



## Strengthening Healthcare Service Delivery through Communities of Practice among Orthopedic Nurses in Federal Hospitals in Kano State, Nigeria

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### Authors' contributions

This work was carried out in collaboration among all authors. Author SUA designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript as well as managed the analyses of the study. Author KDA managed the literature searches. All authors read and approved the final manuscript.

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### ABSTRACT

**Background:** This study investigates use of community of practice as a strategy for strengthening healthcare service delivery among orthopedic nurses working at some selected federal hospitals.

**Aims:** The specific objectives of the study targeted to investigate the level of awareness of Orthopedic Nurses about community of practice for knowledge sharing in Federal hospitals in Kano metropolis; and to determine the type of knowledge shared through Community of Practice by Orthopedic Nurses in the hospitals; as well as to find out how Community of Practice could improve healthcare delivery through knowledge sharing among Orthopedic Nurses in the Hospitals.

**Place of Study:** The study was conducted at National Orthopedic Hospital, Dala-Kano, Nigeria and Aminu Kano Teaching Hospital, Kano, Nigeria from July 2018 to January, 2019.

**Methodology:** The study adopted quantitative research approach with a self-developed questionnaire that was validated using both content and face validity. A sample size of 134 from a population of 217 was drawn with response rate of 99.3%. The study hypotheses were tested using Chi Square and ANOVA tests using SPSS version 20.0.

**Results:** The study found that the level of awareness about community of practice was high. The findings show that tacit and explicit types of Knowledge were generated and shared through community of practice.

**Conclusion:** The study concludes that there is significant relationship between awareness and use of community of practice for knowledge sharing among orthopedic nurses in the hospitals under study. Similarly, the study concludes that the relationship between community of practice and knowledge sharing is reflected in job performance.

*Keywords: Community of practice; knowledge sharing; knowledge management; orthopedic hospital.*

## ACRONYMS

NOHD	: National Orthopedic Hospital Dala
CoP	: Community of Practice
AKTH	: Aminu Kano Teaching Hospital
KM4dev	: Knowledge Management for Development
KM	: Knowledge Management

## 1. INTRODUCTION

The concept of communities of practice (CoP) has gained attention as a way to create, share, and manage knowledge and facilitate learning in both public and private sector organizations. It was used at global level in schools, banks, companies, industries, hospitals etc. The term community of practice has been conceptualized from two main perspectives: Social Learning and Knowledge Management [1].

In this regard, they are related and used in this study. Community of practice is defined as: “groups of people who share a concern, a set of problems, or passion about a topic, and who deepen their knowledge and expertise in this area by interacting on an ongoing basis... these people do not necessarily work together every day, but they meet because they find value in their interactions... they discuss their situations, their aspirations, and their needs... they may create tools, standards, generic designs, manuals and other documents - or may simply develop a tacit understanding that they share” [2].

Community of practice (CoP) has emerged as a “way of managing knowledge” while acknowledging that organizational charts, manuals, job descriptions, and training programs are insufficient to describe the ways that

individuals actually work and learn within a firm. Community of practice was intended to describe the importance of practice and social participation in learning theory [3], and organizational learning [4] within localized groups of professionals. Realizing the benefits of knowledge creation and collaboration that occurred in CoP, many organizations have attempted to increase the scope and scale of community of practice to facilitate knowledge sharing across the entire company. At the same time, increased global demand for a strategy to share knowledge led organizations to adopt CoP to share knowledge. In a nutshell, Wanberg [5] defined community of practice as “a group of professionals informally bound to one another through exposure to a common class of problems, common pursuit of solutions, and thereby themselves embodying a store of knowledge.

The American Nurses Association [6] defines nursing as “the protection, promotion, and optimization of health and abilities, prevention of illness and injury, alleviation of suffering through the diagnosis and treatment of human response, and advocacy in the care of individuals, families, communities, and populations”.

Given the potential of communities of practice (CoPs), many organizations are using them as tools to facilitate collaboration between different development actors. In a study from Netherland by Cummings [7] on knowledge sharing in communities of practice in international development, using a review of literature, the research found four communities of practice (CoPs) in the development sector that are considered from the perspective of domain name, community, and practice. These are: the knowledge management for development (KM4dev) community; Solution Exchange; Health

Information for All 2015; and the Smart toolkit. All four of the communities are able to cross geographical distances, and three of them could be said to have global coverage. Community of practice are positioned to act as 'effective bridges between knowledge, policy and practice' providing three examples of where CoP can be useful [8], namely facilitating collaboration between researchers and practitioners; researchers working together to influence policy; and involving policymakers in the process of generating knowledge. Also the research found that since 1990s, the role of communities of practice in development organizations has received increasing attention. As Wenger [9] predicted, these communities have many different names, depending on the institutional context, including the so-called 'communities of ideas' [10], 'formal knowledge networks' and 'virtual teams' [8]. It was also found that a substantial number of development organizations are positively exploiting the potential of these communities by creating intentional communities of practice. Communities of practice are all around; the concept has gained instrumental significance when it was articulated as knowledge management strategy. Its strength is to fully recognize the importance of sharing both explicit and tacit knowledge.

The concept of CoP was originally developed to acknowledge the fact that learning takes place in social relationships rather than through books or teaching only. The CoP is today a mainstream KM strategy in the business sector, but is also increasingly adopted in the public and health care sector [11]. Community of practice is a company's most versatile and dynamic knowledge resource and forms the basis of an organization's ability to know and learn.

Use of Community of Practice has existed for ages and born in response to peoples' spontaneous need to group and share ideas. However, in Nigerian context Community of Practice is, either used as a natural phenomenon or scarcely adopted as a concept in many organizations to accelerate knowledge sharing among work colleagues. There is paucity of literature on use of Community of practice in this part of the world. Researches similar to the present one found discussed establishment of community of practice in University college hospital, Ibadan, Nigeria [12], role of community of practice in competitive settings, promoting innovation and knowledge sharing among like-minded peers [13], and also, for cooperative

diagnosis by members of healthcare network [14].

Furthermore, it is impossible now to list all the applications of the concept, but it is useful to mention a few examples: In organizations in the private and public sectors, communities of practice have provided a vehicle for peer-to-peer learning among practitioners. It enables them to develop the portfolio of capabilities necessary for the organization to achieve its mission. Communities of practice have always been there, of course. But having the concept makes the process discussable and then potentially more intentional. In education, communities of practice are increasingly used for professional development, but they also offer a fresh perspective on learning and education more generally. This is starting to influence new thinking about the role of educational institutions and the design of learning opportunities. In international development, cultivating horizontal communities of practice among local practitioners presents an attractive alternative to the traditional view of the vertical transmission of knowledge from north to south. In healthcare, communities of practice offer the potential of new learning partnerships that are not hostage to professional silos. The potential even extends to patients who are increasingly forming their own communities. New technologies, in particular the rise of social media, have triggered much interest in communities of practice. Indeed, these technologies are well aligned with the peer-to-peer learning processes typical of communities of practice [3].

According to Kothari et al. [15], Communities of Practices (CoPs) have been used in the health sector to support professional practice change. The experience of a CoP in place of the research engages in improving the care of seniors. For instance, using a large multiple case studies that are aiming to increase understanding of knowledge translation process mobilized through CoPs can be achieved. Semi-structured interview with CoP members, field notes from five planning meetings, and relevant background documents were as well.

The findings of the study, Kothari et al. [15]; community of practice (CoP) recognized the need to support health professionals (nurses, dentists) and related paraprofessionals with knowledge, experience, and resources to appropriately address clients' oral health care needs. CoP functioned as an incubator that

brought together best practices, research, and experiences.

According to a study from Italy by Lettieri et al. [16] on non-profit organizations (NPOs), the research found that NPOs being knowledge-intensive organizations demand for services that are integrated, tailored and timely; these urge NPOs to use Community of practice as a strategy to facilitate knowledge sharing. The research however, used an explorative case study, and the explorative stage of this research was conducted from July 2001 to June 2002. NPOs aimed at creating social value for society as a whole and which do not recognize as their main goal the creation of profit for stakeholders.

There are various processes in managing knowledge, such as storing, distributing, applying and creating. Based on these processes, organizations have introduced two concepts to achieve knowledge management (KM) practices thus:

1. Knowledge sharing, and
2. Communities of practice (CoPs) McClure Wasko [17]; Wenger et al. [18]; Ardichvili et al. [19] and Matayong and Mahmoud [20].

Matayong and Mahmoud [20] in their research which reviewed Journal articles published within the period of 2003 – 2013, which were sourced mainly from Emerald, Science Direct, IS quarterly etc. The research which was conducted in Malaysia found that the majority of Knowledge Management (KM) system studies primarily pertain to adoption, diffusion, usage, and implementation. However, KM has become a major concern for organizations worldwide. KM can be defined as a systematic approach that provides efficient disciplines and procedures to enable knowledge to grow and create value for organizations [20].

Similarly, the research has found that both knowledge sharing (KS) and CoPs have received significant attention in the KM literature and have become popular approaches for KM practice. Basically, the role of community of practice is for the group to share knowledge regularly amongst members with the aim of learning from each other in order to create valuable solutions as well as radical innovations. As a result of this, improvements in quality and business excellence can be achieved and can contribute to competitive advantage, as confirmed by several authors in their research findings [20].

The word Community or social organization implies a set of shared images that involve behaviours, language, and other symbols that constitute the social fabric of the community [21]. A community of practice is the embodiment of a larger concept; a profession. Studies have been conducted on the community of practice of physicians, nurses, social workers, and educators. Wenger [9] suggests that communities of practice: “Can be thought of as shared histories of learning. If communities of practice are to be understood and supported, there must exist a refining of practice across time and processes must be put in place that ensure new generations of practitioners [21]. Also for students entering a healthcare field as, educators, supervisors, and other practitioners represent the history of their chosen practice, and therefore “are living testimonies to what is possible, expected, and desirable” [3].

Similarly, when CoPs originated, they were localized groups of professionals who worked together in a community setting. Now CoPs, have been reorganized to deliberately create connections amongst professionals using distributed (CoPs) globally. Although, CoPs undergone environmental changes, yet Knowledge sharing is the primary activity that CoPs facilitate [5].

Generally, a nurse is a highly skilled professional who has undergone prescribed and accredited programme in School of Nursing and passed prescribed examinations and in addition licensed and registered to practice by the Nursing and Midwifery Council of a country. Orthopedic nurse is a nurse with the medical specialty that focuses on injuries and diseases of human body's musculoskeletal system. This complex system includes human bones, joints, ligaments, tendons, muscles, and nerves that allow you to move, work, and be active. Orthopedic nurse is a general nurse with specialization in orthopedic care and trauma [22].

Orthopedic Nurses share knowledge among them, formally and informally, the knowledge they accumulated through reading and practice, so that it could be managed, shared and kept safe for future use. This is easily done among themselves because it has been recognized that nurses usually acquire knowledge from fellow colleagues before acquiring it elsewhere [23].

To strengthen the healthcare service delivery, access to health knowledge through

Communities of Practice should be considered as equally important as to access to drugs and equipment, as all are essentials tools in the delivery of safe, efficient and effective care. Information technology (IT) has been rapidly integrated into the healthcare industry, including nursing, and has the ability to reduce errors, cut cost, and enhance patient care. There also has been a great social change in practice, which encourages nurses globally to embrace, adopt and use technology and social learning platforms (community of practice) in healthcare [24]. It is on this note that Orthopedics nurses will find community of practice and knowledge sharing very important to their career especially in promoting the culture of learning and working together while sharing the best among them. However, it was observed that there is no empirical evidence showing the awareness level and use of CoP for knowledge sharing (KS) among orthopedic nurses of both hospitals. Hence, the need for the present study to investigate the level of awareness of Orthopedic Nurses about community of practice for knowledge sharing in Federal hospitals in Kano metropolis; and to determine the type of knowledge shared through Community of Practice by Orthopedic Nurses in the hospitals; as well as to find out how Community of Practice could improve healthcare delivery through knowledge sharing among Orthopedic Nurses in the Hospitals.

**2. MATERIALS AND METHODS**

**2.1 Study Area and Population Size**

This study was carried out at the National Orthopedic Teaching Hospital, Dala-Kano, Kano State and Aminu Kano Teaching Hospital, Kano. Following reception of an ethical clearance from Research, Education and Training (RET) of National Orthopedic Hospital Dala-Kano (NOHD), the consent of the recruited respondents was sought. The hospital (NOHD) was solely established to take care of orthopedic cases and it has a number of 200 orthopedic nurses presently, 16 different departments, units and wards.

**2.2 Study Design**

Quantitative approach was used in this study due to its strength on objectivity, generalization of results, and testing of hypotheses as against the qualitative approach, which is prone with prejudices in research process. Questionnaire was used in the current study due to the nature of the target population, and the need to generalize the research outcome to the target population. Again, the use of quantitative research allows the researcher to deductively use similar terms while designing the questionnaire in order to proffer solutions to the research problem and also allows the researcher to effectively determine the existing relationship between the study variables. This approach is also justifiable because of the objectives, research problem and the study population of the study; this is true, as a questionnaire was used to measure the variables that relate to the concept under investigation. It was also easier to collect more response from the target population.

The survey research design was used for the study since it allows data to be collected from a large sample due to its relative cost effectiveness (time and money) [25]. The nature and scope of the study pointed to this design. The essence of survey design can be explained as “questioning individuals on a topic or topics and then describing their responses” [26]. This was a good design as opinions of orthopedic nurses in federal hospitals in Kano Metropolis in relation to awareness and use of community of practice as a strategy for knowledge sharing, using such variables as: types of knowledge shared through community of practice.

In selecting the participants for the present study, purposive sampling technique was used as it could be used in both qualitative and quantitative research techniques [27]. Also purposive sampling technique is the most common technique, where a researcher may select the most productive sample to answer the questions. The reason behind selecting this

**Table 1. Population of the study**

S/N	Hospital	Year of Establishment	Population
1.	National Orthopedic Hospital Dala-Kano (NOHD)	1959	200
2.	Aminu Kano Teaching Hospital Kano (AKTH)	Orthopedic Department established in 2006	17
Total of Orthopedic Nurses			217

sampling technique was that “Purposive sampling technique is a type of non-probability sampling that is most effective when one needs to study a certain cultural domain with knowledgeable experts within”. It also enables quantitative researcher to select individuals and sites that can provide necessary information [28].

National orthopedic hospital Dala-Kano has presently 16 departments, units and wards, and has a number of 200 orthopedic nurses. Orthopedic nurses filled in this sampling technique; therefore, they were solicited to fill the questionnaire in their orthopedic departments and across various departments in the hospitals.

On the other hand, Aminu Kano teaching hospital (AKTH) has two orthopedic departments and a number of 17 orthopedic nurses. Therefore, there are a total of 217 orthopedic nurses in the two hospitals under study. As the population size of this research is 217, the degree of accuracy is 0.05, while the sample size is 132. As population size of this research is 217, the degree of accuracy is 0.005, while the sample size is 132. Number of questionnaires administered on the two hospitals was 134, the percentage of questionnaires administered was 100%, and number of questionnaires returned 133, while number of questionnaire not returned was 1 [29]. The two hospitals were chosen due to their proximity to the researcher and also the activities they engage in towards knowledge sharing. Especially, NOHD takes care of orthopedic cases and, AKTH established its orthopedic wards recently.

Orthopedic nurses were observed to have the habit of looking for knowledge among themselves before they look for it elsewhere. The proximity of the two hospitals to the researcher and the background information the researchers had about orthopedic care. Similar researches have been carried out in other countries other than Nigeria using qualitative methods and focus) [30]. However, this research was intended to use another method to make it unique and generalized. Although, community of practice has been described as one of the most influential concepts to have emerged within the social sciences during recent years [31], the concept is new to many health care providers; that is why present study decided to quantitatively analyze the concept against other qualitative methods and techniques.

The analysis of data for the present study used both descriptive and inferential statistics such as; frequencies, percentages, mean, standard deviation, pie chart, chart, and trend analysis, were tested using SPSS Software version 20.0. In addition, Chi-Square and ANOVA test was used to test the research hypotheses. Also the five close-ended questions of the research study adopted the five point Likert-type scales as: 5= strongly agree; 4= agree; 3=undecided; 2=disagree; 1= strongly disagree were answered as was adopted in Nor-Ashmiza [32].

### 3. RESULTS AND DISCUSSION

The results are hereby presented, analyzed and interpreted according to the research questions of the study under the following sub headings: Introduction, Response rate, Demographic Data, Level of awareness on using Community of practice, Types of knowledge generated through community of practice, and Types of knowledge shared through community of practice.

#### 3.1 Response Rate

This was designed to examine the response rate. This rate helps in evaluating the adequacy of data collected and helps in determining the efficiency and effectiveness of the questionnaire administration exercise conducted by the researcher. The response rate from the two Federal hospitals in Kano Metropolis is depicted below:

It could be seen in the Table 2 that the number of questionnaires administered on NOH, Dala orthopedic nurses was 112, which is 83.6% of questionnaires administered, while the number of questionnaires administered on AKTH orthopedic nurses was 22, equivalent to 15.14% of questionnaires administered. Although the population size of AKTH orthopedic nurses was 17 orthopedic nurses, 22 questionnaires were administered. While one (1) questionnaire was missing, that is 0.7% of questionnaire not returned.

#### 3.2 Demographic Information of the Respondents

Here, the researcher provides the demographic variables of the respondents (orthopedic nurses). Beginning with their hospital names, respondents' gender, qualifications, working, experience and rank of respondents (Tables 3, 4, 5,6 and7).

**Table 2. Response rate of the respondents**

<b>Hospitals</b>	<b>No. of Questionnaire administered</b>	<b>Percentage of Questionnaire administered</b>	<b>No. of questionnaire returned</b>	<b>Percentage of questionnaire returned</b>	<b>No. of questionnaire not returned</b>	<b>Percentage of questionnaire not returned</b>
NOH Dala Kano	112	83.6	112	83.6	0	0
AKTH, Kano	22	15.14	21	15.7	01	0.7
<b>Total</b>	<b>134</b>	<b>100</b>	<b>133</b>	<b>99.3</b>	<b>1</b>	<b>0.7</b>

The Table 3 shows respondents' name of hospitals. Most of the respondents belong to National Orthopedic Hospital, Dala-Kano (NOHD). This is found to be 83.6% or to be more specific 112. 21 respondents equivalent to 15.7% are from Aminu Kano Teaching Hospital Kano (AKTH). Only 0.7% of the total responses are missing. This is attributed to the fact that, the questionnaire was designed to source data from orthopedic nurses in NOH Dala, which has the highest number of orthopedic nurses. However, AKTH as a general hospital has a very few number of orthopedic nurses working in the unit, hence the statistics related to their hospital appeared insignificant.

The Table 4 shows that male constitutes a lesser ratio of 25%, female constitutes a greater ratio of 108% of the total respondents while 0.7% of the total response (1 item) is found missing. Therefore, one can deduce that, females make up the majority of the respondents, having greater percentage of 80.6% than their male counterpart with only 18.7%.

The Table 5 shows the distribution of the respondents by their individual qualifications. 73.9% of the respondents which are 99 in number are having nursing certificates. This is followed by 19.4% equivalent to 26 frequency, 4.5% corresponding to 6 frequencies and 1.5% which is exactly 2 frequencies are having

HND/B.SC, Master degree and other certificates respectively. Only 0.7 of the total response (1 item) is missing. This revealed that most of the respondents are having Nursing Certificates.

The responses show (Table 6.) that 43 respondents equivalent to 32.1% have 1-5years work experience. 51 respondents which equal to 38.1% have 6-10years work experience, and finally 39 respondents equivalent to 29.1% have 11-15years work experience. Therefore, majority of the respondents 38.1% acquired 6-10 years of service. This is followed by respondents with 1-5 years of service with 32.1% and those with 11-15 years of service. None of the respondents is having above 15 years of service. Summing up total responses above 5 years, it shows that majority of the respondents (67.2%) have acquired enough working experience to supply the needed information.

The Table 7 shows that 46 respondents equivalent to 34.3% are ranked Nursing Officer II. This is followed by 38 respondents having 28.4% who are Nursing Officers I, 37 respondents equivalent to 27.6% are Senior Officer and 12 respondents that equals 9.0% are Principal Nursing Officers. Hence, summing up total responses of nursing officers II, senior officers and principal nursing officer (70.9%), one can conclude that majority of the respondents belong to senior cadre group.

**Table 3. Frequency of the respondents from various of hospitals**

	Frequency	Percent	Valid percent	Cumulative percent
Valid	1	.7	.7	.7
AKTH	21	15.7	15.7	16.4
NOHD	112	83.6	83.6	100.0
Total	134	100.0	100.0	

**Table 4. Frequency of the respondents based on gender**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	.7	.7	.7
Male	25	18.7	18.7	19.4
Female	108	80.6	80.6	100.0
Total	134	100.0	100.0	

**Table 5. Frequency of the respondents based on qualifications**

	Frequency	Percent	Cumulative Percent
Valid	Nursing certificate	99	74.4
	HND/B.SC	26	19.4
	Master degree	6	4.5
	Others	2	1.5
	Total	133	99.3
Missing	System	1	.7
Total		134	100.0



**Table 6. Frequency of the respondents based on working experience**

		<b>Frequency</b>	<b>Percent</b>	<b>Valid percent</b>	<b>Cumulative percent</b>
Valid	1-5 years	43	32.1	32.3	32.3
	6-10 years	51	38.1	38.3	70.7
	11-15 years	39	29.1	29.3	100.0
	Total	133	99.3	100.0	
Missing	System	1	.7		
<b>Total</b>		<b>134</b>	<b>100.0</b>		

**3.3 Level of Awareness about using Community of Practice (CoP) for Knowledge Sharing**

This refers to the familiarity organizations have about the adoption or use of community of practice for knowledge sharing in their organization. The following Table 8 depicts the level of awareness orthopedic nurses in both hospitals have about using CoP as a strategy for knowledge sharing.

The Table 8 shows that 19% at the rate of (25) respondents are highly aware about using CoP, 36% at the rate of 48 respondents are aware, while 38% at the rate 51 respondents are undecided. At the same time 7% at the rate of 9 respondents are not aware about using community of practice for knowledge sharing in their hospitals. It has to be stressed here that awareness about using CoP is manifested on the respondents' registration and membership to their professional associations. Even though researches on theory of the concept (CoP) and empirical studies related to it are very

insignificant as very few literatures were found about CoP in this part of the world.

To further buttress the above level of awareness as depicted in the above Table 8, Orthopedic nurses awareness about community of practice was significant in their membership of professional association. In conclusion, the results show positive responses on the levels of awareness about the use of CoP for knowledge sharing by orthopedic nurses. This is for the fact that majority of the respondents were highly aware, followed by those who were aware, then those who were undecided, and those who were not aware. In other words orthopedic nurses' level of awareness about using CoP either was highly aware, aware, undecided, or not aware.

**3.4 Types of Knowledge Shared through Communities of Practice**

Table 9 shows the frequency of the types of knowledge shared through communities of practice.

**Table 7. Frequency of the respondents based on rank of respondents**

		<b>Frequency</b>	<b>percent</b>	<b>Valid percent</b>	<b>Cumulative percent</b>
Valid	Nursing officer II	46	34.3	34.6	34.6
	Nursing officer I	38	28.4	28.6	63.2
	Senior officer	37	27.6	27.8	91.0
	Principal nursing officer	12	9.0	9.0	100.0
	Total	133	99.3	100.0	
Missing	System	1	.7		
<b>Total</b>		<b>134</b>	<b>100.0</b>		

**Table 8. Level of awareness about using community of practice by orthopedic nurses of both hospitals**

		<b>Frequency</b>	<b>Percentage</b>
A	Highly aware	25	19
B	Aware	48	36
C	Undecided	51	38
D	Not aware	9	7
<b>Total</b>		<b>133</b>	<b>100</b>

The Table 9 shows response on questionnaire items defining types of knowledge shared through community of practice. The first item hypothesizes that; job related knowledge is shared through colleagues' casual interaction. 133 respondents equivalent to 99.3% agreed no single respondent undecided or disagree with this supposition. This applies to individual knowledge which is shared in workshops, seminars etc. that 133 respondents equivalent to 99.3% agreed. Another 133 respondents equivalent to 99.3% agreed to the item; technical know-how on how to do things is shared by learning together and new breakthrough / innovations related to work is shared through books, journals, workshops etc. However, response to knowledge for solutions to various work related problems revealed that; 60 respondents equivalent to 45.1% disagreed, 50 respondents equivalent to 37.6% undecided while 23 respondents equivalent to 17.29% disagreed. Therefore going by above analysis, we can conclude that out of 133 respondents, majority (54.88%) of the respondents declined sharing knowledge for solution to various work related problems. This is against the minority (45.1%) who agreed to be sharing knowledge for solution to various work problems.

Based on the above analysis, we can conclude and answer the research question that; the types of knowledge shared through community of practice are: One, (tacit and explicit) through interaction and other forms of get together .Two, (tacit and explicit) through seminars, workshop, presentations and ward round .Three, (tacit) through personal experience, expertise, wisdom etc., and four (tacit and explicit) through chatting, observation, discussion and practicing. Moreover, concerning the extent of sharing this knowledge, measures of dispersion are enough to describe the magnitude of sharing the type of knowledge generated. This may however be ascertained by mere looking at the mean which is often considered useful in determining a typical attribute/value of a variable. Moreover, if the standard deviation is small, the group is considered homogeneous whereas a large standard deviation indicates a heterogeneous group. Hence, the 4.7, 4.8, 4.5, and 4.6 means of the selected (4) types of shared knowledge and their respective standard deviations (0.43, 0.40, 0.10, and 0.42 respectively) are enough to describe how homogeneous the responses are. The research question is hereby answered on affirmative note. Moreover, the means and standard deviations of the above were all found

to be supportive to the selections. Meaning, they were all above 4.0 while the standard deviations are less than 5.

In general, knowledge shared can be either in tacit and explicit forms.

### **3.5 Community of Practice and Knowledge Sharing**

This refers to how community of practice facilitates knowledge sharing. In other words, how knowledge sharing takes place through the strategy of community of practice. Table 10 depicts the connection between community of practice and knowledge sharing.

This Table 10 shows respondents' response on questionnaire items seeking response on community of practice and knowledge sharing among orthopedic nurses. The first item which posits that, tacit knowledge is the most shared type of knowledge through interaction (community of practice). 127 respondents equivalent to 94.8% agreed while 6 respondents equivalent to 4.5% remained undecided. This is followed with 133 respondents equivalent to 99.3% who selected explicit knowledge, as the most shared knowledge through books and journal articles in a community of practice, which are shared among the nurses. Another 133 respondents equivalent to 99.3% agreed to share knowledge through consultations and discussions among colleagues in a community of practice. Concerning knowledge sharing through casual chatting among colleagues (community of practice), 51 respondents equivalent to 38.1% agreed while 82 respondents equivalent to 61.2% remained undecided. Response to sharing information through phones and other media revealed that; 50 respondents equivalent to 37.6.9% agreed while 83 respondents equivalent to 62.4 did not decide on the item. Response to attitude of colleagues towards knowledge sharing is high. 60 respondents equivalent to 45.11% agreed 63 respondents equivalent to 47.4% undecided and 10 respondents equivalent to 7.5% disagreed. Lastly, tacit and explicit knowledge attracted 127 respondents equivalent to 94.8% agreed with the item, and 6 respondents equivalent to 4.5% undecided. It has to be remembered that what binds these orthopedic nurses in this present study is their profession (community of practice), and knowledge sharing depends on their interactions (socialization) through

this strategy of Community of practice (CoP).

### 3.5.1 Community of practice and knowledge sharing among orthopedic nurses

To further buttress, the above responses in order to answer research question 5 (in what ways does community of practice facilitate knowledge sharing activities among orthopedic nurses in hospitals under study?) The responses show that, knowledge-sharing strategies among the nurses are: consultation and discussion (tacit and explicit knowledge). It was clear that there were two types of knowledge (tacit and explicit) that were generated and shared through community of practice by orthopedic nurses. The respondents agreed to these items with varying degrees. For instance, none of the respondents objected to sharing knowledge through books, journal articles and consultation/discussion (explicit and tacit knowledge). Therefore, out of the total responses (133) only 6 respondents reserved their comments while responding to tacit and explicit knowledge. This however confirms the sharing of these two types of knowledge.

Below chart was therefore used to further answer research question 4 (what types of knowledge are shared through community of practice by orthopedic nurses in the hospitals?) better and question 5 (in what way does community of practice facilitate knowledge sharing activities among orthopedic nurses in the hospitals?). Moreover, looking at the mean and standard deviations of the items, we may also observe that the above four items have statistically significant means (4.8, 4.9, 4.8 and 4.5 which are all supported with barely minimal standard deviations of .42, .32, .39, and 2.7 respectively. Hence, to answer the research question, the responses (selected) are regrouped into tacit and explicit. It needs to be emphasized at this juncture, that; tacit knowledge is often context dependent and personal in nature. It can be compressed into a few summaries that can be encoded by language in written words or machine.

Going by these definitions, the researcher cataloged the responses into tacit and explicit to ascertain way through which community of practice facilitate knowledge sharing. The responses were later summed up to find

percentages which were used to compute a pie chart (Fig. 1).

The Fig.1 shows that majority of the response 61%, are explicit types of knowledge. This is against the 39% tacit responses. This shows that the major way through which CoP facilitates knowledge sharing among orthopedic nurses in the hospitals under study was through explicit form of knowledge sharing.

Reasons behind these might be that explicit knowledge is usually exchanged among colleagues through various means like, newspapers, journal articles, conference papers, discussion etc. In fact, explicit knowledge is the most known type of knowledge identified among nurses. Unlike tacit knowledge which is hard to be identified and transferred.

This knowledge could be in tacit or explicit form. However, the researcher thinks that the reason why explicit type of knowledge is mostly generated and shared among members is that someone internalizes what he/she knows, and externalizes what he/she knows in explicit form. However, tacit knowledge is just as a tip of iceberg compared to explicit knowledge which is normally seen and identified by people. Because not all what one knows can be put in explicit form (knowledge), we just have to interact or socialize to learn or know more of one another's knowledge.

### 3.5.2 Mode of knowledge sharing among work colleagues

Similarly, to further depict the ways community of practice facilitates knowledge sharing activities among orthopedic nurses in the hospitals under study. The mode or rather the form/ format and manner through which knowledge sharing takes place among work colleagues (orthopedic nurses) in the hospitals under study are as follows in Table 11.

The Table 11 shows mode through which knowledge was shared among orthopedic nurses. 107 respondents equivalent to 79.9% agree or selected face-to-face mode of sharing knowledge, while 26 respondents equivalent to 19.5% disagreed with the item. Social media attracted 55 agreed responses which is equivalent to 41%, while 78 respondents equivalent to 58.2 undecided on the item. 30 respondents equivalent to 22.5% also agreed

**Table 9. Types of knowledge shared through community of practice (interactions)**

Item	Freq.			Per.			Mean	SDev
	A	U	D	A	U	D	$\bar{x}$	$\Sigma$
Tacit & explicit job related knowledge shared through casual interaction	133	0	0	99.3	0	0	4.6	.49
Tacit & explicit) shared in workshops, seminars and casual chatting among work colleagues.	133	0	0	99.3	0	0	4.73	.44
Tacit knowledge shared through technical know-how when learning together.	133	0	0	99.3	0	0	4.19	.39
Explicit knowledge shared through innovation in journals, books, workshops and seminars	133	0	0	99.3	0	0	4.15	.35
Tacit & explicit knowledge shared for solutions to various work related problems shared among colleagues	60	50	23	45.1	37.6	17.29	2.05	.64

A= agree; U=undecided; D=disagree

**Table 10. Community of practice and knowledge sharing**

Item	Freq.			Per.			Mean	SDev
	A	U	D	A	U	D	$\bar{x}$	$\sigma$
Tacit knowledge is the most shared type of knowledge among orthopedic nurses through interaction at formal meetings.	127	6	0	94.8	4.5	0	4.9	.42
Explicit knowledge is shared among orthopedic nurses through sharing information, news, ideas, through books, journal articles etc.	133	0	0	99.3	0	0	4.2	.42
Tacit & explicit is shared through consulting and discussing with work colleagues.	133	0	0	99.3	0	0	4.1	.39
Tacit & explicit is shared through casual chatting with work colleagues when they work and learn together.	51	82	0	38.1	61.2	0	3.2	.78
Explicit knowledge is shared through sharing information, news, ideas, through phones and other electronic media.	50	83	0	61.9	38	0	2.7	.80
Attitude of work colleagues towards knowledge sharing is high during interactions.	70	63	0	52.3	47.4	0	2.6	.66
Types of knowledge shared with colleagues include both tacit and explicit knowledge.	127	06	0	94.8	4.5	0	3.9	.27

A= agree; U=undecided; D=disagree

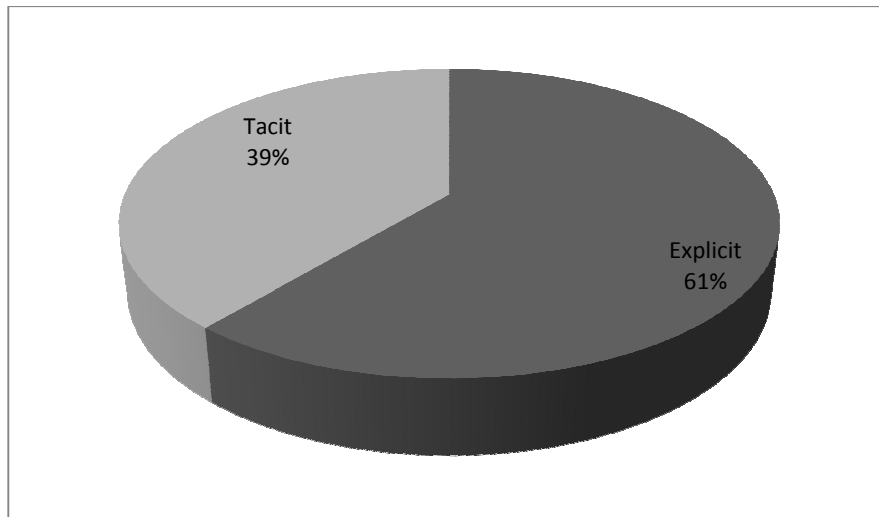


Fig. 1. A Pie Chart showing distribution of tacit and explicit types of knowledge

Table 11. Mode of knowledge sharing among work colleagues is through the following

Item	Freq.			Per.			Mean	SDev
	A	U	D	A	U	D	$\bar{x}$	$\sigma$
Face to face	107	0	26	79.9	0	19.5	3.6	.33
Social media like, blogs, Wikis, face book, WhatsApp, twitter, etc.	55	78	0	41.0	58.2	0	3.4	.69
Email, text message etc.	30	103	0	22.5	76.9	0	2.5	.94
Workshops / seminars	70	63	0	53.6	47	0	3.6	.28
During presentation, ward round etc.	130	30	0	76.9	22.4	0	2.5	.34

with emails, text messages, and 103 respondents equivalent to 76.9% undecided. 70 respondents agreed with workshops and seminars, which are exactly 53.6%, while 63 respondents equivalent to 47% undecided. Lastly, 130 respondents equivalent to 76.9% agreed with presentations and ward round mode of sharing knowledge, while 30 respondents equivalent to 22.4% reserved their comment, i.e. undecided. We can therefore deduce from the statistics that; mode of knowledge sharing which are also identified as ways/types of knowledge sharing strategies among orthopedic nurses are face-to-face, workshops/ seminars, presentations and ward round. Moreover, the selected modes of knowledge sharing have also shown a relatively higher means and lesser standard deviations that may also be further affirmation on their selection. This is relevant to Wenger's multi-membership learning circle theory construct of interaction adopted in this study.

The present study showed that the concept of community of practice can be applied to a greater advantage in any organization where

people of common interest meet to achieve a specific goal. The concept can be effectively used in educational sectors, healthcare sectors, defense sectors, technology, trading, agricultural, social and political settings etc. The findings of this study can be used by policy makers and other concerned authorities for the attainment of proper dissemination of information and/or knowledge sharing among group of people with common ideological goals.

#### 4. CONCLUSION

Community of practice is a natural phenomenon that happens in response to peoples' spontaneous need to group, share ideas and be helped. Therefore, the present study concludes that orthopedic nurses in the two Federal hospitals had adopted the principle of CoP in daily discharge of their medical care responsibilities for sharing practices, lesson learned and know-how both at formal and informal fora. This will no doubt increase their job performance in their organizations (hospitals).

The present study clearly documented the knowledge sharing in relation to community of practice. Most of the respondents are females' orthopedic nurses from National Orthopedic Hospital, Dala Kano and they are having nursing certificates as stipulated by Nursing & Midwives Council of Nigeria coupled with Post basic Nursing certificate in orthopedics and some registered with National Association of Orthopedic Nurses (NAON). While others registered with Federal Health Workers of Nigeria

### COMPETING INTERESTS

Authors have declared that no competing interests exist.

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