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Knowledge, Utilization and Application of Information and Communication Technology on Learning Process of Students in Basic Nursing School in Borno State, Nigeria

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Abstract:

Information and Communication Technology are digital technologies that support the electronic gallery, storage, processing, and exchange of information while learning is a process of acquiring knowledge that leads to a permanent change in behaviour. The aim of this study was to assess the knowledge and utilization of Information Communication Technology (ICT) and its implication on the learning process of Students in basic Nursing schools. A descriptive cross-sectional research design was used in this study and student nurses from Schools of Nursing, UMTH and College of Nursing and Midwifery Maiduguri formed the study population. The sample size of 220 was drawn from 481 total population of students in both schools as determined by using the Yamane formula. Proportionate quota sampling was used to select the respondents. A self-designed and validated questionnaire was used for data collection and data was analyzed using SPSS version 23. The results showed that little more than half (53.6%) of the respondents have knowledge of ICT whereas a significant number (62.3%) of students reported low utilization of ICT. However, comparatively, there is no significant difference between student knowledge of ICT at the two schools. This was obvious because the tested p-value (0.451) was greater than the level of significance (0.05). the result shows the significant difference between the utilization of ICT at the two schools with a wide interquartile range and insignificant p-value (0.001). It was concluded that there was adequate knowledge of ICT among the participants in the study which does not translate into corresponding utilization. Based on the conclusion of this study, it was recommended that the school management should encourage the use of ICT in teaching-learning process in the schools by providing relevant ICT facilities in the schools

Keywords: *Knowledge, Utilization, ICT, Learning, Application of ICT in learning.*

Introduction

Information and Communication Technology (ICT) is a technological term that stresses the role of unified communications and synchronization of communications (Murray 2014). It comprises computing technology, the Internet and other accessories which enable individuals to access, store, transmit, and manipulate information (Chaudhry, Wang, Wu, et al; 2006). Information and communication technologies in nursing education refer to all digital technologies that

support the electronic gallery, storage, processing, and exchange of information in order to promote health, prevent illness, treat disease, and manage chronic illness (Youssef, 2008). The application of ICT indeed has the potential of increasing patient-centred healthcare at a lower cost, improve quality of care and information sharing, educate health professionals and patients, encourage a new form of relationship between patients and their health providers, reduce travel time, etc (Rouleau, Gagnon, Cote; 2017).

The relationship between the use of ICT and student performance in higher education is not clear, and there are contradictory results in the literature. Earlier economic research has failed to provide a clear consensus concerning the effect on students 'achievement. (Yousse, 2008). Nowadays Novelties in educational dissemination systems has challenged the traditional attitudes to education. Technology has prescribed many new characteristics that can be applied in classrooms to make teaching more interesting to learners. Many proponents of e-learning opined that everyone should be prepared to obtain basic knowledge of technology and how to apply it as a mean for achieving educational aims. (Harandi, 2015). The hallmark of ICT in education is to familiarize students' acquaintance with the use and functions of computers, and social and ethical issues related to learning process more so that application of different information communication technologies has become inevitable in educational system.

The use of appliances such like modern, Wi-Fi, external storage and internet networking to access information and communicate same, students can retrieve their required information within a short time. (Murray, 2014). The application of technology to support learning and teaching in education has been increasingly important. Information communication technology in education is a modern, efficient and cost-effective process and has created a need to transform how students from higher institutions learn (Adeleke, Adekanye, Onawola, et al, 2012). Technology-enhanced learning in nursing training institutions and had changed instructivist views to constructivist approaches in health care education. The instructivist learning is a teacher–centred model of learning that suggests knowledge exists independently of the learner and is transferred by the teacher, to the student, who is viewed as a passive recipient. While constructivist theory on the other hand is student centred, rather than teacher-focused. The student constructs new knowledge through analysis of information and reference to experience and understanding. (Ndunagu, 2010). Studies on ICT and health education/practice have proliferated the development of ICT skills among students to ensure that graduates are 'work ready' and adequately prepared to practice in increasingly technological healthcare environments. Nurses are expected to be ICT literate at registration with the growth of social uses of technology, but instead little is known of the views of students on the use of technology enhanced learning (Khan., Bhatti and Khan; 2011).

The relatively huge ICT investment and policy deployed by the Nursing and Midwifery Council of Nigeria and proprietors of nursing institutions in Nigeria as part of the minimum requirement for accreditation, these has made little success about the success in the implementation of ICT applications on learning process for basic nursing programmes. (Ann and Blen 2014) Study on Information and Communication Technology among nursing students is quite apt at this material time and particularly in developing country like Nigeria, more so Northern Nigeria where there is low socioeconomic development. Despite the fact that use of smart phones has greatly increased access to internet-based learning materials, there are few similar studies in Nigeria among students especially studies among nursing students use of ICT for learning purposes.

Therefore, this study seeks to assess the knowledge and utilization of information

communication technology and its application on the learning process of students in basic nursing schools.

Justification/ Relevance of the Study

Information and Communication Technology (ICT) is integral to contemporary nursing practice. The development of these skills is important to ensure that graduates are 'work ready' and adequately prepared to practice in increasingly technological healthcare environments. Nurses are expected to be information and communication technology (ICT) literate at registration but, despite the growth of social uses of technology, little is known of the views of students on the use of technology-enhanced learning. Despite the relatively huge ICT investment and policy deployment by Nursing and Midwifery Council of Nigeria and proprietor of nursing institutions in Nigeria as part of the minimum requirement for accreditation, there exist scanty information on the success of implementation as well implications of the Information Communication Technology (ICT) on the learning process of basic nursing students.

Study on Information and communication technology (ICT) among nursing students is quite apt in this material time and particularly in developing country like Nigeria, more so in Northern Nigeria. This is due to the fact that the use of smartphones has greatly increased access to internet-based learning materials. Therefore, it is timely to evaluate the level of knowledge and utilization of ICT by students in nursing institutions in order to verify, observe and document these phenomena.

Research Questions

1. What is the level of knowledge of Basic Nursing students on ICT?
2. What is the level of Utilization of ICT in learning activities by Basic Nursing students?
3. What are the implications of ICT on the learning process of Basic Nursing students?

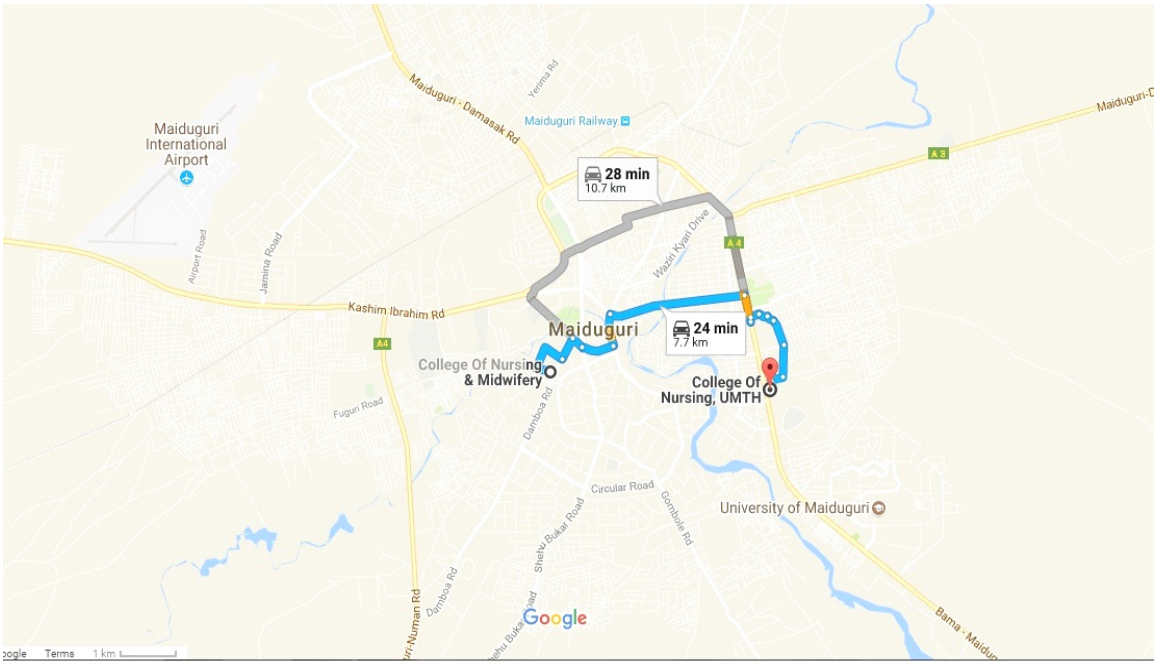
Hypotheses

1. There is no significant difference in the level of knowledge of ICT between the two schools.
2. There is no significant difference in the level of utilization of ICT between the two schools.
3. The knowledge of ICT does not significantly influence the level of ICT utilization.

Materials and Methods

Design/Setting

This study was a descriptive cross-sectional design aimed to determine the knowledge and utilization of information communication technology in Schools of Nursing, University of Maiduguri Teaching Hospital and Borno State College of Nursing and Midwifery Maiduguri respectively. Both schools are located within Maiduguri metropolis with a distance of 7.7 km apart on a shortest route which is approximately 24 minutes' drive by road. See the map below.



Population/Sample

The target population for this study was the nursing students in the School of Nursing UMTH and College of Nursing and Midwifery Maiduguri. There were total of 481 students in the two schools (234 and 245) respectively, according to the schools' registers. The sample size was determined using the Taro Yamani statistical method and 218 sample sizes were arrived at using 481 as the total population from which the sampled population of 220 was drawn for this study. Proportionate quota sampling was used in which the population was divided into various quotas based on their academic levels (first year, second year, and third-year students) in the two schools.

Instrument/Data Analysis

The researchers designed a Questionnaire based on the major variables of the study. The questionnaire was validated by experts in educational measurement and evaluation at the faculty of the Education University of Maiduguri. The reliability of the instrument was confirmed via the test-retest method in a pilot study with a reliability index of 7.0. The questionnaires were distributed to the respondents by the researchers following the ethical approval and consent from each participant. Two research assistants were trained and used for data collection which was intensively carried out within a week. Data was sorted and analyzed using an electronic SPSS package (V-23). The descriptive statistics (frequency distribution) was used to analyze the socio-demographic characteristics of the respondents while appropriate inferential statistics of the Mann-Whitney Test was used to analyzed hypotheses and draw inferences.

Ethical Considerations

Ethical approval was obtained from both the University of Maiduguri Teaching Hospital Research and ethical committee and from the Provost of the College of Nursing and Midwifery Borno State with approval code number (UMTH/REC/18/0074) and letter of approval respectively. The aims and objectives of the study were explained to the respondents and their consents were obtained voluntarily with complete assurance that their identities will not be revealed.

Result

The results of this study were presented on the frequency and percentages tables based on the objectives and the hypotheses postulated.

Table 1 revealed that most of the respondents (57.7%) were between the ages of 20-24 years and the greater number of them (71.4%) is female. On the assessment of knowledge of ICT among basic nursing students, the study revealed the majority (53.6%) of the students had inadequate knowledge of ICT. While, the level of utilization of ICT by students in the two schools shows that the majority (62.3%) of the respondents do not utilize ICT for their academic activities, even though the vast majority (81.4%) of the respondents had a positive perception regarding the application of ICT on the learning process in the schools.

Table 1: *Socio-Demographic Characteristic of the Respondents (N=220)*

Category	Variable	Frequency	Percent
Age	15-19 yrs	70	31.8
	20-24 yrs	127	57.7
	25-29 yrs	23	10.5
Sex	Male	63	28.6
	Female	157	71.4
	Total	220	100.0
Marital Status	Single	192	87.3
	Married	28	12.7
Institution/School	School of Nursing UMTH Maiduguri	110	50.0
	College of Nursing and Midwifery Maiduguri	110	50.0
Academic Level	First Year	80	36.4
	Second Year	60	27.3
	Third Year	80	36.4

Table 2: *Result: determination of the level of knowledge of ICT among Basic Nursing Student (N=220)*

Level of knowledge	Frequency	Percent
Inadequate Knowledge	102	46.4
Adequate Knowledge	118	53.6

School * *Level of knowledge Cross tabulation (N 220)*

School	Level of knowledge		Total
	Inadequate Knowledge	Adequate Knowledge	
School of Nursing UMTH Maiduguri	57 (51.8%)	53 (48.2%)	110 (100.0%)
College of Nursing and Midwifery Maiduguri	45 (40.9%)	65 (59.1%)	110 (100.0%)

Hypothesis I: There is no significant difference in the level of knowledge of ICT between the two schools. This hypothesis was tested using **Mann-Whitney Test**. The data were transformed into quantitative form with a total of 8 score on overall and the average median score was considered as adequate knowledge. Normality test to verify whether the data were normally distributed or not was done by ***One-Sample Kolmogorov-Smirnov Test.***

Hypothesis II: There is no significant difference in the level of utilization of ICT between the two schools. This hypothesis was similarly tested using the **Mann-Whitney Test** which is an equivalent of a t-test for nonparametric data. The data was also transformed into quantitative form with a total of 7 scores on the overall and the average of the median score was considered as good utilization. Normality test to verify whether the data were normally distributed or not was done by ***One-Sample Kolmogorov-Smirnov Test.***

Mann-Whitney Test results of ICT knowledge and utilization for hypotheses I & II

This result shows no significant difference between student knowledge of ICT at school of Nursing UMTH and their colleagues at College of Nursing and Midwifery Maiduguri. This was obvious because the p-value (0.451) is greater than the 0.05 level of significance. Therefore, the null hypothesis that says there is no significant difference in the level of knowledge of ICT between the two schools was significant, thus it was accepted.
Similarly, for hypothesis II, the result shows the significant difference between utilization of ICT at the two schools with a wide interquartile range and insignificant p-value (0.001) which is less than 0.05 level of significance. Therefore, the null hypothesis that states there is no significant difference in the level of utilization of ICT between the two schools was not significant and thus the null hypothesis was rejected.

Table 3: *Students' perception regarding implication of ICT on learning (N=220)*

Level of utilization	Frequency	Percent
Poor utilization	137	62.3
Good utilization	83	37.7
Total	220	100.0
Perception of student on implication of ICT		
Negative	41	18.6
Positive	179	81.4
Total	220	100.0

Mann Whitney test results of hypotheses I & II: ICT knowledge and utilization (N 220)

School / Variable	School of Nursing UMTH	College of Nursing & Midwifery Maiduguri	p-value
Knowledge score	62.5 (12.5)	75 (12.5)	0.451
Utilization score	57.14 (14.29)	85.71 (28.571)	0.001

Hypothesis III: The knowledge of ICT does not significantly influence the level of ICT utilization. This hypothesis was tested using the **chi-square test**

The result actually reveals significant differences between those who had adequate knowledge of ICT and those who do not. Out of the 118 students who have adequate

knowledge, about half of them (44.9%) show good utilization of ICT. On the other hand, out of 102 students who have inadequate knowledge, the majority of them (70.6%) do not utilize ICT. The p-value of 0.025 is indeed less than 0.05 which indicates there is a significant difference between students who have the knowledge and those who do not in terms of ICT utilization. Therefore, the null hypothesis that says knowledge of ICT does not significantly influence the level of ICT utilization was not true and was consequently rejected.

Table 4: Chi-square test result for hypothesis III. (N 220)

level of knowledge * Level of utilization Crosstabulation

Level of knowledge		Level of utilization		Total	p-value (2-sided)
		Poor utilization	Good utilization		
Inadequate Knowledge	Count	72	30	102	.025
	% within level of knowledge	70.6%	29.4%	100.0%	
Adequate Knowledge	Count	65	53	118	
	% within level of knowledge	55.1%	44.9%	100.0%	
Total	Count	137	83	220	
	% within level of knowledge	62.3%	37.7%	100.0%	

Discussion

This study on assessment of knowledge and utilization of information communication technology among nursing students in two institutions in Maiduguri revealed that little number above half of the students who have ICT knowledge do not utilize it for educational purposes. This implies that with the technological advancement witness today, students in schools of Nursing in Northeastern Nigeria particularly in Maiduguri with adequate knowledge of ICT do not utilize it for academic purposes. This may have an implication on their learning ability and probably explain the gap in the educational difference between these students and their colleagues in the other part of the world. This result is contrary to the findings of a similar study by Daniel et al who opined that almost all the participants in their study have adequate knowledge about ICT. Similarly in this study, majority of the students demonstrated apathy in the use of ICT application, especially for academic purposes. This correlates with their little knowledge as reported above. This by implication deprived students in these schools from benefiting from

an up to date information on various courses available online for their educational achievement which can be accessed through ICT. It can also be deduced that student learning may be turbulent and slowed as they were largely dependent on the traditional face-to-face learning approach. This finding is in agreement with Daniel et al finding in a related study that only a few students in their study indicate fair usage of ICT.

On the perception of the student regarding the application of ICT on the learning process, this study identified that majority of students in this study have a positive perception about the implication of ICT on the learning process in nursing schools, which means that they believed the use of ICT will further enhance their learning ability as it will solve most of their academic problems if ICT facilities are available in schools. This finding conforms to the Adeleke, et al study where most

participants displayed a positive perception about the effect of ICT on health system information management.

Comparatively, on the knowledge of students in the two schools studied, this study shows no significant difference in knowledge of ICT among students in the School of Nursing UMTH and those in College of Nursing and Midwifery Maiduguri ($P<0.001$). However, on the difference in utilization of ICT between the students of the two institutions, there was a significant difference between participants of the school in terms of utilization of ICT. The direction of the difference shows participants from the College of Nursing and Midwifery Maiduguri utilized ICT more than participants from the School of Nursing UMTH. This is probably due to the difference in the provision of ICT facility in the two schools as it was more in the latter. Comparing the knowledge and utilization of ICT among the students in the two schools, there was an association between the degree of knowledge and level of ICT utilization. The respondents who have the knowledge tend to utilize ICT than those who had inadequate knowledge. This is expected due to the fact that knowledge actually influences utilization. Wareta, Kebede and Zegeye (2017) in a related study among science students in North-western Ethiopia, shows low utilization of ICT associated with inadequate knowledge of ICT.

Conclusion

This study concluded that a low level of ICT knowledge among the students will invariably be translated into its non-utilization among students. However, there is no significant difference between the knowledge of students on ICT in the two schools but varies in terms of utilization. The positive perception of students regarding the implication of ICT on learning could be an avenue for school management to improve on the provision of ICT facilities in schools.

The study, therefore, recommended that the management of the school of Nursing UMTH and the college of Nursing and Midwifery Maiduguri should provide the most needed ICT facility which should be made accessible to all students in a view to enhance learning. The Lecturers and management should enforce the use of the provided ICT facilities in the school by the students.

Conflict of Interest

The authors have no conflict of interest whatsoever

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