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Research Paper

Perceived Usefulness And Perceived Ease Of Use (Acceptability) Of Robotics In Nursing Care Among Nurses And Patients, In A Selected Hospital, South-West, Nigeria

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ABSTRACT:
Introduction: *The fast increasing ageing population is placing an unprecedented strain on healthcare services. Robots have been proposed to assist patients in staying healthy and safe.* ***Method:*** *A quantitative design, cross-sectional survey method was used to assess the perceived usefulness and perceived ease of use (acceptability) of robotics in nursing care among nurses and patients, Lagos State House of Assembly Clinic, Lagos State. The total enumeration method was used to determine the sample size of 126, and a purposive non-probability sampling technique was used for the study. A pre-tested, 28-item, self-designed questionnaire divided into four sections was used: Section A: contains 5 items on the social demographic characteristics of the respondents. Section B: contains 8 questions on nurses' perceived usefulness and ease of use (Acceptability) of Robotic Nursing Care. Section C: contains 8 questions on the patients' perceived usefulness and ease of use (Acceptability) of Robotic Nursing Care. Section D: contains 7 questions on the determinants of perceived usefulness and ease of use (Acceptability) of Robotic Nursing Care among nurses and patients. The retrieved data were coded, entered into a computer and analysed using SPSS version 23.0. Descriptive statistics (such as measures of frequency - Count, Percent, Frequency, and measures of central tendency - Mean) were used in analysing the demographic data and the research questions. Inferential statistics such as the multiple regression analysis, at a p-value of ≤0.05% significance level, was used to ascertain the determinants of perceived usefulness and ease of use (Acceptability) of Robotic Nursing Care.* ***Results:*** *Nurses' perceived usefulness of robotics in nursing care was found to be high with a mean score of 13.2 (82%), and the perceived ease of use was 12.2 (76%) when measured on a 16-point reference scale, respectively. Patients' perceived usefulness of robotics in nursing care was below average with a mean score of 7.6 (48%) when measured on a 16-point reference scale, indicating lesser-than-average acceptability of robotics in nursing care based on this factor. Also, the patients' perceived ease of use of robotics in their care was above average, with a mean score of 8.4 (53%), when measured on a 16-reference point scale, indicating higher-than-average acceptability of robotics. Respondents experience with technology, security and privacy of data issues, reliability of the robots, and safety concerns were significant determinants of the acceptance of robotics in their care.* ***Conclusion and Recommendation:*** *Robots are a rapidly growing part of the modern health care landscape. Moreover, the coronavirus pandemic pressure on hospitals and healthcare workers to deliver services may expedite the drive to automate healthcare system. However, there is the need to address the factors identified in the present study as determinants of acceptance of robotics in nursing care. More research needs to investigate these factors and the needs of potential users and their expectations in specific situations.*

KEYWORDS*: Perceived Usefulness, Perceived Ease of Use, Robotics, Nursing Care, Nurse, Patient*

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I. INTRODUCTION

The mechanistic view of nursing practice and programming of nursing chores was popular, which pace the way for consideration of a humanoid nurse had been popular as early as 1928. The United Kingdom's first robot named Eric was manufactured, exhibited, toured, and displayed. Nevertheless, this did not last long as Eric disappeared without a trace. Fortunately, blueprints, pictures and film clips, were recovered by the London Museum of Science and from these pieces of evidence 'resurrected' it, and a new ERIC was manufactured. Today, it is part of the museum's permanent display marking 500 years of Robotics (1). Robotic services are on the increase in some parts of the world, most especially in Japan, conceivably even more than in the United States. In the year 2010, it was projected that by year 2016, that every home in Japan will have a small household robot to help with chores (2). Interestingly, robots are also making their way into the healthcare industry. As in America, hospitals in Europe and Africa are increasingly feeling the pressure of an ever-increasing patient population and increase workforce shortage, allowing the need for more technological assistance in the health sector (3).

In developing humanoid robots, new health technology has dramatically improved the burden of health care in advanced and developed countries. Masahiro Mori's theory of the uncanny Valley was influential in creating less human-like robotic physiognomies. Contemporary roboticists and computer scientists are engaged in designing, developing, and manufacturing Humanoid Robots (HRs), which are, in the most sense, human-like (4). Today, roboticists not only target physiognomy but the robots' functions as well. According to Krzysztof (5), which Points out numerous research areas in the application of robotics in healthcare settings, such as robotic surgical Systems, laparoscopy surgery and tele-rounding robots, robot-assisted rehabilitation, caregiver and patient's assistants, robotic applications in dentistry, bio-prosthetic has helped improved performance in these settings.

Robots are endowed with human capabilities for human-robot interaction to assist nurses and patients, particularly in contaminated environments. For instance, the tele-operated semi-autonomous robots can be used to perform assisted healthcare tasks during outbreaks, reducing the time personnel need to spend in dangerously contaminated areas and on their personal protective equipment (PPE) in high temperature and humid conditions, particularly in the West African region of the world (6). Robots serve various tasks and purposes in the medical/health and social care sectors beyond the traditional scope of surgical and rehabilitation, and robots are poised to become one of the most significant technological innovations of the 21st century. The utilization of robots for surgeries over the years has given rise to many new methods and the emergence of a wide variety of robots for use in the medical domain (7).

Furthermore, Panzer (8) highlighted some healthcare robots that have been developed for similar fields of application. The robot Cody was programmed to wash human limbs autonomously, and an evaluation of the patient's system showed that acceptance strongly depends on the interpretation of robot intention (9). In 2011, a self-contained robot RIBA II (10), was manufactured and programmed to assist in lifting patients, although still automated to respond to human 'orders' with a much-improved physical appearance similar to humans. However, in today world, the quest for real-life-like humanoid robots has been put to the test severally. In 2016, researchers from the Georgia Institute of Technology came together to develop a robot that can simulate sponging motions as if simulating a nurse performing bed baths using the traditional process (11).

Furthermore, about 90 years after the first robot was designed, developed, and manufactured, Honda developed and used a seemingly autonomous robot called ASIMO (12), prepared to welcome visitors and provide timely responses to questions from prospective human clients. Mesquita, Zamarioli, and Carvalho (13), in their study of robots and patents used in nursing care practices, published in the Online Brazilian Journal of Nursing, revealed that thirty-five patents accepted robotic nursing care practices. About 40% of these were related to creating robots to aid in patients' mobility; 28.5% had to do with the development of robots to aid daily activities; 23% were about robots created for physiological assessment and monitoring rehabilitation. The reality of robot manufacturing now occupies the technological environment of healthcare, offering a variety of robots to be used in the nursing care arena.

Importance of Robotics in Nursing Care

The use of robots in healthcare will provide an exciting opportunity to help several patients. It is estimated that about 20% of the world's population experiences difficulties with physical, cognitive/mental health, or sensory functioning, which may be temporary or permanent, acute or chronic, and may change throughout one's lifespan. And of these individuals, 190million experience severe difficulties with activities of daily living tasks. These include physical tasks, such as grooming, feeding, and mobility, to cognitive functioning tasks, including goal-directed tasks such as problem-solving, finance management, and housekeeping (14). also, the world has a rapidly ageing population, which will only add to this large number of people who may need help with activity of daily living (ADL) (15). Therefore, robots can be used to enable individuals suffering cognitive, sensory, and motor impairments, help patients who are ill or injured and support

healthcare professionals.

Majority of the approximately 3 million registered nurses working across all industries experiences one form of workplace hazards or the other in performing their routine duties. Nurses spend enormous time walking, bending, stretching, and standing (exposing themselves to potential fatigue, as well as slips, trips, and falls). Furthermore, nurses often lift and move patients (becoming vulnerable to back injuries) and contact potentially harmful and hazardous substances, including drugs, diseases, radiation, accidental needle sticks, and chemicals used for cleaning (which can cause exposure-related injuries and illnesses). In 2016, workplace hazards for RNs resulted in 19,790 nonfatal injuries and illnesses that required at least one day away from work, at an incidence rate of 104.2 cases per 10,000 full-time workers (private industry) (16).

Robotic devices like lifting and mobility aids are not only considered to lessen the physical burden, prevent work-related injuries and enable nursing care staff to work longer hours. They might also have a significant influence on how long caregivers can continue working later in life. These tremendous numbers of injuries provide a clear need for assessing the cause and a solution to the problem assessed. Beyond this distinct risk of injury, the concern is the growing need to satisfactorily supply the increasing demand for elderly care. With the need for such care increasing yearly, the supply of young and physically capable nursing staff fails to keep up (17). With new and exciting technological advances in development, the exploit of robots in healthcare represents a moving opportunity to help many people. Robots can be utilized to enable people with cognitive, sensory, and motor impairments, help people who are ill or injured, support caregivers, deliver medication, reposition patients, aid the clinical workforce and even perform certain surgeries (17).

Research has shown that 90 per cent of the patients in hospitals in Europe show signs of dementia and fit into the category of needing "continuous support from Staff" However, there is also a shortage of staff which resulted in extra overtime for the hospital staff and increased turnover rate for hospital jobs (18). The increased strain on health care employees is likely to yield decrease performance due to stress and, in general, a lessened ability to render proper care. This problem, presumably, necessitates a resolution. In today's technologically progressive world, a robotic solution begs a discussion. Modern automated robotic technology possesses the capability to render reliable and affordable care to millions in need.

Acceptance of Robotics

The fast increasing ageing population is placing an unprecedented strain on healthcare services, and several other challenges in the health care system have been exposed during the current COVID-19 pandemic. Though the literature has shown some robotics applications to overcome the potential hazards and risks in hospital environments, the implementation of those developments is still limited, and few studies measure clinicians' perception and acceptance. Robots have been proposed to assist patients in staying healthy and safe. However, despite its need and the success recorded by some healthcare robots, other robots have had a poor response from the users (19). The reduction of human contact is one of the most pressing concerns. Already there has been much work with "smart homes" and various automated systems that could help the elderly to be treated and cared for while remaining in their own homes without needing an extensive staff. One study found a group of progressive elderly who welcomed such technology, so long as it was improved their security and could be relied upon. The study found that the participants soon began naming their robotic devices. Speaking to the robots was sometimes the only social interaction these people had all day (20). The study acknowledged that this could not completely replace social interaction with other humans but suggested it augmented human interaction. Others are not so positive about the nature of these interactions. People may bond with their assistance robots, but some experts warn that these "misplaced personal relationships" with robots can have negative effects in the long run (21).

While these robots may improve nursing time and nurse safety, allowing more time for patient interactions, the question regarding robots being able to replace human nurses in clinical practice remains noteworthy. Usability and user acceptance are extremely important for the success of any robotic solution, particularly medically assistive robots that are designed to help patients and nurses. Adopting this new technology rests principally on the public's enthusiasm and the medical institution to accept and support it and having a thorough indulgence of its capabilities and shortcomings. Therefore this study seeks to assess the perceived usefulness and perceived ease of use of robotic nursing care among nurses and patients in Lagos state house of assembly clinic Alausa Ikeja Lagos state.

Theoretical Framework

The technology acceptance model (TAM), is adapted from the Theory of Reasoned Action (22) and initially proposed by Davis (23), assumes that an individual's information systems acceptance is determined by two significant variables: Perceived Usefulness (PU) and Perceived Ease of Use (PEOU) (24). This present study used two subscales of the TAM (i.e., perceived usefulness and perceived ease of use), initially proposed by Davis in 1989 (23), to evaluate the acceptability and adoption likelihood of using robots in nursing by nurses

and patients. The TAM has effectively predicted nurses' acceptance of other health care technology (25). As mentioned previously, the TAM evaluates user acceptability of a given technology via two subscales: perceived usefulness and perceived ease of use. The perceived usefulness measures the extent to which an individual thinks using a specific system facilitates their job. On the other hand, perceived ease of use is the degree to which an individual thinks using that system is effort-free (23; 26).

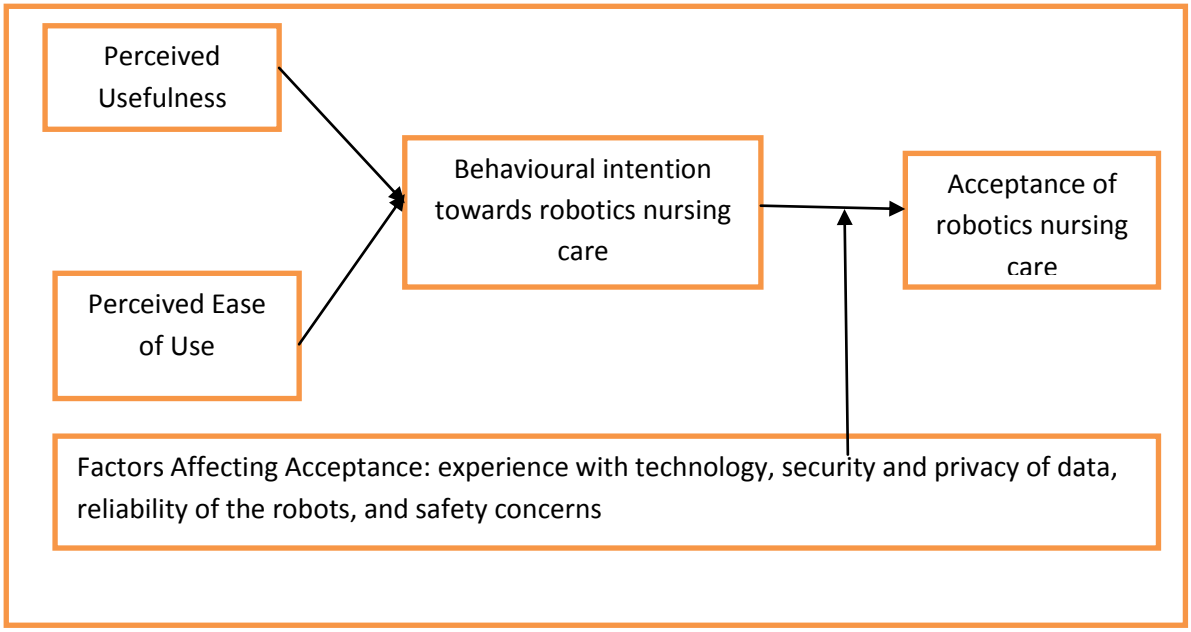

Figure 1: Perceived usefulness and ease of use (acceptability) conceptual framework. Adapted from Technology Acceptance Model (TAM),

II. METHODS

Study Design

A quantitative design, cross-sectional survey method was used to assess the perceived usefulness and perceived ease of use (acceptability) of robotics in nursing care among nurses and patients, Lagos State House of Assembly Clinic, Lagos State.

Study Setting

The Lagos State House of Assembly is the state legislature of Lagos State. It is situated right inside the Lagos State Government Secretariat at Alausa in Ikeja central business district. The House of Assembly is currently under the All Progressives Congress, the current party ruling Lagos state. There have been seven different houses of assemblies. The first one was inaugurated on the 2nd of October 1979, and the present one was inaugurated on the 6th of June 2015. There are about forty members of the House of Assembly, and two represent one of the twenty various local government areas in Lagos.

The clinic is situated inside the Lagos State House of Assembly premises, and the clinic runs 12hours of services daily from Monday to Friday. It has six nurses with two visiting Doctors, two attendants, two cleaners and one computer operator. The clinic has consultation rooms, an observation room, a dressing room, an injection room, and a sterilizing and sluice room for sterilizing and storing dirty linen. Also, there is a kitchenette, rest and bathroom. The clinic runs two shifts: morning from 8 am to 4 pm and afternoon from 12noon to 8 pm from Monday to Friday only, with an estimated 30 patients attending the hospital weekly.

Study Population

The study population comprises nurses and patients. The target population includes all nurses working in Lagos state house of assembly clinic irrespective of their cadres and department and all patients attending clinics of the Lagos state house of assembly clinic, Lagos states. An estimate of 30 patients attends the clinic weekly, which is multiplied by four weeks totaling 120. The clinic has 6 nursing staff. Therefore, the estimated total population was 126 respondents.

Inclusion criteria

i. All consenting staff nurses and patients in Lagos state house of assembly clinic, Lagos states were included in the study

ii. Staff nurse and patients who are available at the time of data collection Lagos state house of assembly clinic, Lagos states

Exclusion criteria

i. Staff nurses and patients who did not give their consent

Sample and Sampling Technique

Sample size

The total enumeration method was used to determine the sample frame or size for this research, as the nurses and patients in this study were of small size and share similar characteristics of interest to the researcher. A total of 126 respondents (i.e. 6 nurses and 120 patients) were utilized as the sample size for this study. The total enumeration size of 126 respondents used in this study by the researcher will help to provide a desirable degree of precision.

Sampling technique

A purposive non-probability sampling technique was used for the study. With an estimate of over 30 patients attending the hospital weekly, the data were collected within four weeks, and it is expected to have approximately 120 patients and 6 nurses, accounting for 126 respondents.

Validity and Reliability of the Instrument

Face and content validity was ensured by constructing the questionnaire based on the literature and objective of the study and given to experts in the field of nursing to scrutinize and make necessary corrections. Reliability of the test instrument was ensured through the test-retest method, and the value obtained was 0.85 (section B), 0.87 (section C), and 0.78 (section C).

Instrumentation

A pre-tested, 28-item, self-designed questionnaire divided into four sections was used to assess the respondents' perceived usefulness and ease of use (acceptability) of robotics in nursing care in Lagos State House of Assembly Clinic, Lagos State. Section A: contains 5 items on the social demographic characteristics of the respondents. Section B: contains 8 questions on nurses' perceived usefulness and ease of use (Acceptability) of Robotic Nursing Care. Section C: contains 8 questions on the patients' perceived usefulness and ease of use (Acceptability) of Robotic Nursing Care. Section D: contains 7 questions on the determinants of perceived usefulness and ease of use (Acceptability) of Robotic Nursing Care.

Method of Data Analysis

The retrieved data were coded, entered into a computer and analysed using SPSS version 23.0. Descriptive statistics (such as measures of frequency - Count, Percent, Frequency, and measures of central tendency - Mean) were used in analysing the demographic data and the research questions. Inferential statistics such as the multiple regression analysis, at a p-value of $\leq 0.05\%$ significance level, was used to ascertain the determinants of perceived usefulness and ease of use (Acceptability) of Robotic Nursing Care.

Ethical Clearance

Ethical clearance was obtained from the Babcock University Health Research ethics committee, and permission was sought from the authority of the selected hospital in Lagos state to conduct the study. Informed verbal consent was obtained from each subject. The anonymity of responses guaranteed respondent's privacy and confidentiality and all information collected was treated with the utmost confidentiality.

III. RESULTS

About 120 respondents participated in the study out of 126 estimated population, with a response rate of 95%.

Table 1: Respondents Socio-Demography Characteristics

Variable	**Nurse**		**Patient**	
	Frequency	Percentage (%)	Frequency	Percentage (%)
Age				
20 – 30	1	16.7	37	32.5
31 – 40	4	66.7	43	37.7
41 – and above	1	16.7	34	30

Gender				
Male	0	0	43	37.7
Female	6	100	71	62.3
Educational Qualification				
SSCE	Not applicable	Not applicable	0	0
Diploma	1	16.7	37	32.5
Degree	5	83.3	72	63.2
Masters	0	0	5	4.4
Ph.D.	0	0	0	0
Marital Status				
Single	4	66.7	71	62.3
Married	2	33.3	43	37.7
Divorced	0	0	0	0
Religion				
Christian	4	66.7	77	67.5
Islam	2	33.3	37	32.5
Traditional	0	0	0	0

Source: Field Report

Table 1 shows that majority of the respondents are within the age of 31 to 40 (nurses – 66.7%, patients – 37.7%), are females (nurses – 100%, patients – 62.4%), degree holders (nurses – 83.3%, patients – 63.2%), single (nurses – 66.7%, patients – 62.3%), and are of the Christian faith (nurses – 66.7%, patients – 67.5%).

Table 2: Nurses perceived usefulness and ease of use (Acceptability) of Robotic Nursing Care

S/N	Items	Response Rating					
		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	
	Perceived Usefulness						
1	Robotics in nursing will help augment care delivery.	0	0	0	1	5	
2	Robotics will help in the delivery of supply	0	0	1	2	3	13.1667 (82%)
3	Robotics will improve nurses productivity	0	0	2	2	2	
4	Robotics will afford nurses more time with the patients	0	1	1	1	3	
	Perceived Ease of Use						
5	It is easy to become skillful at using robotics	0	0	0	3	3	
6	I will find it easy to work with robots in the delivery of nursing care..	0	1	1	2	2	
7	Learning how to use healthcare robots would be easy and understandable for me.	0	0	0	2	4	12.1667 (76%)
8	Using robotics will be more flexible in care delivery than traditional one	1	2	0	1	2	

Source: Field Report

Table 2 shows that nurses' perceived usefulness of robotics in nursing care was found to be high with a mean score of 13.2 (82%), and the perceived ease of use was 12.2 (76%) when measured on a 16-point reference scale respectively. This indicates higher-than-average acceptability of robotics in nursing care.

Table 3: Patients' perceived usefulness and ease of use (Acceptability) of Robotic Nursing Care

S/N	Items	Response Rating					
		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	
	Perceived Usefulness						
1	Robotics will help augment nursing care delivery to me.	78	0	0	0	36	
2	Robotics will help in the delivery of supply to me.	21	10	0	3	80	
3	Robots would increase my chances of getting better.	21	30	5	28	30	7.6 (48%)
4	Robots would enable me to get treatment more quickly.	36	15	4	34	25	
	Perceived Ease of Use						
5	It will be easy to become skillful at using robotics	70	11	2	10	21	
6	I would find robots easy to use.	15	26	2	6	65	8.4 (53%)
7	My interaction with healthcare robots would be clear and understandable.	22	11	30	30	21	
8	I plan to accept healthcare robots in the near future.	15	19	20	20	40	

Source: Field Report

Table 3.3 revealed that the patients' perceived usefulness of robotics in nursing care was below average with a mean score of 7.6 (48%), and the perceived ease of use of robotics in their care was above average with a mean score of 8.4 (53%), when measured on a 16-reference point scale respectively.

Table 3.4: Determinants of perceived usefulness and ease of use (Acceptability) of Robotic Nursing Care

Variables	Robotic Nursing Care (Nurses response)		p-value	Robotic Nursing Care (Patients response)		p-value
	Yes	No		Yes	No	
Age:						
20 – 30	0(0%)	1(16.7%)	0.677	17(14.9%)	20(17.5)	0.687
31 – 40	2(33.3%)	2(33.3%)		20(17.5%)	23(20.2%)	
41 – and above	1(16.7%)	0(0%)		20(17.5%)	14(12.3)	
Educational qualification:						
SSCE						
Diploma	NIL	NIL		0(0%)	0(0%)	
Degree	1(16.7%)	0(0%)		20(17.5%)	17(14.9%)	
Masters	3(50%)	2(33.3%)	0.776	37(32.5%)	35(30.7%)	0.698
PHD	0(0%)	0(0%)		3(2.6%)	2(1.8%)	
	0(0%)	0(0%)		0(0%)	0(0%)	
Gender:						
Male	0(0%)	0(0%)	0.966	30(26.3%)	13(11.4%)	0.758
Female	4(66.7)	2(33.3)		40(35.1%)	31(27.2%)	
Experience with technology	5(83.3%)	1(16.7%)	0.043	100(87.7%)	14(12.3%)	0.013
Security and privacy of data	6(100%)	0(0%)	0.001	112(98.2%)	2(1.8%)	0.002
Reliability	6(100%)	0(0%)	0.000	90(78.9%)	24(21.1)	0.000
Safety	6(100%)	(0%)	0.000	100(87.7%)	14(12.3%)	0.000

Table 3.4 revealed that the respondents experience with technology, security and privacy of data issues, reliability of the robots, and safety concerns were significant determinants of the acceptance of robotics in their care, as their p-values were ≤ 0.05.

IV. DISCUSSION

Majority of the respondents (nurses – 66.7%, patients – 37.7%) are within the age of 31 to 40, are females (nurses – 100%, patients – 62.4%), degree holders (nurses – 83.3%, patients – 63.2%), single (nurses – 66.7%, patients – 62.3%), and are of the Christian faith (nurses – 66.7%, patients – 67.5%). Nurses' perceived usefulness of robotics in nursing care was found to be high with a mean score of 13.2 (82%), and the perceived ease of use was 12.2 (76%) when measured on a 16-point reference scale, respectively. This implies that nurses' high perceived usefulness and ease of use of robotics in nursing care will positively influence their behavioural intention towards the acceptance of robotics in nursing. This might be because robots possess the potential to operate continuously throughout the day and respond promptly to the assigned tasks. Also, the acceptance of robotics will eventually alleviate the physical burden on nurses attributed to non-clinical tasks, thus, allowing them to focus on their primary clinical duties. This result is consistent with a similar study by Saadatzi, Logsdon, Abubakar, Das, Jankoski, Mitchell, et al. (26), who conducted a pilot study to investigate the perceived ease of use and perceived usefulness (acceptability) of a customized service robot among nursing students (as proxies for nursing staff in health care environments). The study result revealed an average perceived usefulness and perceived ease of use metrics among the participants were 4.13 and 5.42, respectively, out of a possible score of 7, indicating higher-than-average acceptability of this service robot. This is similar to a study by Christoforou, Avgousti, Ramdani, Novales, & Panayides (27), aimed at assessing the perceptions of nurses and others involved in the provision of clinical care in healthcare indoor settings on the different aspects of the ENDORSE concept in particular and robotics solutions in general. The study results revealed that the majority of participants perceived themselves as technologically competent and confident with the idea of controlling robots and working alongside them, and learning how to provide the required direction to colleagues and patients.

Despite the acceptance of robotics by nurses, employment may be a widespread concern, as caregivers may tend to view robots with a fear that they may replace them in the near future. However, human-social contact is essential, especially when a patient requires care, as robots may not be able to fulfil the emotional and physical needs of the patients, especially the elderly (28). Carros et al. (29) showed clearly that the participants do not want robots to replace caregivers. The robotic nursing assistants should be designed to function under nurses' direct supervision, act as a teammate, and help nurses perform non-critical tasks, such as fetching supplies, thus providing nurses with more time to concentrate on critical tasks such as caring for patients. Moreover, the COVID-19 pandemic showed nurses' vulnerability due to personal protective equipment shortages (30). On the other hand, robots are not vulnerable to viruses or other microorganisms and can assist during pandemics.

Patients' perceived usefulness of robotics in nursing care was below average with a mean score of 7.6 (48%) when measured on a 16-point reference scale, indicating lesser-than-average acceptability of robotics in nursing care based on this factor. This result is similar to Carros et al. (29), who showed clearly that the participants do not want robots to replace caregivers. On the other hand, the patients' perceived ease of use of robotics in their care was above average, with a mean score of 8.4 (53%), when measured on a 16-reference point scale, indicating higher-than-average acceptability of robotics. This result is similar to a study by Cavallo, Esposito, Limosani, Manzi, Bevilacqua, Felici (31), who investigated the acceptance of the Robot-Era system, which provides robotic services to permit older people to remain in their homes. The study results revealed that the Robot-Era system could be developed as a socially acceptable and believable provider of robotic services to facilitate older people to live independently in their homes.

Most of the robotic systems discussed in the literature are evaluated by volunteers willing to interact with robots (32). However, in critical health-related circumstances, there is a question of whether patients would accept robotic assistance and whether their families and caregivers would accept them. It is important to note that human-social contact is pivotal, especially when a patient requires care, as robots may not be able to fulfil the emotional and physical needs of the patients, especially the elderly (28).

In addition, respondents experience with technology, security and privacy of data issues, reliability of the robots, and safety concerns were significant determinants of the acceptance of robotics in their care. This finding is similar to a study by Alaiad & Zhou (33), who used a qualitative and quantitative method to assess the determinants of home healthcare robots adoption among 108 participants from home healthcare agencies located in the U.S., including both patients and healthcare professionals. The study results revealed that the usage intention of home healthcare robots is a function of social influence, performance expectancy, trust, privacy concerns, ethical concerns and facilitating conditions. Among these factors, social influence was found to be the strongest predictor of acceptability.

V. CONCLUSION

This paper presented nurses' and patients' perceived usefulness and perceived ease of use (acceptability) of robotics in nursing care in a selected hospital, South-West, Nigeria. A total of 120 respondents completed the study.

In general, the outcomes showed that Nurses' perceived usefulness of robotics in nursing care was high with a mean score of 13.2 (82%), and the perceived ease of use was 12.2 (76%) when measured on a 16-point reference scale, respectively. Patients' perceived usefulness of robotics in nursing care was below average with a mean score of 7.6 (48%) and when measured on a 16-point reference scale, indicating lesser-than-average acceptability of robotics in nursing care based on this factor. Also, the patients' perceived ease of use of robotics in their care was above average, with a mean score of 8.4 (53%) when measured on a 16-reference point scale, indicating higher-than-average acceptability of robotics. In addition, respondents experience with technology, security and privacy of data issues, reliability of the robots, and safety concerns were significant determinants of the acceptance of robotics in nursing care.

However, there is the need to address the factors identified in the present study as determinants of acceptance of robotics in nursing care. More research needs to investigate these factors and the needs of potential users and their expectations in specific situations.

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