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UTILIZATION OF DRUG INFORMATION SERVICES IN SELECTED TERTIARY HOSPITALS IN ENUGU STATE, NIGERIA

Ogbonna Brian O[1] and Okoye Ijeoma Mary-Ann[1]

Department of Clinical Pharmacy and Pharmacy Management, Faculty of Pharmaceutical Sciences, Nnamdi Azikiwe University, Awka, Nigeria
Correspondence: ozziexng@yahoo.com

ABSTRACT

Drug information services are the activities geared toward the provision of fact-based recommendations to aid specific medication use practices. There is paucity of data on the information seeking behavior and utilization of Drug Information Centers (DICs) by health care professional in Nigeria.

This study evaluated the utilization of DICs in selected tertiary hospitals in Enugu State Nigeria, identified the gaps and generated data for interventions.
A cross-validated, self-completed questionnaire was administered to 153 pharmacists in three tertiary hospitals and a response rate of 95% was obtained. The 5-point Likert-Scale Ordinal Measure (ranging from 1 lowest to 5 highest) was adopted to determine the strength of agreement of respondents to a particular statement. The median of the scale was applied to frequency of question, information need area, number of queries per week, usefulness of reference materials and services provided. The medians for positive (higher) decision was accepted at above 3.0 cut-point while the negative (lower) was accepted at below 3.0. Descriptive statistics was used to summarize the data. Chi Square was used to test the relationship between the categorical variables. Significant values were accepted at $p<0.05$.
The results showed that the percentage utilization of the DICs by prescribers (29.7%) was low. The chi square test shows that there was no significant association between tertiary hospitals and level of services offered by the information centers p-value =0.211, df=2, X^2 = 2.981. The association between the hospitals and their primary goals was p-value =0.132, df =6, X^2 = 5.134. The Emdex (87.80%) was the most availability drug information reference.

Conclusion: The study suggested that the most useful drug information reference materials to the DICs were not readily available and the centers were under- utilized by the prescribers.

Keywords: Drug Information, Adverse Drug Reactions, Drug Therapy, Enquiry, Health Service, Medication Therapy Management

Introduction

Drug information services (DIS) is defined as, "*the activities geared toward the provision of carefully evaluated, fact-based recommendations to assist specific medication use practices*" (Schneider, 2017). Some of the services provided by a standard Drug Information Centre (DIC) include the supply of Drug Information (DI), creating awareness on medication-use policies, education and Research (Ghaibi *et al.*, 2015). In view of providing drug information services, pharmacists work together with other stake-holders in the health-care profession, with patients, and the public to ensure the communication of consistent, accurate and all-inclusive information on prescribed medications during care transition. This helps in minimizing or eradicating potential and actual medication errors (Abdulghani *et al.*, 2018). The establishment of the first Drug Information

Centre in the world took place in Kentucky in 1962 (Rosenberg *et al*, 2004). It was founded in the U.S.A. In 1977, the United Kingdom got her Drug Information Centre (Alomi *et al*, 2016). In Nigeria, the National Drug Policy was launched in 1990. Subsequently, the Pharmaceutical Society of Nigeria (PSN) set up a Medicine Information Centre (MIC) in Lagos manned by a pharmacist who was trained in information retrieval and analysis (PSN, 2017).

Surveys have revealed that in Nigeria as in Malaysia and other places, patients and the public are willing to pay for pharmacists services aimed at reducing medication-related problems (Adibe *et al.*, 2018). Literature reviews reported that despite their capacity to obtain DI from the internet and other literature sources, physicians and nurses prefer a reliable and timely supply of medication information at the point of need from a professional and trusted healthcare provider (Clarke *et al.*, 2013). Besides, most information available on new drugs come from the pharmaceutical company representatives or from expert opinions which are not exempted from conflicts of interest (Dechartres *et al.*, 2011; Bindley *et al*, 2013). As reported by another study, notable among the causes of under-use of DICs was the deficiency in awareness of the existence and level of functionality of such centers and lack of the use of advanced information technology (Rosenberg *et al*, 2004). This necessitated the need to evaluate the operational standards and utilization of existing DICs for proper alignment in view of prospective futuristic developments.

The availability of unbiased, accurate, and evidence-based DI is a sine qua non for the effective decision on treatment and positive outcome in patient management. In developed nations, DICs are properly equipped (Schneider et al, 2008). Although many studies have been conducted on different aspects of DIS (Ojieabu *et al.*, 2016; Adibe, 2010); Udezi, 2007), an efficient DI management system (Ogbonna, 2016) and the effective utilization of DIC for appropriate drug therapy and greater positive patient outcomes have not been clearly achieved in Nigeria (Laskshmi *et al.*, 2003). Drug information services entail making use of written and/or verbal means of information transfer in responding to drug information requests from other healthcare providers, organizations, committees, patients, or members of the public (Kelra *et al*, 2011). It has been shown in a prospective observational study that up to 10% of hospital prescriptions contained errors and that recently graduated prescribers as well as senior physicians were culpable in making prescription errors (Dornan *et al*, 2009). In more developed countries, much have been achieved in the areas of electronic prescribing and electronic drug information, with the vision of creating an electronic Summary of Product Characteristics (e-SPC) which will simplify the voluminous drug and health information into authoritative, validated, standardized, and regularly updated information repository that will be easily and readly accessible. Some of the services provided by standard DICs include: provision of drug information services, provision of Continuing Education, Documentation of DI requests, and Quality Assurance. This study evaluated the utilization of DI references, provided information on DIS in the DICs of selected tertiary hospitals, identified the existing practice gaps and generated date for future interventions and development.

Methods

The study was a cross-sectional prospective survey conducted using pre-tested, self-administered questionnaire dapted from a similar study carried out in Utah, Washington, United States (Moorman *et al*, 2017). Out of the four major tertiary hospitals

located in Enugu metropolis, three were purposively selected, namely: the University of Nigeria Teaching Hospital (UNTH), Enugu State University Teaching Hospital Parklane (ESUTH), and Federal Neuropsychiatric Hospital (FNH). All the eligible respondents who gave their informed consent to participate in the study were all sampled. Out of 153 questionnaires distributed, 146 were returned with a response rate of 95%.

Ethical Approval was obtained from the Research and Ethics Committee of the UNTH, Ituku Ozala Enugu with approval number: UNTH/CSA/329/VOL. 5. Inclusion for the study were tertiary hospitals which are located within Enugu State and all Pharmacists in the institution who have completed the required study for the Bachelor of Pharmacy Degree and were present at the time of study

Data Presentation and Analysis

The completed questionnaires were classified and fed into the Statistical Package for Social Sciences (IBM SPSS) version 22. Results were reported in descriptive statistics of frequency, median and percentages, while Chi square was used to examine the differences between categoricalvarriables in thesame sample.

Results

Data Presentation

The primary goals of the drug information centers shows that education 42.3% has the highest distribution followed by service (36.6%). wahere is no significant association between the tertiary hospitals locations and the primary goal of the information centers. Their services include answering drug information request (78.6%), Participation in pharmacy and therapeutic committees (52.4%), Providing training or education (60.3%), reporting adverse drug reactions (57.4%), and preparation of newsletters (33.8%), conducting drug-use reviews (48.4%), attending to online “ask the Pharmacist” services and administrative duties not related to drug information.

The data collected from the study were presented in the tables and figure below:

Table 1: Demographic characteristics of respondents

Gender	Frequency	Percentage
Male	79	54.2
Female	67	45.8
Total	**146**	**100.0**
Age (Years)	**Frequency**	**Percentage**
< 20	0	0
21-30	110	75.3
31-40	15	10.3

41-50	9	6.2
51-60	6	4.1
>60	6	4.1
Total	**146**	**100**

Descriptive Demographics for Respondents: Table 1 shows that 54.2% of the respondents in the survey are males while 45.8% are females. And 71.3% fall within 21-31 years of age.

Table 2: Number of questions per week received by respondents

Questions/week	Frequency	Percent (%)
1-50	127	89.4
51-100	12	8.5
>100	3	2.1
Total	**142**	**100**

DI Questions Received: Table 2 shows that the highest rate of DI questions received by the DICs per week falls within 1-50 (89.4%) questions and they hardly receive more than 100 drug information questions in a week.

Table 3: Availability and Distribution of reference materials in the DICs

Reference materials	Responses		
	Avail. N (%)	**Not Avail. N (%)**	**Valid Resp. (N)**
Emdex	**128 (87.8%)**	18(12.2%)	146
British National Formulary (BNF)	**114 (77.9%)**	32 (22.1%)	146
British Pharmacopeia (BP)	113(77.8%)	33(22.2%)	146
Drug leaflet Insert (DLI)	**122(83.6%)**	24(16.4%)	146
American Journal of Health-system Pharmacy (AHSP)	32(21.6%)	114 (78.4%)	146
Annals of Pharmacotherapy (AP)	43(29.5%)	103(70.5%)	146
Internet Application	102(70.0%)	44(30.0%)	146
Essential Drug List (EDL)	**118(80.6%)**	28(19.4%)	146

The distribution of frequently used reference materials: As shown from the result in Table 3, in Enugu Sate Nigeria, EMDEX (87.8%) is the most distributed reference material in the tertiary hospitals. This is followed by the drug leaflet inserts or the drug packet inserts (DPI) with 83.6%

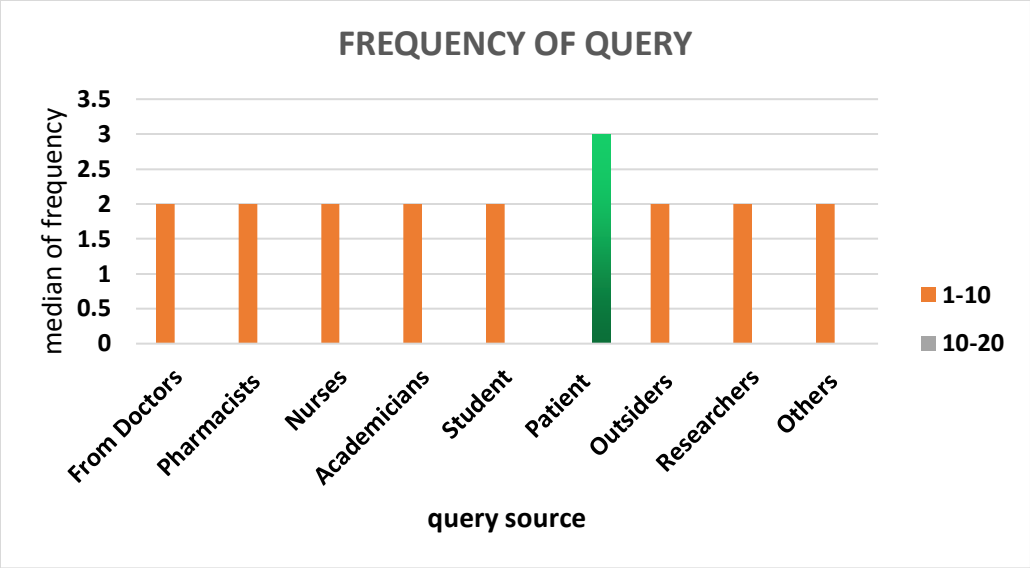

Figure 1: frequency of questions at the DICs in the tertiary hospitals in Enugu State

Table 4: Usefulness of reference materials to the tertiary hospitals

DI Reference	Excellent (5)	Satisfactory (4)	Fair (3.0)	Poor (2)	V. Poor (1)	MEDIAN	DECISION
Emdex	56(38.2%)	75(51.5%)	13(8.8%)	-	2(1.5%)	**4.5**	Excellent
BNF	60(40.9%)	70(48.5%)	11(7.6%)	2(1.5%)	2(1.5%)	**4.5**	Excellent
BP(Pharmacopoeia)	32(21.7%)	85(58.3%)	24(16.7%)	-	5(3.3%)	**4**	Satisfactory
Drug Leaflet Inserts	39(26.9%)	65(44.8%)	39(26.9%)	-	2(1.5%)	**4**	Satisfactory
AP	19(12.8%)	45(30.8%)	71(48.7%)	7(5.1%)	4(2.6%)	**3**	Fair
Merck Manual	30(20.5%)	41(28.2%)	64(43.6%)	7(5.1%)	4(2.6%)	**3**	Fair
Internet App.	73(50.0%)	46(31.3%)	25(17.2%)	2(1.6%)	-	**4.5**	Excellent
Essential Drug List	51(35.2%)	65(44.4%)	22(14.8%)	3(1.9%)	5(3.7%)	**4**	Satisfactory

Table 5: The association between the hospitals and level of services provided

Hospital	Level of Service Provided	Total

	24-hours services	Part time service	
ESUTH	5 33.3%	10 66.7%	15
UNTH	16 57.1%	12 42.9%	28
Federal Neuropsychiatric Hospital	17 65.4%	9 34.6%	26

*__p value =0.133__, df=2, X^2 = 4.031

Table 6: The association between hospitals and their primary goal

Hospital location	**Primary Goal of The Center**				**Total**
	Services	Education	Research	Combination	
ESUTH	4 25.0%	6 37.5%	5 31.3%	1 6.3%	16
UNTH	13 46.4%	12 42.9%	1 3.6%	2 7.1%	28
Federal Neuropsychiatric Hospital	9 33.3%	12 44.4%	3 11.1%	3 11.1%	27

*__p value =0.228__, df =6, X^2 = 8.136

DISCUSSION

The highest number of respondents felled within 21-30 years and predominantly made up of young graduates who constituted the major the work force. The older pharmacists would have diversified into other practice areas such as academics and community practice. This finding resonates with a similar study conducted in North-Western Nigeria (Ma'aji *et al*, 2018) and in Ogun State, south western Nigeria in which most of the participants fell within the same age-limits and had below 10 years of experience (Ismail, 2011). The result in Table 2, indicated that the rate at which DI questions were received in the tertiary hospitals was poor, considering the fact that they are tertiary hospitals situated in a state with seventeen Local Government Areas, with over three million population, many district hospitals, health centers and cottage hospitals which send referrals to them (Ughasoro *et al.*, 2017). The high DPI could be associated with good available at very minimal cost. However, a cross-sectional survey in Malaysia, indicated that DPIs are most readily available, but are mostly neither current nor consistent with their DI contents and need (Hassali *et al.*, 2011; Bangalore *et al*, 2010). A quantitative survey by an expert panel which was carried out in the United States, United Kingdom and Australia on Consumer Medication Information, revealed that information obtained in DPI for generic medications are

often inconsistent when compared among different manufacturers (Raynor *et al.*, 2007).

The result on the availability of resources indicated that Emdex was very useful and was readly available. The result of usefulness for internet application reveals that while internet application may be useful, it was not readily available as expected. This was probably due to the unstable power supply. Conversely, DLI were more readly available though they are not more useful in terms of the required unbiased information need. Overall, The EMDEX, BNF, and Internet Application were found to be of very useful to the DICs surveyed**.** Other information resources like the BP, EDL are "Satisfactory", whereas Annals of Pharmacotherapy and the Merck Manual were the "least" useful as shown in Table 4. Although the AHSP is found satisfactory in its usefulness according to the result, yet this survey revealed that it is the least available information resource. Its was probably due to the inaccessibility of international journals and other digital information due to lack of internet access made worse by poor power supply in the country especially in the region of the survey.

The EDL and the Medical Dictionary were not among the resources with excellent usefulness, but only satisfactorily useful. Notable in this survey, internet application, Emdex and British National Formulary are the most useful reference resources of information in the DICs in the tertiary hospitals in Enugu, although not readily available. The measure of frequency of DI request revealed that the doctors, unlike the pharmacists, did not often make drug information requests from the DICs in the tertiary hospitals.. There was no significant association between the hospitals location and the primary goal of the information centers. McKeever maintains that it is important to train pharmacists as drug information specialists who have clinical knowledge and skills for providing clear, concise and accurate recommendations on drug use since the constant changing culture of drug information and health-care in general has raised the need for continual growth and refinery of the standard that govern drug information practice (McKeever and Amy, 2009).

Summary

The evolving role of pharmacists beyound dispensing has extended to other cognitive services such as patient education and patient counseling (Cruthird *et al*, 2013). In Nigeria, there are limited studies on the information seeking behavior of health care professional (Anasi *et al.*, 2017). The availability of DIS and its operations leave much to be desired (Ma'aji et, 2018).

Conclusion

The study suggested that the DICs in the tertiary hospitals lacked reference materials for effective DIS and are under-utilized by the prescribers. They are staffed with experts, but poorly. Most of the useful and current reference materials and advanced technologies were lacking.They were under-utilized by the physicians and other health-care givers.

Conflict of interest: The authors have none to declare

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