



# **The Influences of Open Access of Online Health Information on Patient Compliance to Professional Healthcare Providers Prescription in Kasangati Town Council, Wakiso District Uganda**

**Martha Hope Nakitto**  
Clarke International University

**Drake Patrick Mirembe**  
Makerere University

**Christopher Waako**  
Clarke International University

**Jude Lubega**  
Nkumba University

**Martha Kibukamusoke**  
Cavendish University

**Fiona Nambogo**  
Eight Tech Consults

## **ABSTRACT**

Globally the health sector has witnessed disruptive transformation of how information is generated, analyzed and shared using Information Communication Technologies (ICT). There is limited understanding on how patient's access of online health information influences their desire to seek professional healthcare services or their adherence to professional healthcare service providers prescription/advise. Thus, the aim of this study was to investigate the influence that online health information has on patients' compliance to professional healthcare service provider's case management plans in Kasangati Town Council, Wakiso District, Uganda. Results show that, availability of internet, accessibility and availability of information and desire to gain deeper understanding are some of key factors that influence patients to access online health information. The study further revealed that access to online health information reinforces patient desired to seek professional care services and adhere to a case management plan provided by the health workers in addition to improving patient awareness and participation in management of their health.

**Key words:** Online health information; health care providers; patient compliance

## **INTRODUCTION**

The Internet and associated technologies have changed the way information is generated, shared and analyzed [1]. Today, every sphere of human life is controlled by information

systems resulting in increased generation and sharing of information often times on the internet [1]. The Internet is a global computer network providing a variety of information and communication facilities, consisting of interconnected networks using standardized communication protocols [2]. As of January 2021 it is estimated that there are 4.66 billion users of the internet globally [3], of which Africa is estimated to have about 567 million users while Uganda is estimated to have about 20.1 million users (49%) of the population according to Uganda Communication Commission Report, 2020 [4].

The rapid internet penetration and the associated innovative service technologies such as; YouTube, blogs, social media, wikis, among others are promoting the culture of open communication and sharing resulting to increased availability of information on web covering all fields of human life including healthcare. According the study conducted by [5] it was found that increasing internet penetration was directly related to increasing use of internet by healthcare professionals and patients. The study also found out that the most common source of health information on the internet was from two key sources; website run by organizations and web pages run by individual persons, often the information published on these pages is not peer reviewed is varied by authorities of a given jurisdiction. The observations of [5] are further reinforced by the observations of [6] and [7] who noted that, globally patients are increasingly seeking and using online health information to become more active in managing their own health in a partnership with their physicians. Their studies further concluded that the increasing access to information from the internet by patients was complicating the relationship between patients and their healthcare service providers. This is as a result to the often misguiding information on the internet and the limited abilities of patients to comprehend technical health information.

## **MATERIALS AND METHODS**

The researcher used a cross sectional research design adapting a mixed methods approaches of data collection and analysis involving both quantitative and qualitative methods. The mixed methods were chosen because they provide the researchers with the flexibility to answer the research questions given the nature of the study which seeks options of people which sometimes can be subjective hence the need to interrogate facts from different angles.

The research was conducted in areas of Kasangati Town Council, which is located in the central region of Uganda in Wakiso District. Kasangati Town Council was selected for the study because, it represents a typical rapidly growing urban center in an African setting, with rapid expanding population, largely composed of the middle class and served with both 3G and 4G Internet (High Speed Internet). The target population for the study were; patients, perspective patients, healthcare professionals (physicians, doctors and other medical personnel) in the medical facilities in and around Kasangati town council. Prospective patients were also found in public places around Kasangati town council.

The study used a stratified purposive random sampling technique to select respondents for the study. The purposive sampling allowed us to select respondents who are most likely to answer the questions of the study like patients and health professional in health facilities. Random sampling is a sampling technique in which participants are randomly chosen within a subgroup of the target population.

The research tools used included;

**Survey Questionnaire (SQ):** Survey questionnaire were used to collect opinions from the patients. The questionnaire included four main sections: a preamble, this provided the background of the study and the associated disclaimer; the respondent profile which covered demographic data; thematic questions presented in various forms such as open ended, closed options and likert scale these covered the main thrust of the study and structured around research objectives.

**Key Informant Interviews (KII) Protocol:** The researcher also used a KII-protocol to collect opinions from; health professionals at various healthcare facilities and within the population, key sector opinion leaders, and academia. The responses from key informants were largely used to generate thematic issues in line with the objectives of the study. The KII-Protocol had three main sections; the preamble, the respondent profile and thematic sections. The tool was designed to accommodate the attention span aspects to be short but precise. A total of 15 interviews were conducted.

The research was reviewed and approved by Clarke International University Ethics Review board and informed consent was provided by the respondents.

### **RESULTS AND DISCUSSIONS**

Of the 385 target sample size, 381 patients were reached through an online questionnaire and 27 health workers were interviewed through a KII tool from the hospitals, pharmacies, clinics among others. This made a total of 408 respondents for this study which is 106% participation.

## Respondent Demographics

**Table 1 below summarizes the demographics of the respondents to the study.**

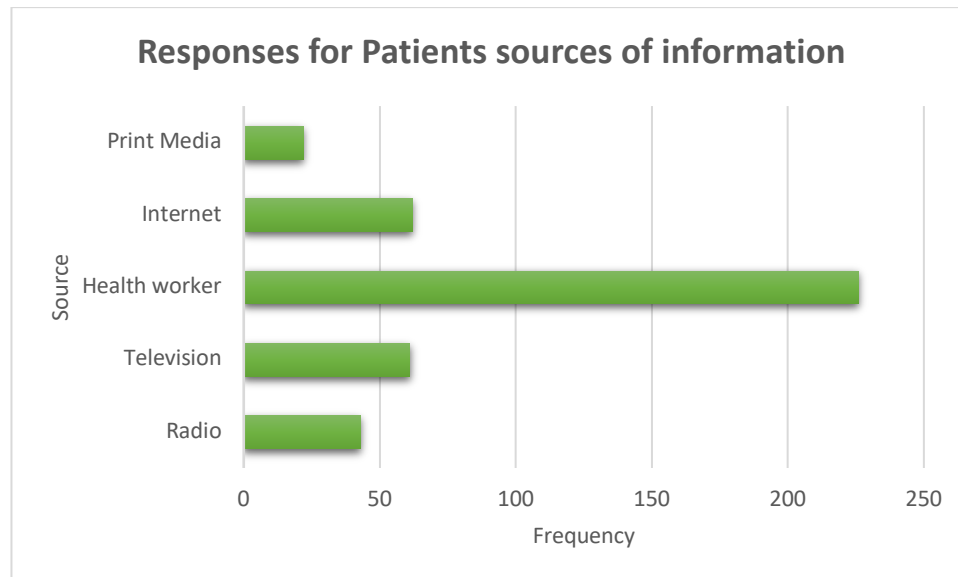
Variable	Group	Number	Percentage (%)
Age	18-25	82	20.1%
	26-35	150	36.8%
	36-45	117	28.7%
	46-55	41	10.0%
	>56	18	4.4%
	<b>Total</b>	<b>408</b>	<b>100.00%</b>
Gender	Male	158	38.7%
	Female	250	61.3%
	<b>Total</b>	<b>408</b>	<b>100%</b>
Highest level of education	Post graduate	15	3.7%
	Bachelors	90	22.1%
	Diploma	82	20.1%
	A 'level	59	14.5%
	O'level	66	16.2%
	Primary	57	14.0%
	None	39	9.6%
	<b>Total</b>	<b>408</b>	<b>100.0</b>
Respondent Category	Patient	381	93.3%
	Health worker	27	6.7%
	<b>Total</b>	<b>408</b>	<b>100%</b>
Patient Health Insurance	Yes	41	10.5%
	No	340	89.5%
	<b>Total</b>	<b>381</b>	<b>100</b>
Patient Marital Status	Single	113	29.7%
	Married	193	50.7%
	Divorced	25	6.6%
	Separated	50	13.1%
	<b>Total</b>	<b>381</b>	
Patient Occupation Type	Informally employed	129	33.9%
	Formally employed	60	15.7%
	Self employed	105	27.6%
	Unemployed	87	22.8%
	<b>Total</b>	<b>381</b>	<b>100</b>

**Table 1: Respondent Demographics**

As shown in Table 1, majority of the respondents were Female (61.3%), falling in the age group of 18-45 years, majority (22.1%) had attained a bachelor's degree followed by diploma holders (20.1%) as illustrated in Table 1. Most of the patient's respondents were either self-employed (27.6%) or informally employed (33.9%). About 70% of the patient respondents are either in a relationship (*married*) or they have been in a relationship (*divorced or separated*). Majority (89.5%) of the respondents did not have health insurance.

### Patient Sources of Health Information

In terms of access to health information, the patients were asked to indicate their key sources of health information. The results of the analysis show that, majority of the patients get health care information from health workers (**226**) (in hospitals, clinics, pharmacies and drug shops) followed by internet searches (**62**) and television advertisements (**61**) in that order of preference. The least source of health information for patients was radio (**43**) and print media (**22**) as shown in Figure 2.



**Figure 1: Main sources of health information for patients**

The results are not surprising given the fact that most health workers are easily accessible in the town council with the increasing number of private health facilities. In addition, the use of internet as the second main source is justified by the population demographic, which is largely urban and Internet savvy. Clearly, patient prefer access of health information from qualified health providers as sign of trust in healthcare workers as opposed to online information.

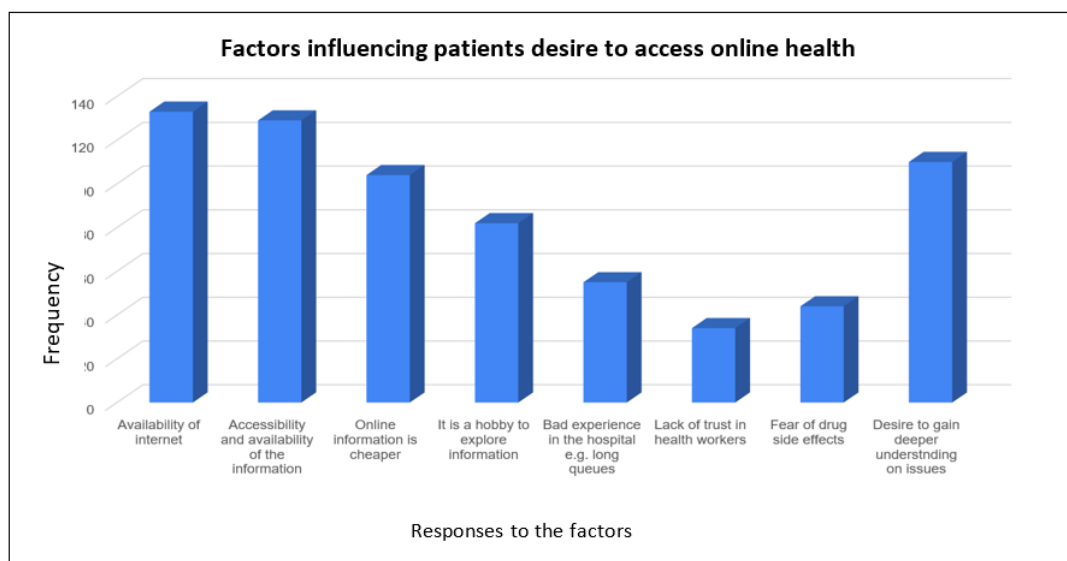
On the side of healthcare workers, they were asked about the mainly source of information and the analysis of the responses from all the 27 revealed that; Uganda clinical guidelines (27), Ministry of health bulletins (20), Fellow health workers (19), Internet (19), medical books and journals (11), other sources (11). It is very clear the internet sources are becoming one main source of information for health workers. The health worker opinion was well summarized by one nurse at a clinic in KTC who stated that:

*“Sometimes am left hear in the night alone, so when I get a complicated case as the doctor is not reachable I Google for quick help to guide my decision on case management, Moyo clinic website has good information”*

### Personal and Environmental Factors that influence patients desire to access online health information

The analysis of the patients’ responses indicated that; availability of internet (133), Accessibility and availability of information online (129), Desire to gain deeper understanding on health issues (110) and online information being cheaper (104) in that order of preference

are the key factors. While; hobby to explore information (82), Bad experience at a health facility (55), fear of drug side effects (44), and lack of trust in health workers were the least influence factors as illustrated in Figure 3 below;



**Figure 2: Showing patients' response towards the factors that influence desire to access online health information**

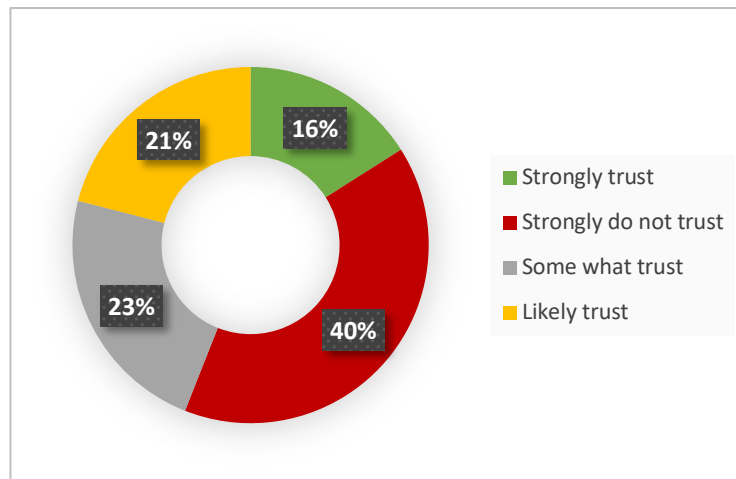
Thus, according to the results of the study, improving internet accessibility and affordability encourages more patient to access online health information, while poor services and bad experiences from health services providers, do not drive patients to access online health information, rather motivate them to seek health information from other professional health care service providers. Thus, **professional healthcare worker remain the most preferred sources of health information by patients in Kasangati town council.**

The analysis of responses on why health workers seek online health information, the results revealed that; (25/27) seek online information to gain deeper understanding of health and medical issues, (21/27) are driven by the availability and affordability of internet, and (12) have a hobby of exploring information especially on social media to establish news and trends. As well stated by one pharmacist in one of the health facilities; *"To enhance my understanding of drugs and new technologies in the field, I regular search about some conditions and drugs online, the internet provides more information than that we get from clinical guidelines"*

### **Level of trust in the online health information**

#### **a) Patients**

The study sought to establish the extent to which respondents trust the quality and reliability of online health information. The results in Figure 4 show that; **40%** of the patients strongly don't trust online information, about 44% indicated that they trust online health information, and only 16% indicated they strongly trust online information (Rank 5) (Refer to Figure 4).



**Figure 3: Patient Level of Trust in online health information**

For patients who indicated to trust online health information in some form gave the following key reasons to justify their opinion:

**Table 2: Patient Reasons for trusting online health information**

Reason	Frequency
It is well presented and detailed with elaborated examples	131
Information is from experts in health domain	120
Highly true and saves time	71
It is private and no need to tell people your disease	22
It is trusted and used by some health workers too	91
It is the same information health workers give	62

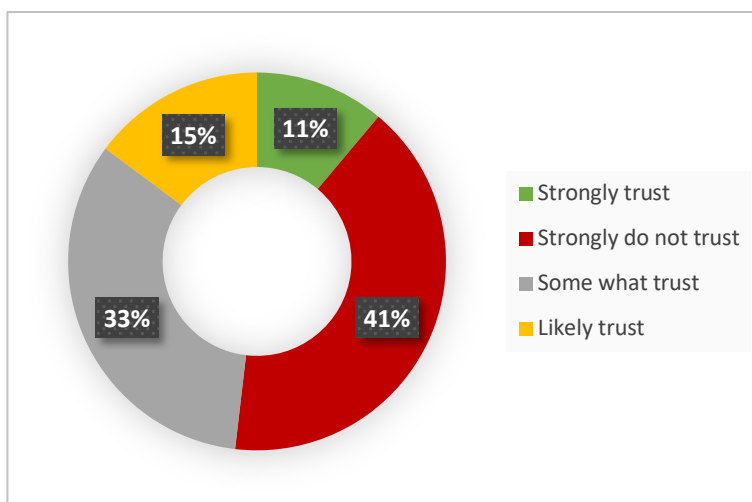
For those who indicated not to trust online health information gave the following as some of the key reasons for their mistrust:

**Table 3: Patient Reasons for not trusting online health information**

Reasons	Frequency
Most online information is false, misleading	89
The source of online information is not clear	72
Different versions of online information provided	57
Provision of outdated health information especial on drugs	51
No physical examination is done while using online information for diagnostics	32

**b) Health worker**

While majority 41% of the health workers strongly do not trust online health information, 33% of the somewhat trust online health information and 15% likely trust it while only 11% strongly trust online health information as illustrated in the Figure 5 below:



**Figure 4: Health worker Level of Trust of online health information**

They gave the following key reasons for their opinions; Any person can submit articles on the internet, I trust it because there are authentic sites with correct information, It is available all the time, Some of that information contradicts the formal medical books which makes it wrong, Information is fairly good, right, authentic and from reliable sources, There are a lot of bloggers , and some information is not fully right and misleading, It's all confusing an some is not right and not well presented, Most the online information is false and Information is always very shallow medically.

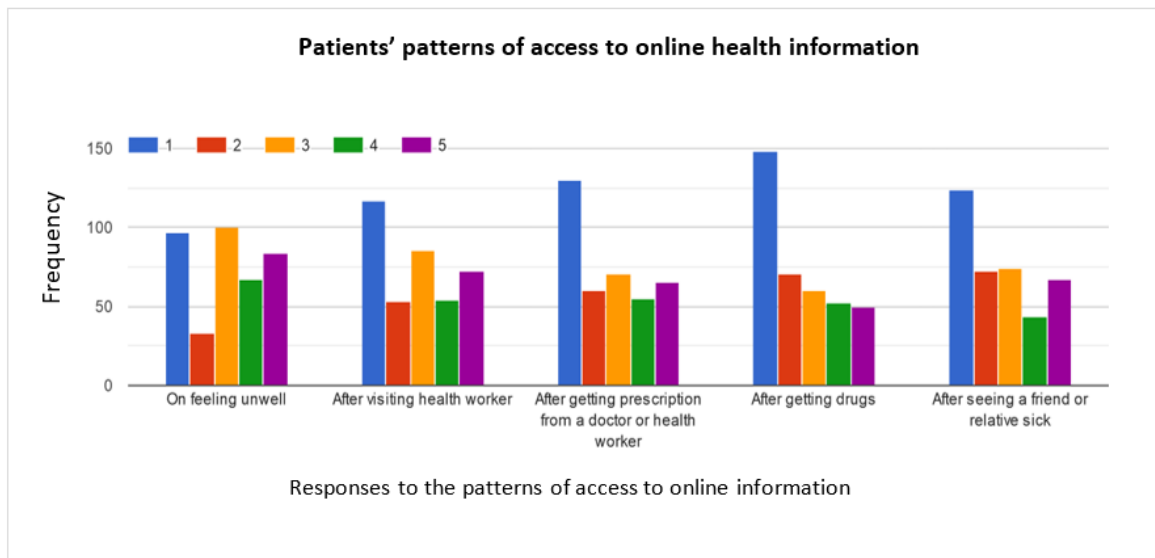
Thus, it is very clear from the findings that for online health information to be trusted by patients and health care professional, it must be; provided by a trusted and verified source and presented in an easy to use format with illustrations. This implies there is need to regulate publishing of health information on online platforms to ensure only qualified professional publish this information and it should be peer reviewed or approved by relevant authorities. As observed by one doctor at the health facility:

*"I normally read medical books and journals to update my knowledge on case management since their authentic sources; this COVID19 has opened my eyes about new emerging technologies like the Pfizer vaccine which is based on new technologies, but also the power of misinformation from the internet. Reason to first verify source of information before consuming it"*

### **Patients' patterns of access to online health information**

In terms of patterns of access to online health information by patients, the results in Figure 6 show that; majority of the patients (251) seek online health information "on feeling unwell", followed by (210) who do so after "visiting a health worker", followed by (191) "after getting a prescription from a doctor", followed by (185) "After seeing a friend sick", followed by (162) "after getting drugs".





**Figure 5: Patients' patterns of access to online health information**

For which; Rank 1= Not at all, Rank 2=to less extent, Rank 3 = to some extent, Rank 4 = to great extent, and Rank 5 = to a greater extent.

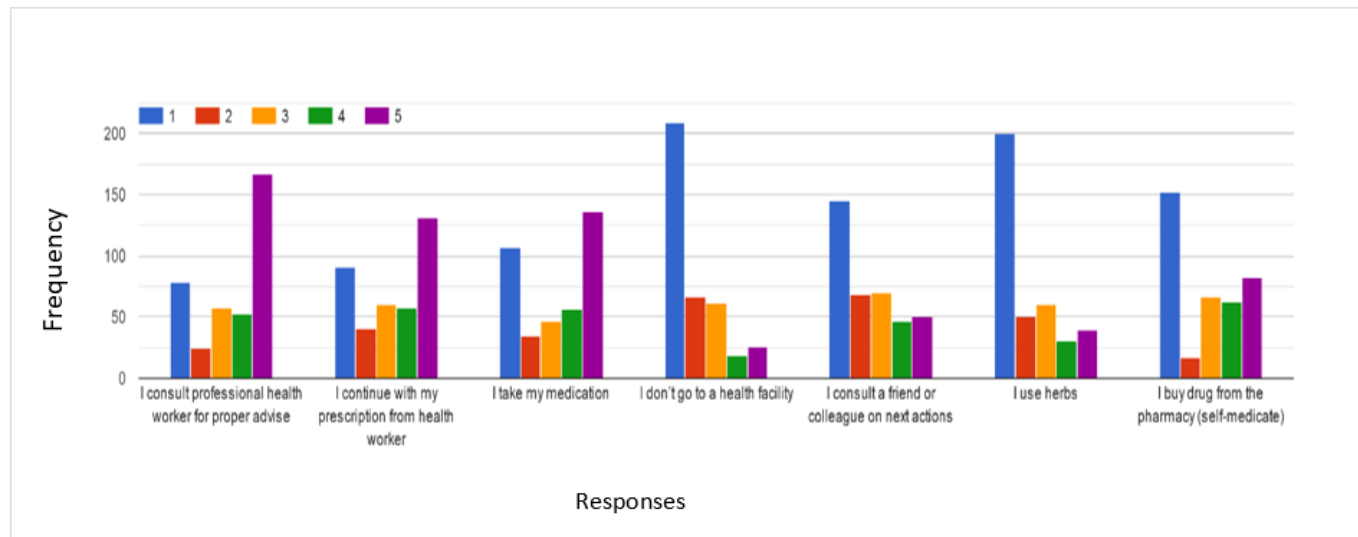
It is clear from Figure 6 above that, patients are less likely to seek online health information; after getting drugs (rank 1 and 2 = 219), followed by on seeing a friend or relative seek (196) and after getting prescription from a doctor ( 190). The observation was well articulated by the pharmacist at one of the health facility in Gayaza Kasangati Town Council who stated:

*“When patients come to buy drugs often they have a lot of questions , especially on the price differences between drug of the same type , which sometime can cause curiosity but when you explain to them and they understand on returning they testify that the information provided to them was helpful. It is very important for health workers to take time and explain to patients; otherwise they will resort to getting information from unreliable sources”*

### **Online health information influence on patient's compliance to professional healthcare**

One of the key research questions this study sought to establish was the influence of online health information on patient's decision to access professional healthcare in Kasangati town council. The results of analysis in Figure 7 show that access to online health information reinforces patient desired to seek professional care services and adhere to a case management plan provided by the health workers.

### i) Patients reaction after consultation of online health information



**Figure 6: Patients reactions after consultation of online health information**

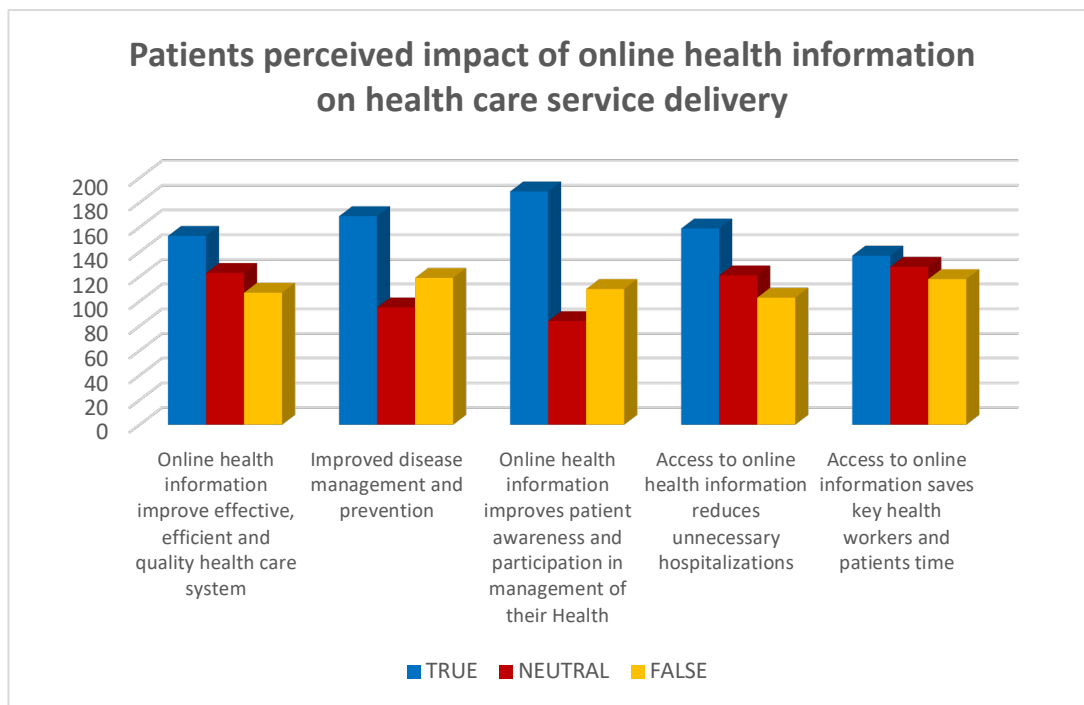
For which; Rank 1= Not at all, Rank 2=to less extent, Rank 3 = to some extent, Rank 4 = to great extent, and Rank 5 = to a greater extent.

It is therefore; fair to conclude that access to online health information by patients has a positive influence on their adherence to prescription provided by the health workers. This was well echoed by a nurse at one of the facilities in Kasangati Town Council:

**“We get good number of patients who have searched about their condition on the internet and because of lack of clarity of online information they get, they come to consult a doctor”**

### ii) Impact of Online health information on health care service delivery in Kasangati town council

It was important to assess the impact of online health information on the delivery of health care services in Kasangati Town Council (Figure 8). It was clear that majority of patients (189/381) and health workers (19/27) believe that access to online health information improves patient awareness and participation in management of their health. In addition, majority of health workers (16/27) and patients (159/381) agree that access to online health information reduces unnecessary hospitalization, (153/381) agreed that online health information improves effective, efficient and quality health care system and only (137/381) agreed that it saves key health workers and patients time in that order of preference.



**Figure 7: Perceived impact of online health information on health care service delivery in KTC**

Health workers strongly disagree (18/27) that online health information improves effective, efficient and quality health care system and improves disease management and prevention. This was backed up well by one of the patients who explained as follows:

*“During the time of Covid-19, we got so much information online that had been used by other people and we used it to treat ourselves. This prevented many people from hospitalization and prevented a lot of deaths across the entire country.”*

### **Limitations Associated with Online health information**

Both patients and health workers were asked to state the challenges associated with online health information and provided suggestions on what can be improved.

### **Challenges faced with online health information in Kasangati district**

- i) Accessibility to internet and devices to use is a challenge since internet enabled devices are expensive
- ii) Use of strong diction and complicated terms when providing the information, which makes it hard for patients to easily interpret.
- iii) False information from none authentic sites that mislead patients.
- iv) There is also lack of a regulated system that provides health information; therefore, different sites can contradict each other about the same topic.
- v) Misconceptions between the doctors prescriptions and recommendations and the information that was derived online
- vi) Poor internet connectivity in some areas thus making internet access hard
- vii) Self-treatment using medicine not prescribed by doctors amongst the community is on the increase

## **Suggestions on the improvement of access and use of online health information among patients**

The following are some of the key suggestions by the respondents of the study on what needs to be done to improve the usage of online health information.

- i) Creation of more awareness programs about online health information, when to use it, how and the danger associated with it.
- ii) Authentication and Regulation on the information that is published on the internet in order not to mislead the people.
- iii) Widen the scope of information provided online.
- iv) Training users especially the patients on how to access the online health information
- v) Use of simple and understandable terms preferably in local languages. 4.5 Results Dissemination
- vi) Zero rating for all authentic health sites that provide information to be used by the community so that there is more access to health information.
- vii) Capacity building at all health centers in terms of ICT infrastructure and staff on how to use digital health information to support effective diagnosis and treatment.

## **CONCLUSIONS**

Majority of patient respondents did not have health care insurance and indicated to access health care information mainly from the health workers and to some extent from health websites on internet. The study revealed that majority of the patients are influenced to access online health information by; the availability, accessibility, cheaper cost of information online and the desire to gain a deeper understanding on health related issues.

It is apparently clear that, a large number of both patients and health worker indicated that they do not trust online health information because; it is sometimes false, costly, outdated, misleading among others. It was further observed that patients often seek for online health information after getting drugs/prescriptions, and other after seeing a sick friend or relative therefore they make research on causes, prevention and cure of the related sickness and they further indicated that in cases where online consultation is done first they later consult a professional health worker. It is worth noting that several challenges are also associated with the access of online information, which include high costs, unreliable information, and false information among others.

It is was clearly revealed that online health information has a positive contribution to the delivery of health care services in Kasangati town council, Wakiso district as it; enables patients take active participation in the management of their health and helps to reduce unnecessary hospitalization in the town council.

## **RECOMMENDATIONS**

Given the unique contribution of online health information in the delivery of health care services in Kasangati Town Council, and the associated limitation of its use as identified in this study, the researcher makes the following key recommendations to patients, health workers and other stakeholders i.e. Government:

- i. The Ministry of Health should carry out Sensitization of the population towards the use of online health information and the dangers that can arise from its misuse.

- ii. Patients should keep in mind that there is a lot of unregulated information on the internet and first verified the source of information before relying on it to make important decisions.
- iii. The Ministry of Health and associated agencies of government should maintain a list of approved authentic sources of health information for both health workers and patients to verify information with.
- iv. The Ministry of Health, in collaboration with the Ministry of ICT and associated agencies like Uganda Communications Commission should work together to regulate the circulation of online health information
- v. The Doctors and bloggers that provide online health information should endeavor to use clear terms and explanations that patients can easily understand. Also, provide evidence of their practicing license.
- vi. There should be creation of a governed body responsible for the profiling of online health information before it is published to the users.
- vii. The health workers should advise patients on the use of online health information.
- viii. There should be zero rating for authentic health websites that provide effective information to patients, doctors for use on health needs.

### **ACKNOWLEDGEMENT**

This research was conducted with financial and technical support from the Eight Tech Consults Ltd [www.8technologies.net](http://www.8technologies.net) through a studentship research grant awarded to Engaged Scholarly Academic Network (ESCANET) [www.escanet.org](http://www.escanet.org) research grant number ESCANET-2019-GT-09.

### **References**

1. Aceng, D. J. (2017-2021). Uganda National eHealth Strategy. Kampala
2. Ampaire L, Muhindo A, Orikiriza P, et al. A review of antimicrobial resistance in East Africa. *J Lab Med.* 2016; 5(1), a432. <http://dx.doi.org/10.4102/ajlm.v5i1.432>
3. Annie Banbury 1, Alison Roots, Susan Nancarrow Rapid review of applications of e-health and remote monitoring for rural residents, PMID: 25303412, DOI: 10.1111/ajr.12127
4. Ash J: How to avoid an e-headache. *BMJ.* 2007, 334: 1373-10.1136/bmj.39252.490880.80.
5. Benedict Osei Asibey, Seth Agyemang, and Augustina Boakye Dankwah.(2017).The Internet Use for Health Information Seeking among Ghanaian University Students: A Cross-Sectional Study.Hindawi International Journal of Telemedicine and Applications, Volume 2017, Article ID 1756473, 9 pages. <https://doi.org/10.1155/2017/1756473>
6. Bloom, G., Berdou, E., Standing, H. et al. ICTs and the challenge of health system transition in low and middle-income countries. *Global Health* 13, 56 (2017). <https://doi.org/10.1186/s12992-017-0276-y>
7. Borrill C, West M, Shapiro D, Rees A: Team working and effectiveness in health care. *Brit J Health Care Mngt.* 2000, 6 (8): 364-371.
8. Braithwaite J, Runciman WB, Merry A: Towards safer, better healthcare: harnessing the natural properties of complex sociotechnical systems. *Qual Saf Health Care.* 2009, 18: 37-41. 10.1136/qshc.2007.023317.
9. Braithwaite J, Westbrook M: Rethinking clinical organizational structures: an attitude survey of doctors, nurses and allied health staff in clinical directorates. *Journal of Health Services Research & Policy.* 2005, 10 (1): 10-17. 10.1258/1355819052801778.
10. Braithwaite J: Hunter-gatherer human nature and health system safety: an evolutionary cleft stick?. *Int J Qual Health Care.* 2005, 17 (6): 541-545. 10.1093/intqhc/mzi060.

11. Christine Holst, Felix Sukums, Danica Radovanovic, Bernard Ngowi, Josef Noll and Andrea Sylvia Winkler. (2020). Sub-Saharan Africa—the new breeding ground for global digital health. *The Lancet Digital Health*. VOLUME 2, ISSUE 4, E160-E162, APRIL 01, 2020
12. De Leo G, LeRouge C, Ceriani C, Niederman F. Websites most frequently used by physician for gathering medical information. *AMIA Annual Symposium Proceedings 2006*; 902.
13. Dollarhide, M. E. (2020). Social media definition. *small business*.
14. Furusal, S. S., & Coleman, A. (2018). Factors influencing e-health implementation by medical doctors in public hospitals in Zimbabwe. *South African Journal of Information Management*.
15. Gerald Bloom, E. B. (7 August 2017). ICTs and the challenge of health system transition in low and middle-income countries. *Global Health* 13,
16. Gillies RR, Zuckerman HS, Burns L, Shortell S, Alexander JBPP, and Waters T: Physician-System Relationships. *Stumbling Blocks and Promising Practices*. *Med Care*. 2001, 37 (7): I92-I106.
17. GSMA (2020). Mobile Internet Connectivity 2020 Sub-Saharan Africa Factsheet .<https://www.gsma.com/r/wp-content/uploads/2020/09/Mobile-Internet-Connectivity-SSA-Fact-Sheet.pdf>
18. HEPS Uganda, C.f., & Samasha Medical Foundation. (2014).Final cost and pricing study report.
19. [5] Higgins O, Sixsmith J, Barry MM, Domegan C. A literature review on health informationseeking behaviour on the web: a health consumer and health professional perspective. Stockholm: ECDC; 2011
20. Jackie Davies, Bernard Trude, Harry McConnell, Roberto Ramirez, T Shields, Peter Drury, J Kumekawa, J Louw, G Fereday, Caroline Nyamai-Kisia (.31 May 2006) . *Improving Health, Connecting People: The Role of ICTs in the Health Sector of Developing Countries A Framework Paper*.
21. Jadad AR, Delamothe T: What next for electronic communication and health care?. *BMJ*. 2004, 328 (7449): 1143-1144. 10.1136/bmj.328.7449.1143.
22. [3] Joseph Johnson, (Jan 2021) Global digital population as of October 2020. <https://www.statista.com/statistics/617136/digital-population-worldwide/#:~:text=Almost%204.66%20billion%20people%20were,percent%20of%20total%20internet%20users.> accessed on 26th Jan, 2021
23. Kiberu, R. E. (2017). Barriers and opportunities to implementation of sustainable e-Health programmes in Uganda: A literature review. *African journal of primary health care and family medicine*
24. Mirembe, D.P. (2010). Security framework for Telemedicine, E health and Wellness Services. LAP publishers ISBN 978-3-8383-4330-3, April, 2010
25. [1] Mirembe, D.P. (2015). The Threat Nets Approach to Information Systems Security Risk Analysis. PhD thesis, ISBN 978-90-367-8139-8, University of Groningen
26. National ICT Policy (2004). Kampala: Ministry of ICT and National guidance.
27. NPA, 2007. Uganda Vision 2040. <http://www.npa.go.ug/uganda-vision-2040/>
28. [6] Sara Heath. (2018). How Online Medical Info Impacts Patient-Provider Relationships. <https://patientengagementhit.com/news/how-online-medical-info-impacts-patient-provider-relationships>
29. [7] Sharon Swee-Lin Tan, Nadee Goonawardene (2017). Works citing "Internet Health Information Seeking and the Patient-Physician Relationship: A Systematic Review". *J Med Internet Res* 2017 (Jan 19); 19(1):e9
30. Tang H, Ng JH. Googling for a diagnosis – use of Google as a diagnostic aid: internet based study. *British Medical Journal* 2006;333(7579):1143-1145
31. [2] TechTarget Contributor, (Jan 2021). Internet. <https://searchwindevelopment.techtarget.com/definition/Internet>
32. The Independent, July 2 , 2019; Magnitude of antibiotic resistance in Uganda unknown-Expert :<https://www.independent.co.ug/magnitude-of-antibiotic-resistance-in-uganda-unknown-expert/>

33. [4] UCC (2021). UCC Market Report Shows Post Lockdown Recovery. <https://uccinfo.blog/2021/01/08/ucc-market-report-shows-post-lockdown-recovery/>. accessed on Jan 27th, 2021
34. Uganda Bureau of statistics, U. (2016). National Population Housing Census 2014. Uganda Bureau of statistics.
35. Union, I. T. (2007). Telecommunications/ICT markets and trends in Africa. Kigali.
36. Westbrook J, Ampt A, Williamson M, Nguyen K, Kearney L: Methods for measuring the impact of health information technologies on clinicians' patterns of work and communication. 12th World Congress on Medical Informatics (Medinfo): 2007; Brisbane, Australia. Edited by: Kuhn KA WJ, Leong T. 2007, IOS Press, 1083-1087.
37. WHO (2012). Health Systems in Africa Community Perceptions and Perspectives: The Report of a Multi-Country Study.
38. Yi, W. M., Eli, L., Dai, W. M., & Yuanhao, H. (2011). A qualitative study about self-medication in the community among market vendors. Retrieved from <https://doi.org/10.1111/j.1365-2524.2011.01009.x>
39. Zekeng Elis (2016). Health Systems in Sub-sahara Africa: Focusing on Community based delivery of health services and development of local research institution. United Nation Peace and Progress. Vol(3) 1. Pp 44-49