

ASSESSMENT OF SOURCES AND LIMITATIONS OF DRUG INFORMATION USED BY HEALTH CARE PROFESSIONALS OF SELECTED HOSPITALS IN KADUNA METROPOLIS

Sani, J* and Muhammad, B.M

Department of Clinical Pharmacy and Pharmacy Practice, Faculty of Pharmaceutical Sciences, Kaduna State University, Kaduna.

*Corresponding author: jamcy012@gmail.com Tel: +234 (0) 8034174021

ABSTRACT

Background: Health professionals have certain drug information needs and hence get drug information from different sources. Access to correct, upto-date and unbiased information on drugs is of utmost importance in ensuring rational use of drugs, patient safety and therapeutic success.

Aim: To determine drug information needs and sources used by health care professionals (HCP) of the selected hospitals.

Methods: A total of 261 questionnaires were distributed to doctors, pharmacists and nurses of three public hospitals in Kaduna state; Barau Dikko Teaching Hospital, Yusuf Dantsoho Memorial Hospital and Kawo General Hospital through convenience sampling. Data were analysed descriptively.

Results: A total of 231 valid and completed questionnaires were returned (response rate of 88.5%). Majority (n=55.8%) of the respondents were nurses, 33.3% doctors, while 10.8% were pharmacists. High percentage (59.3%) of the respondents had no postgraduate qualification, 13.0% had Masters Degrees while 27.7% had other postgraduate qualifications such as fellowships of professional colleges. Health professionals (19.9 %) always used the internet while another 15.9% always used professional colleagues as sources of drug information. Majority (50.6%) never used compendia and a portion of them (34.6%) never used journals for their drug information needs. More than a quarter of the respondents (35.5%) most of the time sought for information on uses of drugs in pregnancy and (32.0%) on drug interactions. . In comparison, the respondents (49.8% & 41.0%) never sought for information on storage conditions of medications and cost of medicines respectively.

Conclusion: The selected hospitals' HCPs obtained drug information through the internet and professional colleagues with the majority of their drug information needs centered on pregnancy and drug interactions.

Key words: Drugs Information; Internet; Healthcare professionals; Drug information needs.

INTRODUCTION

Healthcare professionals often get drug information from various sources. However, not all sources are timely, reliable, authentic, unbiased, and upto-date. Drug information (DI) is the provision of written or verbal information about drugs and drug therapy response to request from healthcare providers and the general public^{4, 22}. DI can be gotten through reading, study, or practical experience on

chemical substance that is used in diagnosis, prevention and treatment of a disease²¹. It covers all types of information including objective and subjective information as well as information gathered by scientific observation or practical experience⁹. One of the most important aspects of drug information is to be unbiased in its contents¹³. Thus, the unbiased nature of information is of

paramount importance to enhance patient outcomes and reduce adverse drug reactions (ADRs)⁴. The provision of timely and accurate DI to healthcare professionals is very important in promoting safe and effective use of drugs by improving patient outcome, enhancing the quality of patient care and ensuring the efficient use of resources²⁵. Unjustified use and prescription of medication pose hazardous consequences on the health of patients and society at large¹⁶. Situations such as adverse drug reactions, drug-drug interactions, and drug use during pregnancy are all commonly encountered by clinicians during their daily practice, and it requires access to drug information that is up-to-date, accurate, user-friendly and trustworthy. Thus, failure to provide accurate and good quality drug information can lead to harmful patient outcomes²⁶. In Nigeria, DI is mainly obtained from sources such as journals, medical representatives, internet reference books and colleagues². A study in Benin city, Nigeria found out that healthcare professionals used drug package/labels, internet, textbooks and professional colleagues as DI sources¹².

METHODS

Study Site

The area of the study was Kaduna metropolis of Kaduna State, Nigeria. Kaduna State, is a state in Northwest Nigeria with its capital as Kaduna. The vegetation cover is Sudan Savannah type, characterized by scattered short trees, shrubs and grasses. Kaduna State is located on the coordinates: 10°20'N 7°45'E. The state has 23 Local Government Areas.

Study Design

This study was a cross sectional study. Questionnaires were used as the instrument for collecting data for this study.

Study Instrument

The questionnaire was adapted from a previous similar study conducted by Adibe, 2010)². Instrument was modified by adding some sources of drug information. Instrument was pretested with 15 people, and then issued to respondents. Reliability of questionnaire was significant at Cronbach's alpha 0.871. Data were collected through the use of the survey questionnaire. The questionnaire was in four sections. Section 1 & 5 (questions) was about the population demographics while Section 2 and 3 took care of the research questions.

Sample Size Determination

Sample size was calculated using the Taro Yamane method (1967). Total sample size calculated was 270.

Study Participants and Sampling

The study participants consist of pharmacists, doctors and nurses in the three hospitals selected for the study. These hospitals are: Yusuf Dantsoho Memorial Hospital, Barau Dikko Teaching Hospital and General Hospital Kawo. All situated in Kaduna metropolis. Questionnaires were administered face to face to health professionals in a random sampled manner. Other health professionals were excluded from the study. Only Professionals who were willing to be part of the study were included. Students on industrial attachment were excluded.

Data Collection

Out of the 267 questionnaires issued, only 231 were filled and collected back from respondents. They were coded and made ready for analysis.

Ethical Considerations

Ethical approval to conduct the study was obtained from the State's Ministry of

Health and Barau Dikko Teaching Hospital. No information that could be used to identify respondents was collected, and all information collected were securely handled and used only for the purpose of this study.

Data Analysis

Data collected from the questionnaire were analysed descriptively.

RESULTS

1.0 Demographic Characteristics of the Health Professionals Surveyed

There were more females (76.6%) in the study as compared to males (23.4%). Most

(65.8%) of the study respondents were within the age range of 20-40years, 33.3% were within 41-60years of age, while only 0.9% was within 60-80years of age. High percentage of the respondent (55.8%) were nurses, 33.3% doctors, while 10.8% were pharmacists. Most (59.3%) of the respondents had no postgraduate qualification, 13.0% had a Master's Degree while 25.1% had some other type of post graduate qualification including fellowships. Most (61.0%) had practiced for 1-10years, 25.1% for 11-20years while 13.9% had practiced for more than 20years.

Table 1: Demographic Characteristics of the Surveyed Health Professionals

Characteristics	Variables	n (%)
Sex of respondents	Males	54 (23.4)
	Females	177 (76.6)
Age of respondents (years)	20-40	152 (65.8)
	41-60	77 (33.3)
	61-80	2 (0.9)
Profession	Doctors	77 (33.3)
	Pharmacists	25 (10.8)
	Nurses	129 (55.8)
Years of Practice (years)	1-10	141 (61.0)
	11-20	58 (25.1)
	>20	32 (13.9)
Post Graduate Qualification	MSC	30 (13.0)
	Fellowships and Others	64 (27.7)
	None	137 (59.3)

2.0 Various Sources of Drug Information Used by the Surveyed Health Professionals

The respondents reported getting information most of the time from the internet (36.8%) and from their professional colleagues (37.6 %) while some reported getting information always from the internet (19.9 %). Medical sales representatives were sometimes used as sources of drug information by 53.7% of respondents. Most of the respondents (50.6 %) reported that they never used compendia as source of information, and 34.6% of respondents also never used medical journals as source of information (Table 2).

Table 2: Sources of Drug Information Used by Health Professionals in Kaduna Metropolis

Sources of drug information	Never n (%)	Rarely n (%)	Sometimes n (%)	Most of the time n (%)	Always n (%)
Journals	80(34.6)	57(24.7)	56(24.2)	34(14.7)	4(1.7)
Medical Sales Representatives	17(7.4)	32(13.9)	124(53.7)	52(22.5)	6(2.6)
Emdex	60(25.9)	42(18.1)	47(20.3)	57(24.6)	25(10.8)
BNF	62(26.8)	28(12.1)	58(25.1)	58(25.1)	25(10.8)
Conferences	58(25.8)	61(27.1)	80(35.6)	19(8.4)	7(3.1)
Internet	18(7.8)	22(9.5)	60(26.0)	85(36.8)	46(19.9)
Textbooks	82(35.4)	34(14.7)	60(25.9)	34(14.7)	21(9.09)
Compendia	117(50.6)	61(26.4)	32(13.8)	11(4.8)	10(4.3)
Drug leaflets	86(37.2)	27(11.7)	60(25.9)	50(21.6)	8(3.5)
Professional colleagues	33(14.2)	37(16.0)	45(19.5)	87(37.6)	29(15.9)

3.0 Drug information Needs of the Surveyed Health Professionals

More than a quarter of the respondents (35.5%) sought for information most of the time on uses of drugs in pregnancy, also (32.0%) of the respondents sought for information most of the time on drug interactions. In comparison, the respondents (49.8%) never sought for information on storage conditions of medications and also 41.0% of them never sought for information on cost of medicines. The respondents sometimes sought for information on use of drugs in lactation (47.6%), use in paediatrics (36.4%), adverse drug reactions (41.5%), overdose (35.1%), efficacy (38.8%), contraindications (22.3%), use in the elderly (40.3%) and indication (29.8%) (Table 3).

Table 3: Drug Information Needs of the Surveyed Health Professionals

Information need	Never n (%)	Rarely n (%)	Sometimes n (%)	Most of the time n (%)	Always n (%)
Use in Pregnancy	8 (3.5)	11 (4.8)	97(42.0)	82(35.5)	33(14.3)
Use in Lactation	10 (4.3)	24 (10.4)	110(47.6)	72(31.2)	15(6.5)
Use in Paediatric	35 (15.2)	28 (12.1)	84(36.4)	36(15.6)	48(20.7)
Adverse Reaction	25 (10.8)	20 (8.7)	96(41.5)	66(28.6)	24(10.4)
Doses	36(15.6)	15 (6.5)	81(35.1)	65(28.1)	34(14.7)
Efficacy	35 (15.4)	36 (15.9)	88(38.8)	49(21.6)	19(8.4)
Contraindications	41 (17.9)	37 (16.2)	51(22.3)	73(31.9)	27(11.8)
Use in the Elderly	42 (18.2)	37 (16.0)	93(40.3)	48(20.8)	11(4.8)

Drugs Interactions	43 (18.9)	27 (11.9)	72(31.7)	74(32.0)	11(4.8)
Use in Hepatic Disease	59 (26.2)	71 (31.6)	46(20.4)	29(12.9)	20(8.7)
Use in Renal Disease	58 (25.8)	79 (35.1)	35(15.6)	26(11.6)	27(12.0)
Indication	64 (28.0)	15 (6.6)	68(29.8)	53(23.2)	28(12.3)
Mode of Administration	74 (32.0)	49 (21.2)	41(17.7)	42(18.2)	25(10.8)
Pharmacokinetics	79 (34.5)	44 (19.2)	58(25.3)	39(17.0)	9(3.9)
Mechanism Of Action	80 (34.9)	58 (25.3)	39(17.0)	32(14.0)	20(8.7)
Formulation	87 (38.0)	69 (30.1)	33(14.4)	29(12.7)	11(4.8)
Cost	94 (41.0)	44 (19.2)	58(25.3)	25(10.9)	8(3.5)
Storage Conditions	115 (49.8)	41 (17.7)	39(16.9)	27(11.7)	9(3.9)

DISCUSSION

The growing number of drugs and their expansive literature makes it tedious for health professionals to get the required and unbiased information about them⁷. In Nigeria, there are inadequate numbers of healthcare professionals taking care of various patients with different ailments. This factor also makes having the right drug information difficult.

The demographics of this study showed that females (76.6%) were the highest respondents, males accounted for only 23.4%, which shows that females accounted for more than two-thirds of the total respondents. Most of the respondents (65.8%) were within the age range of 20-40years, 33.3% of them were within the range of 41-60years while only 0.9% were within the age range of 61-80years. This is similar to a study in which healthcare professionals within the age range of 20-40years were highest (66.2%), and the least age range was 61-80years². More males were found in the study, which is in contrast with the findings of this research. Also, a similar study had more females than males¹². Nurses were the health professionals that took part most in the study (55.8%), doctors were 33.3% while pharmacists (10.8%) were the least. This could be due to the high number of nurses and doctors in hospitals and few number of

pharmacists. A similar study in Benin had more doctors than nurses as respondents¹². Years of practice of health professionals were mostly 1-10years (61.0%). This is similar to a study where most of the respondents (53.9%) were found to be within the same age range¹². The age range of most of the respondents could be because they are the ones in active service and always found in hospitals. Some of the respondents (13.0%) had a Master's qualification while 27.7% had other types of qualification and 59.3% had no postgraduate qualification. This shows more than half of the respondents never had any postgraduate training after their first degree, which could limit them from getting current and upto date knowledge.

This study found out that health professionals (19.9 % & 15.9%) always used the internet and professional colleagues as sources of drug information respectively. Majority (50.6%) never used compendia and a portion of them (34.6%) never used journals for their drug information needs. The development of the internet has brought hope that access to health information might one day be universal¹⁸. The internet is a popular and frequently used source of medical information for patients and healthcare professionals. However, information gotten can be incomplete, inaccurate, and

misleading¹⁷. Due to the unregulated nature of the internet, it is of utmost importance to critically evaluate information gotten through the use of internet. A study also found out that community and hospital pharmacists (90.5%) used the internet for drug information¹. Another study found that most of the respondents used the internet often (50.0%) and very often (47.1%)¹⁰. In another study it was found out that only 40.8% of pharmacists used the internet as a drug information source¹⁰. From the above studies, it can be deduced that the earlier studies carried out showed less use of the internet¹⁰ while later studies showed higher use of the internet¹, this could be due to the fact that technology gets better and easier for use everyday. There is a vast amount of information on the internet, information gotten from the web must be critically evaluated prior to its use in treatment decisions¹⁷.

More than half of the respondents (53.7%) sometimes sought for information from pharmaceutical or medical sales representatives. The pharmaceutical industry is profit oriented and centers most times on marketing their products than research and development¹⁹. These drug sales representatives provide drug information and product samples to healthcare professionals especially physicians⁶. Ethical sales promotion has resulted in health professionals been more knowledgeable, however, information gotten from these representatives might be biased in such a way that they will be able to market their drug products and reach their proposed targets from their companies¹⁷. Physicians find information from medical sales representatives as convenient, reliable and highly educational^{6,15}. The use of sales representatives for pharmaceutical drug promotion is often unethical and inappropriate and may promote irrational

prescriptions, which could lead to therapeutic failure and also complications²⁰.

Professional colleagues have been great sources of information for most healthcare professionals and this was also found in a study in Uganda where 100% of respondents got drug information from their colleagues²⁴. Some of the respondents (25.1%) sometimes got information from the British National Formulary (BNF)¹². This could be due to the fact that it has become the gold standard source for guidance for prescribers and dispensers. This could also be due to its comprehensive, reliable, clinically relevant and up-to-date information. The BNF was first introduced at the start of the Second World War in 1939 and since then it has been revised and produced every three years¹². A study in Iran also showed the use of drug manuals and books by health professionals²³. Results from a similar study also showed that 53.9% of pharmacists used both EMDEX and BNF very often¹². On the other hand, another study showed that doctors and nurses hardly used BNF but preferred using EMDEX as their source of drug information¹². Emdex (Essential Medicines InDex) which was used most of the time by the respondents (24.6%) is also a formulary first published in 1991 as Nigeria's Essential Drugs Guide. It is commonly used as a reference source of drug and therapeutic information by healthcare professionals in Nigeria. It is the largest and up-to-date source of information on drug products approved for use in Nigeria by NAFDAC.

The respondents rarely sought for information from compendia (4.1%), journals (7.0%), conferences (8.2%) and textbooks (9%). This is similar to a study which found out that only 36% of respondents used textbooks as sources of

drug information²⁶. This could be due to the fact that they are not readily available, not convenient and could be also time consuming. This may result in getting information that may not be accurate, patient specific, timely, and up-to-date.

More than a quarter of the respondents most of the time sought for information on uses of drugs in pregnancy (35.5%) and drug interactions (32.0%). This could be due to the importance of teratogenic effects of some drugs and also the ability of some drugs to pass through breast milk, which can cause harm to the baby. Also, the use of some drugs in paediatrics need special caution and dosing. In a similar study it was found that 50% of pharmacists agreed to seeking for information on drug use in pregnancy¹². This is contrary to a study which reported that health professionals in Enugu State, Nigeria frequently sought for information on drug indication (86.6%) and use in special groups (77.6%)². Also contrary to a study in which drug indication and route of administration were most their drug needs¹². A similar study also found out that most respondents sought for information on dosages and dosage forms¹⁴. The respondents in this study never sought for information on storage conditions of medications (49.8%) and cost of medicines (41.0%). This is similar to results gotten from a study in Benin¹².

The need for accurate, timely and current DI can't be overemphasized. Hence, there's need for the government to build functional drug information centres across hospitals in the state and the country at large¹². This will leave the healthcare professionals sufficient time to take care of patients while ensuring efficacy and safety of medications used¹⁴.

CONCLUSION

Healthcare professionals of Barau Dikko Teaching Hospital, Yusuf Dantsoho Memorial Hospital and General Hospital

Kawo always get drug information from the internet, professional colleagues and official books (EMDEX and BNF). More than a quarter of the respondents most of the time sought for information on uses of drugs in pregnancy and drug interactions while they never sought for information on storage conditions of medications and cost of medicines.

REFERENCES

1. Abdu-Aguye, S.N., Yusuf, H., Thomas, N., Ma'aji, H.U. (2018). Utilization of internet and non-internet-based drug information resources by pharmacists practicing in hospital and community settings in Kaduna, Nigeria. *Nigerian Journal of Pharmaceutical Sciences*. 17(2):1-9.
2. Adibe, M.O. (2010). Assessment of attitude and behavior of health Professionals towards provision of drug information Services in Enugu State. *International Journal of Drug Development & Research*. 2(3): 555-564.
3. Alamri, S.A., Aljaizani, R.A., Naqvi, A.A., Al Ghamdi, M.S. (2017). Assessment of drug information services in public and private sector tertiary care hospitals in the Eastern Province of Saudi Arabia. *Journal of Pharmacy*. 5(3):37-43.
4. Ali, A.A., Yusoff, S.M., Joffry, S.M., Wahab, M.A. (2013). Drug information service awareness program and its impact on characteristics of inquiries at DIS unit in Malaysian public hospital. *Archives of Pharmacy Practice*. 4(1): 9-14.
5. Almazrou, D.A., Ali, S., Abdulkareem, D.A., Albalawi, A.F., Alzharani, J.A. (2019).

- Information seeking behavior and awareness among physicians regarding drug information centres in Saudi Arabia. *Pharmacy practice*. 17(2): 1-6.
6. Altawalbeh S.M., Ibrahim I.A, Al-shatnawi S.F. (2020). Influence of pharmaceutical promotion on prescribers in Jordan. *International Journal of Clinical Pharmacy*. 42(2): 744-755
 7. Ashirwar, S.C., Mishra, K.A., Pathak, K.A. (2017). A need to be fulfilled: Drug information services. *IOSR Journal of Pharmacy*. 7(6):15-19.
 8. George, B. & Rao, P.G. (2005). Assessment and evaluation of drug information services provided in a South Indian teaching hospital. *Indian Journal of Pharmacology*. 37(5): 315–319.
 9. Godlee F, Pakenham-Walsh N, Ncayiyana D, Cohen B, Packer A. (2004). Can we achieve health information for all by 2015?. *364(2): 295-300*.
 10. Iheanacho O.C., Odili, U.V., Ohuigbo, E.K. (2021). Predominant Sources of Pharmacists' Drug Information needs and identification of drug information needs from pharmacists in community and hospital settings. *Indian Journal of Pharmacy*. 14(1): 46-53.
 11. Joshi MP. (2008). Drug information services at teaching hospitals in developing countries. *Indian Journal of Pharmacology*, 30(1): 1-5.
 12. Joshua, O.I & Anthony, U.W. (2018). An investigation of drug information needs of doctors and nurses in Benin city, Nigeria. *Nigerian Journal of Pharmaceutical and Applied Science Research*. 7(2): 95-103.
 13. Karim, A.C, Amy, M.H. (2001). Drug information, A Guide for Pharmacists: Formulating Effective responses and Recommendations: A Structured Approach. 2nd Ed. *The McGraw Companies*. p. 31-51.
 14. Kayode, O.M.& Yetunde, A.F. (2012). The study of the relevance on the establishment of drug information centre at a secondary hospital in south west Nigeria. *International journal of Research in Pharmacy*. 3(5):710-714.
 15. Khan, N., Naqvi, A.A., Ahmad, R., Ahmed, F.R., McGarry, K., Fazlani, R.Y., Ahsan, M. (2017). Perceptions and Attitudes of Medical Sales Representatives (MSRs) and Prescribers Regarding Pharmaceutical Sales Promotion and Prescribing Practices in Pakistan. *Journal of Young Pharmacists*. 8(3):244–250.
 16. Kazeem, A.O & Ibrahim O. (2011). Sources of drug information and their influence on the prescribing behavior of doctors in a teaching hospital in Ibadan, Nigeria. *The Pan African Medical journal*. 9(3):478.
 17. Luigi, B & Evelyn H.D. (2010). The internet as a drug information resource. *US Pharmacist*. 35(1):Epub.
 18. Mouhouelo P, Okessi A, Kabore MP. (2006). Where there is no Internet: delivering health information via the blue trunk libraries. Retrieved from PubMed.
 19. Naqvi A.A., Zehra F, Khan N, Ahmad R, McGarry K. (2019). Interactions and conflicts of interests between prescribers and medical sales representatives regarding prescribing and drug

- promotion practices in Karachi, Pakistan. *Pakistani Journal of Pharmaceutical Sciences*. 32(2): 687-695.
20. Oshikoya, K.A., Oreagba, I. and Adeyemi, O. (2011). Sources of drug information and their influence on the prescribing behaviour of doctors in a teaching hospital in Ibadan, Nigeria. *Pan African Medical Journal*. 9(13):Epub.
21. Osiobe, S.A. (1988). Physicians' and pharmacists' drug information Sources in Nigeria. *age journals*.
22. Sankara L. (2021). Assessment of Knowledge about Drug Information Center among Health Professionals. *Journal of Applied Pharmacy*. 13(3):282-286.
23. Tahamtan, I., Farahi, M.T., Afshar, A.S. and Baradaran, H.R. (2015). Drug information seeking behaviors of health care professionals in Iran. *New Library World*. 116(4): 173-186.
24. Tumwikirize WA, Ogwal-Okeng JW, Vernby A, Anokbonggo WW, Gustafsson L L, Lundborg CS. (2008). Access and use of medicines information sources by physicians in public hospitals in Uganda: a cross sectional study. *African Health Sciences*., 8(4):220-226.
25. Udezi, A.W., Oparah, A.C. & Enyi, K.U. (2007). An Investigation of Drug Information Needs of Nigerian Pharmacists. *Drug Information Journal*. 41(4): 471-479.
26. Yusuf H, Abdu-Aguye S.N, Sulieman H.O, Modi M.H, Labaran K.S, Ahmed A. (2019). Utilization of Drug Information Resources by Pharmacists Practicing in Hospital and Community Settings in Maiduguri, Nigeria. *Journal of Pharmaceutical and Allied Sciences*. 16(5):3138-3145.