

Use of Collaborative Technologies for Knowledge Management in Psychiatric Hospitals in Southwest Nigeria

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Abstract

This article concerns the study examining the use of collaborative technologies (CTs) for the acquisition, creation, sharing, transfer, and retention of knowledge by therapy team members (TTMs) in psychiatric hospitals, and the determinants of the use of CTs as well as how they relate to knowledge management (KM) practices. The skills of the TTMs in the use of CTs were also investigated. Carried out within the positivist and constructivist paradigms, a sample survey was conducted among TTMs from two purposively selected psychiatric hospitals in Southwest Nigeria. Quantitative data was collected from self-administered questionnaires completed by 283 TTMs and was analysed using the Statistical Package for Social Sciences (SPSS) 22. Qualitative data was collected from interviews conducted with four heads of departments. The study showed that the TTMs in the relevant hospitals used 26 different CTs for knowledge acquisition, creation, sharing, transfer, and retention. The largest proportion (84.5%) of the respondents confirmed that skill in the use of CTs determined the use of CTs for KM practices. More than half (54.3%) of the TTMs were highly skilled in the use of CTs for KM practices. The findings suggested that the respondents were positively inclined towards the use of CTs and that they were involved in the use of various CTs to facilitate KM practices and processes. It was found that task interdependence was characteristic of the TTMs' work in the selected psychiatric hospitals, and that, to benefit from the potential advantages of task interdependence and to effectively employ CTs in operations and processes, TTMs' skills in the use of CTs should be developed. In addition, professional ties among experts in different fields of specialisation should be encouraged.

Keywords: collaborative technologies; information and communication technologies; knowledge management; communities of practices; therapy team; psychiatric hospitals

Introduction and Background to the Study

The use of various collaborative technologies (CTs) (e.g. mobile phones, blogs, wikis, Web portals, WhatsApp) to capture and share both tacit (personally acquired) and explicit (easily recorded and shared) knowledge is essential to knowledge management (KM) initiatives and effective service delivery by stakeholders in hospitals. KM encompasses human resource management and good information technology and information system management (Davenport and Prusak 1998). Klasson (1999, 6) observes that, in most instances, technology-enabled KM solutions employ content technologies that enhance the capture and management of explicit information and collaboration to enable individuals and communities to create, share and socialise in order to meet specific business objectives. Utilising information technologies for collaborative purposes effectively enables KM, because these technologies facilitate the collaborative processes and the wide distribution of knowledge for capture and re-application (Perrott 2007). The capacity of CTs to combine all KM activities and processes allows for the dynamic creation, capture, and sharing of all types of knowledge in an organisation.

When they are utilised for collaborative purposes, information and communication technologies (ICTs) facilitate the cross-fertilisation of ideas, intuition, skills and expertise for effective personal and collective professional development and efficiency. They also facilitate socialisation among people of similar and different disciplines. For this reason, many scholars and practitioners emphasise the collaborative roles of ICTs (Ajuwon 2015; Bello et al. 2011; Nwagwu, Adegunwa, and Soyannwo 2013; Udousoro 2014). Although all ICTs are collaborative in their functions (Ogbomo and Ogbomo 2008; Walsh 2013), they play better collaborative roles when they are wireless. Typical examples of wireless ICTs include Web portals and groupware (McAndrew 2009, 33).

CTs play a significant role in KM activities and form part of the social context in which they occur. CTs allow groups that collaborate to be efficient in their activities. Take a SMART Board™ interactive whiteboard for instance, the use of which allows each member of a group to connect to colleagues via Microsoft NetMeeting software (or any other software) in different locations. Social media platforms, such as blogs and wikis, enable the collaborative creation of information and knowledge. According to Kennedy, Mighell, and Kennedy (2010, 1), CTs are unique because they always facilitate interactions with other people to manage knowledge assets. CTs can be used to facilitate virtual meetings, create subject expert repositories and image galleries, do instant messaging, and manage wireless Web services, training and e-mails (Hedgebeth 2007).

Context

This study was carried out in two of the oldest psychiatric hospitals in Nigeria: the Neuropsychiatric Hospital, Abeokuta and the Federal Neuropsychiatric Hospital, Yaba in Southwest Nigeria. Psychiatric hospitals are unique in terms of the provision of specialist services that are based on high task interdependence, teaming strategy (Menninger 1998), a strategy of professional capacity development and a need for a knowledge-friendly culture to promote quality, evidence-based medical practices (Dizon, Grimmer-Somers, and Kumar 2012). Characteristically, a psychiatric hospital setting is a therapeutic environment where a collaborative approach is inevitably employed. According to Menninger (1998), effective treatment in modern psychiatric practice requires a collaborative approach by the mental care professionals and other healthcare professionals responsible for treatment and therapy.

Statement of Research Problem and Purpose of the Study

The use of information technology to manage knowledge and information is considered essential to the transformation of the healthcare delivery system and the promotion of preventive care (Bowles, Dykes, and Demiris 2015; Mohajan 2016; Wheatley 2013). Mohajan (2016) emphasises the critical role and the complexity of employing information technologies to manage knowledge in mental health institutions. In a comprehensive review of information systems application in mental healthcare, the World Health Organisation (WHO) (2005, 2) has elucidated the role of information systems to “improve the effectiveness and efficiency of the mental health service and ensure more equitable delivery by enabling managers and service providers to make more informed decisions for improving the quality of care.” The WHO recognises that the knowledge provided by mental health planners and clinicians for the collection and use of data specific to mental health can be facilitated by information technologies and systems.

It has been observed that medical and para-medical professionals in six low- and middle-income countries (including Nigeria) use CTs for clinical and non-clinical purposes (Upadhya et al. 2016). Yet, the extent of this use in the context of psychiatric hospitals in Nigeria has not been clearly documented, their use among therapy team members has not been properly institutionalised, and there is no clear policy to guide the use of CTs for knowledge management initiatives. Hence, the present study sought to investigate which CTs were employed to create, share and retain knowledge in psychiatric hospitals in Southwest Nigeria. The study explored, for instance, what the factors were that influenced the use of CTs and what TTMs’ level of skill in the use of CTs was in psychiatric hospitals in Southwest Nigeria.

Research Objectives

The objectives of the research were:

- (i) To examine the CTs that TTMs used for KM practices in the psychiatric hospitals in Southwest Nigeria
- (ii) To investigate factors influencing the use of CTs for KM
- (iii) To examine the CT skills of the TTMs in psychiatric hospitals in Southwest Nigeria

The present study will be useful to policy makers in regard to the employment of CTs to build capacity, share skills and facilitate the fast flow of information and knowledge from the sources to those who need it. It will also enable healthcare practitioners in mental health institutions to benchmark prevalent KM practices and the way CTs facilitate the sharing of best practices.

Literature Review

The literature review focuses on (i) the theoretical framework, (ii) the use of CTs in hospitals and healthcare generally and in psychiatric hospitals specifically, and (iii) the factors influencing the use of CTs for KM.

Theoretical Framework

Orlikowski's (2000) Theory of Structuration was used to guide this study.

Orlikowski (2000) developed a "practice lens" to investigate how individuals interact with ICTs. She considers KM tools as being inscribed with designers' intention but as being socially constructed through use within recurrent social practices (Orlikowski 2000, 405). Orlikowski moves beyond both the social influence and deterministic perspectives to recognise that features of ICT are specifically decided by users. Viewed from a "practice lens" approach, an individual's use of ICTs is understood by the use in a specific context. Orlikowski argues that individuals use technology differently as they change jobs or have new commitments and that their use is also dictated by changes in ICTs over time. She contests the fact that embedded structures within ICTs shape use. Contrarily, she focuses on how individuals single-handedly adapt ICTs, and she indicates that technology on its own remains constant. Hence, instead of starting with the technology and investigating how actors appropriate its embodied structure, she begins with human action and investigates how it enacts emergent structures via recurrent interaction with the technology at hand (Orlikowski 2000, 407). The present study was theoretically underpinned by Orlikowski's "practice lens" because it provided a suitable basis for the study to the extent that it is grounded in human action and inherently dynamic and emergent.

Use of Collaborative Technologies in Hospitals and Healthcare

CTs are used in hospitals by various categories of medical personnel in different ways and for different purposes. According to Thomas and Adeniyi (2013), health personnel have a favourable perception of the use of social media in healthcare delivery. ICTs play

an essential role in the development of the health information system for KM. Electronic health technologies enable effective networking by physicians, promote online review of patients' treatment, and equally enhance accurate prescription of drugs (Benson 2011). CTs assist in the data collection, analysis, management and sharing of information between business processes for healthcare (Mahmood et al. 2012, 37). According to Mahmood et al. (2012), there is a general lack of awareness of the benefits but also of the risks of using ICTs. They mention the video conferencing tool that can help a physician to interact with different experts at the same time and make a decision. One of the cheapest and most affordable ICT tools is the mobile phone (Imouokhome and Osubor 2012, 146), which allows knowledge sharing and collaboration among users.

CTs are not KM, but can be used as tools in KM practice (Mavodza and Ngulube 2012, 3). CT infrastructure facilitates the provision of healthcare services to organisations and individuals situated at distant locations. Nwagwu and Ejeh (2014) report the use of ICT by stakeholders to collaborate in the management of terminal cancer patients. Ventola (2014) discusses the use of social media for patient care, patient education, professional networking, professional education and the promotion of a hospital. Ventola adds that when systematically and correctly used, social media sites and platforms promote individual and public health, as well as professional development and advancement. Bordoloi and Islam (2012, 113) confirm that many scholars note that knowledge transfer among healthcare professionals (physicians, nurses, technicians) is pivotal for professional networks and communities of practice. Such transfer is enabled by the integrated use of CTs. The literature shows that health professionals use different CTs for KM relating to patient care, diagnoses, treatment, documentation and storage of health information, and collaboration.

Factors Influencing the Use of Collaborative Technologies for Knowledge Management

There are factors that influence the successful use of technologies for KM initiatives. Such factors are associated with individuals, organisations, KM processes, and the technologies themselves. These factors are the following:

Willingness to share knowledge: People's willingness to share knowledge dictates sharing behaviour and is part of pro-social transformation behaviours. The intention to share knowledge is especially important in determining the use of technology in KM (El Said 2015, 75). Willingness to share knowledge is directly associated with KM and indirectly associated with the use of technologies in KM. A person who is unwilling to share knowledge is unlikely to use technology for this purpose. Thus, the more one has the intention to share knowledge, the more one is motivated to use appropriate technologies to share knowledge. The degree of willingness to share knowledge in practice determines the use of technology in practice. According to Omotayo (2015), technology does not automatically make an organisation share knowledge, but people's

willingness to share knowledge can make them use technology to increase the reach and scope of their exchanges. In addition, Oye, Salleh, and Noorminshah (2011) posit that unwillingness to use technology will demotivate workers from sharing knowledge.

Knowledge ownership: The ownership of knowledge as perceived by individuals determines the degree of knowledge creation, sharing, and retention within an organisation. Workers do not only feel great ownership over the knowledge they create but they also understand that risks are inherent in sharing knowledge. The creators of tacit knowledge have no personal need to share it because they have already acquired and used it for their own purposes. Hence, they share tacit knowledge, if they ever do, solely for the benefits of others (Oye Salleh, and Noorminshah 2011, 80). Individually owned knowledge is more easily shared and transferred than organisationally owned knowledge because the latter is procedural in nature, which affects sharing and transfer. The more the knowledge is owned by an individual, the higher the motivation to use technologies for KM practices.

Task interdependence: The theory of task technology asserts that for an information technology to have a positive impact on individual performance, the technology must be utilised and the technology must be a good fit with the tasks it supports (Constant, Keisler, and Sproull 1994). Task interdependence refers to the extent to which the performance of a task depends on the collaboration of people. The more people's tasks depend on others, the more people are encouraged to collaborate. Task interdependence has a positive influence on the use of technology in KM (Lin and Huang 2008). Thus, more task interdependence motivates people to use CTs for information sharing (Jarvenpaa and Staples 2000).

Technology skill: The acquisition of needed skills to effectively operate and use technologies is essential. Skill determines the use or non-use of technology for KM. ICT skill determines the adoption and use of it (Saleh and Burgess 2009). The use of technology depends on users' understanding of the properties and functionality of technology (Orlikowski 2000). The more the users understand the functionality of a particular technology and possess the skills to operate it, the more they are motivated to use it to manage knowledge. Alqahtani, Watson, and Partridge (2010, 26) identify self-efficacy in producing content for technology as an important determinant of technology use for KM.

Technology perception: Users' perception of technology's robustness, user friendliness (Davis 1989, 319) and task fit (El Said 2015; Lin and Huang 2008) usually affects the adoption and use of such technology. A positive perception of technology spurs its use for KM. The major findings from a study done by Ruhi and Al-Mohsen (2015) validate the role of technology perceptions, which include ease of use, usefulness, media richness, sophistication of a technology to improve the use of enterprise 2.0 technologies in a workplace, and the positive effect of the use of a technology on a KM environment of an organisation. El Said's (2015, 80) study found that the use or non-

use of technology was determined by reliability, accessibility, and ease of use, as confirmed by 84 per cent of their study’s participants. These characteristics of a technology have a high impact on users’ perceived usefulness of the technology, as well as on productivity and efficiency in the workplace.

Methodology

Research Design

This study was carried out within both the positivist and constructivist paradigms, and it employed both quantitative and qualitative techniques. The quantitative technique is useful since it emphasises the objectivity and reliability of findings and encourages the generalisation of results. This technique necessitated the adoption of a descriptive sample survey research design for this study. This design was adopted because the sample was large and the subjects were widely spread in the institutions. According to Groves et al. (2004, 4), a survey is a systematic design for gathering data or information from a sample of a population that quantitatively describes the larger population from which the sample is taken. Interviews were conducted to collect qualitative data to corroborate the quantitative findings.

Sampling

Two federal psychiatric hospitals in the geo-political zone of Southwest Nigeria were purposively selected on account of ease of access. At the time of the study, the two hospitals had 2,632 employees, out of which 990 were TTMs: doctors, nurses, nutritionists, clinical psychologists, social workers and occupational therapists. A proportionate-to-size stratified sampling scheme was used to select the sample of 496 TTMs (see Table 1). This means that the sample size of each stratum was proportionate to the population size of the TTMs in the particular stratum. The sample size of each stratum is shown in Table 1.

Table 1: Sample size

Population of study	NPH Abeokuta (A)	Sample size of (A)	FPH Yaba (B)	Sample size of (B)	Total sample size
Doctors	45	23	67	34	57
Nurses	338	169	400	200	369
Clinical psychologists	6	3	18	9	12
Social workers	10	5	22	11	16
Occupational therapists	37	19	40	20	39
Nutritionists	5	3	2	1	4
	441	221	549	275	496

NPH = Neuropsychiatric Hospital; FPH = Federal Neuropsychiatric Hospital

Instrumentation

Data was collected through the use of a structured questionnaire. A 5-point Likert scale was used to measure the variables, ranging from strongly agree (SA = 5), agree (A = 4), undecided (U = 3), disagree (D = 2) to strongly disagree (SD = 1). The structured questionnaire contained questions on the demographic characteristics of the TTMs, their perceived use of CTs and the factors they perceived as impediments to their full use of the technologies. The questionnaire for this study was pre-tested on 10 respondents (medical and para-medical professionals) from the Community Mental Health Hospital, Oke Ilewo, Abeokuta in order to refine it. A reliability analysis function was employed using the Statistical Package for Social Sciences (SPSS) 22. The internal consistency of the whole questionnaire was investigated. The overall Cronbach's alpha value for the whole questionnaire was 0.94, which was above the recommended 0.70. Copies of the self-administered questionnaire were distributed to 496 respondents. Respondents completed the questionnaires in their work environments and returned them to the researchers between October and December 2017. A semi-structured interview was also used to collect data from four departmental heads among the TTMs who took part from the two selected hospitals. The interview guide was pre-tested on three members of staff conveniently selected from the School of Psychiatric Nursing, Abeokuta before it was used for the interviews.

Response Rate

Out of 496 copies of the questionnaire distributed to the respondents and returned to the researchers between October and December 2017, 283 were correctly completed, representing a response rate of 57.06 per cent. In the opinion of Rubin and Bellamy (2012), 50 per cent is an acceptable response rate, particularly in the case of an unsolicited survey.

Data Preparation and Analysis

The quantitative data was analysed using SPSS 22 for Windows. For ease of presentation and interpretation, responses given as SA = strongly agree and A = agree were combined to form A, whereas D = disagree and SD = strongly disagree were combined to form D. Responses given as U = undecided were retained as U.

Ethical Consideration

For this research, ethical approval was obtained from the institutionally based National Health Research Ethics Committee of Nigeria, the Health Research Ethics Committee of the Neuropsychiatric Hospital, Abeokuta, and the Health Research Ethics Committee of the Federal Neuropsychiatric Hospital, Yaba, Lagos. All the required ethical principles were observed throughout the study.

Results

This section deals with the analyses of the demographic characteristics of the participating TTMs, the CTs used by the TTMs, the factors influencing the use of CTs for KM, as well as the participating TTMs' level of skill in using CTs in the two psychiatric hospitals in Southwest Nigeria.

Demographic Characteristics of the Respondents

Of the respondents, only 97 (34.3%) were males whereas more than half (186 = 65.7%) were females. More than one third (99; 35%) of the respondents were between the ages of 30 and 39 years, and 98 (34.6%) were between the ages of 40 and 49 years. Of the TTMs, 51 (18%) were younger than 30 years old, 32 (11.3%) were between the ages of 50 and 59 years and only a small number (3; 1.1%) were older than 59 years. The mean age of all the respondents was 38.68 years. Furthermore, of the six main categories of the respondents who participated in the study, 36 (12.7%) were doctors, 202 (71.4%) were nurses, 11 (3.9%) were clinical psychologists, 11 (3.9%) were social workers, 20 (7.1%) were occupational therapists and three (1.1%) were nutritionists. The distribution of the highest qualifications of the respondents showed that about one third (36.7%) of them were registered psychiatric nurses, and 36.4 per cent had a B.Sc. degree. A small proportion (10.6%) had an M.Sc. degree, 8.1 per cent had an MBBS degree, 3.2 per cent had an MBChB degree and only 0.4 per cent had a Ph.D. degree. As far as working experience was concerned, about one third (96; 34%) of the TTMs had between six and 10 years of working experience, 70 (24.7%) had between nought and five years of working experience, 59 (20.9%) had between 11 and 15 years of working experience, 27 (9.5%) had between 16 and 20 years of working experience, 19 (6.7%) had between 21 and 25 years of working experience, six (2.1%) had between 26 and 30 years of working experience, five (1.8%) had between 31 and 35 years of working experience, and only one person (0.4%) had more than 35 years of working experience. The mean number of years of working experience was 10.55 years.

Collaborative Technologies used by Therapy Team Members for Knowledge Management

Respondents were asked to indicate in order of preference which of the CTs listed in Table 2 they used for the following KM practices: knowledge acquisition, knowledge creation, knowledge sharing, knowledge transfer, and knowledge retention/storage. The results in percentages are presented in Table 2.

Table 2: CTs used by TTMs ($N = 283$) for KM

Collaborative technologies	KA%	KC%	KS%	KT%	KR%	NU%
E-mail	18.4	15.5	36.7	7.8	7.4	14.1
Mobile phone	18.7	16.3	39.2	12.4	6.0	7.4
Chatter	11.0	18.0	28.3	5.3	4.6	32.9

Facebook	13.8	14.1	37.8	8.1	6.4	19.8
Blogs	11.3	13.4	28.6	5.7	4.2	36.7
Twitter	11.0	13.4	27.6	8.5	3.2	36.4
Wikis	15.2	9.5	18.4	8.5	3.9	44.5
Knowledge portals, e.g. Hinari	26.9	16.3	16.3	8.5	6.7	25.4
Web portals	17.7	18.4	16.6	9.5	9.5	28.3
LinkedIn	13.8	12.7	17.3	10.6	6.4	39.2
Video-sharing site	8.5	11.7	30.7	9.5	5.7	33.9
Video conferencing	8.5	12.7	25.4	10.2	6.0	37.1
Intranet	12.0	15.2	20.8	8.5	6.4	37.1
Extranet	12.7	12.7	23.7	4.9	5.3	40.6
Instant messaging, e.g. BBM	6.0	14.1	35.7	8.8	4.6	30.7
Google Docs	23.7	15.2	23.0	6.0	5.7	26.5
Photo-sharing site	8.8	13.8	24.7	6.0	6.0	40.6
Bluetooth	9.5	13.1	32.2	12.0	6.0	27.2
WhatsApp	15.9	16.3	40.3	11.0	4.2	12.4
Groupware	9.5	13.8	25.4	8.1	4.6	38.5
SMART board interactive whiteboard	11.7	13.4	21.6	8.8	4.9	39.6
Electronic document management system (EDMS)	11.0	14.5	18.4	9.5	13.1	33.6
Media-sharing sites e.g. YouTube	12.4	13.8	27.6	9.2	6.0	31.1
Myspace	10.6	13.1	21.2	5.3	4.2	45.6
Google+	16.6	14.8	21.6	4.6	5.7	36.7
Social networking sites e.g. Nursing Link	21.9	13.1	33.2	7.8	3.2	20.8

KA = knowledge acquisition; KC = knowledge creation; KS = knowledge sharing; KT = knowledge transfer; KR = Knowledge retention; NU = Not used.

Table 2 indicates respondents' preferential use of CTs for KM. Two patterns of use of CTs were revealed: (1) each CT was used by TTMs for different KM practices; and (2) all CTs were used by TTMs for each of the KM practices. However, all the CTs were used for knowledge sharing more than for any other KM practice, with the exception of knowledge portals (e.g. Hinari), which 26.9 per cent of the respondents indicated that they preferred to use for knowledge acquisition rather than for knowledge creation, sharing, transfer, and retention.

As presented in Table 2, the TTMs preferred some CTs to others for each of the KM practices. The least used of all the CTs was Myspace—45.6 per cent of the respondents selected “Not used” for this CT. Thus, just above half (54.4%) of the TTMs used Myspace for knowledge acquisition, creation, sharing, transfer, and retention. The most

used CT of all was the mobile phone—only 7.4 per cent of the respondents selected “Not used” for this CT. The majority (92.6%) of the TTMs used the mobile phone for knowledge acquisition, creation, sharing, transfer, and retention.

Factors Influencing the Use of Collaborative Technologies for Knowledge Management

Table 3 presents the respondents’ opinions about factors influencing the use of CTs for KM practices.

Table 3: Factors influencing TTMs’ (*N* = 283) use of CTs for KM

Determinants of use of CTs	A %	U %	D %
My good intention to share knowledge makes me use collaborative technologies to share my special skills with colleagues in my discipline.	74.5	16.3	9.2
My good intention to share knowledge makes me use collaborative technologies to share my expertise with colleagues in other disciplines.	81.6	12.7	5.7
High good intention to share knowledge is associated with high use of collaborative technologies in creation of new ideas.	81.6	15.2	3.2
There is no need for me to use collaborative technologies to share knowledge because I own my knowledge.	14.9	13.0	72.1
I am encouraged to use collaborative technologies to transfer knowledge because I regard knowledge as an asset that is of communal benefit.	78.8	15.2	6.0
I continually use collaborative technologies to create knowledge because I accept that my organisation where I work owns my knowledge.	48.8	24.4	26.8
A positive attitude towards knowledge ownership is associated with increased use of collaborative technologies in knowledge management practices.	75.6	19.1	5.3
I do not use collaborative technologies to share my expertise since my expertise is an asset for making me better than others.	14.1	17.7	68.2
I share my special skills because it is an asset for making my organisation better than other organisations.	80.9	13.4	5.7
The more workers value knowledge as an asset for making their organisation better than other organisations, the more they use collaborative technologies to store knowledge.	82.7	11.7	5.6
The more experts are involved in tasks that need working with colleagues to achieve a common goal for execution, the more they use collaborative technologies to create knowledge for reuse.	83.1	12.6	4.3

High task interdependence increases demand for knowledge sharing which makes me use collaborative technologies in knowledge sharing.	80.9	14.2	4.9
Collaborative technologies' perceived user friendliness (ease of use) determines the choice of collaborative technologies used in creating knowledge.	76.7	17.7	5.6
Collaborative technologies' perceived task fit (adaptability for diverse uses) determines the choice of collaborative technologies used in creating knowledge.	76.4	18.0	5.6
Collaborative technologies' perceived versatility (ability to do many things) determines the choice of the ones used in retaining knowledge.	79.6	15.1	5.3
A high level of collaborative technologies skill is associated with a high use of collaborative technologies in knowledge management practices.	84.4	12.1	3.5

A = Agree; U = Undecided; D = Disagree

Table 3 shows that more than 70 per cent of the respondents responded positively to almost all the statements. A majority (81.6%) of the respondents agreed that their good intention to share knowledge made them use CTs to share their expertise with colleagues in other disciplines, whereas 74.5 per cent of them agreed that their good intention to share knowledge made them use CTs to share their special skills with colleagues in their discipline. Of the respondents, 81.6 per cent agreed that a high good intention to share knowledge was associated with a high use of CTs for the creation of new ideas. These responses suggest that the intention to share knowledge influences the use of CTs.

Furthermore, 78.8 per cent of the respondents agreed that they were encouraged to use CTs to transfer knowledge because they regarded knowledge as an asset that was of communal benefit. Of the respondents, 72.1 per cent disagreed with the statement "There is no need for me to use CTs to share knowledge, because I own my knowledge." Of the respondents, 68.2 per cent disagreed with the statement "I do not use CTs to share my expertise, since my expertise is an asset for making me better than others" whereas 75.6 per cent of them agreed that a positive attitude towards knowledge ownership was associated with an increased use of CTs for KM practices. These responses indicated that knowledge ownership determined the respondents' use of CTs. A large proportion (82.7%) of the respondents confirmed that the more value that workers attached to knowledge as an asset for making their organisation better than other organisations, the more they used CTs to store knowledge. Of the respondents, 80.9 per cent agreed that they shared their special skills because it was an asset for making their organisation better than other organisations. These views suggest that knowledge valuation determines the use of CTs.

The majority (83.1%) of the respondents agreed that the increased involvement of experts in tasks that required them to work with colleagues to achieve a common goal for execution, increased their use of CTs to create knowledge for reuse. Of the respondents, 80.9 per cent agreed that high task interdependence increased the demand for knowledge sharing and that it made them use CTs in knowledge sharing. These responses indicated that task interdependence determined the respondents' use of CTs. According to a majority (76.4%) of the respondents, CTs' perceived task fit (adaptability for diverse uses) determined the choice of CTs used in creating knowledge. Also, 79.6 per cent of the respondents agreed that CTs' perceived versatility determined the choice of the ones used in KM, whereas 76.7 per cent of them agreed that CTs' perceived user friendliness (ease of use) determined the choice of CTs used in creating knowledge. These responses suggest that the perception of CTs determines their use.

Finally, a large proportion (84.4%) of the respondents agreed that a high skill in the use of CTs was associated with a high use of CTs for KM. Hence, CT skill was the highest determinant of the use of CTs for KM. In all, judging from the responses of the respondents, six key factors determined the use of CTs for KM (see Table 3).

Skill of Therapy Team Members in Psychiatric Hospitals in Southwest Nigeria in Using Collaborative Technologies

Table 4 presents the skill of the TTMs in the two surveyed psychiatric hospitals in Southwest Nigeria in using CTs.

Table 4: Rating of TTMs' (*N* = 283) skill in using CTs

Rating of TTMs' CT skill	Frequency	Percentage
Poor	40	14.1
Fair	89	31.4
Good	102	36
Very good	40	14.1
Excellent	12	4.2
Total	283	100

As presented in Table 4, a small proportion (4.2%) of the respondents had excellent skills in the use of CTs, followed by 14.1 per cent who had very good skills. More than one third (36%) of the respondents had good skills in the use of CTs for KM whereas 31.4 per cent were fairly skilled in the use of CTs. The results showed that more than half (54.3%) of the TTMs were highly skilled in the use of CTs to acquire, create, share, transfer, and retain knowledge.

This study explored three questions:

- Which CTs do TTMs use for KM?

- What are the factors influencing the use of CTs for KM in psychiatric hospitals?
- What is the level of skill of TTMs at the selected psychiatric hospitals in using CTs?

In the next section, the findings relating to these questions are discussed.

Discussion

Which Collaborative Technologies Do Therapy Team Members Use for Knowledge Management?

According to the findings of the present study, the participating TTMs preferred to use 26 CTs for knowledge acquisition, knowledge creation, knowledge sharing, knowledge transfer, and knowledge retention/storage. These CTs were: e-mails, mobile phones, Chatter, Facebook, blogs, Twitter, wikis, knowledge portals (e.g. Hinari), Web portals, LinkedIn, video-sharing sites, video conferencing, intranet, extranet, instant messaging (e.g. BBM), Google Docs, photo-sharing sites, Bluetooth, WhatsApp, Groupware, SMART Board™ interactive whiteboard, electronic document management system (EDMS), media-sharing sites (e.g. YouTube), Myspace, Google+, and Nursing Link. Similar observations were made in studies conducted by the following scholars: Afolayan and Oyekunle (2014); Imouokhome and Osubor (2012); Mosha (2017); Nwagwu, Adegunwa, and Soyannwo (2013); and Ventola (2014). This confirms the viability of CTs in facilitating processes, operations and knowledge management activities. Hence, this advantage should continually be harnessed by the TTMs in psychiatric hospitals in Nigeria.

In research done by Nwagwu et al. (2013, 310), they found that health professionals at the University College Hospital, Ibadan, Nigeria used e-mails, mobile phones, land phones, the Internet, blogs, the electronic health information system, podcasts, and audio and video conferencing tools for communication and collaboration in healthcare delivery. It should be noted that communication and collaboration facilitate KM. Borousan et al. (2012), in their study about the implementation of a KM system in healthcare in Malaysia, found that five stages of knowledge circulation processes, namely, accumulation, sharing, utilisation, internalisation, and creation of knowledge, can be enabled by the use of technologies, not only inside a hospital, but collaboratively among different hospitals. Dulipovici and Vieru (2015, 661) note that the use of collaboration tools—from e-mails, text messages, wikis and shared directories to sophisticated KM systems and Web content management systems—is prevalent in today's organisational environment. These tools are used to enable various collaborative activities, especially in hospitals where health professionals across a whole hospital and its annexes connect and interact with one another and/or create, store, search and share clinical information and evidence-based practices. This implies that professionalism and efficiency can be enhanced through the constant and purposeful use of CTs.

TTMs' use of various CTs provides evidence that these tools have an important contribution to and impact on KM processes. Hence, appropriate employment of CTs should be encouraged among the TTMs in psychiatric hospitals. Koochang, Harman, and Britz (2008, 87) acknowledge that technologies continue to play a crucial role as enablers and supporters of knowledge-sharing processes, particularly in terms of information management systems and communities of practice, though they are no longer at the centre of KM strategies. Social media tools as collaborative technologies are currently being put to use by healthcare professionals locally and internationally due to their enabling capacity to foster knowledge exchange and support effective healthcare services. According to Ventola (2014, 520), social media tools and platforms can adequately promote individual and public health, as well as foster professional development when used appropriately. In the two hospitals surveyed in the present study, two patterns of the use of CTs were revealed: (1) each CT was used by TTMs for different KM practices; and (2) all CTs were used by TTMs in each KM practice. All 26 CTs were used for knowledge sharing more than for any other KM practice. The exception was knowledge portals (e.g. Hinari) in respect of which 26.9 per cent of the respondents indicated that they used these portals preferably for knowledge acquisition rather than for any other KM practice. In the present study, the findings revealed which CT the TTMs preferred to use for each of the KM practices.

The present study established that the TTMs used CTs for different purposes. For example, as indicated by a total of 85.8 per cent of the TTMs, 18.4 per cent of them used e-mail for knowledge acquisition, 15.5 per cent used e-mail for knowledge creation, 36.7 per cent used e-mail for knowledge sharing, 7.8 per cent used e-mail for knowledge transfer, and 7.4 per cent used e-mail for knowledge retention/storage. Therefore, although the TTMs used the e-mail tool for information and/or knowledge sharing (for which it was originally designed), they also used it for knowledge acquisition, creation and storage. This confirmed the findings of Whittaker and Sidner (cited in Orlikowski 2000) who applied Orlikowski's "practice lens" in their study of Lotus Notes and found that though e-mail was originally designed for information exchange purposes, it was also being used for task management and personal archiving. In the present study, it was observed that the use of all the CTs by the TTMs in the two psychiatric hospitals in Southwest Nigeria followed the same pattern as in the e-mail example referred to above. The TTMs were found to have adapted the various CTs to serve different KM purposes. Orlikowski (2000) asserts that ICTs are not stabilised after invention—people can adapt them recurrently to serve different purposes.

The present study established that in the surveyed psychiatric hospitals, the CT that was used the least was Myspace. Of the respondents, 45.6 per cent indicated Myspace as "not used." Thus, just more than half (54.4%) of the TTMs used Myspace for knowledge acquisition, creation, sharing, transfer, and retention. The CT that was used the most was the mobile phone: only 7.4 per cent of the respondents indicated it as "not used" whereas the majority (92.6%) of the TTMs indicated that they used the mobile phone for knowledge acquisition, creation, sharing, transfer, and retention. The fact that the

mobile phone was the CT that was used the most may be ascribed to its accessibility, availability, adaptability, and ease of use in a hospital setting. On the other hand, the use of WhatsApp by the majority (87.7%) of the TTMs could have had an impact on the frequency of use of mobile phones, since WhatsApp is easy to install and use on a mobile phone. Similarly, Idowu, Ogunbodede, and Idowu (2003), in their study on the use of ICTs in teaching hospitals in Nigeria, found that medical experts used mobile phones to consult colleagues in order to acquire knowledge.

The CTs that the TTMs in the surveyed hospitals preferred to use for each of the KM practices are discussed below:

(a) The knowledge portal (e.g. Hinari) was the preferred CT to use for knowledge acquisition, as indicated by 26.9 per cent of the respondents. Similarly, Ajuwon (2015, 11) found that doctors used the Web of Knowledge, Hinari, Ajol, Essential Health Links, and journal websites to access online health information resources. The respondents in Ajuwon's study confirmed their use of the Internet and health information resources for their preparation of seminar presentations (98.8%), examinations (94.5%), research (93.1%), and continuing medical education (76.9%). All these are knowledge acquisition activities. Kažimír, Bureš, and Otčenášková (2012, 7) posit that the purpose of knowledge portals is to store knowledge and make it easily available to users. Knowledge portals, such as Hinari and Ajol, are electronic repositories of explicit knowledge in diverse areas of medical specialisation. Research studies and information on medical best practices are readily found on Hinari. Healthcare professionals use such portals to update their information and knowledge, acquire new knowledge and also contribute knowledge through research publications and workshop and conference paper presentations.

(b) The Web portal was the CT preferred for knowledge creation, as indicated by 18.4 per cent of the respondents. Though the specific Web portals used were not ascertained in this study, such Web portals might include any or a combination of the following: patient portals, hospital-physician portals, and corporate portals. Similarly, in the study done by Grossman, Bodenheimer, and McKenzie (2006), they found that a hospital-physician portal was used for knowledge creation, sharing and consultation. Some hospital portals feature secure electronic messaging systems that permit doctors to share results and consultations. Also, in a qualitative study done by Das, Faxvaag, and Svanaes (2015) on the impact of an e-health portal on healthcare professionals' interaction with patients in a bariatric surgery clinic in Norway, it was found that an e-health portal facilitated the provision of information and KM as it was (1) a source of information, (2) a gateway to approach and facilitate the care of patients, (3) a platform for irrevocable postings, (4) a channel to expose responsibility and competence, and (5) a tool in the clinic.

Web portals are potent CTs for information and KM. The reason TTMs in the surveyed psychiatric hospitals used it might be because Web portals are rich in diverse

knowledge, including evidence-based medical practices. This supports the submission of Benbya, Passiante, and Belbaly (2004, 212) that the generation of knowledge needs tools that enable the acquisition, synthesis, and creation of knowledge. Web portals have communication, application and community-building features that foster knowledge-generation processes. They are accessible by means of various technologies and from various electronic devices such as Internet-enabled computers and smart phones. According to Draper (2018, 1), a Web portal permits people to connect with one another and find relevant content without experiencing stress in the process. It aggregates information or knowledge from various sources into a single user interface. The pooling of information or knowledge from different sources results in the creation of new knowledge that is stored for reuse. This CT facilitates knowledge creation through a process of combination. Evidence-based practices in mental healthcare demand constant research to update medical knowledge, and Web portals make a significant contribution in this regard. Web portals also facilitate communication about clinical information among healthcare professionals and other stakeholders. Likewise, Mansourvar and Yasin (2010, 970) opine that Web portals are user-centric and that, by implication, their users can gather and give information and data.

(c) Of the respondents in the present study, 40.3 per cent indicated that they preferred WhatsApp for knowledge sharing. This is a reflection of the potential of WhatsApp in effectively sharing information and knowledge, as confirmed by Jayarajan, Lee, and Mwaikambo (2017) and Kufre and Abe (2017). Nevertheless, this is contrary to the finding of Hassandoust and Kazerouni (2009, 6) that 86 per cent of the respondents in their study preferred to use e-mail for sharing online knowledge. Their study was done in a university setting and not a hospital setting, and this may explain the discrepancy in the findings. The busy work schedule of the TTMs in a psychiatric hospital setting might account for their preferential use of WhatsApp, which is readily accessible on their mobile phones. WhatsApp is a mobile application available on android phones, smart phones and other technological devices and is purposefully designed for the communication, information and sharing of knowledge. WhatsApp provides a platform for instant messaging, video calling, sharing of files, videos, texts, documents and images. These facilities make it a significant knowledge-sharing tool among the TTMs in the psychiatric hospitals surveyed. They probably prefer to use WhatsApp based on its versatility and low cost. This corroborates the finding of Gon and Rawekar (2017) and Kufre and Abe (2017) that WhatsApp is a viable collaborative tool for knowledge sharing. Knowledge sharing is significant to the professional development and job efficiency of mental health professionals, and WhatsApp provides the needed platform for this. Hence, the potential benefits of WhatsApp should be properly harnessed in the hospital setting.

Research conducted by O'Sullivan et al. (2017, 1) at the University Hospital Limerick in Ireland revealed the widespread use of WhatsApp for communication between medical professionals. The majority (90%) of the doctors linked their provision of best possible clinical care to the use of WhatsApp for instant messaging. As indicated on the

website of Digital Health (2018, 1), using WhatsApp in a clinical setting is highly advantageous. Advantages include the efficient sharing of medical knowledge and the potential of surmounting inefficient hierarchical barriers within clinical teams.

(d) Of the TTMs who participated in the present study, 12.4 per cent preferred to use the mobile phone as a CT for knowledge transfer. However, the mobile phone was preferably used for knowledge acquisition, creation, and sharing. This may suggest the versatility, accessibility and ease of use of the mobile phone in clinical settings. The main purpose of knowledge transfer is to organise, create, capture and disseminate knowledge and to ensure its availability and accessibility for future use, and the TTMs in the surveyed psychiatric hospitals confirmed the efficiency of the mobile phone in this regard. TTMs engage in clinical practices that involve knowledge-intensive activities such as retrieving data, transferring data, exchanging and communicating clinical information, and exchanging expertise. The use of mobile phones in clinical practices has been confirmed in studies done by Idowu, Ogunbodede, and Idowu (2003), Koehler, Vujovic, and McMenamin (2013), Olatokun and Adeboyejo (2009), Price (2018), Primmer et al. (2013), and Udousoro (2014).

Koehler, Vujovic, and McMenamin (2013) found that 87 per cent of health professionals in 71 healthcare facilities in Australia used mobile phones during clinical practice to access e-mails and health-related Internet sites, communicate with professional colleagues, and exchange information and knowledge. In a study done at the University Hospital Basel in Switzerland, Primmer et al. (2013) found that mobile technology was used by the respondents for interclinician communication, medical knowledge transfer, and learning. During such practices, exchange of knowledge takes place and new expertise and/or ideas are created. Less experienced professionals learn from the interclinician communication and thereafter transfer the lessons learned to the future care of patients. Interclinician communication is a common phenomenon in all hospital settings, including psychiatric hospitals. This is evidenced by the responses of the TTMs in the surveyed hospitals in Southwest Nigeria who confirmed their use of the mobile phone for communication that culminated in knowledge transfer.

According to the Australian Mobile Telecommunications Association (2018), the effective use of mobile phones can result in improved diagnoses and care of patients. Healthcare professionals can share images and explain symptoms over the phone, overcoming the distance barrier when a second opinion is needed urgently. This is especially important in psychiatric hospitals where experts from different disciplines need to collaborate even at short notice. However, care must be taken by the healthcare professionals to adhere to professional ethics while using a mobile phone to transfer sensitive medical knowledge.

(e) Knowledge retention is achieved when an organisation is able to make possible the capture and transfer of all forms of knowledge via knowledge networking, thereby using the available intellectual capital to its advantage (Mavodza and Ngulube (2012). The

purpose of retention is to prevent the loss of data, information, and knowledge in an organisation. In the psychiatric hospitals surveyed, the TTMs used diverse CTs for knowledge retention. Among the CTs they used for knowledge retention, EDMS was the most preferable, as indicated by 13.1 per cent of the respondents. Nevertheless, EDMS was preferably used for knowledge sharing, creation, and acquisition. This may indicate TTMs' awareness of the significance of EDMS in effective patient diagnosis, treatment and care, and in the reduction of medical error in mental healthcare practices. Hashim, Al-Sulami, and Ali (2017) note that EDMS is used for storage of knowledge. Similarly, Miller and Sim (2004, 118) found in their study that clinicians used an electronic medical record system for documentation and care management. Documentation by clinicians is strategic to the retention of information and knowledge for reuse in the future. This is contrary to the finding of Marutha and Ngulube (2012, 58) that the hospitals in the Limpopo province in South Africa that they surveyed were not using the EDMS. Through empirical research, Kahouei et al. (2015) found that 15 per cent of the healthcare organisations in Iran used clinical information systems extensively for information exchange inside their institution. An EDMS captures and stores knowledge in explicit form. Such stored knowledge, for example, patients' records, patients' case notes, treatment and care plans, is critical to day-to-day operations, clinical documentation, and informed clinical decision-making in a psychiatric hospital setting. This importance might have been reflected in the TTMs' preferred use of EDMS for knowledge retention in the psychiatric hospitals surveyed. This finding is similar to the finding of Salomon et al.'s (2010) study relating to the clinician who had taken part in their study and had used an electronic health record system. Mastellos (2011) also found that an electronic patient records system, which is a form of EDMS, was used by staff in a healthcare setting in a private hospital, the Mitera Hospital in Greece. TTMs cannot effectively operate with a structure that is 100 per cent paper-based. In their clinical practices, which are knowledge-intensive and evidence-based, they need to use an EDMS.

To conclude: in exploring TTMs' use of CTs for KM in the surveyed psychiatric hospitals, it became clear that the respondents preferred the same CT but that they used it for different purposes. Some of the CTs were used most often or extensively whereas others were used to a limited extent or only for specific KM practices. All in all, the CT that was used least was Myspace (45.6% of the respondents indicated "not used" for this CT). It is possible that certain factors, such as knowledgeability, CT skill, CT perception and willingness to share knowledge, could have influenced the participating TTMs' use of the CTs. Mastellos (2011), whose study was also based on the theory of Orlikowski (2000), found that (i) users' previous experience with electronic patient records, (ii) users' positive perception of IT, (iii) users' technical knowledge, (iv) users' organisational vision / target (v) the functionality of the system, and (vi) users' resourcefulness determined the use of a particular technology such as electronic patient records.

The interviews conducted for the present study with the four heads of department also revealed that TTMs used different CTs to connect with colleagues, disseminate clinical information at opportune times, create reviews, and so on. Such CTs included Facebook, WhatsApp, Twitter, LinkedIn, Web portals, mobile phones, instant messaging, the Internet, the online forum Assistant Director of Nursing Services (ADNS), the online forum for nurses, Closed User Group (CUG), National Association of Nigeria Nurses and Midwives (NANNM) Aro Group, Aro Nurses World, and Hinari. The analysis of the quantitative data obtained in the present study corroborates the aforementioned findings.

What Are the Factors Influencing the Use of Collaborative Technologies for Knowledge Management in Psychiatric Hospitals?

Several studies have revealed a number of factors that determine or structure the use of technologies for KM. For example, the study done by Orlikowski (2000, 409) indicated that the use of a technology was strongly determined by users' understanding of the properties and functionality of the technology. The present study established that the TTMs' use of CTs for KM in psychiatric hospitals in Southwest Nigeria was dictated by six key determinants. More than 70 per cent of the TTMs indicated that the following six key factors determined the use of CTs for KM.

(a) Intention to share knowledge: Of the respondents, 81.6 per cent indicated that high good intention to share knowledge was associated with a high use of CTs for the creation of new ideas. Thus, determination or willingness to share knowledge has an effect on the use of CTs for KM. This finding is consistent with the finding of El Said (2015, 75) that intention to share knowledge significantly determines the use of technology in KM, and the finding of Omotayo (2015, 5) that technology does not automatically encourage people to share knowledge but that their willingness to share knowledge can promote the use of technology for knowledge exchange. The findings probably suggest that TTMs' good intention to share knowledge is directly associated with KM and indirectly associated with the use of CTs for KM. The more unwilling they are to share their knowledge, the more they are unlikely to use technology for this purpose.

(b) Knowledge ownership: Of the respondents, 75.6 per cent indicated that a positive attitude towards knowledge ownership was associated with an increased use of CTs for KM. The TTMs' response in this regard may be an indication of a collectivist culture of knowledge ownership or a feeling that people are free to share individual knowledge without necessarily adhering to organisational procedures. This supports the assertion of Oye, Salleh, and Noorminshah (2011, 80) that people do not only feel great ownership over the knowledge they create, but that they are also aware of the risks that are inherent in sharing knowledge. The creator of tacit knowledge may have no need to share it, unless solely for the benefit of others. It can be concluded that TTMs who do not have a positive attitude towards knowledge ownership will not be willing to use CTs to share their personally acquired knowledge. However, it was established in this study

that the extent to which a culture of knowledge sharing and/or of collectivist knowledge ownership existed among the TTMs was encouraging. This assumption was made based on the fact that 72.1 per cent of them disagreed with the statement: “There is no need for me to use collaborative technologies to share knowledge because I own my knowledge.”

(c) Knowledge valuation: A large proportion (82.7%) of the respondents in this study confirmed that the more value the workers attached to knowledge as an asset for making their organisation better than other organisations, the more they used CTs to store knowledge. Once employees value knowledge as a tool for collective competitiveness they are encouraged to use CTs in their organisation for creating, sharing, and transferring knowledge. On the other hand, if they value knowledge as a tool for their individual competitiveness, they are unlikely to use CTs for KM. From the responses of the respondents in the present study it can be concluded that the majority of the TTMs in the surveyed psychiatric hospitals valued knowledge as a tool for collective competitiveness. This was further confirmed by the negative response of 68.2 per cent of the TTMs to the statement: “I do not use CTs to share my expertise since my expertise is an asset for making me better than others.” This may equally suggest their understanding of the collaborative nature of their work (i.e. rendering effective mental healthcare services).

(d) Task interdependence: The study found that the increased involvement of experts in tasks that required them to work with colleagues to achieve a common goal resulted in the increased use of CTs to create knowledge for reuse. This was confirmed by 83.1 per cent of the respondents. The assumption can be made that, the more the tasks of the TTMs in the surveyed psychiatric hospitals in Southwest Nigeria depend on teamwork, the more the team members will need to collaborate, resulting in their use of technologies to facilitate processes. This is consistent with the finding of Lin and Huang (2008, 410) that task interdependence has a positive influence on the use of technology for KM, as well as the finding of Jarvenpaa and Staples (2000, 139) that increased task interdependence motivates people to use collaborative technologies for information and knowledge sharing.

(e) Perception of CTs: The present study established that TTMs’ perception of the task fit of CTs (adaptability for diverse uses) and of their versatility (ability to do many things) determined the preferential use of CTs for KM. According to the majority (76.4%) of the respondents, CTs’ perceived task fit determined the choice of CTs used for creating knowledge. In addition, 79.6 per cent of the respondents indicated that CTs’ perceived versatility determined the choice of the CTs used for KM. From these responses it is clear that the TTMs’ perceptions of the CTs structured their use of the technologies for KM. In a similar study done by Ruhi and Al-Mohsen (2015, 1), they confirmed this role of technology perceptions, for example, relating to the technologies’ ease of use, usefulness, media richness, technological sophistication in determining the use of enterprise 2.0 technologies in the workplace, and the positive effect of the use of

these technologies on KM. Constant, Keisler, and Sproull (1994, 213) and El Said (2015, 75) equally found that if technology had to be used, it had to be a good fit with the task it supported. According to Davis (1989, 319), users' perception of a technology's robustness and user friendliness determines the adoption and use of such a technology.

(f) Skill in using CTs: In the psychiatric hospitals surveyed, the largest proportion (84.4%) of the TTMs confirmed that good skills in using CTs were associated with an increased use of CTs for knowledge creation, sharing, transfer, and retention. This study indicated that skill in using CTs was the highest determinant of the use of CTs for KM. This corroborates the submission of Saleh and Burgess (2009, 15) that ICT skill determines the adoption and use of technologies. Therefore, TTMs' acquisition of the necessary skills to optimally operate and use CTs for KM is absolutely essential. This supports the finding of Orlikowski (2000, 409) that technology use is strongly determined by users' understanding of the properties and functionality of a technology. Having a good understanding of the functionality of a particular technology and the skill to operate it, encourage its use for KM. This implies that TTMs who have poor skills in using CTs will make limited use of CTs for knowledge acquisition, creation, sharing, transfer, and retention. Similarly, Alqahtani, Watson, and Partridge (2010, 26) found that self-efficacy in producing content for technology was an important determinant of the use of technology for KM.

In conclusion, the interviews conducted for the present study equally revealed that ease of use, ICT awareness, schedule of work, age, perception of the ICT, time constraints, funding, and availability of ICTs were determinants of CT use. This further corroborates the findings reached based on this study's quantitative data.

What is the Level of Skill of Therapy Team Members at the Psychiatric Hospitals in Using Collaborative Technologies?

A small proportion (4.2%) of the respondents had excellent skills in the use of CTs, and 14.1 per cent had very good skills. More than one third (36%) of them were good at using CTs, and 31.4 per cent had a fair skill in the use of CTs. The findings showed that more than half (54.3%) of the TTMs were highly skilled in the use of CTs to acquire, create, share, transfer, and retain knowledge. This finding correlates with the finding of Afolayan and Oyekunle (2014) that more than 50 per cent of health professionals rate themselves as having good skills in the use of ICTs, and with the finding of Adeleke et al. (2015, 51) that 52 per cent of the participants in their study were skilled in the use of collaborative technology such as e-mails. The finding of the present study also confirms the finding of Nwagwu et al. (2013) that the majority of health professionals have good skills in the use of CTs. According to their study, 90 per cent of their respondents indicated a high skill in the use of computers, 76 per cent in the use of mobile phones, above 60 per cent in the use of social networking services and blogs, and just above 50 per cent in the use of the electronic health information system and instant messaging.

On the contrary, Ofori-Dwumfuo and Kommey (2013) found in their study that only 32 per cent of their respondents possessed knowledge about the use of CTs. Though their study was conducted in a university setting, which can be regarded as an organisation with knowledge-intensive activities, the present study, which was conducted in a hospital setting, recorded a better performance.

Conclusion

The findings of the present study suggest that the TTMs in the relevant two psychiatric hospitals displayed a positive inclination to use and be involved in the use of various CTs to promote KM processes, practices, and strategies. According to the findings, the CTs that they used were e-mails, mobile phones, Chatter, Facebook, blogs, Twitter, wikis, knowledge portals (e.g. Hinari), Web portals, LinkedIn, video-sharing sites, video conferencing, intranet, extranet, instant messaging (e.g. BBM), Google Docs, photo-sharing sites, Bluetooth, WhatsApp, Groupware, SMART Board™ interactive whiteboard, EDMS, media-sharing sites (e.g. YouTube, Myspace), Google+, and Nursing Link. This finding supports the findings of similar studies by Afolayan and Oyekunle (2014), Imouokhome and Osabor (2012), Nwagwu et al. (2013), and Ventola (2014). The present study confirmed that CTs were platforms that the TTMs in the surveyed psychiatric hospitals in Southwest Nigeria used to acquire, create, share, exchange, and store knowledge, and, since the individual use of CTs is context-bound, the use of CTs by the TTMs can be easily institutionalised.

The study also found that the TTMs used the same CT for different KM practices. This is in support of Orlikowski's (2000) theory of structuration. TTMs displayed preferences in terms of their use of CTs. Knowledge portals (e.g. Hinari) were preferably used for knowledge acquisition, Web portals for knowledge creation, WhatsApp for knowledge sharing, mobile phones for knowledge transfer and EDMS for knowledge retention. A number of factors seemed to determine the TTMs' preferential use of the CTs for KM, for example, intention to share knowledge, perception of CTs, skill in the use of CTs, and task interdependence. This is similar to the findings of a study done by Mastellos (2011). Paroutis and Al Saleh (2009, 56) note that the effectiveness and complexity of using Web 2.0 technologies could adversely affect the willingness to use them. In this study, the results revealed that CT skill was the greatest determinant of the use of CTs. This seemed to indicate the need to emphasise high technology literacy among the TTMs in order to maximise the use of CTs for KM in psychiatric hospitals in Nigeria. In this regard, the hospital management should encourage self-effort and should effectively implement policies for the provision and support of CT infrastructure. From observation it seems that lack of Internet access and inadequate electricity supply are among the critical challenges facing health institutions in developing countries. Thus, psychiatric hospitals need to make the necessary effort to overcome these barriers.

To transform healthcare, which is a knowledge-driven process, it is important to use appropriate KM tools within and outside a hospital setting (Shahmoradi, Safadari, and Jimma 2017). This implies that for psychiatric hospitals to benefit from the advantages of task interdependence and to effectively employ CTs in operations and processes, TTMs' skill in the use of CTs should be developed, and professional ties should be encouraged among experts in different specialisations.

Contribution and Implications of the Study

Most existing studies on the use of ICTs have not investigated the use of CTs for KM practices and CTs facilitation of KM strategies in the context of psychiatric hospitals. The present study is the first to explore the use of CTs among TTMs in the context of psychiatric hospitals in Nigeria. The study's contribution to scholarly works and literature in the field of information science resides in its findings that can be practically implemented to provide an insight into the context of future studies in psychiatric hospitals in developing countries. Moreover, this study has established that Orlikowski's (2000) theory of structuration can be employed to examine the factors that determine or structure individuals' use of CTs. It is believed that in establishing that there are factors that influence the use of CTs for KM, namely, the intention to share knowledge, the perception of CTs, skill in the use of CTs (which is the highest determinant of the use of CTs), and task interdependence, the study contributes by giving input to hospital management and policymakers about considering implementing continuous CT training as it is a key to effective KM initiatives and timely service delivery.

The findings of this study will enable psychiatric hospitals to devise strategies to effectively harness the use of CTs in capturing and sharing the tacit knowledge of experts that may have been and may still be lost through the massive brain drain of experts to developed countries. This study also adds value by providing the medical and paramedical professionals at psychiatric hospitals with information on various types of CTs that can be used for effective KM strategies, thereby creating awareness of their usefulness for KM initiatives.

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