



## **Readiness for Drug Information Service Provision in Community Pharmacies in Akwa-Ibom State, Nigeria**

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### **Authors' contributions**

*This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.*

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## **ABSTRACT**

This study was aimed at assessing the readiness for drug information service (DIS) provision at community pharmacies in Akwa Ibom state using a cross sectional, observational study approach. A pretested, validated questionnaire was adapted for the study. A total of 187 premises were enlisted for visits with questionnaires targeted at the superintendent pharmacists for desired responses. Response rate was 93.6%. Respondents were male (77, 44%) and female (98, 56%) with mean years of experience of respondents as 18.7 years. All respondents were aware of DIS terminologies and believed the concept to include enquiries on dosing (75%), side effects of drugs (99%), safety of drugs in cases such as pregnancy (79%), drug route of administration (80%), pill identification (66%) and substitutes to requested drugs (78%). Responses to limitations in discharging efficient DIS include non-trending service style (26%), premises requiring restructuring (26%), prohibitive setting up cost (17%) and non-availability of trained personnel (7%). At the time of this study, available resources for DIS in the premises included reference books (90%), periodicals (19%), and internet access through smart phones (60%). Secondary and tertiary sources of drug information were

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essentially relied on for DIS provision in the study area. There was significant association between socio-demographic characteristics such as age with readiness status ( $p < 0.05$ ). There was poor in-service training for effective DIS provision. Summarily, there was no significant difference ( $p > 0.05$ ) in the DIS approach across the state. There is need for improvement in facilities and resources for efficient discharge of DIS in the study area.

**Keywords:** *Drug information service (DIS); pharmaceutical care; community pharmacies; readiness; resources; limitations to DIS provision.*

## 1. INTRODUCTION

Drug information services (DIS) is often cited as the first clinical pharmacy role to have developed in U.S. hospitals [1]. It is more important to have satisfying knowledge about the use of medicines before procuring or administering it. Everyone requiring medicine appears to need more information about the drugs than they presently have. It is believed that pharmacists in developing countries have a challenge to meet in delivering pharmaceutical services to optimize medication therapy in various settings. These include the community practice which is a primary care center in most countries. There is limited information about the disposition of practitioners to effective DIS provision in the study area.

The role of community pharmacist continues to expand with the emerging and challenging pressure from primary care patients in terms of their acute demand management with respect to drugs [2, 3]. Drug information services comprise of facilities, resources and personnel dedicated and specialized for the provision of written or oral information about drugs and pharmacotherapy in response to a request from health care professionals, organizations, committee, patients or their caregivers [4]. Drug information refers to current critically examined relevant data about drugs and drug use in a given patient and in a defined situation [5].

Drug information service is well established in developed countries with purpose and specifically designed drug information unit whereas in developing countries, there is scarcity of literature that gives the correct picture. Similarly there is no documentary evidence on the quality of personnel and materials available in community pharmacy practice settings for the provision of DIS in most parts of Africa [6, 7].

As pharmacists are charged with the responsibilities of pharmaceutical care and

rational use of medicines, this forms a challenge to all and sundry, especially at the primary care points. There is the necessity to promote pharmacy profession by standardizing the practice of DIS provision at the level of community pharmacy. According to Thomas and Zachariah [8], pharmacy practice is coming up strongly and the face of the profession depends on the impact it makes on the callers, especially enquirers. Information on drugs is available in print, electronic or oral format without which effective patient counseling cannot be achieved [8]. As this study x-rays the position of practitioners in this area, the realization of the readiness status is believed to be able to give a positive challenge to the association of pharmacists within and beyond, in the same region, on restructuring of premises to accommodate drug information services which is widely acclaimed the backbone of evidence-based pharmacy practice [9-11].

Though drug information is readily available in journals, databases accessible via the internet, personal digital assistants or software, there is the need, often times, for verbal communications with a knowledgeable person appearing as the quickest approach for getting solutions to clinical questions about medications. This study therefore was aimed at assessing the readiness of pharmacists practicing in community pharmacy outlets in Akwa-Ibom state for provision of drug information services.

## 2. METHODOLOGY

This observational and descriptive study was conducted in 3 months (September 2018 to November, 2018) in Akwa Ibom State, Nigeria. The study focused on randomly selected community pharmacies. A non-probability sampling technique with no fixed or defined selection process from a list of registered community pharmacies in the study area was employed. A close-ended survey questionnaire was used to assess the components of discharge of DI services. The questionnaire contained (A)

the demographics of the respondents and (B) the evaluation of resources and personnel required for effective discharge of DIS.

The protocol of this research work was submitted to the Ethical Committee on research ethics, University of Uyo, Nigeria with approval certificate number (IRC/2018/014). All respondents acceded to our consent form.

## 2.1 Study Area

This study was conducted in Akwa-Ibom state, Nigeria.

## 2.2 Sample Size

From the study population of 227 registered premises, the sample size was calculated as 175 including a 5% margin of error. The sample size was calculated using a two-step formula for sample size determination for infinite population (equation 1) and then deducing to the adjusted sample size for the prevailing study population size (Equation 2).

$$SS = Z^2 \times P \times (1 - P) / M^2 \quad (1)$$

$$SS_{adj} = SS / 1 + (SS - 1) / N \quad (2)$$

Where SS Infinite population sample size; Z is Z score at confidence interval (CI) of 95% (i.e., CI at 95% gives Z score of 1.964); P is population proportion of 50% (0.5); M is the margin of error, usually taken as 5%; SS<sub>adj</sub> is the study required sample size while N is the study population size [12].

### 2.2.1 Inclusion criteria

Pharmacists superintending over registered premises were included in the study.

### 2.2.2 Exclusion criteria

Registered premises without a licensed pharmacist in attendance were excluded from the study. Registered Pharmacists in hospitals and government services and other services outside community practice were also excluded.

## 2.3 Data Collection

The pre-tested, structured questionnaires were administered to the predetermined number of facilities and responses to questions were made

in the presence of the research assistants who served them.

## 2.4 Data and Statistical Analyses

The collected data were sorted, and coded appropriately. Statistical Package for Social Sciences (SPSS) version 20 (IBM, USA) was employed for data analyses. Descriptive statistics including frequency and percentages were used to summarize the data. Variables were considered for association or relativity using Chi square and the Confidence Interval was set at 95%.

## 3. RESULTS

A total of 187 premises were enlisted and visited for the study. The study period had 175 pharmacists filled out the questionnaires in their premises. A total of 12 persons declined to complete the questionnaire thereby making the response rate to be 93.6%. The demographics of the respondents are presented in Table 1. The modal age in the study was 31 to 40 years while over 67% of the respondents had less than 20 years of experience in community practice. The perception of the concept of DIS provision in this study is presented in Fig. 1. All the respondents believed they have heard and know about DIS provision. A good number of respondents (73%) attributed this to simply answering enquiries on substitutes to a drug while (72%) believe it is resolving questions on doses of medications. Respondents' reported limitations to efficient discharge of DIS include cost of provision (17%), need for premise restructuring (26%), need for bigger space than already have (23%), nature of pre-existing service pattern DIS versus DIS provision protocols alongside clients' acceptability (26%), all presented in Fig. 2.

The available resources for resolving enquiries at the premises include reference books (84%), periodicals (15%), smart phone-based internet access (57%), expressed in Fig. 3.

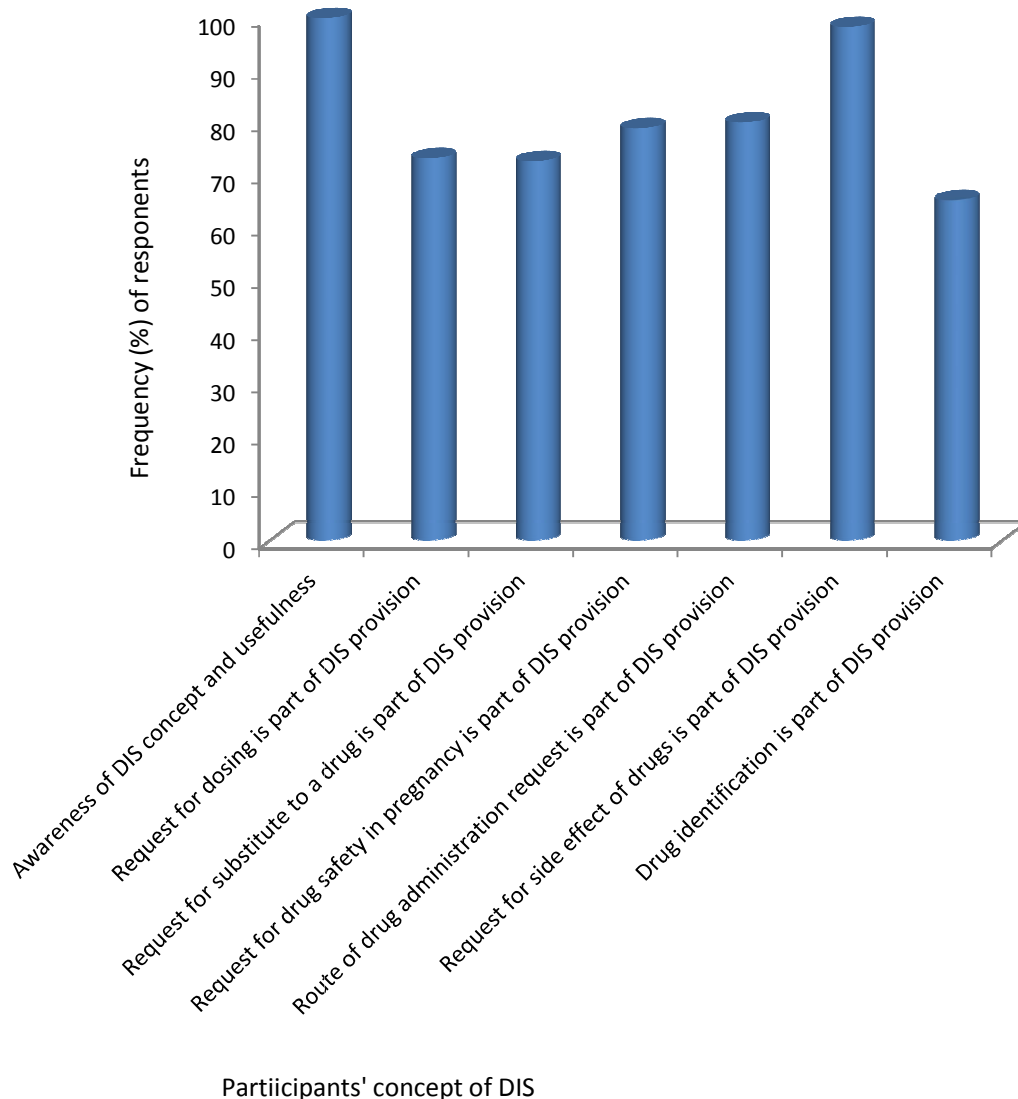
The study has shown that the age of respondent (p=0.013) and year of experience (p=0.003) as socio-demographic factors had significant association with the readiness for provision of DIS. These are presented in Table 2. The association between rank in the premises and knowledge level (p=0.196) was not significant. Similarly there was no significant association between working hours (p=0.631) and knowledge level (p=0.316).

Fig. 4 presents the awareness of respondents and their access to bibliographic materials on health and biomedical information. The National Cancer Institute (NCI) CancerNet Website and CANCERLIT are available on the net while a total of 15% of respondents are aware of these bibliographic resources with only 3% of respondents' access it in this study. MEDLINE appears to be widely known (70%) and accessed (68%). A greater than 50% of respondents

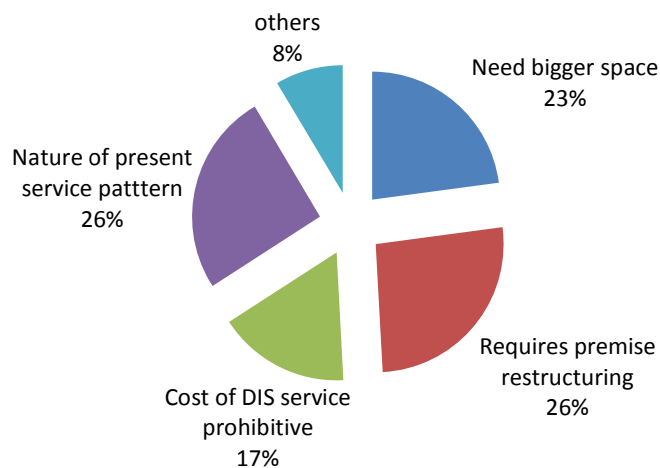
however are not aware of the resources and do not consult them.

#### 4. DISCUSSION

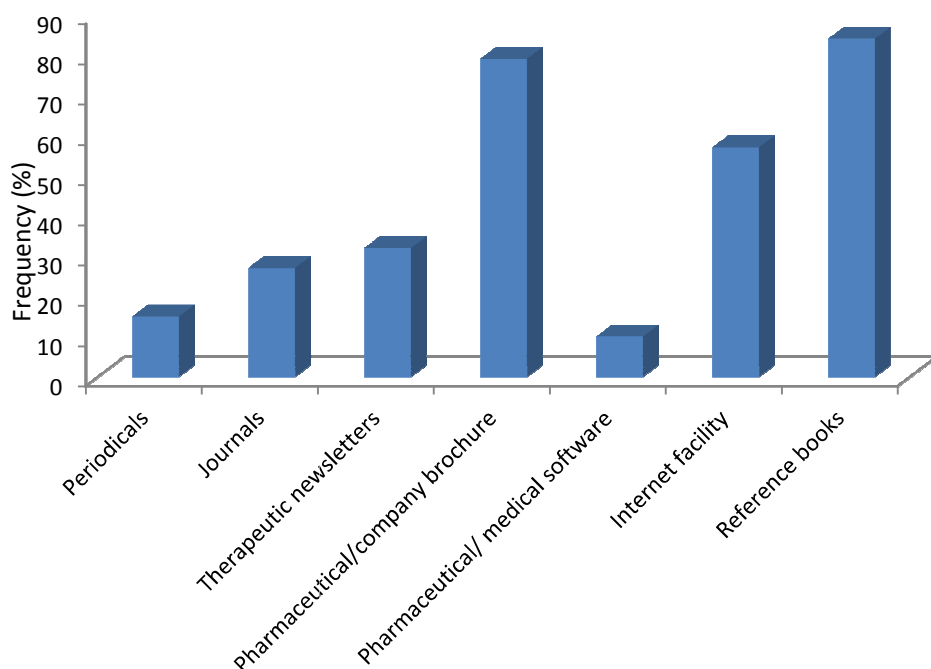
This study is a pioneer research in its attempt to assess the readiness of practitioners in the study area for the emerging scientific concept of handling DIS at the level of the community pharmacy practice in Nigeria, a current trend across the globe. This study reveals the status of



**Fig. 1. Respondents' perception of content of DIS**



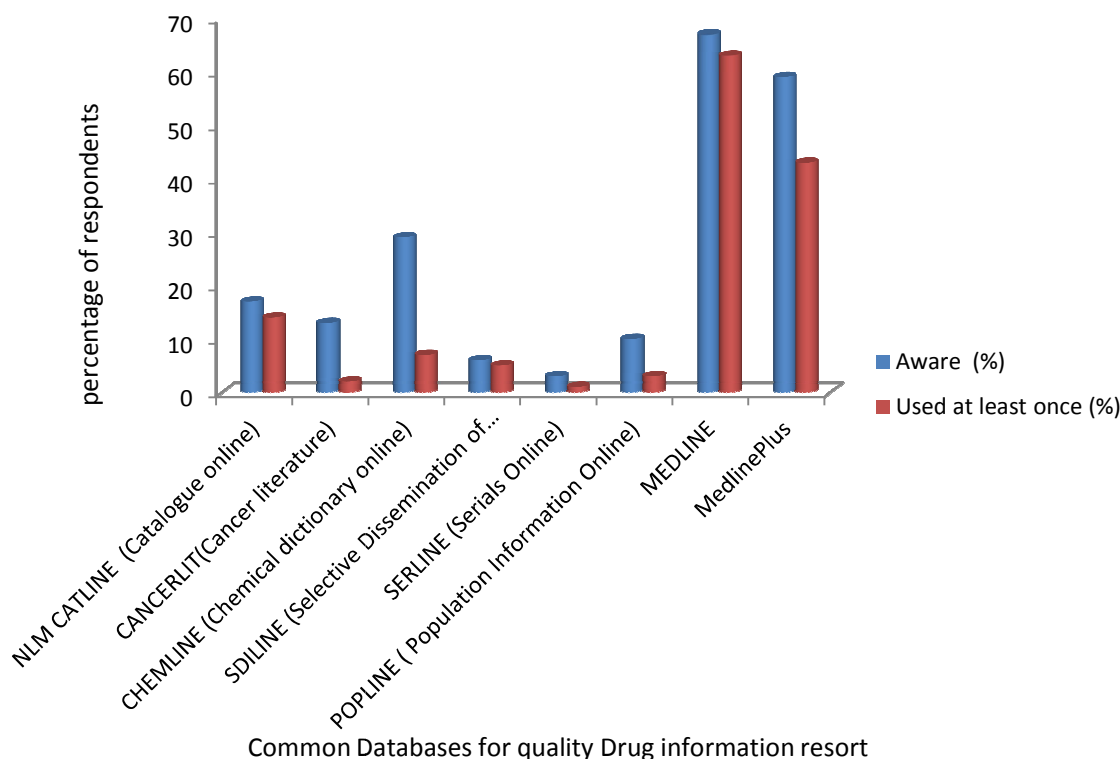
**Fig. 2. Respondents' reported limitations to DIS provision**



**Fig. 3. Available resources in community outlets in the study area**

personnel, infrastructure as well as disposition of the practitioners in the pharmacies. The respondents have shown significant variation in their knowledge of DIS provision. This however has not significantly affected the readiness of the discharge of the service ( $p=0.72$ ). The analysis of the outcome of study showed that 90 % of respondents were not totally ignorant of the

embodiment of DIS concept. Virtually all (97.5%) of the respondents agreed that DIS is necessary for drug's appropriate utilization and safety. It was however noted that 69.5% respondents did not perceive the service as a systematic and comprehensive delivery of information alongside documentation of protocols relating to enquiries entertained.



**Fig. 4. Awareness and access to some commonly available bibliographic databases for responding to enquiries on drugs**

\*NLM CATLINE (The national Library of Medicines Online catalogue), CANCERLIT (NCI bibliographic database of cancer literature), CHEMLINE (Chemical Dictionary online), SDILINE (Selective Dissemination of Information Online), SERLINE (Serials Online), POPLINE (Population Information Online), MEDLINE (NLM bibliographic database), MedlinePlus (NLM information service on health and drug issues)

In this study, respondents believe that resolving queries such as doses of drugs from time to time as such arises, amounts to the conceived DIS. Assessment of the readiness of the DIS provision by the respective outlets alongside respondent's full involvement revealed an unsatisfactory outcome with respect to readiness of DIS provision ( $p > 0.05$ ). The comprehensive concept of DIS provision was not imbibed as drug information is a specialty area within the realms of clinical pharmacy. In this study area, postgraduate professional training in DIS provision is grossly deficient. The same experience is noted in Singapore in pharmacists-operated DIS centres [13]. In cases where specialization and postgraduate exposure is lacking, the quality of DIS provision is expected to be low and consequently the quality of pharmaceutical care delivery. In the study area it can be concluded that the readiness for DIS provision hinges on the educational standard of the practitioners. The standard of DIS delivery in

the study area is not comparable with what obtains in the U.K and U.S whereas the workload may be similar.

A study by Rosenberg et al, revealed that the resources most commonly used by DIS providers were Micromedex Healthcare Series, followed by MEDLINE and AHFS Drug information [14]. In this study, however, tertiary source reference books were mainly employed for information service provision. The familiar use of periodicals as a primary source for DIS provision had the poorest frequency (20%). This indicates that community pharmacists in the study area are not conversant with scientific periodicals required to update them with current trends in drug use. The response to the use of textbooks as a tertiary drug information source was high indicating that most of the respondents have textbooks handy and therefore relate to clients as such. The use of tertiary information sources for answering questions on drugs requires the professional to

be apt with the type of books, the appropriate section and sometimes matching of two or more books for reliable and effective service provision. Information using tertiary sources provides core knowledge provided by primary literature and is accepted as standard of practice with the pharmaceutical/medical community. Though these are well established information but they are not tailored to patient-specific needs. This sometimes can be time consuming.

**Table 1. Pharmacists demographics**

Variables	Total (n=175)
<b>Sex(%)</b>	
Male	77 (44.0)
Female	98(56.0)
<b>Age n(%)</b>	
21-30	68(38.9)
31-40	56(32.0)
41-49	32(18.3)
50-59	12(6.8)
60 and above	7 (4.0)
<b>Years of experience in community practice</b>	
1-10	63(36)
11-20	53(30.3)
21-30	39(22.3)
31-40	20(11.4)
<b>Rank in the community outlet</b>	
Intern Pharmacist	18(5.5)
Corp. Pharmacist	17(5.2)
Superintendent pharmacist	163(50.2)
Owner/Director	127(39.1)
<b>Hours of service daily in the outlet (h)</b>	
1-6	16(10.3)
6-12	139(89.7)

\*Some items have multiple responses.

**Table 2. Statistical analysis of level of association of socio-demographic parameters with readiness for DIS provision**

Parameters	Readiness for DIS provision (p values)
Age of respondents	0.013
Gender of respondents	0.079
Years of experience	0.003
Hours of service	0.631
Rank (employment status) of respondent	0.196
Knowledge level	0.316

Respondents in this study may therefore answer enquiries with other resources that give biased information. The revealed information sources

here are pharmaceutical company brochure. This is premised on the fact that this study presented the respondents with a picture of a non-holistic DIS concept. This will impart on the quality of pharmaceutical care that is discharged in the area based on consequent respondents' acclaimed limitations on DIS provision. This outcome is similar to an earlier study conducted in Palestine in 2003 [15]. Pharmacists who are custodian of drugs and all composite information discharge their duties with poor access and inadequate practice of storage and retrieval of current research outputs. This impinges on the quality of their counseling on use of medicines.

The use of the internet or web via phone-linked surfing has been reported to be an increasing trend by professionals as a health information tool for answering health-related questions [16]. This study has revealed a high frequency of respondents relying on the internet for their DIS provision. Information on the web has been largely reported to be unregulated, therefore the practitioner must be apt to make reliable decisions based on the information surfed. Respondents in the study area had a high frequency for using pharmaceutical leaflets for DIS provision. A similar study in Malaysia, aimed at identifying the types of DIS resources used by community pharmacists had 82% using drug information leaflets provided by drug manufacturers and possibly take home jotters and seminar brochures for DIS provision. In as much as these suffice, the correctness and validity of claims on drugs may not be absolutely reliable as these are not peer-reviewed information. They however come in handy for timely answers to related questions [17, 18, 19].

The inter-professional collaboration on DIS provision and transfer of drug information within an area is similarly deficient. A study by Alrasheedy and Ibrahim in Nepal seeking to evaluate the role of community pharmacists in adverse drug reaction (ADR) reporting, presents a scenario where information on drug use, safety and possible ADR are in an organized manner in the area incorporating the hospitals and tertiary care centres. In the study area, a loose structure of inter-professional consultation exists [20, 21].

The availability of qualified and dedicated staff was evidently an issue at the time of this study. This could translate to poor pharmaceutical care service delivery and consequently dissatisfied clients [22]. There is need for an upgrade of the service provision in the study area as to come in

tandem with the best practices in other climes. The result of this study showed that training on DIS provision is lacking for the pharmacists in the study are [17, 18, 21]. This means that the importance of DIS provision and the need to undergo training for its effective discharge is not evident in the study area. Respondents have reported that the cost of discharge of DIS service can be a challenge. This cost includes training and other related expenses.

It was observed in this study that manual information management system had a strikingly high frequency and was majorly employed. This has been known to be associated with slower and uneasy information storage and retrieval [23, 24]. The use of computerized/electronic documentation system has been known to facilitate efficient discharge of services as similar enquiries can be met with similar responses just by the tap of a button. The cost of installation of this information management system however can be an extra burden to the financial commitment of the business.

Any serious minded DIS provider may approach the modified systematic approach (MSA) for quality DIS. The poor concept of practitioners on the embodiment of DIS provision as well as their practice style is seen as being far from MSA for quality DIS delivery. Drug information centres may use this system or an adaptation as a basis for responding to drug enquiries. The growing number of drugs and literature coming through everyday will make clinicians and all interested persons hard pressed to keep up with requests for drug information in an unbiased, up-to-date and objective manner.

## 5. CONCLUSION

This study has shown that practitioners across the state have a consistent fashion of resolution of enquiries on drugs and are not practicing the systematic DIS provision due to some inherent limitations.

## CONSENT

As per international standard or university standard, respondents' written consent has been collected and preserved by the author(s).

## ETHICAL APPROVAL

The study protocols were approved by University of Uyo Research Ethics Committee.

## COMPETING INTERESTS DISCLAIMER

Authors have declared that no competing interests exist. The products used for this research are commonly and predominantly use products in our area of research and country. There is absolutely no conflict of interest between the authors and producers of the products because we do not intend to use these products as an avenue for any litigation but for the advancement of knowledge. Also, the research was not funded by the producing company rather it was funded by personal efforts of the authors.

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