access to ready solutions to health matters within the confine of their homes and places of work but ended up being confused with a whole lot of health information. [3] Additionally, some nutrition and physical e-health tools are intended to foster a particular nutritional and physical health behavior change, for example, quit smoking and intoxicant drinking, beginning a standard exercise or getting a mammogram for the anticipation of malignant growth. Most prevention-related tools on nutrition and physical health are developed through research with defined target audiences under controlled conditions. [3]

More so, nutrition and physical e-health tools provide structured support to consumers. Some nutrition and physical e-health tools support treatment decisions and demand management. Support nutrition and physical e-health treatment decision tools have to do with observing and measuring the tradeoffs between the treatment of various malignant growths while demand management tool helps consumers to pick and assess healthcare service providers in the areas of nutrition and physical health. [3] Maximising healthcare benefits is an integral component of nutrition and physical e-health tool function. Demand and benefits management nutrition and physical e-health tools are thriving inconspicuously as an element of trending "consumer-driven" healthcare system. Additionally, nutrition and physical e-health tools provide monitoring, record keeping and specialized gadgets for communication to assist consumers in handling a particular illness, for example, diabetes or malignant. Ordinarily, in close communication with the pertinent healthcare service provider. [4]

Therefore, CHI suggests that everybody has probably some measures to observe regardless of how restricted that can be applied to choices and activities in the light of nutrition and physical health. For instance, profoundly enacted able consumers would routinely search out health information, keep up or activate a healthy way of life, partake in shared decision making with healthcare service providers, screen health conditions, keep up close to home health records, look at healthcare cost and quality. Less enacted people may play out these functions less oftentimes, less deliberately, or with less exactness, or they may detail somebody to do it for them as noted in Wafa cited by Halliday and corroborated by Aleke and Ekine. [3,5]

However, the availability of the CHI platforms may not guarantee their utilization and application by the healthcare consumers and providers, as well. Despite a good number

of e-health information tools on nutrition and physical health such as short message service (SMS) and social media, [1,3] not much is known about the consumers' actual utilization and application of this health information in improving their own health, including their friends and family's health. Specifically, it is evident that the utilization and application of nutrition and physical e-health information by consumers are low, compared to the quantum of nutrition and physical health information dished out on daily basis to the public via e-health information tools. This has prompted the research in embarking on investigating the utilization of consumer health informatics in nutrition and physical health promotion among the staff of tertiary institutions in Rivers state.

Statement of the Problem

A large segment of the Nigerian populace is savvy about digital technologies in general as revealed by extant literatures on the use of emerging technologies in Nigeria. Be that as it may, it has been discovered from recent empirical works that most Nigerians, especially the staff of health institutions such as midwives, janitors and administrative workers are largely unfamiliar with the range of e-health tools available for nutrition and physical health promotion. An observation of CHI by some studies indicated that much well-researched nutrition and physical e-health tools are still not easily available to the majority of consumers. Moreover, there is the tendency that the enormous variations in nutrition and physical e-health tools' features could make it difficult for consumers to compare and evaluate competing e-health tools on nutritional and physical health.

Hence, what motivated the researchers is, in what ways have the staff of tertiary institutions in Rivers state utilized CHI in promoting sound nutritional and physical health? Put simply, the study sought to determine the utilization of CHI in nutritional and physical health promotion among the staff of tertiary institutions in Rivers state.

Aim and Objectives of the Study

This study investigated the utilization of consumer health informatics in health promotion among the staff of tertiary institutions in Rivers state. Specifically, the objectives were to:

1. Ascertain the extent of utilization of consumer health informatics to promote nutritional health among the staff of tertiary institutions in Rivers state; and,
2. Find out the extent of utilization of consumer health informatics to promote physical health status among the staff of tertiary institutions in Rivers state

Research Questions

1. What is the extent of consumer health informatics to promote the nutritional status of staff in tertiary institutions of Rivers state?
2. What is the extent of utilization of consumer health informatics to promote the physical health of staff in tertiary institutions in Rivers state?

Conceptual Review

Consumers' Utilization and Application of Health Informatics Tools.

Literature showed that there is a growing awareness concerning the potential of information and communication technology and e-health solutions that are modified to meet the health of the consumer of healthcare services. As substantiated by Smith Saunders, Stuckhardt, McGinnis that e-health information is one of the most frequently sought topic on the inter-net these days as there is increasing array of technology-based tools for consumers' utilization and application which claim to facilitates health improvement, however, despite many text message available on the internet, facebook. [6,7] Twitters, WhatsApp and others, not much is known about the consumers actually use and apply e-health information in order to improve their health.

The utilization of e-health informatics by health care consumers are affected by a number of factors, some personal factors include educational level, technology-knowledge based and skills, gender, culture, and orientation of the consumer. [5] Other environmental factors are health facilities and personnel, national health philosophy policy, orientation and values, economy, national technological level or standard, information and communication technology (ICT) facilities, capacities and capability of network providers, and the interconnectivity of various networks, climate changes, and weather fluctuations. [8,9]

Physical Health Promotion Activities

The World Health Organization in tandem with Bull, Al-Ansari, Biddle, Borodulin, Buman, Cardon, Carty, Chaput, Chastin, Chou, and Dempsey described physical activities as any movement of the body occasioned by skeletal muscles that require energy consumption. [10-12] Mainstream approaches for an individual to be active can be through strolling, cycling, sports and recreation which does not require any fixed degree of ability and can as well take place as a hobby. Regular physical activity in adults reduces the risk of hypertension, coronary heart disease, stroke, diabetes, breast and colon cancer, depression and risk of falls. While in children and young adults they help to reduce the risk of developing these diseases in later life.

Similarly, White in Halliday stressed that physical health promotion activities include mild to the moderate exercise of 3-4 times a week, smoking cessation, dental health, nutrition education, stress management and weight control management. [3] A moderate amount of all physical activities provide important positive health benefits as they improve bone and functional health.

Theoretical Framework

Diffusion of Innovation Theory

Everett Mitchell Rogers reinvigorated the diffusion of innovation theory in the year 2003. Rogers' diffusion of innovation theory stated that diffusion occurs through a 5 step of the decision-making process: awareness; interest; evaluation; trial; and, adoption. Diffusion also happens through a progression of correspondence channels throughout some undefined time frame among individuals from the comparison group. Thus, as noted by Gunter and Terry in Halliday the theory is very suitable in guiding health promotion intervention in the adoption of novel concepts. [3] Scholars have been increasingly intrigued by the factors of diffusion that impact on innovation in different fields. This interest has been channeled into the intensification of technology use which has given rise to technological innovations. These technological innovations have opened up space for an increase in the competitive advantage of enterprises. This in tandem with Tanriverdi and Lacono in Halliday who averred that insight concerning the diffusion of innovation can be applied to the implementation of telehealth services. [3]

Empirical Reviews

Yahya completed a study on healthcare-related smartphone use among doctors in hospitals in Kaduna. [13] A cross-sectional research design was adopted for the study. The population of the study comprised all the doctors working full time in all (54) public, private and faith-based hospitals in Kaduna metropolitan area. Using random sampling, a total of 472 doctors were requested to complete a pre-tested, 20-item, structured questionnaire between August and September 2017 which was constructed by the authors based on anecdotal evidence and the study of relevant literature. Hospitals were identified based on information from the Department of Hospital Services, Ministry of Health and Human Services, Kaduna state and the Guild of Medical Directors, and the number of doctors working there was obtained from heads of the hospitals. Paper questionnaires were administered to participants in their workplaces after permission was obtained from the heads of the various institutions. Participation in the study was voluntary and respondents who chose to

fill the anonymous questionnaires were considered to have given informed consent. No honorarium was given. Statistical analysis was performed using SPSS version 22 for Windows. Chi-square was used to assess the significance of differences between groups. A P value of < 0.05 was considered significant. Findings showed that all except one respondent possessed a smartphone and 99% announced utilizing these during work in an emergency clinic. 86% of respondents reviewed their telephones as exceptionally helpful. The perceived absence of time and the unstable internet connection was the most ordinarily revealed boundaries to ideal use. It was anyway presumed that smartphone use in hospitals among specialists in Kaduna is general and is essentially for purpose of care, correspondence and reference purposes.

Batta and Iwokwagh did a subjective report on advancing the computerized age health-wise: Utilization of new/online media by Nigerian teaching hospitals. [14] In particular, it explored whether the new and online media are utilized as advertising apparatuses (for upgrading their perceivability, advancing their administrations and corporate image), educational devices (to give health information, edification and training to forestall sickness and advancing health), social instruments (to develop communications and trades between healthcare suppliers and healthcare recipients). The study moored on three hypotheses: Social Relationships Theory, Social Exchange Theory, and the Extended Parallel Process-Model. Inductive substance investigation was utilized to inspect the sites of twenty Nigerian educating and expert hospitals.

Discoveries demonstrated that the significant uses to which Nigerian training hospitals put the online media to utilize are: to get input from customers (100%), present their vision and statements of purpose (65%), post regulatory and faculty structure information (65%), and give subtleties of agreements (60%). Nonetheless, these media are minimally utilized for health advancement (25%), monetary exchanges (10%) and intelligent commitment with customers (0%). It presumed that Nigerian showing hospitals' response to the web-based media is for the motivations behind exposure and engendering of mental self-portrait (advertising). To change this pattern, it was suggested among others that: training hospitals ought to progressively utilize the new and online media to give roads to patients and family members to recount their accounts, and for health experts to offer educated conclusions on clinical and health matters.

Materials and Methods

A cross-sectional descriptive survey design was adopted for this study. This type of research design provides for a wide scope of describing situations or phenomena as they are. Examples of this research design in similar empirical

works abound with scholars such as Assadi and Hassanein; Bashshur, Reardon and Shannon. [15,16] The population of this study comprised all the 13,046 staff drawn from five (5) selected tertiary institutions in Rivers state. (Source Office of the Registrar of the Institutions—adapted from Halliday). [3] A sample of 1,226 respondents representing approximately 10% of the population was drawn. A multi-stage sampling procedure was used to select the respondents.

The instrument used for data collection was a self-structured questionnaire titled: “Utilization of Consumer Health Informatics in Health Promotion Questionnaire” (UCHHPQ). The questionnaire was made up of sections A and B. Section A contained the demographic data used to elicit information from the respondents; while section B contained 12 questionnaire items structured based on the variables of the study. The items were responded on a modified Likert scale of four-point ratings. Thus, the items as were scored 4, 3, 2 and 1 for Very large extent (VLE), large extent (LE), low extent (IE), very low extent (vLE) respectively for positively keyed items and 1, 2, 3 and 4 for Very large extent (VLE), large extent (LE), low extent (IE), very low extent (vLE) for negatively keyed items.

The data generated using the instrument were analyzed and discussed accordingly. Respondents who obtained scores approximately equal to 4, 3, 2 and 1 are adjudged to have accepted that consumer health informatics was used to improve the nutritional and physical health conditions of staff in tertiary institutions of Rivers state to a Very large extent (VLE), large extent (LE), low extent (IE), and very low extent (vLE) respectively. The instrument was validated and reliability was carried out using the test-retest method. A correlation coefficient was calculated with Pearson's Product Moment Correlation coefficient and a reliability index of 0.80 (0.73 and 0.86—for nutritional status and physical activities) was obtained. The administration of the 1,226 copies of the questionnaire took the research team three weeks to complete and retrieve it. A criterion mean of 2.5 was set as a benchmark for accepting or rejecting the items on the questionnaire. Mean

(x) and Standard deviation (SD) were used to analyze data in relation to research questions.

Results

Research Question 1: What is the extent of consumer health informatics to promote the nutritional status of staff in tertiary institutions of Rivers state?

Results in [Table 1] showed the mean response of the subjects on the item to item basis. The mean responses of the subjects for all the items are greater than the criterion means of 2.50. Furthermore, the overall mean which is 2.82 with a standard deviation of 0.93 is greater than the criterion mean of 2.50. Hence, the respondents accepted that consumer health informatics was used to improve their nutritional status to a

Table 1: Mean and standard deviation of respondents on the extent of consumer health information to improve nutritional status of the respondents

S/N	Nutritional status	X	SD
1	Information on my internet has enabled me to reduce quantity of carbohydrate in my daily meal	2.97	0.83
2	I now know how to eat for healthy living through information from my smart phone	2.86	0.94
3	I adhere to eating more proteinous food as an adult through the Information from my WhatsApp on adult food	2.83	1.05
4	Due to the implication of too much alcohol and tobacco intake from my WhatsApp text messages, I have reduced or abstained from taking them.	2.76	1.10
5	The information on my Facebook pages about the causes of chronic illnesses, have enabled me to reduce amount of salt and sugar in my food.	2.60	0.82
6	I have adhered to eating vegetables and fruits to prolong my life due to the information received from my smart phone.	2.87	0.93
	Overall	2.82	0.93

very large extent.

Research Question 2: What is the extent of utilization of consumer health informatics to promote the physical health of staff in tertiary institutions in Rivers state?

The result in [Table 2] showed that the respondents obtained means greater than the criterion mean of 2.50 for all the items tested. Furthermore, the overall mean is 2.81 with a standard deviation of 0.98. The value of the overall mean implies that the respondents utilized consumer health informatics to improve their physical health to a very large extent.

Summary of Findings

1. It showed that to a very large extent, the respondents accepted that consumer health informatics was used to improve their nutritional status.
2. It revealed that, that the respondents utilized consumer health informatics to improve their physical health to a very large extent.

Discussion

The Extent Consumer Health Informatics Promote Nutritional Status of Staff in Tertiary Institutions of Rivers State

It was found that consumer health informatics was used to improve the nutritional status of staff of tertiary institutions in Rivers state to a very large extent. This finding is in agreement

with the finding of Umoru which reported a significant impact of consumer health informatics on dietary awareness nurses in public hospitals in Kwara state. [17] The finding that consumer health informatics was used to improve the nutritional status of staff of tertiary institutions in Rivers state to a very large extent is not surprising and can be explained by the fact that in this era of technological advancement, social media are replete with all manners of information. So, people can obtain relevant information on nutrition from the internet or other means as they deem necessary. Therefore, the awareness that consumer health informatics is necessary to improve the nutritional status of staff of tertiary institutions in Rivers State cannot be stressed.

The Extent Consumer Health Informatics Promote the Physical Health of Staff in Tertiary Institutions of Rivers State

It was found that consumer health informatics was utilized to improve the physical health of staff of tertiary institutions in Rivers state to a very large extent. This finding that consumer health informatics was utilized to improve the physical health of staff of tertiary institutions in Rivers state to a very large extent agrees with the findings of Onuh as well as Déglise, Suggs, Odermatt which revealed that consumer health informatics contributed to the improvement of the physical health of participants in a survey study to the tune of 78%. [18,19] That consumer health informatics was utilized to improve the physical health of staff of tertiary institutions in Rivers state can possibly be explained from the fact that workers in tertiary institutions in Rivers state are literate and enlightened people. They can read and understand information concerning their health and wellbeing and they are capable of putting that is

Table 2: Mean and standard deviation of respondents on the extent of consumer health informatics to improve the physical health of the respondents .

S/N	Physical Activities	X	SD
7	Information I get from my platform enables me to know and participate in physical exercise that improves my endurance capacity.	2.53	1.19
8	I now take a fitness walk daily due to the health advice on my WhatsApp pages to keep fit.	2.89	0.97
9	I have now resolved to engage in regular exercise to increase bone density and make my heart strong due to information from my Smartphone.	2.71	0.98
10	From the information I get from my platforms I now know that cycling is a way to watch body weight.	2.82	0.87
11	From the information I get from my smartphone on exercise, that strenuous is not good for adults.	2.92	0.83
12	I have now known that mild-moderate exercise 3-5 times a week keeps the body fit from the health advice I receive from my smartphone.	2.92	1.04
Overall		2.81	0.98

important to them into use.

Conclusion

The staff of tertiary institutions in Rivers state was of the opinion that consumer health informatics is vital to their nutritional and physical health status by gaining relevant nutritional and physical health updates while on their job. However, this was due to the fact that they were enlightened.

Recommendations

The following recommendations were made based on the findings of the study

1. The staff of tertiary institutions in Rivers state should regularly use intelligent informatics applications to attain a healthy balance between self-reliance and seeking professional help concerning health matters relating to nutritional status and physical health.
2. The staff of tertiary institutions in Rivers State should consider putting consumer health informatics into practice while at work and away from the workplace.

Contributions to Knowledge

Based on the findings, the study has contributed to knowledge in the following ways:

1. The study has empirically documented that consumer health informatics when fully applied has the potential of improving the nutritional status and physical health of staff of tertiary institutions in Rivers state
2. It also discovered that there are dimensions of consumer health informatics that are still at the early stage of research and development.

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