



Socio-demographic Differentials in the Knowledge of E-Health Care Delivery among Health Care Professionals in Federal Teaching Hospital Abakaliki, Ebonyi State, Nigeria

C. L. Kpe-Nobana¹, C. E. Elechi¹ and C. O. Aleke^{2*}

¹*Ignatius Ajuru University of Education Rumuolumeni, Port-Harcourt, Rivers State, Nigeria.*

²*Department of Human Kinetics and Health Education, Faculty of Education, Ebonyi State University, Abakaliki, Nigeria.*

Authors' contributions

This work was carried out in collaboration among all authors. Authors CLKN, CEE and COA designed, conceived and commissioned the study. Authors CLKN and COA performed the literature search and screened for the related studies, extracted the data and wrote the first draft of the manuscript. Authors CEE, CLKN and COA critically revised the manuscript for important intellectual content. All the authors supervised all aspects of the study and agreed to the final manuscript.

Article Information

DOI: 10.9734/IJTDH/2020/v41i1730370

Editor(s):

- (1) Dr. Romulo Dias Novaes, Federal University of Alfenas, Brazil.
- (2) Dr. Cihad Dundar, Ondokuz Mayıs University, Turkey.
- (3) Dr. Giuseppe Murdaca, University of Genoa, Italy.

Reviewers:

- (1) Aditi Mishra, Shri Ramswaroop Memorial University, India.
 - (2) Shariq Aziz Butt, University of Lahore, Pakistan.
 - (3) Hidirova Mohiniso Bahromovna, Tashkent University of Information Technologies, Uzbekistan.
- Complete Peer review History: <http://www.sdiarticle4.com/review-history/62311>

Original Research Article

Received 22 August 2020
Accepted 27 October 2020
Published 18 November 2020

ABSTRACT

Background: The emerging and re-emerging infectious diseases in developing countries including Nigeria underscores the need for electronic health (e-Health) to improve health care delivery. This study thus determined the knowledge and socio-demographic differentials in the knowledge of e-Health care delivery among health care professionals in Federal Teaching Hospital Abakaliki (FETHA) Ebonyi State, Nigeria.

Methods: The descriptive research design and a self-developed questionnaire was used for the study. Three objectives with three research questions and two null –hypotheses were postulated to

guide the study. Out of a population of 2092 health workers in FETHA, 209 representing 10% were drawn through a multistage sampling technique and were studied. Frequency and percentage were used to answer research question one, while mean and standard deviation were used to answer research questions two and three. The Analysis of Variance (ANOVA) was used in testing null hypotheses one while Mann-Whitney U test was used in testing hypotheses two at .05 level of significance.

Results: The overall mean percentage of respondents was 85.6% which indicates that health care professionals in FETHA possessed a good knowledge of e-Health care delivery. The findings further indicated that health care professional in FETHA differed in their level of education with diploma and below possessing higher knowledge of e-Health care delivery ($\bar{x}=1.23$) than those with B.Sc. and above ($\bar{x}=1.14$). Also differed by their age ($P>0.05$), and level of education ($P<0.05$).

Conclusion: Nigerian government at all levels, through their various Ministries of Health should organize intensive ICT training and retraining of their employees, especially those with B.Sc and above.

Keywords: Knowledge; e-health care delivery; socio-demographic difference; health care professionals.

1. INTRODUCTION

The rapid expansions of information and communication technology (ICT) have impacted in the way we live, work and communicate including in the health care delivery. Over the years, technology has touched the acme of human development and now it is not confined to developed countries. In developing countries healthcare providers can no longer ignore the application of information technology to healthcare delivery. This has given rise to the concept called e-health, or electronic health [1]. E-Health which involves the use of Information and Communication Technologies (ICTs) in support of health to improve the efficiency and effectiveness of healthcare delivery and management [2,3]. Also serves as a medical record used to capture, store, and share information among healthcare providers in an organization, supporting the delivery of healthcare services to patients [4,5].

E-Health covers a wide range of services such as electronic health records to ensure continuity of patient care across time, mobile health (m-Health) services for assisting doctors in recording patients' personal and medical conditions, advising or educating patients and their families on health issues related to the patients any where any time, telehealth, health research, consumer health informatics to support individuals in health decision making, and eLearning by health workers among others. With the development of this new technologies including Web 2.0 and 3.0 communication media, e-Health can offer a plethora of new

opportunities for both individuals and patients to access and exchange health information's, manage their health through electronic platforms, and participate in "peer-to-peer health care" [6-8]. These online opportunities have been identified to assist both patient and providers in self-management and delivery of care [9]. The e-Health applications have provided golden opportunities for health care professionals to communicate with patients in both traditional and novel ways by addressing health concerns such as diabetes management, heart health, cancer prevention, smoking cessation, and health promotion activities [10-17]. Also the use of Smartphone applications for disease prevention and management especially in this era of social distancing protocols of COVID-19 pandemic [18,19].

E-Health with several potentials in improving healthcare professional's retention in resource constraint environments and effectively reduces professional isolation and face to face contact of patients/providers will enhance healthcare [20]. This online opportunities must be adopted in developing countries especially in Nigeria where the high burden of disease incidence/prevalence including emerging and re-emerging diseases including the low number of skilled personnel and other shortcomings in health systems in the country have affected many health workers and patients dying in numbers. E-Health is believed to improve health care by strengthening the health system, supporting delivery of care, and improving communication among different health care organizations and professionals [21]. Several studies have affirmed that the use of

technology in health care delivery is efficient and is growing rapidly [10-22].

The present study wish to ascertain the knowledge and socio-demographic differentials in the knowledge of e-Health care delivery among health care professionals in FETHA. This study will focus on age and level of education to ascertain the knowledge of e-Health care delivery in FETHA. These factors will assist in understanding the digital divide regarding e-Health care delivery in FETHA and also suggest directions for interventions to overcome these barriers in the use of e-Health care delivery in FETHA and for a broader population. Currently, an overview of such factors is missing in the literature hence the need for the present study.

2. MATERIALS AND METHODS

2.1 Study Design and Study Area

A descriptive cross sectional research design was conducted among health care professionals in FETHA, Ebonyi State, Nigeria. FETHA is located in the heart of Abakaliki, the capital of Ebonyi State. It is the federal and the biggest hospital in Ebonyi State with about 608 beds. It is also a training institution for medical students, nursing students, medical laboratory science students among others. Just recently, it started receiving students from the new Federal University, Ndufu Alike Ikwo in Ebonyi State. Generally, the hospital renders primary as well as specialist services to those in need within and outside Ebonyi State. Being the largest tertiary and federal hospitals in the state, it receive clients directly and referrals from general hospital and nooks and crannies of the 13 local government areas of Ebonyi State and beyond. For the fact that Ebonyi State is new state with its health system at the developmental stage, the present study with FETHA will play major roles in determining socio-demographic differentials in the knowledge of e-Health use in health care delivery among health care professionals in FETHA.

2.2 Study Population and Selection Criteria

The population of the study consisted of 2,092 staff comprising of 200 consultants in various specialties, 467 resident doctors undergoing residency training, 1,070 Nurses, 189 Med Lab, 56 Radiographers and 110 Pharmacists totaling 2,092 health care professionals in FETHA.

2.3 Sample Size Estimation and Sampling Technique

The sample for this study is 209 health care professionals in FETHA. This represented 10 per cent of the total population. This is in line with the rule of the thumb which stated that, when a population is in a few thousand, five to ten per cent of the population will be deemed appropriate to determine the sample size [23]. The total sampling was stratified into different departments where 10% were proportionately drawn from the population of each of the department or unit. These are consultant 20, resident's doctors 47, nursing 107, medical laboratory 19, Radiography 7, and pharmacy 11 staff. This process gave a total of 209 sampled staff that was studied.

2.4 Instruments

The researcher developed instrument was used for data collection. The instrument was titled, Knowledge of e-Health Care Delivery Questionnaire (KEHCDQ). A pilot study was done among 20 health care professionals working in National Fistula Center (NAFIC), Abakaliki who were not included in the study but possessed similar characteristics. The internal consistency of each subscale was computed separately. The overall reliability coefficient of the instrument was 0.72. The instrument was then considered reliable to be distributed to the research participants in this study. This aligned with the assertion that in reliability test, if the reliability co-efficient index of an instrument is .60 and above, the instrument should be deemed reliability enough to be used in a study [24].

2.5 Data Analysis

The completed copies of the KEHCDQ were collected and crosschecked for completeness of information and responses. All statistical analysis was done using the Statistical Package for Social Science (SPSS) batch system. Frequency and percentage were used to answer research question one, where a percentage between 0.1 and 50 was adjudged poor, between 51 and 100% was adjudged good. Mean was used to answer research questions two and three, where a mean between 0.1 and 1.00 was adjudged poor level of knowledge while 1.01 to 2.00 was adjudged good levels of knowledge of e-Health. The Analysis of Variance (ANOVA) was used for null hypotheses one while Binomial Logistics Regression was used in testing hypotheses two at .05 level of significance and appropriate degree of freedom.

3. RESULTS

A total of 209 samples were collected from Health Care Professionals to evaluate their socio-demographic differentials in the knowledge of e-Health care delivery. Of this number 85.6% indicated good level of knowledge of health care professionals about e-Health care delivery while 14.4% possessed a poor knowledge of e-Health use in health care delivery see Table 1. Data in Table 2 reveal an overall mean score of $\bar{x} = 1.15$ for 30years and below, $\bar{x} = 1.12$ for 31 to 40 years, $\bar{x} = 1.13$ for 41 to 50 year and $\bar{x} = 1.24$ for those above 50 years. This implies that the health care professionals in their different age bracket had a good knowledge of e-Health care delivery in FETHA hence it falls within $\bar{x} = 1.01$ to $\bar{x} = 2.00$ that was adjudged good knowledge of e-Health Delivery. However, those within the age bracket of below 30years $\bar{x} = 1.15$ and above 50years $\bar{x} = 1.24$ possessed higher knowledge of e-Health care delivery than those within the age bracket of 31 to 40 years $\bar{x} = 1.12$ and 41 to 50 years $\bar{x} = 1.13$ respectively. Table 3 reveals that both respondents under B.Sc and above, and

Diploma and below have good knowledge of e-Health care delivery because their grand mean values 1.14 and 1.23 fall within $\bar{x} = 1.01$ to $\bar{x} = 2.00$ that was adjudged good knowledge of e-Health care delivery. However, their mean score indicated that those health care professionals in FETHA differed in their level of education with diploma and below possessing higher knowledge of e-Health care delivery ($\bar{x} = 1.23$) than those with B.Sc. and above ($\bar{x} = 1.14$). On the aspect of standard deviation, 0.10 and 0.04 for B.Sc and above, and Diploma and below respectively shows that the respondents were homogeneous in their responses. Data in Table 4 shows that the probability value of .236 is greater than the significant level of 0.05 ($P > 0.05$). Hence, there is no statistical significant difference in level of knowledge of health care professionals about e-Health care delivery in FETHA by age. Data in Table 5 shows that the probability value (i.e. significant value) is 0.055 which is greater than the significant level of 0.05, ($P > 0.05$). Therefore, there is no statistical significant difference in level of knowledge of e-Health care delivery in FETHA by level of education.

Table 1. Percentage responses of knowledge of e-health care delivery in FETHA

Knowledge of e-Health	Yes	No	% Rating
Meaning of e-Health	92.8%	7.2%	Good
E-health services	91.2%	8.8%	Good
Channels of E-health Delivery	79%	21%	Good
Areas e-health can be applied	89.1%	10.9%	Good
Examples of E-health applications	75.8%	24.2%	Good
Over all %	85.6%	14.4%	Good

Table 2. Knowledge of e-health care delivery by age?

Knowledge differences by age	Below 30 years	31-40 years	41-50 years	Above 50 years
	\bar{x}	\bar{x}	\bar{x}	\bar{x}
Meaning of e-Health	1.08	1.07	1.06	1.23
e-Health services	1.06	1.12	1.09	1.29
Channels of E-health Delivery	1.23	1.07	1.13	1.32
Areas e-health can be applied	1.13	1.08	1.12	1.13
Examples of E-health applications	1.25	1.28	1.25	1.27
Overall mean \bar{x}	1.15	1.12	1.13	1.24

Table 3. Difference in mean responses regarding the level of knowledge of e-Health care delivery in FETHA, by level of education

Meaning of E-health	B.Sc & Above		Diploma & Below		Diff in mean
		SD		SD	
Meaning of e-Health	1.07	0.27	1.21	0.10	-0.14
E-health services	1.09	0.23	1.16	0.15	-0.07
Channels of E-health Delivery	1.20	0.08	1.37	0.03	-0.17
Areas e-health can be applied	1.10	0.04	1.20	0.09	-0.10
Examples of E-health applications	1.27	0.21	1.23	0.09	0.04
Grand Mean/STD	1.14	0.10	1.23	0.04	-0.09

Table 4. Summary of one-way Analysis of Variance (ANOVA) testing the statistical significant difference in level of knowledge of e-Health care delivery in FETHA by age

Level of knowledge	Sum between groups	Squares within groups	df	Mean between groups	Squares within groups	F	P-value
Age	151.727	7237.330	3	50.576	35.477	1.426	.236**

** = Not Significant at .05 level

Table 5. Summary of Mann-Whitney U table testing the level of knowledge of health professionals on e-Health care delivery in FETHA by level of education

Level of Education	N	Mean rank	Sum of ranks	Mann-Whitney U	Asymp. Sig. (2-tailed)	Decision
B.Sc and Above	157	85.53	13428.50			
Diploma and Below	18	109.53	1971.50	1025.500	.055	Significant
Total	175					

4. DISCUSSION

The study found that health care professionals in FETHA possessed good knowledge of e-Health care delivery. This finding of the study agrees with the studies who reported high knowledge of health care professionals concerning ICT use in health care delivery [25,26]. However, the findings contradict the studies who observed that lack of ICT knowledge; unreliable ICT equipment; high cost of ICT; low level of skills of potential users and limited access to ICT as challenges hindering ICT use in health care delivery [27,3].

The study also found that there were differences in the level of knowledge of e-Health care delivery among health care professionals concerning age. The findings aligned with the study [22] who indicated age to be a significant factor that influences the use of e-Health in health care delivery. It is also in line with the studies, who revealed that younger people are more willing and have more experience and interest in using e-Health in health care delivery compared to older people [28-37]. The current study is also in agreement with the study who observed that the usage of mobile-phone among children have increased significantly [38]. However, the study disagrees with those who reported age as not a significant factor for the e-Health care delivery [39-43].

The study further revealed that the level of knowledge of health care professionals regarding e-Health care delivery in FETHA differs in their

level of education with diploma and below possessing higher knowledge of e-Health care delivery than those with Bsc., and above. This finding is however, surprising and not expected, however, this finding might not be unconnected to the fact that those who have B.Sc and above are always appointed the head of every unit in charge of both human, material and financial aspect of the work place hence might be busy with office duty and not time to learn those ICT tools thereby employing those with lower qualifications (Diploma and below), to manage the ICT or e-Health tools in their offices as is the case of every high offices in Nigeria today. The findings contradict the view expressed in the studies [28,29,33,42,39,44], who indicated that higher education is correlated with more knowledge as well as more use of e-Health technologies in health care delivery and that people who are educated to a higher level are more interested and more experienced in using e-Health than those with low level of education and that lower level of education is associated with less adherence to telehealth [44,28].

5. CONCLUSIONS

E-health is a new and specialized concept in healthcare delivery, and its application has not been explored in health care delivery in FETHA and in Nigeria health sector. However our respondents reported a good knowledge of e-Health care delivery despite the multitude of structural and systemic difficulties in FETHA. Based on our findings, there is hope for e-Health

to be fully integrated in the healthcare system in Federal Teaching Hospital Abakaliki (FETHA), Ebonyi State and Nigerian hospital in general given the high burden of disease incidence/prevalence including emerging and re-emerging diseases in Nigeria and the emerging trends in the Nation's healthcare systems and the low number of skilled personnel. There is need for Nigerian government at all level, through their various Ministries of Health to organize intensive ICT training and retraining of their employees, especially those with B. Sc and above whose their knowledge of e-Health care delivery significantly differed by their level of education as indicated in the study. Hence, e-Health is believed and has 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/patient. E-Health integration cannot be overemphasized as we can perceive its importance in this era of COVID-19 on social distancing principle.

DISCLAIMER

The products used for this research are commonly and predominantly use products in our area of research and country. There is absolutely no conflict of interest between the authors and producers of the products because we do not intend to use these products as an avenue for any litigation but for the advancement of knowledge. Also, the research was not funded by the producing company rather it was funded by personal efforts of the authors.

ETHICAL APPROVAL AND COSENT

The Institutional Research and Ethics Committee (REC) of Federal Teaching Hospital Abakaliki (FETHA) provided ethical approval for the study. The clearance enabled the researcher to gain access to head of different departments concerned and the respondent.

Also Informed consent was explained in writing and obtained from all participants. The DKEHQ was administered by the researchers to all eligible respondents in the hospitals on a unit basis.

ACKNOWLEDGEMENTS

We thank the Institutional Research and Ethics Committee (REC) of Federal Teaching Hospital

Abakaliki (FETHA) for prompt approval of the ethical clearance to carry out this research.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Gour N, Srivastava D. Knowledge of computer among healthcare professionals of India: A key toward e-health. *Telem Journal of E-Health*. 2010;16(9):957-62.
2. United Nation Foundation. Assessing the enabling environment for ICTs for Health in Nigeria: A review of policies. Federal Ministry Health. ICT4SOML; 2014. Available:www.nigeria-health-ict-policy-report
3. Coleman A. Migration from resource based to knowledge based strategy for e-health implementation in developing countries; 2014. Available:https://www.krepublishers.com/Coleman JC-5-1-001-14-114-Coleman-A-Ab [1]
4. World Health Organisation. e-Health. The Bulletin Series; 2016. Available:http://www.who.int/topics/e-Health/en/ (Accessed 6 October 2019)
5. International Telecommunication Union. Implementing e-Health in developing countries: Guidance and principles; 2016. Geneva: International Telecommunication Union; 2016.
6. Fox S, Jones S. The social life of health information. Washington, DC: Pew Internet & American Life Project; 2009. Available:http://www.pewinternet.org/Reports/2011/Social-Life-of-Health-Info/Summary
7. Fox S, Purcell K. Chronic disease and the internet. Washington, DC: Pew Internet & American Life Project; 2010. Available:http://www.pewinternet.org/Reports/2010/Chronic-Disease/Summary-of-Findings.aspx
8. Fox S, Duggan M. Health online. Washington, DC: Pew Internet & American Life; 2013. Available:http://www.pewinternet.org/Reports/2013/Health-online/Summary-of-Findings
9. Kreps GL, Neuhauser L. New directions in e-Health communication: Opportunities

- and challenges. *Patient Educ Couns*. 2010;78(3):329–36.
10. Bock BC, Graham AL, Whiteley JA, Stoddard JL. A review of web-assisted tobacco interventions (WATIs). *J Med Internet Res*. 2008;10(5):e39. Available:<http://www.jmir.org/2008/5/e39/>
 11. Lindsay S, Smith S, Bellaby P, Baker R. The health impact of an online heart disease support group: A comparison of moderated versus unmoderated support. *Health Educ Res*. 2009;24(4):646–54. Available:<http://her.oxfordjournals.org/cgi/pmidlookup?view=long&pmid=19251770>
 12. Smith DT, Carr LJ, Dorozynski C, Gomashe C. Internet-delivered lifestyle physical activity intervention: Limited inflammation and antioxidant capacity efficacy in overweight adults. *J Appl Physiol*. 2009;106(1):49–56. Available:<http://jap.physiology.org/cgi/pmidlookup?view=long&pmid=19008491>
 13. Steele RM, Mummery WK, Dwyer T. A comparison of face-to-face or internet-delivered physical activity intervention on targeted determinants. *Health Educ Behav*. 2009;36(6):1051–64.
 14. Graham AL, Cobb NK, Papandonatos GD, Moreno JL, Kang H, Tinkelman DG, Bock BC, Niaura RS, Abrams DB. A randomized trial of internet and telephone treatment for smoking cessation. *Arch Intern Med*. 2011;171(1):46–53. Available:<http://europepmc.org/abstract/MED/21220660>
 15. Vuong AM, Huber JC, Bolin JN, Ory MG, Moudouni DM, Helduser J, Begaye D, Bonner TJ, Forjuoh SN. Factors affecting acceptability and usability of technological approaches to diabetes self-management: A case study. *Diabetes Technol Ther*. 2012;14(12):1178–82. Available:<http://europepmc.org/abstract/MED/23013155>
 16. Kuijpers W, Groen WG, Aaronson NK, van Harten WH. A systematic review of web-based interventions for patient empowerment and physical activity in chronic diseases: Relevance for cancer survivors. *J Med Internet Res*. 2013;15(2):e37. Available:<http://www.jmir.org/2013/2/e37/>
 17. Cobb NK, Graham AL, Byron MJ, Niaura RS, Abrams DB. Workshop participants online social networks and smoking cessation: A scientific research agenda. *J Med Internet Res*. 2011;13(4):e119. Available:<http://www.jmir.org/2011/4/e119/>
 18. Muessig KE, Pike EC, Fowler B, LeGrand S, Parsons JT, Bull SS, Wilson PA, Wohl DA, Hightow-Weidman LB. Putting prevention in their pockets: Developing mobile phone-based HIV interventions for black men who have sex with men. *AIDS Patient Care STDS*. 2013;27(4):211–22. Available:<http://europepmc.org/abstract/MED/23565925>
 19. Hebden L, Balestracci K, McGeechan K, Denney-Wilson E, Harris M, Bauman A, Allman-Farinelli M. 'TXT2BFIT' a mobile phone-based healthy lifestyle program for preventing unhealthy weight gain in young adults: Study protocol for a randomized controlled trial. *Trials*. 2013;14:75. Available:<http://www.trialsjournal.com/content/14/75>
 20. Richards H, King G, Reid M, Selvaraj S, McNicol I, Brebner E. Remote working: Survey of attitudes to e-Health of doctors and nurses in rural general practices in the United Kingdom. *Fam Pract*. 2005;22(1):2–7.
 21. Sukums F, Mensah N, Mpembeni R, Kaltschmidt J, Haefeli WE, Blank A. Health workers' knowledge of and attitudes towards computer applications in rural African health facilities. *Glob Health Action*. 2014;7(24):534.
 22. Fabienne R, Janienke S, Lisette JWB, Eveline JMW. Sociodemographic factors influencing the use of E-health in people with chronic diseases. *International Journal Environmental Research Public Health*. 2019;16(5):645. Available:www.mdpi.com/journal/ijerph
 23. Nwana OC, Thomas Nelson. Introduction to educational research. Ibadan; 1990.
 24. Olaitan SO, Ali A, Ejoh EO, Sowande KG. Research skills in education and social sciences. Owerri: Cape Publishers International Ltd; 2000.
 25. Adeleke IB, Salami AA, Achinbee M, Anamah TC, Zakari IB, Wasagi MH. ICT knowledge, utilization and perception among healthcare providers at National Hospital Abuja, Nigeria *American Journal of Health Research*. 2015;3(1):47- 53.
 26. Alwan K, Awoke AT, Tilahun B. Knowledge and utilization of computers among health professionals in a developing country: A cross-sectional study. *Journal of Medical*

- Internet Research Hum Factors. 2015;2(1):10-21. Available:96/humanfactors.4184
27. Ruxwana NL, Herselman ME, Conradie DP. ICT applications as e-health solutions in rural healthcare in the Eastern Cape Province of South Africa. *HIM J.* 2010;39(1):17-26.
28. Hofstede J, de Bie J, van Wijngaarden B, Heijmans M. Knowledge, use and attitude toward health among patients with chronic lung diseases. *Int. J. Med. Inform.* 2014;83(3):967–974.
29. Kamis K, Janevic MR, Marinec N, Jantz R, Valverde H, Piette JD. A study of mobile phone use among patients with non-communicable diseases in La Paz, Bolivia: Implications for m health research and development. *Globalization and Health.* 2015;11. DOI: 10.1186/s12992-015-0115-y
30. Anglada-Martínez H, Rovira-Illamola M, Martín-Conde M, Sotoca-Momblona JM, Codina-Jané CM. Health intervention to improve medication management in chronically ill patients: Analysis of the recruitment process. *Postgrad. Med.* 2016;128:427–431.
31. Duplaga M. A cross-sectional study assessing determinants of the attitude to the introduction of eHealth services among patients suffering from chronic conditions. *BMC Med. Inform. Decis. Mak.* 2015;15. DOI: 10.1186/s12911-015-0157-3
32. Nelson LA, Mulvaney SA, Gebretsadik T, Ho YX, Johnson KB, Osborn CY. Disparities in the use of mhealth medication adherence promotion intervention for low-income adults with type 2 diabetes. *JAMIA.* 2016;23(1):12–18.
33. Samiei V, Wan Puteh SE, Abdul Manaf MR. Are Malaysian diabetic patients ready to use the new generation of health care service delivery? A telehealth interest assessment. *Malays. J. Med. Sci.* 2016;23(3):44–52.
34. Smith R, Menon J, Rajeev JG, Feinberg Kumar RK, Banerjee A. Potential for the use of mHealth in the management of cardiovascular disease in Kerala: A qualitative study. *BMJ Open.* 2015;5:e009367–e009367.
35. Drewes C, Kirkovits T, Schiltz D, Schinkoethe T, Haidinger R, Goldmann-Posch U, Harbeck N, Wuerstlein R. E-Health acceptance and new media preferences for therapy assistance among breast cancer patients. *JMIR Cancer.* 2016;2:e13.
36. Saied A, Sherry SJ, Castricone DJ, Perry KM, Katz SC, Somasundar P. Age-related trends in utilization of the internet and electronic communication devices for coordination of cancer care in elderly patients. *J. Geriatr. Oncol.* 2014;5(3):185–189.
37. Whittemore R, Jaser SS, Faulkner MS, Murphy K, Delamater A, Grey M. Type 1 diabetes ehealth psychoeducation: Youth recruitment, participation and satisfaction. *J. Med. Internet Res.* 2013;15(1):1–16.
38. Mishra A, Tiwari NK. Green communication: An effective approach to minimize risk of forgetfulness from mobile phone usage. *E-health Telecommunication Systems and Networks.* 2014;3:1-7. Available:http://dx.doi.org/10.4236/etsn.2014.31001
39. Rho MJ, Kim HS, Yoon KH, Choi IY. Compliance patterns and utilization of e-health for glucose monitoring: Standalone internet gateway and tablet device. *Telemed. J. E. Health.* 2017;23(3):298–304.
40. Rixon LP, Hirani S, Cartwright M, Beynon M, Selva A, Sanders CP, Newman S. What influences withdrawal because of rejection of telehealth – The whole systems demonstrator evaluation. *J. Assist. Technol.* 2013;7(7):219–227.
41. Sarkar U, Piette JD, Gonzales R, Lessler D, Chew LD, Reilly B, Johnson J, Brunt M, Huang J, Regenstein M. Preferences for self-management support: Findings from a survey of diabetes patients in safety-net health systems. *Patient Educ. Couns.* 2008;70:102–110.
42. Song L, Tatum K, Greene G, Chen RC. EHealth literacy and partner involvement in treatment decision making for men with newly diagnosed localized prostate cancer. *Oncol. Nurs. Forum.* 2017;44(2):225–233.
43. Terschüren C, Mensing M, Mekel OC. Is telemonitoring an option against shortage of physicians in rural regions? Attitude towards telemedical devices in the North Rhine-Westphalian Health Survey, Germany. *BMC Health Serv. Res.* 2012;12. DOI: 10.1186/1472-6963-12-95

44. LaMonica HM, English A, Hickie IB, Ip J, Ireland C, West S, Shaw T, Mowszowski L, Glozier N, Duffy S. Examining internet and eHealth practices and preferences: Survey study of Australian older adults with subjective memory complaints, mild cognitive impairment, or dementia. *J. Med. Internet Res.* 2017;19(1):1–16.

© 2020 Kpe-Nobana et al.; This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Peer-review history:
The peer review history for this paper can be accessed here:
<http://www.sdiarticle4.com/review-history/62311>