

**Type of Article:** Original Research Article

**A Cross-Sectional Questionnaire-Based Study to Find Out the Knowledge and Awareness of Community Pharmacist and Physician about Drug Information Center (DIC) and Its Services**

**Running title:** Knowledge and Awareness of Community Pharmacist and Physician About Drug Information Center

**ABSTRACT**

**Background:** Drug information centre (DIC) is a facility specially developed to provide relevant, accurate and unbiased drug information (DI) to consumer and health care professionals regarding the proper use of the drugs, drug safety and all the critical problems regarding the drug information of their usage and side effects.

**Objective:** The present study was about to access the knowledge of the primary care physicians and community pharmacists about the DIC and its facilities and to spread awareness regarding the same. **Methodology:** A cross-sectional, questionnaire-based study was conducted among the 88 participants of Vadodara city, Halol-Kalol town for 6 months of period. 68 pharmacist and 20 physicians took part in the study from these cities. The data was further analysed by comparing the available data and resource to find out the awareness regarding the DIC.

**Result:** During the study duration, a total of 88 participants took part in the study from various out of them 68 (77%) were community Pharmacist, and 20 (23%) were primary care physicians. In the end of the study, 48 (70.2%) pharmacist and 10 (50%) physicians know about the following data of DI, DIC, DIQ (Drug Information Query), resources and the role of pharmacist in DIC and it was clearly evaluated that the knowledge about the DIC, DI, DIQ was not thoroughly available for the pharmacist and physicians.

**Conclusion:** The present study concludes that the awareness about Drug Information Centre (DIC), Drug Information, and its value and importance is not as much as it should be in Vadodara city, Halol-Kalol. Several awareness programme should be carried to bring the importance and value of DIC in limelight and to make it accessible easily for all to decrease several drug related problems.

**Keywords:** Drug Information Centre, Drug Information, Drug Information Query, Community Pharmacist, Primary Care Physician

**Introduction:**

Drug information is defined as identifying cost, use and pharmacokinetics to dosage and adverse effects of drugs and medication. It is also known as Medication Information or Drug Informatics. Drug information centre (DIC) is a facility specially developed to provide proper drug information and to note, report and solve various drug related problems. The purpose of the drug information centre is to provide relevant, accurate and unbiased drug information to consumer, physicians, doctors and other health care professionals regarding the proper use of the drugs, drug safety and all the critical problems regarding the drug information of their usage and side effects. It clearly includes use of medication which varies with different age group of people and dose. Information should be patient specific or relative to group of patients regarding providing proper clinical and therapeutical guideline of medicines, reporting of ADR in Pharmacovigilance centre and its analysis, publication of leaflets which provides information on drugs, or updating an application or website. Information on drug is mainly provided by Pharmacist and explaining information on drugs is a must role of every pharmacist which encourage patients to take medications with proper dose and frequency. Information provided by the pharmacist brings a change in health care environment with a focus on evidence-based medicine and evaluation of outcomes, the sophistication of medical therapy and healthcare movement. Drug information is an aid to physicians in making decisions about treatment options about most appropriate medication for the patient with appropriate dose. [1] The efficient use of Drug Information (DI) is an important skill for all pharmacists to have regardless of their practice site. Pharmacist are recognised as drug experts and as a provider of DI. They know how to provide accurate and complete response to the DI request. Technology has brought the DI at ease and accessible to everyone. [2]

Drug information centre (DIC) is a facility specially developed to provide proper drug information and to note, report and solve various drug related problems. The purpose of the drug information centre is to provide relevant, accurate and unbiased drug information to consumer, physicians, doctors and other health care professionals regarding the proper use of the drugs, drug safety and all the critical problems regarding the drug information of their usage and side effects. DIC also provides several sources of crucial drug information of the drug to meet the need of the practising physician, pharmacist and other health care professional. This combine actions of the drug information centre are collectively called as Drug Information Services. In drug information centre the drug information is mainly provided by Pharmacist, but it requires the guidance and support of various health care professionals to compete the need. First drug information centre was opened in 1962 at university of Kentucky medical centre and was chosen as centre of delivering the drug information. First DIC of India was opened by Karnataka State Pharmacy Council (KSPC) in 1997. WHO with the help of collaboration with KSPC established five DIC in Haryana, Chhattisgarh, Rajasthan, Assam, Goa. Drug Information Centre also provides services such pharmacovigilance centre (Adverse drug reaction and Adverse Event Reporting), patient counselling, clinical research and also produce review by giving information regarding the proper use of drug. [3]

The condition of the DIC in India is at very poor stake and has to be promoted to increase awareness and use of the facility. The present study was about to access the knowledge of the primary care physicians and community pharmacists about the DIC and its facilities and to spread awareness regarding the same.

### **Methodology:**

This study was conducted for 6 months among the Community Pharmacists (CPs) and Primary Care Physicians (CPCs) of town Halol and Kalol and certain areas of Vadodara city. Prior to initiation of the study, obtained ethical approval from the Sumandeep Vidyapeeth Institutional Ethics Committee (SVIEC).

### **Study design:**

This was a questionnaire-based cross-sectional study conducted in a community setting. The main participants in the study were all Community Pharmacists (CPs) and Primary Care Physicians (CPCs) working in a community setting during the study period and are selected based on qualification. In this study, several different types of

questions related to the knowledge about DIC were asked in different forms to make it at ease for the participant to understand and answer. The questions asked were in form of general questions, multiple choice questions and descriptive questions. Demographic details were collected from the study participants. After explaining to the participants, the details of the study, the Informed consent form was taken. Participants were assured that their information will be kept confidential.

#### **Development, validation, and distribution of survey questionnaire:**

A questionnaire-based cross-sectional survey has included different types of questions [Tables 1-2] in the English language related to knowledge about DIC among Community Pharmacists (CPs) and Primary Care Physicians (CPCs) and was formulated using reference material from a similar type of study. The survey covered the domains of demographics, knowledge based on DIC. The developed draft questionnaire was validated by face and content validation method by the three selected physicians and three selected faculty members to assess its readability and validity before pretesting among five randomly selected medical doctors for clarity, significance, and acceptability. Modifications and refinements were made as per the comments received to enable better understanding and to organize the sequence of questions. On the day of the data collection, structured and prevalidated questionnaires were distributed to the Community Pharmacists (CPs) and Primary Care Physicians (CPCs) who gave consent for participating in the study.

#### **Content of the survey questionnaire:**

The survey comprised several different types of closed-ended questions related to the knowledge about DIC which takes about 30 min to complete.

#### **Data collection:**

All the participants were well informed about the study, and the reminder card was sent 1 day before providing the questionnaires. On the day of the data collection, structured and prevalidated questionnaires were distributed to the participants who gave consent for participating in the study. As per the participants feedback after validating questionnaire, necessary amendments were made to the questions before the main study. The responses of all participants were included in the analysis.

#### **Statistical analysis:**

Descriptive statistics was used to analyze the demographics of the participants and respective answers on different categories of the questionnaires.

### **Result:**

**Demographic data:** A total of 88 participants were included in this study. Out of 88 participants, 68 (77%) participants were pharmacist and 20 (23%) participants were physicians. Comparing the gender proportionality, male represents N=72 (82%) and female represents N=16 (16%) of the total population. In our study, the age varies from 21-70 years with mean age of  $17.6 \pm 14.93$  years. The maximum number of participants were from the age group of 21-30 years [41 % (N=36)] followed by age group 31-40 years [34% (N=30)] and lastly the least number of participants were found in age group of 61-70 years [1%(N=1)].

In this study, duration of establishment of clinic or pharmacy store varies from less than 1 years to more than 30 years. The maximum number of pharmacy stores and clinics were operating from 1-10 years N=43 (48.86%) followed by 11-20 years N=33 (37.5%) the least duration of pharmacy stores and clinics were found during more than 30 years N=1 (1.13%).

**Distribution according to Locality:** The study was conducted in different locations such as Vadodara, Halol and Kalol to know about the awareness of Drug Information Centre. In Vadodara the number of pharmacists [N=40 (45.5%)] and physician [N=18 (20.45%)] was included. Similarly, in Halol the number of pharmacists [N=20 (22.72%)] and physicians [N=2 (2.27%)] were also included. In Kalol also the number of pharmacists [N=8 (9.09%)].

**Distribution on basis of educational background:** In this study, the education background of participants was also recorded. For pharmacist, the participants mainly from D. Pharm graduates [N=33 (48%)] followed by B. Pharm graduates [N=29 (39%)] and least from M. Pharm graduates [N=9 (13%)]. For physicians, the maximum number of participants from BHMS graduate [N=10 (11.36%)] followed by BAMS graduate [N=7 (11.36%)] and least from MBBS graduates [N=2 (2.27%)].

**Questionnaire data:** In this study, several different types of questions were asked in different forms to make it at ease for the participant to understand and answer. The questions asked were in form of general questions, multiple choice questions and descriptive questions. General questions: these were direct questions with the option

included yes or no and were to be answered in direct manner of an opinion or the answer. Multiple choice questions: This type of questions was directly relevant and to the question and were asked in the manner to access the knowledge of the participant and to know the opinion regarding the new concept of the drug information centre. Participants were allowed to choose multiple answer in one each multiple-choice question according to their knowledge. Descriptive questions: These questions were descriptive answer type to answer the question in descriptive manner whether in the form of opinion or as a direct answer to the question according to the knowledge. Some questions were independent questions while some were related to the previous question their answers were to be dependent upon the previous answer given.

In this study, general questions covered the major part of the study this study, out of the overall questionnaire the general questions included all the direct questions accessing the know about drug information, DIC, drug information query, resources and importance of pharmacist in DIC out of overall result of the following 72% participants were aware about the following information's. While 18% were not known to these terms or have encountered this for the first time.

In this study, the bifurcation of the result of data on the basis was done that showed that out of 68 (100%) pharmacists almost 48 (70.2%) pharmacists know about the following data of DI, DIC, DIQ, resources and the role of pharmacist in DIC. While other 20 (19.8%) pharmacist were not aware about the following terms. In this study, out of 20(100%) physicians on an average 10(50%) physicians knew about the following information while other 10(50%) were not aware with these terms.

**Table 1: Overview of assessment of knowledge on the basis of general questions for all responses and bifurcates answered by pharmacist and physicians**

Question	All Response		Pharmacist		Physician	
	Yes	No	Yes	No	Yes	No
Do you know what Drug Information is?	81	7	65	3	16	4
Do you know what DIC is?	55	33	49	19	6	14
Have you ever encountered a Drug Information Query From	73	15	61	7	12	8

your consumers /patients?						
Have you ever Asked a Drug Information Query/Question to any one?	66	22	57	11	9	11
Have you ever heard about Drug Information Pharmacist?	48	40	41	27	7	13
Do you know how a drug information pharmacist answers to your question in DIC?	33	55	28	40	5	15
Do you know what the various Drug Information Resources are?	45	43	35	33	10	10
What is your opinion about establishing A Drug Information Centre?	67	21	53	15	15	5
If your opinion, weather the establishment of DIC will be beneficial to the community pharmacist and primary care physician?	54	34	41	27	13	7

In this study, several multiple choices questions were included regarding the objectives, queries to be taken in DIC and their reference of the knowledge regarding the medication use, and through data the result for pharmacist the most common answers found were the main objective according to them were to counsel patients and physicians, and they usually ask questions such availability and dose, and they mainly ask to their fellow pharmacist or physician.

**Table 2: Overview of assessment of knowledge on the basis of multiple-choice questions answers selected by pharmacists and Physicians.**

Questions	Pharmacist					Physician				
	A	B	C	D	E	A	B	C	D	E
Do you know what are the objectives	40	10	11		7	10	4			6

of DIC?										
Have you ever encountered a drug information query from your consumers or patients? If yes, what kind of question they usually ask?	20	22	19	2	5	5	10	3		2
Have you ever asked a drug information query or question to anyone? If yes, whom you asked?	30	26	6		6	8	3			9
Have you ever asked a drug information query or question to anyone? What kind of questions you usually ask?	28	33	5	1		11	4		2	3
DIC answers queries raised by?	48	4	8		8	14				6
What is your opinion about establishing drug information centre? If yes?	40	11	6		11	9	5	1		5

**Note:**  
E=Not  
provid  
ed any  
respon  
se/  
Don't

know

In this study, the questions were also filled by the physicians, the response in physicians though was quite different as they mainly enquire about the availability and according to their knowledge the main objective of DIC is to counsel patients. And the main reference for the knowledge about medication is their fellow physicians and the pharmacist.

In this study, several descriptive questions such as knowledge about different drug information resources and their opinion over the main objective of DIC were asked to access the knowledge. And very common answers including several drug resources such as Micromedex, drugs.com, internet and textbooks such answers were obtained while, in opinion the main objective of DIC was told to be the counselling of patients and information about new drug in market.

**Table: 3 Drug Information Centre (DIC) Awareness Questionnaire**

Location:
Name of Physician/Pharmacist:



Name of Clinic/Pharmacy Store:						
Gender	<input type="checkbox"/>	Male	<input type="checkbox"/>	Female	Age:	
Degree	<input type="checkbox"/>	D.Pharm	<input type="checkbox"/>	B. Pharm	<input type="checkbox"/>	M.Pharm
	<input type="checkbox"/>	Pharm D	<input type="checkbox"/>	MBBS	<input type="checkbox"/>	MD
	<input type="checkbox"/>	BAMS	<input type="checkbox"/>	BHMS	<input type="checkbox"/>	Other (Specify)
Description:						
Year of Graduation:						
Duration of Clinic/Pharmacy Store:						
<b>No.</b>	<b>Questions</b>					
1	Do you know what drug information is?					
	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No		
2	Do you know what DIC is?					
	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No		
3	Do you know what are the objectives of DIC?					
	<input type="checkbox"/>	To provide drug related information.				
	<input type="checkbox"/>	To report ADRs.				
	<input type="checkbox"/>	To counsel patients about their medications.				
4	Have you ever encountered a drug information query from your consumers or patients?					
	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No		
4a	If yes, what kind of questions they usually ask?					
	<input type="checkbox"/>	About dose	<input type="checkbox"/>	About frequency/ duration		
	<input type="checkbox"/>	About side/ adverse effect	<input type="checkbox"/>	Other (Specify)		
5	Have you ever asked a drug information query or question to anyone?					
	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No		
5a	If yes, whom you asked?					
	<input type="checkbox"/>	Physician	<input type="checkbox"/>	Follow Pharmacist		

	<input type="checkbox"/>	Manufacturer	<input type="checkbox"/>	Other (specify)		
	Description:					
5b	What kind of questions you usually ask?					
	<input type="checkbox"/>	Dose	<input type="checkbox"/>	Duration/Frequency		
	<input type="checkbox"/>	Price	<input type="checkbox"/>	Availability		
6	Have you ever heard about Drug information Pharmacist?					
	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No		
7	Do you know how a drug information pharmacist answers to your question in DIC?					
	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No		
7a	If yes, then specify.					
8	DIC answers the queries raised by?					
	<input type="checkbox"/>	Physicians	<input type="checkbox"/>	Pharmacists	<input type="checkbox"/>	Nurse
	<input type="checkbox"/>	Patient	<input type="checkbox"/>	All the above		
9	Do you know what are the various drug information resources?					
	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No		
9a	If yes, then specify as per answer given?					
10	What is your opinion about establishing drug information centre?					
	<input type="checkbox"/>	Necessary	<input type="checkbox"/>	Not required		
10a	If yes.					
	<input type="checkbox"/>	should be in every hospital				
	<input type="checkbox"/>	should be in state pharmacy council				
	<input type="checkbox"/>	should be in a pharmaceutical company				

11	Role of Drug Information Center?			
12	If your opinion, whether the establishment of a DIC will be beneficial to the community pharmacist and primary care physician?			
	[ ]	Yes	[ ]	No
13	What is your expectation from DIC?			

### Discussion:

Drug Information Centre (DIC) is considered to be a specific facility to provide the Drug Information related to any of the medication their counselling points and the use usage of the drug in proper manner. A drug information centre is specifically designed to have such a wide perspective of knowledge about the medication such that it can complete the proper need of the information at the time, of the society and the health care professionals to create a proper therapeutic perspective of the medication and to achieve the proper goal of the clinic effect and the better life of the patient. DIC being a very new concept right now it is not in the limelight and its usage is not as being promoted as it should be. The present study evaluates the awareness among the community Pharmacists and primary care physician of Vadodara city, Halol- Kalol town about the concept and usage of DIC. We collected data from almost 88 participants out of which 68 were community pharmacists and 20 were primary care physicians, comparing the gender proportionality male participants were N=72 while female participants were F=18. From this bifurcated data of the pharmacist and physicians we found out the educational background which among pharmacist mainly were D. Pharm graduates [N=33 (48%)] followed by B. Pharm graduates [N=29 (39%)] and least were M. Pharm graduates [N=9 (13%)]. For physicians, the maximum number of participants were BHMS graduate [N=10 (11.36%)] followed by BAMS graduate [N=7 (11.36%)] and least were MBBS graduates [N=2 (2.27%)]. The age varies from 21-70 years with mean age of 17.6±14.93 years. The maximum number of participants were from the age group of 21-30 years [41% (N=36)] followed by age group 31`-40 years [34%(N=30)] and lastly the least number of

participants were found in age group of 61-70 years [1%(N=1)]. The duration of the pharmacy store and clinic was bifurcated which helped a lot to gain knowledge from the experience, duration of establishment of clinic or pharmacy store varies from less than 1 years to more than 30 years. The maximum number of pharmacy stores and clinics were operating from 1-10 years N=43 (48.86%) followed by 11-20 years N=33 (37.5%) the least duration of pharmacy stores and clinics were found during more than 30 years N=1 (1.13%).

In this study, carried out in Vadodara city, Halol-Kalol town. The basic general knowledge of the pharmacist and physicians regarding the DIC and its functions among

the participants were found to be 72% which is more than the study carried out by Harshad kesari at which was 32%. [4]

We have also accessed some various opinions from the participants regarding their opinions about the DIC and about its establishment and specifically their main sources of knowledge for any drug query. Several pharmacists depend upon several websites which are either not authorised to officially design or designated to provide such information. Several answer including the response of the names such as Micromedex.com, Drugs.com etc. and main sources considering for the information being a fellow pharmacist or the physician. From the various opinions received about the establishment of the DIC a main opinion was to open it up at hospital and being the place were patient friendly and pharmacist friendly it can be useful to bring the change in the environment and to change the current drug scenario in the nation. A common and widely perspective DIC with proper set of information and providers is a necessary part and is being welcomed

## **Conclusion**

Drug Information Centre (DIC) is considered to be a specific facility to provide the Drug Information related to any of the medication their counselling points and the use usage of the drug in proper manner. DIC being a very new concept right now it is not in the limelight and its usage is not as being promoted as it should be. The main objective of the study was evaluating the awareness among the community Pharmacists and primary care physician of Vadodara city, Halol- Kalol town about the concept and usage of DIC. Out of 88 participants 68 (77%) were pharmacist while

20(23%) were primary care physicians. In this study the questionnaire was bifurcated on several parts to assess the knowledge of the participants. This was into General question regarding the DIC and its usage, core questions regarding the subject, while some were opinion questions to ask about their opinion about the need of the DIC. The result states out of all 72% participants know about the general information about the DIC. While regarding the core questions about the DIC 68% participants knew about this. While several participants opted to give their feedbacks and opinions regarding the establishment of the DIC. Further analysis of the answers revealed that the participants were welcoming. Thus, from this study, it can be concluded that, the increasing in the misuse and adverse of the medication can be only be tackled with proper knowledge and with a source providing it to the society. The awareness regarding the DIC in the Vadodara city, Halol-Kalol town is delinquently good and it can be useful in further times to bring the concept to the city. But prior a proper awareness and knowledge is to spread to all the respective pharmacist and physicians in the city regarding the DIC and its usefulness to keep them aware and updated regarding this and they can access this opportunity for the better health care of the patients and for the betterment of the society.

#### References:

1. Library Guides: Finding Drug Information: Home [Online]. Guides.lib.uw.edu. 2019. Available from: <https://guides.lib.uw.edu/hsl/drugs>. [cited 30 July 2019].
2. Harper m, May j. Introduction to the concept of medication information [Online]. Access pharmacy. Available from: <https://accesspharmacy.mh.medical.com>. [Cited 10 March 2019].
3. Rajanandh m. drug information-srm University [Online]. Welcome to SRM Institute of Science and Technology (formerly known as SRM University) – India’s Premier Educational Institution. 2019. Available from: <http://www.srmuniv.ac.in/>. [cited 10 March 2019].
4. Kumar MM, Sowmya B, Dinesh R, Karthik M, Nagar AK, Yogananda R, Amanpathan S. Evaluation of performance of drug Information center providing quality of information services to healthcare professionals in a tertiary care teaching hospital of south India. *Innovations in Pharmaceuticals and Pharmacotherapy*. 2013;1(2):81-90.

UNDER PEER REVIEW