The Adoption of Mobile Health (mHealth) Services by Internally Displaced Persons (IDPs) in Nigeria

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Abstract. This study operationalized the unified theory of acceptance and use of technology (UTAUT) to study the attitudes and opinions of internally displaced persons (IDPs) in Malkohi host community Yola, to mHealth if deployed to support their healthcare and health information needs. Findings from the research revealed that the IDPs have a positive behavioral intention towards mHealth technology, which could then lead to its adoption. The study also unveiled new constructs such as "Language" and "No Tariff" which are more vital determinants of the IDPs attitude towards mHealth than the original UTAUT constructs. These newly discovered constructs were added to modify the UTAUT to make it a suitable framework to check attitudes and opinions of IDPs towards mobile health (mHealth).

Keywords: Mobile Health, mHealth, UTAUT, internally displaced persons, IDPs

1 Introduction

Nigeria has a high population of displaced persons living in the country. The major reason for this is the Boko Haram insurgency that has been plaguing the country for almost a decade, with this terrorist group having carried out most of their attacks in the North East region of Nigeria leaving more than 2million people displaced (Gwadabe, Salleh, Ahmad, & Jamil, 2018). These displaced people seek refuge in IDP camps and host communities, the living conditions of these people having been very well explored in literature and has been stated to be deplorable. The relief items donated and distributed by humanitarian agencies and health care services and information are found to be inadequate, as a result of the overcrowding situation in these camps (Eme, Azuakor, & Mba, 2018). The studies that have been conducted on IDPs in Nigeria have mainly revolved around their living conditions, their plights, physical health conditions, mental health, causes of their migration, educational needs, psychological needs and various other needs (Eme et al., 2018; Gwadabe et al., 2018; Okon, 2018; Owoaje, Uchendu, Ajayi, & Cadmus, 2016). The health problems of these displaced persons in the camps is one of the issues that is stated in almost all the literature reviewed on IDPs in Nigeria. However, research has not comprehensively covered possible solutions to their lack of adequate healthcare and health information (Owoaje et al., 2016).

Patil (2019) on the role of ICT in the lives of refugees, recommends that we start viewing displacement problem as a development problem rather than just a humanitarian crisis. Thus, technological solutions are being explored in literature for refugees and IDPs to provide sustainable solutions to their plights and to allow them to create self-reliance opportunities. However, this area of research has not gained much popularity in the Nigerian context because the majority of the literature reviewed on refugees and ICT has been carried out in other countries and this has focused on addressing the issues of refugees. Mobile health provides the advantage of the use of mobile phones to provide medical health services to patients in remote areas. Based on the gaps identified from the foregoing, this study aims to explore the attitudes and opinions of IDPs to adopting mHealth technology to support their lack of adequate healthcare and health information. With this in mind, the research asks the following questions:

1. To what extent do IDPs utilize mobile phones?
2. What is the attitude and opinion of IDPs to mobile phones to provide for their health information needs?

The remainder of the paper is structured thus; section 2 explains a brief history of the cause and current situation of IDPs in Nigeria. Section 3 highlights the theoretical foundation adopted for the study. Section 4 explains the research methodology and method of data analysis. Lastly, section 5 explains the empirical evidence and findings, and sections 6 & 7 contain the contribution to knowledge and research conclusion.

2 Internally Displaced People in Nigeria

IDPs are people that have been forced to elope from their natural place of habitat or homes but are still within the borders of their country, while refugees are displaced people that have had to run beyond the borders of their county Gwadabe et al., (2018) to seek refuge in other countries. The population of IDPs in Nigeria as at 31st of December 2018 is 2,216,000 as reported by the Internal Displacement Monitoring Centre (IDMC, 2018). Nigeria has the worst IDP situation in Africa which has made it become the third in the world after Syria and Columbia (Lenshie & Yenda, 2016). Mukhtar et al. (2018) in their study stated that 80% of the IDPs in Nigeria are found in the North-eastern part of Nigeria according to The National Emergency Management Agency (NEMA). This high population of displaced persons in the North East region of Nigeria is as a result of the attacks from the Boko Haram terrorist group that has been ongoing in the country for almost a decade now.

The Boko Haram religious terrorist group started its attack against the Nigeria Government in 2009 in Maiduguri, Borno state (Gwadabe et al., 2018). Borno state is one of the North eastern states in Nigeria, it contains 27 local Government areas and about 20 of these local governments areas are controlled by the Boko Haram terrorist group with the Government controlling the remaining 7 (Sambo, 2017). This provides evidence of the reason why Nigeria has such an overwhelming population of IDPs from the year 2009 because the population of people that are displaced due to natural disaster is only about 24%, with the other 12.6% being from the Fulani herdsmen crisis with farmers. The remaining 85% of the total population of IDPs in Nigeria are from the

terrorist attacks in the North east (Nwaoga, Okoli, & Uroko, 2017). Adamawa and Yobe state and other North Eastern states also have a high population of IDPs after Borno state with a distribution of 18%, 13% and 63% respectively. IDP camps were created for victims of these terrorist attacks in the local Government areas that are safe from the attacks. Such camps receive donations of relief items from well-meaning Nigerians, the Nigerian Government, International Government and humanitarian agencies (Nwaoga et al., 2017).

2.1 Technological Solutions for Refugees and IDPs

Considering the fact that the world has gone digital over the years, more people (old, young, literate or illiterate) are adopting information and communication technologies. Lewis and Thacker, (2016) considers displacement as a continuous trend in the "21st century" and suggests that adequate preparedness should be made to meet the needs of this occurrence. Okon (2018) also suggests that the IDP situation in Nigeria is "recurring and large scale". Much research has been conducted on ways to provide solutions to the issues experienced by IDPs by making recommendations on Government policies to protect their rights, and also suggestion on the role of trained social workers as opposed to just volunteers (Chinwe & Oparaoha, 2018). Patil (2019) recommends that the issue of displaced persons should also be seen as a "development problem" rather than just a "humanitarian problem" and also calls for more research to be done on the impact that technology would have on the lives of displaced people. Hence, the need to consider ICT solutions for the problems of displaced persons.

3 Theoretical Foundation

3.1 Unified Theory of Acceptance and Use of Technology (UTAUT)

The UTAUT theory was created through a combination of eight technology acceptance and motivation models which includes the TAM and DOI theories. In the early 2000's technology adoption in organizations became rapid. However, these technologies wouldn't have improved productivity if the users had not accepted the technology. Thus, research on technology acceptance became important and there were various types of theories and models from information systems research, sociology and psychology which researchers were adopting to measure users intentions to use a new systems. Researchers were also faced with the choice to decide among the various number of models, and found they had to pick constructs across the models or pick a "favoured model" which tended to overlook the contributions from other models. This situation prompted Venkatesh, Morris, Davis, & Davis, (2003) to complete a study that reviewed and synthesized literature on user acceptance models to create a unified view of user acceptance theory. This model is presented in figure 3.1 below.

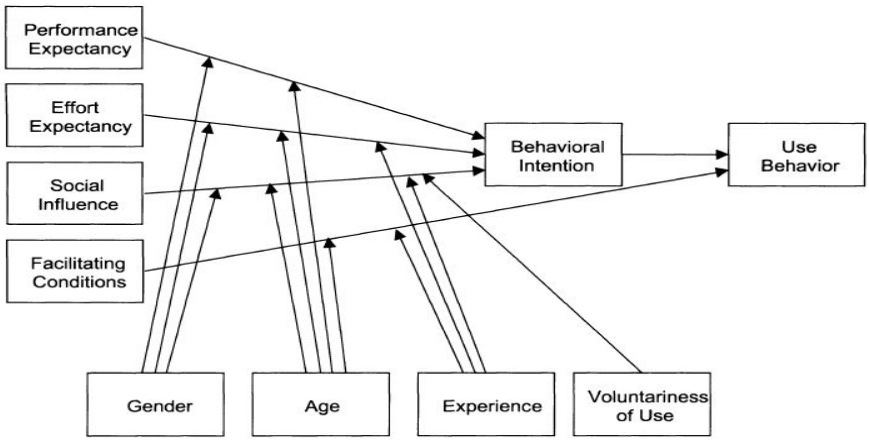

Figure 3.1: The UTAUT model (Source: Venkatesh et al., 2003)

Gender, age, experience and voluntariness of use are used as moderating variables in the model but are not used in this study. Among the studies that utilize information technology theories to review the components influencing the adoption of mobile health, the TAM model was utilized more than other models. Perceived usefulness (PU) and perceived ease of use factors (PEOU) in TAM are also very well represented in the UTAUT model as are performance expectancy (PE) and effort expectancy respectively (EE). The performance expectancy, effort expectancy and facilitating conditions from UTAUT are the best in predicting the adoption of mHealth technology as reported in a systematic literature review study on published articles from year 2004-2015 which was designed to discover the factors that influence users adoption of mHealth (Garavand, Samadbeik, Kafashi, & Abhari, 2017). The UTAUT model is thus a combination of all major technology acceptance theories, and is considered a right fit for the study because it not only consists of constructs that have been tested to be adequate to measure users intentions towards the mHealth technology, but also because it has been reported to have a 70% accuracy rate on testing users intentions compared to other models (Hoque & Sorwar, 2017; Garavand, Samadbeik, Kafashi, & Abhari, 2017; Pheeraphuttharangkoon, 2015).

Although the UTAUT model has gained a lot of popularity amongst researchers and its level of reliability is reported as being high, the model poses some limitations. In our study we were able to find out that the constructs of the UTAUT model are not all encompassing, and it required some modification to fit the context of our study. The original constructs of the UTAUT alone wouldn't have yielded a strong positive behavioral intention to adopt the mHealth technology if the new constructs (language and no tariff) were not included in the constructs; i.e. without the new constructs, the results may have shown that the IDPs might not be interested in adopting technology. This is a major limitation because it goes on to insinuate that the UTAUT model would always need modification when it's been used to investigate the intentions of individuals towards technology. In addition, "the original UTAUT model which was focused on large organizations in the business environment has caused an extensive discussion among

researchers who contend that the UTAUT constructs alone may not be adequate to clarify user acceptance of new technology in a voluntary setting as its initial purpose of use limits its explanatory power" (Ali, Mazen, Maged, & Alan, 2016).

4 Research Methodology

4.1 Interpretivism

The interpretivist acknowledge that realities exist in the minds of individuals differently. They recognize that notions of "reality" exist in a social setting and that the most suitable method for understanding activities of social actors may not really be through numbers and thorough measurable tests. This view is explained by Roode (2003) who affirms that "the interpretivist scientist perceives that numerous significant issues identified with the improvement, use and execution of information systems personally concern individuals, and acknowledges that the social world exhibits a superior stage to consider these wonders than the simply material universe of technology."

This research has adopted a case study design with a qualitative method which includes observation, focus group discussions and interviews. The data collection process from the IDPs in Malkohi host community started on 9th September and was concluded on 1st October. Having spent some time on the field, we understood to some extent the way of life of the IDPs in that camp. They rely solely on authority in their decision-making process and are mostly united on all other fronts. The data gathering process started off by seeking permission from the host community chairman who is also an IDP, which led on to him being the first interviewee. He felt it was important to include and invite the 9 other elders who have spent the highest number of years in the host community and are very well knowledgeable about the happenings and needs of the community. This led to the focus group discussion that started our data gathering process. Although, the general opinions received from the people was that the response of the chairman and elders was sufficient for them and that he speaks the mind of the people, the researchers still obtained permission to go on with interviewing other participants for research credibility. The 20 other respondents of the interviews included 10 women and 10 men distributed across different age groups.

The participants were all fluent in only the Hausa language, so the data collection process was done with the help of an interpreter who was fluent in both English and Hausa. The interview questions were open-ended questions, with responses to each question interpreted during the discussion and interview process with notes being taken during this process. The community chairman gave an estimate that about one-third of the people in the host community use mobile phones, and they can make calls, receive calls, and also send text messages. A purposeful random sampling method was employed in recruiting other participants that were interested in participating in the study. These included men and women from different age groups that use and own mobile phones. Each interview took about 10-15mins, with a total of 30 participants interviewed. The researcher stopped the process after reaching a level of data saturation; i.e. when no new data was being received (Fusch & Ness, 2015).

4.2 Method of Data Analysis

This study adopts a thematic analysis method of data analysis. Transcripts were transcribed manually into a Word document, and the transcribed data was read over and over again to produce a coherent understanding of the data. Notes on the first impression gotten from the data were taken, and the data was run through over again and then used to generate codes from the data. Code generation involves identifying and labelling relevant pieces present in the data, such as opinions, actions, activities, incidents, emotions etc.

The amount of data collected from interviews and focus group discussions was quite large and it was difficult to identify what was relevant to code. However, identifying codes can be done by probably considering a point that appears a couple of times within the data, including points that seemed important to the respondents and points that are new and can be an addition to the study. This also includes preconceived theoretical concepts or points that seem important to the researcher. These codes are then brought together for review to decide which ones are important and relevant to the study, with the codes identified as important then put together in categories or themes. This is done without bias with the codes and themes being strictly defined by the data. At this point the data is beginning to become conceptualized.

When the relevant themes are labelled and the relationships between them have been identified, the process builds the results of the study which provides new information about the world from the perspectives of the participants of the study. The connections between the themes can then be represented diagrammatically to create a thematic map. The results are then described, and this includes detailed descriptions of the themes and the connections between the themes. Also included are some scripts from the respondents which are used to support the results.

5 Empirical Evidence and Findings

This section examines the initial themes generated from the interview codes as derived from the research model. These themes can be seen on table 5.1 below and are discussed in greater detail in the following sections.

5.1 Themes Description Based on the Dimensions of Research Model

Performance Expectancy

According to Venkatesh et al. (2003) “Performance expectancy is defined as the degree to which an individual believes that using the system will help him or her to attain gains in job performance”. In this case, performance expectancy would refer to the degree to which IDPs believes that mHealth will help improve their current healthcare situation. The majority of the participants of the study believed that if they were provided an alternative to their current health situation, even if it is via a mobile phone, they were willing to accept it. There were also many complaints about the situation of the hospital in the camp. Apart from the host community where the study was conducted, there is another IDP camp very close by and they are also served by the same hospital and one doctor. Some respondents described situations where they have had to stay home

throughout their sick days because there was no space for examination or admission in the hospital due to the large number of people seeking treatment at the same time. This is usually common in the rainy seasons when they are more prone to all sorts of diseases, e.g. malaria.

Mobile phone usage	**Available healthcare in the host community**	**Alternative source of health care**	**Technology as an alternative**
Low population of people with mobile phones (about one-third of the population)	1 hospital, 1doctor, Overcrowded	Specialist hospital	Receiving health information via mobile phones will be helpful
Phone calls are more common than text messages/ Education barrier	Lack of expertise to treat some cases.	Specialist hospital is far	Communication with the doctor for progress and follow up
Inability for some people to afford mobile phones	Lack of adequate drugs to serve the population	Very expensive, very few can afford it	Reduced cost of going to the specialist hospital
I can ask for help when I need to do other things on my phone	Lack of adequate bed spaces for patients	Difficult to return for follow up and check up	Diagnoses and immediate treatment, when the camp hospital is occupied
	Need for more support from the Government	Difficult for Pregnant and breastfeeding mothers to get adequate information	Source of information in emergency situations
			Receiving test results and feedback will be easier and cheaper

Table 1: Initial Themes Generated from Interview Codes

Quite a number of respondents expressed their dissatisfaction about having to go to the specialist hospital for treatment because of the distance, and some of them mentioned they couldn't afford to go there at all and had to rely on whatever services the hospital on the camp provides. There have also been some situations where the doctor in the hospital on site was not equipped to handle some cases that had occurred in the camp and which needed immediate attention.

Effort Expectancy

According to Venkatesh et al. (2003) "Effort expectancy is defined as the degree of ease associated with the use of the system". As mHealth services are dispensed through mobile phones and other wireless devices, the basic phone calls and text messaging services are utilized in some mHealth initiatives. This study involved discovering the capabilities of the IDPs as regards the utilization of mobile phones. Thus, the study purposely chose samples of respondents that utilize mobile phones and would be able to relate to idea of mHealth technology. It should be noted that the population that use mobile phones are less than the population that do not have access to a mobile phone. This is mostly because some of them cannot afford a phone and furthermore some of them cannot use it. The majority of the respondents could however make and receive phone calls with their mobile phones without help, and the younger respondents are able to make calls, receive calls, send, read text messages as well as do other various things on their phones. This is because the younger respondents were more educated than the older respondents. However, the older respondents explained that they receive help from their children to operate the mobile phone when they need to do other things on their phones.

Solo Influence

According to Venkatesh et al. (2003) "Social influence is defined as the degree to which an individual perceives that important others believe he or she should use the new system". This was an important factor in the study as the IDPs are people with similar experiences and are able to relate to each other's situation. They are a community of people that have being brought together through crisis and they have had to grow, survive, support, and protect each other on a daily basis. This has enabled them build trust amongst themselves as they always come together as a unit whenever there was a decision to be made about the happenings in the camp. Through this, they also select a representative of their community which is someone they believe has been around for the longest time, is trustworthy and also capable of making good decisions for them whenever the need arises.

Facilitating Conditions

It is suggested that "Facilitating conditions are defined as the degree to which an individual believes that an organizational and technical infrastructure exists to support use of the system" (Venkatesh et al., 2003). mHealth involves the use of mobile phones and mobile phone services, and this services also needs mobile network connectivity. The population of people with mobile phones was relatively low, and the only reliable mobile network is the Globacom network.

Language
This construct was added as a modification to the UTAUT model. This was done in order to check if this would also be a factor that could make a positive influence on the attitudes of the IDPs to the mHealth technology. As already stated, all the respondents in the study were only able to communicate fluently in Hausa language and only a few of the younger respondents declared their ability to understand and speak English. Thus, the general consensus was that they would be more comfortable if they could interact with their healthcare provider in Hausa. The available healthcare provider in the host community also communicates with them in Hausa, so they find it easier to explain their symptoms to him. This construct is considered a strong determining factor to the positive attitude of IDPs towards mHealth technology.

No Tariff
This is a new construct that was discovered during the process of conducting this study. The Chairman of the camp was the first to raise concerns about this and he was supported by others during the focus group discussion. This then became an addition to the interview questions as everyone raised concerns about having to recharge their phones to utilize the mHealth technology. They complained about their struggle to feed and survive on a daily basis and expressed that it would be difficult to adopt the technology if they had to be recharging their phones all the time to make use of the service.

6 Discussion

The issues of IDPs in Nigeria is a problem which is yet to be provided with a solution. This is not because there has been no effort to find a solution, but because their population around the country continues to grow and has become too complex to manage. In Nigeria, extant studies have investigated the issues experienced by IDPs in the IDP camps. The solutions recommended in most these studies have been geared towards Government policies, but barely any study has been geared towards technological solutions for their plights. This is the research path followed by this work, with the study based on the quest to discover IDPs mobile phone use and their attitudes and opinions towards adopting mHealth technology. Healthcare is vital to society and this happens to be one of the major needs of the IDPs. This was established in extant literature and also confirmed during the course of this study. Many technology innovations have failed in the past as a result of the refusal of the users to adopt the technology, which is why technology acceptance theories were created in the social sciences to investigate users' intentions towards a particular technology. This study adopted the UTAUT model to analyze the attitudes and opinions of IDPs in the Malkohi host community, to mHealth technology, with the model being modified to fit the empirical situation. The findings from the study based on the theoretical foundation are discussed in the following sections.

Performance Expectancy
The healthcare situation in the Malkohi host community was found to be inadequate and the IDPs were interested in an alternative solution. The kidnappings and other life-threatening crisis that had occurred in the past to volunteers in the camp were explained

to be a major reason why healthcare providers are scared to stay in the host community. Hence, they have had to make do with just one doctor that has been there since the invention of the camp, who is an indigene of the community, conversant with the environment, and is comfortable staying back to provide his services to the IDPs. However, the services provided are inadequate, the respondents of the study discussed some of their present situation which they think having access to a healthcare provider even if it is via a mobile phone will help solve these problems. Therefore, performance expectancy is a construct that would strongly influence the IDPs intentions to adopt mHealth technology.

Effort Expectancy
This a strong determinant of user's intentions to adopt a technology, if the effort needed to use a new technology is greater than what is existing users are most likely to reject the technology. Here, mHealth services can be provided through the basic phone calls and text messages. As mentioned, the IDPs have the ability to make and receive phone calls and also to send and read text messages. Some of the respondents that stated that their mobile phone use ability is limited to making and receiving phone calls, and they also mentioned that they get help from their educated children to read and send text messages. This construct has a strong positive influence on the IDPs intentions to adopt the mHealth technology.

Social Influence
The circumstances in which the IDPs find themselves have made them dependent on each other. However, it has also built the trust which they have amongst themselves. Social influence is a construct that will have a strong positive influence on their intentions to adopt the technology. They believe that if other members of the community can use the technology they will also use it, with the chairman of the community being the most influential factor.

Facilitating Condition
A technology solution cannot be effective without existing infrastructures that will enable smooth operation of the technology. An example is the availability of network and mobile phones required to enable the mHealth technology. The findings from the study showed that Globacom network is the only reliable mobile network that is available in the host community, and this is a hindrance to the smooth operation of the mHealth technology. Also, as many of the IDPs cannot afford mobile phones the number of people that use mobile phones in the community is relatively few.

Language
This construct was introduced into the study due to the geographic location of the study site. The study confirmed that IDPs in the Malkohi host community mostly communicated through the Hausa language, with only a few of the younger participants of the study able to communicate using the English language. Despite this they were still of the opinion that they would be more comfortable if the healthcare providers could communicate in Hausa language. This was also found to be one of the strongest determinants that could positively influence the IDPs intentions to adopt the health technology.

No Tariff
This construct is the second strongest determinant of IDPs positive attitude towards the mHealth technology. They believe that the Government should provide support that makes such services free to them. This includes introducing mHealth services that require charges which are likely be rejected by the IDPs. This is because the IDPs are people that have been affected a crisis which has seized their means of livelihood. Although they attempt to survive in the new environment in which they find themselves, they are still living in deplorable conditions where the poverty rate is high. Thus, any technology that requires extra expenses would most likely not be used.

6.1 Additional Model Modification

The already modified UTUAT model was further extended/modified based on findings from the research by adding a "No Tariff" construct. This is because this construct was considered to be vital to the positive behavioral intention of the IDPs to accepting mHealth. Also, the opinions from the participants about the host community chairman being a very important influencing factor on whether or not any new technology would be accepted. Thus, leadership was added to the model as a moderating factor affecting the construct social influence.

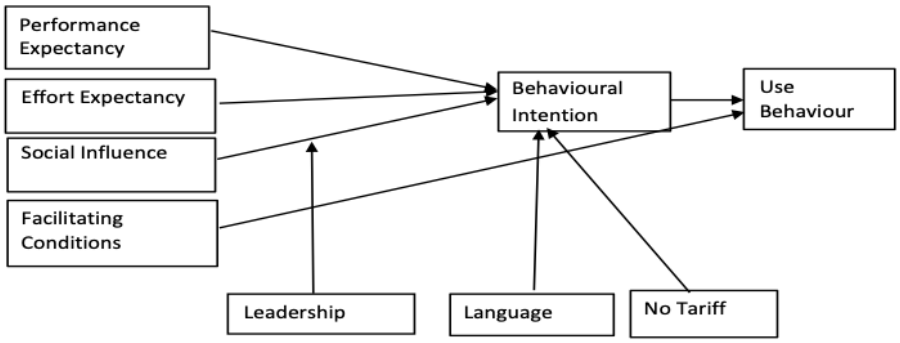

Figure 6.1: Finding-Based Modified UTAUT Model

6.2 Contribution to Theory and Practice

Our modified and extended UTAUT model can be applied in other studies that involve IDPs and technology acceptance. It has also contributed to the dearth of knowledge on technology solutions for IDPs in Nigeria, a research area that is gaining much prominence in other parts of the world. The study can also be a source of reference to the Government and non-governmental organizations (NGOs) on alternative ways to provide supports to address the issues of IDPs in Nigeria.

7 Discussion

As previously mentioned, the problem of refugees and IDPs should be seen as a development issue and not just a humanitarian issue. This is why technological solutions are being recommended for the needs of the IDPs in this case. This study aimed to make recommendations of technology solutions for IDPs by exploring their mobile phone use and their attitudes and opinions towards mHealth technology. Adopting the previously described research approach, findings shows that IDPs have a positive behavioral intention towards the mHealth technology. The findings also revealed new constructs which became a modification to the original UTAUT model and are considered to be the more vital constructs to determine the successful adoption of mHealth by IDPs.

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