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Drug Information Resources in Iraqi Community Pharmacies (Conference Paper)

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Abstract

Drug information resources are the information that is used in medications discovery, utilization, and management. Little information about different types of resources used by Iraqi community pharmacists is known. Therefore, the objectives were to determine drug information resources' type do the pharmacists used and the common drug information questions they faced during their work in community pharmacy. A cross-sectional descriptive study was conducted in different Iraqi provinces and online self-reported survey was introduced through Google Form Software to an appropriate sample of graduated pharmacists who were working in a private community pharmacy and having at least one year of experience between February 27 and May 15, 2021. The researchers received 402 usable surveys. British National Formulary was used by (47%) of the surveyed pharmacists to find specific information, followed by "Pharmacotherapy(s) and Applied Therapeutics" (16.9% for both). On the other hand, internet was used by (93%) of the surveyed pharmacists and Google search engine (65%) and Medscape application (62%) were frequently surfed to find specific drug information and (81%) of pharmacists trusted in this information and passed them to consumers. Safety of drugs during pregnancy and lactation periods was the most frequently question received from the patients (60.7%). In conclusion pharmacists prefer to surf specific internet websites to collect specific information about medicines and they referred to pharmaceutical textbooks if available at their pharmacies to get such information. The pharmacist is the person who is more often accessed by patients and the patients follow pharmacist's instruction for specific drug related questions.

Keywords: Information, Community pharmacy, Resource, Iraq, Internet.

مصادر المعلومات الدوائية في صيدليات المجتمع في العراق (بحث مؤتمر)#

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 # المؤتمر العلمي العاشر لكلية الصيدلة، جامعة بغداد ٢ – ٣ حزيران٢٠٢٢

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الخلاصة

مصادر المعلومات الدوائية هي المصادر المختصة بتوفير معلومات موضوعية وحديثة عن الأدوية واستخدامها. على الرغم من أهمية هذه المصادر المتنوعة وتوافرها الا ان القليل منها معروف ويشيع استخدامه من قبل الصيادلة في العراق. هدفت هذه الدراسة لتحديد مصادر المعلومات الدوائية التي يستخدمها الصيادلة بالإضافة للأسئلة الدوائية الشائعة التي واجهوها أثناء عملهم في صيدليات المجتمع. أجريت هذه الدراسة المجتمعية المستعرضة في عدة محافظات عراقية خلال الفترة من ٢٧ شباط ٢٠٢١ الى ١٥ ايار ٢٠٢١. تم جمع المعلومات عبر الإنترنت عن طريق استمارة استبيان تم اعدادها من قبل المؤلفين اعتمادا على الادبيات المنشورة في هذ المجال وتم توزيعها عبر برنامج نماذج جوجل وشملت عينات ملائمة من الصيادلة المتخرجين الذين يعملون في صيدلية خاصة ولديهم خبرة لا تقل عن عام واحد. اربعمئة واثنين استطلاعاً تم استلامها. تواجد كتاب الوصفات الوطنية البريطانية في (٤٧٪) من الصيدليات التي شملتها الدراسة، يليه كتاب العلاج الدوائي والعلاجات التطبيقية (١٦,٩٪ لكليهما). من ناحية أخرى، تم استخدام الإنترنت من قبل (٩٣٪) من الصيادلة الذين شملهم الاستطلاع، (65% و٦٢٪) منهم اعتمدوا محرك البحث كوكل وتطبيق مدسكايب للعثور على معلومات دوائية محددة ونسبة عالية من الصيادلة كانوا يثقون بالمعلومات المتوفرة في هذه المواقع. كانت سلامة استعمال الأدوية أثناء الحمل والرضاعة من بين الأسئلة الأكثر تلقيا من المرضى. يستنتج من هذه الدراسة تفضيل الصيادلة لتصفح مواقع إنترنت محددة للحصول على معلومات موثوقة عن الأدوية بالاضافة إلى الكتب الصيدلانية إذا كانت متوفرة في صيدلياتهم للحصول على هذه المعلومات كون العديد من المراجعين يثقون بالمعلومات المقدمة من قبل الصيدلاني ويعملون على تطبيقها.

الكلمات المفتاحية: المعلومات، صيدلية المجتمع، المصادر، العراق، الانترنيت

Introduction

Drug information (DI) resources, also called medication information, drug information, or sometimes drug informatics, are basically included discovery, utilization, and management of information in the medications usage. They should include the identification, pharmacokinetics, cost, and dose in addition to adverse effect profile of medicines[(1)].

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Drug information resources were defined by other authors as "a resource dedicated to provide objective, independent and current information on drugs and their use, and communicate to the different categories of users for better understanding and benefit of patients"[2].

Three categories of DI resources are available depending on their originality: primary, secondary or tertiary[3]. Primary DI sources are the original resources on which the study is based. These include scientific articles and journals showing the results of the experimental research, meetings proceedings, symposia and conferences, patents, dissertations, and technical reports[3]. Note that not all journal articles are regarded as primary literature, such as review articles that summarize the literature; these are categorized as tertiary resources[4]. Upon publishing, the information of primary resources serves as the basis for secondary DI sources. They belong to indexing and abstracting systems that are organized and provided easy method of retrieving primary resources. These involve indexing and abstracting systems, medline database search, works of criticism and interpretations, or otherwise 'add value' to the newly reported primary literature information[5]. Tertiary DI sources involve summary of data that was retrieved from the primary literature. They are represented as reference textbooks, pharmacopoeias, treatment guidelines, list of essential drugs, drug bulletins, drug formularies, and drug compendia[6]. The best DI sources are those that provide highly accurate and relevant information which is simple to be applied[7].

Appropriate DI is vital for pharmacists in order to correct the use of drugs and to improve patient outcome. Common situations in community pharmacy like adverse reactions of drugs, the use and safety of drugs during pregnancy and lactation periods, and drug-drug interactions need the access to DI sources[8]. The International Pharmaceutical Federation (FIP) states that " It is the responsibility of the pharmacist to ensure that the patient receives the required information for the quality use of medications ". In contrast to this, failure to provide high quality drug information may lead to several detrimental results[9]. An Ethiopian study reported that lack of appropriate DI that is belonged to the adverse effects among the populations led to high level of self-medication practice[10]. Another Ethiopian study reported that (76%) of 50 prescribers enrolled reported to have an access to up-to-date DI, while from 30 pharmacists, (43.3%) did not get any access to such DI[11]. Also, from a total of 1875 pharmacists enrolled in a Jordanian study, only one-fifth of them stated that they depend on DI lists for specific information[9].

As the pharmacists were became the primary source of information on medicines and had the respect as well as appreciation of the healthcare team providers everywhere in the world; they should maintain their frontline position as information experts and providers, they must provide accurate, precise, current, and unbiased information and must be extremely effective, skilled, and competent when looking for and providing such information[12]. It has been indicated that DI provided by pharmacists in the settings of community pharmacy are usually associated with better patient satisfaction with pharmaceutical care services[13]. In addition to that, it has been reported that patients do usually have a wide variety of questions about their medicines; even though the internet is becoming a significant source of information, the pharmacist can still be extremely helpful in giving patients DI about their medications[14].

Little is known about the types of DI sources frequently used by pharmacists in Iraq, despite the significance and accessibility of a variety of DI sources for healthcare provider members; therefore the objectives of the current study were to find out the type of DI resources do the community pharmacists in Iraq were used to find specific drug information in addition to determine the most common drug information questions they faced during their work in community pharmacy.

Subjects and Methods

This cross-sectional descriptive study was done in different Iraqi provinces by using a web-based self-reported electronic survey that was introduced through Google Form Software. The survey link was electronically distributed through different social media groups (Facebook, Whatsapp, Telegram) of Iraqi pharmacists only between February 27 and May 15, 2021. Inclusion criteria involved graduated pharmacists who are working in a private (community) pharmacy and having worked at the same pharmacy for at least a year.

Approximately 20,000 pharmacists were registered in Syndicate of Iraqi Pharmacists at the time of the study. Based on this and using a confidence interval of 95%, a standard deviation of 0.5, and a margin of error of 5%, the minimum sample size required was 290 pharmacists.

No validated questionnaires in this context were available. Consequently, a standardized questionnaire was developed by the authors based on available literatures. The questionnaire was first developed to obtain general data (gender, age, experience duration, location and type of the pharmacy, and graduation degree), accessible DI resources, how often you access them, the availability of tertiary textbooks in the pharmacy, the use internet for DI purposes and the most common websites used for them, and the kinds of questions that the patients asked the pharmacists who were surveyed.

The pretest (pilot study) for the survey was conducted in February 2021 to assess the clarity of the data that would be gathered. There were no

incentives provided. The survey taken was both voluntary and anonymous. This study was approved by the Research Ethics Committee at the College of Pharmacy at Tikrit University, Sallahaddin, Iraq (No. 2021 – 10).

The data were reviewed, organized, tabulated and analyzed by using SPSS version 23. Continuous variable are expressed by using their mean ± standard deviation (SD), while discrete variables were presented using their number and percentages.

Results

Only 402 of the total of 472 surveys that the researchers received were usable (because some of the participants were not graduated pharmacists and some had less than one year of experience at their pharmacy). Pharmacists from seventeen Governorates in Iraq were participated in this survey and pharmacists from Baghdad had the highest percentage of participants (40.3%) followed by pharmacists from Sallahaddin (17.4%), Diyala (7%), Kirkuk (6.5%) and Babil (5.5%). The remaining participants from other Governorates are represented in Table 1.

The mean ages for these participants were (29.76 ± 4.652) years. Approximately three-quarters (64.4%) of the participants were less 35 years, of them, 218 (54.2%) were females. The vast majority of the participants (92%) were gained a bachelor degree. Two hundred and ninety two pharmacists were worked in pharmacies presented in urban area while the remaining 110 pharmacists were worked in those presented in rural area. More than half of these pharmacies (62.2%) were offered both prescriptions only and over the counter medications while the remaining (29.6% and 8%) were offered over the counter medications and prescriptions only medications respectively. These data are expressed in Table 2.

Table 1. Number and percentage of pharmacists who participated in this study with their Governorate (*n* = 402)

Governorate	No.	%
Baghdad	162	40.3
Sallahaddin	70	17.4
Diyala	28	7.0
Kirkuk	26	6.5
Babil	22	5.5
Karbala	16	4.
Thi-Qar	14	3.5
Basra	12	3.0
Najaf	10	2.5
Ninevah	8	2.0
Wasit	8	2.0
Maysan	8	2.0
Other*	24	4.5

*: Participants from Al-Anbar, Dohuk, Sulaymanyya, Erbil and Muthana.

Table 2. General information of pharmacists and their pharmacies (*n* = 402).

Parameter		No.	%
Age (years)	25 - 35	260	64.4
	35-45	126	31.4
	More than 45	16	4.0
Gender	Male	184	45.8
	Female	218	54.2
Academic degree	Bachelor	370	92.0
	Master of science	22	5.5
	Doctor of Philosophy	10	2.5
Pharmacy location	Urban area	292	72.6
	Rural area	110	17.4
Pharmacy type	Prescription medication only	32	8.0
	Over the counter medication only	120	29.6
	Both types	250	62.2

The available tertiary textbooks resources in the pharmacies reported in this study were the “British National Formulary” (BNF) (47.3%) followed by "Pharmacotherapy(s) and Applied Therapeutics" (16.9% for both).

The "Drug Information Handbook and Iraqi Drugs Guide" were available in the (15.9% and 15.4% respectively) of the included pharmacies. Figure 1 shows other resources.

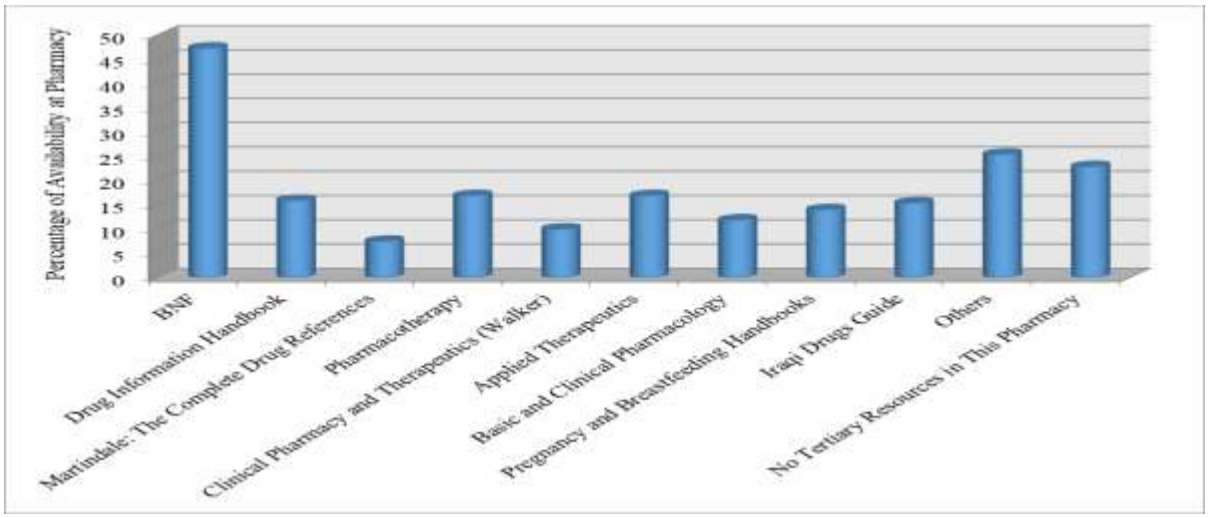

Figure 1. Tertiary textbooks available in the pharmacy where the participants currently in (a hard copy or soft copy).

In order to find specific drug information, (93%) of the enrolled pharmacists used the Internet during work time; on the other hand (7%) never used it for DI purposes as shown in Figure 2.

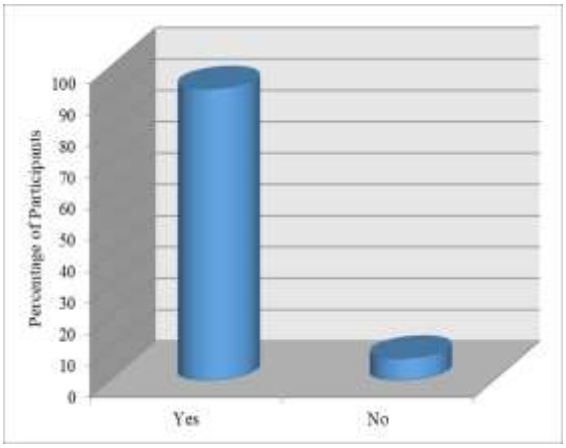

Figure 2. Percentage of participants using the internet during working hours in the pharmacy to find a specific information for certain drug.

For the majority of the time, pharmacist enrolled searched for DI using general search engines like Google (65.2%),while Medscape was relied on by (62.7%), Wikipedia by (25.9%), Drugs.com by (24.9%), WebMD by (18.4%), Mayo Clinic by (13.9%) and Food and Drug Administration (FDA) by (10.4%) as shown in Figure 3.

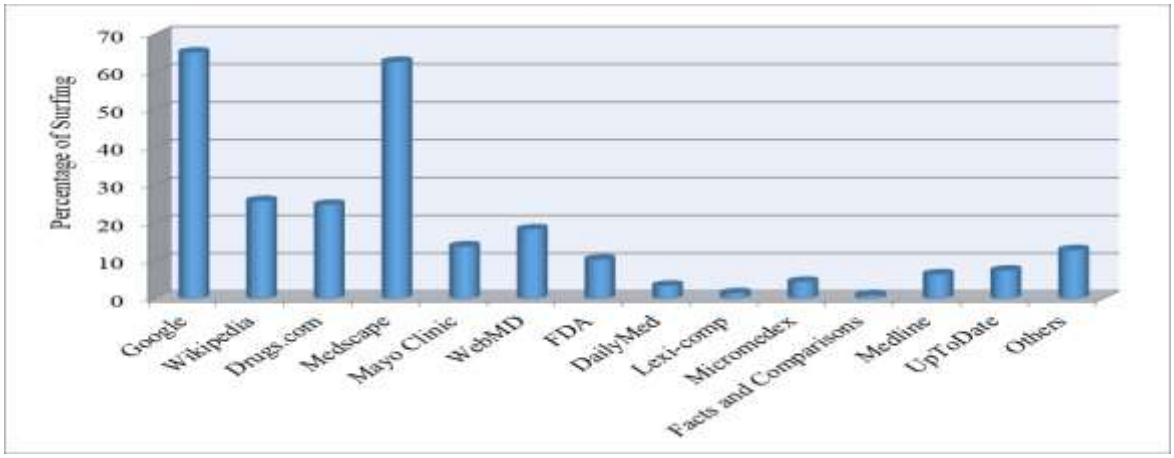

Figure 3. Web sites the participants most commonly surfed to find specific drug information during working in the pharmacy.

When asking the pharmacists " Do you trust the drug information gained from the internet and forward it to the patients? (81.1%) of them answered with "yes" while the remaining (18.9%) answered with "no" as shown in Figure 4.

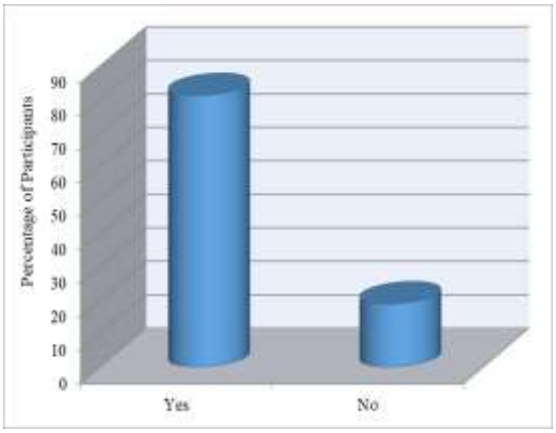

Figure 4. Percentage of participants trusting the drug information gained from the internet and forward them to the patients.

The most common type of questions received and forced the enrolled pharmacists to seek different DI resources to get an exact answer were those related to drug use and safety during pregnancy and lactation periods (60.7%) followed by the adverse effect of certain drug (51.2%), dose of certain drug (50.2%), drug interactions (46.3%), and pediatric safety (38.3%). Other requests are shown in Figure 5.

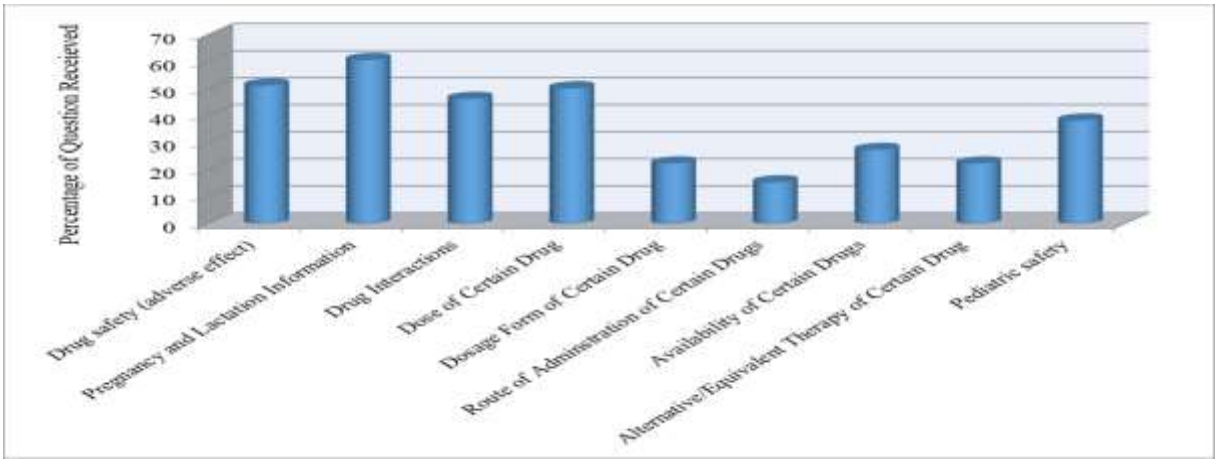

Figure 5. Questions the participants were received and looked for appropriate answer in different resources during working in the pharmacy.

Discussion

The results of advancements in healthcare lead to an increasing demand for pharmacists as primary DI providers to healthcare professionals and to the population. As professional support for pharmaceutical care, pharmacists should become the primary source of drug knowledge[15]. Patient care, medication error hazard, and medication compliance are all positively affected by pharmacist interventions. According to a recent Cochrane Database review, pharmacist intervention can improve patient behavior and compliance and improve physician prescribing in addition to the expanding role of pharmacists on improving patient outcomes, health care utilization, and cost[16].

The results showed that most of pharmacists participated in this survey were from Baghdad and this is related to the huge population in this city. Therefore, a large number of pharmacists were required to provide the appropriate pharmaceutical care for people. In addition, (54.2%) of the participants were females, their mean age was (29.76 ± 4.652) years and (64.4%) of these participants were less 35 years. The vast majority of the participants (92%) were gained a bachelor degree. In line with a study of Mohammed and Al-Razaq that was conducted in Baghdad city only, in which 150 pharmacists accept to participate in it, their age was ranging from 23 to 65 years and (42%) of these participants were less than 33 years. The participants' females had the highest percentages (56.7%) that were qualified as bachelor pharmacists (63.3%)[17]. While in Qadus et al study more than (80%) of the participants were less than 35 year-old, (68.5%) were females and (80%) were gained bachelor degree[9].

The study showed that BNF is the most available usable tertiary textbooks resources in the pharmacies (47.3%). In according with this result,

Al-Tabakha et al reported that all the pharmacists enrolled in their study were had and use the BNF for further information regarding medicines while working in community pharmacies [18]. In contrast, BNF was only (15%) available and ranked fourth among the surveyed community pharmacies in the study conducted in Kuwait[19]. The BNF is released twice annually (March and September). It provides concise, clear, and authoritative information on the selection and clinical use of medications. It also includes details about the medications offered in the United Kingdom, such as their pharmacology, dosages, side effects, and contraindications. It also includes information about their legal classification, proprietary names, and generic names, as well as the cost of the medications[18]. The BNF's accessibility can be partially attributed to the fact that most pharmacists are familiar with it and that it is less expensive than hardware and software DI resources. The other important resources like applied therapeutics and pharmacotherapy hand book. Possibly because clinical pharmacy bachelor courses of Iraqi pharmacy programs depend on these textbooks that the pharmacists were became familiar with them therefore (16.9%) of the pharmacies had these textbooks[20].

In response to the question: "do you use the internet during work in the community pharmacy to get a specific DI?" (93%) were replied "yes". The same result was reported by Al-Tabakha et al [18] while Jaradat and Sweileh reported that (29%) of the community pharmacies surveyed were had an internet access for DI[14]. Although there may be a huge of DI on the internet that isn't necessarily covered in textbooks, their quality is frequently in doubt[21]. Some pharmacists indicated that they did not use it for DI purpose due to the load during work hours or they didn't have to because they didn't have much faith in the internet-based information.

A sizable percentage of participants (65.2%) said they get their Internet DI from the Google search engine, followed by Medscape (62.7%). Next to e-mail and product research, search engines used to find health information on the web are listed as the third most popular Internet usage. Google is the one of these search engines that is used the most frequently[1]. On the other hand, Medscape is particularly useful for pharmacists since pharmacy-specific topics are addressed in a section of this application[1]. In a study evaluated online DI databases when answering infectious disease-specific queries, Polen et al reported that Medscape on top databases for completeness (95%) and answered significantly more questions compared to other databases[22].

In an open question "Do you trust the drug information gained from the internet and forward it to the patients?", the answer by relatively large proportion was "yes". Because websites offered by the government, universities, and non-profit organizations may offer good quality of DI, this demonstrates the widespread belief that internet websites contain high quality DI. However, the provided information ought to be current and backed up by pertinent references[23].

The most common type of information requested by the clients and provided by the pharmacists in this study were those related to drug use and safety in pregnancy and lactation periods (60.7%). This finding was also reported by Al-Tabakha et al [18] In contrast to this, a Palestinian study reported that the most common question reported was that related to drug price (30%) and only (6%) requested pregnancy and lactation drug safety information[14]. This could mean that patients in these various settings have a variety of concerns. Evaluating the safety of medicines in pregnancy or lactation is a challenge that most physicians will face at some time in their careers. Almost all women will want some type of drug therapy while they are pregnant or breastfeeding. Such questions may be passed to the pharmacists who care for women in their reproductive years on a daily basis. In fact, a pharmacist may be the first health care professional to meet a patient when she knows she is pregnant, or a physician may ask the pharmacist to recommend safer treatment options for pregnant and lactating females[24].

This study has limitations. It's possible that some of the targeted population was not included in the online survey, which would have limited the findings' ability to be generalized and the 402 surveyed pharmacists might not demonstrate the entire pharmacists working in Iraq at the time of the study. Also the response rate for this study could not be estimated, which may lead to nonresponse bias. Therefore, a careful interpretation of the findings is required.

In conclusion the study results reported that most of the pharmacists prefer to surf specific internet websites to collect specific information about medicines. At the same time they referred to pharmaceutical textbooks if available at their pharmacies to get such information. In addition to these findings, this study also reported that the consumers are more often accessed the community pharmacists and followed pharmacists for specific drug related questions. The pharmacist needs to be educated about the various DI resources and how to evaluate information obtained, particularly via the Internet.

References

1. Shields KM, Park SK. Drug Information Resources. In: Malone PM, Malone MJ, Park SK. eds. Drug Information: A Guide for Pharmacists 6e. New York, NY: McGraw-Hill; 2018.

2. Nova-Manosalva M.A., López-Gutiérrez J.J., Cañas M. Drug information centers: An

overview to the concept. Rev. Colomb. Cienc. Quím. Farm. 2016; 45(2), 243-255.
3. Alamgir, A.N.M. Origin, definition, scope and area, subject matter, importance, and history of development of pharmacognosy. In: Therapeutic use of medicinal plants and their extracts: Volume 1. Progress in Drug Research, 2017;(73). Springer, Cham. 2017.
4. Kier KL and Goldwire M. Drug information resources and literature retrieval. In: ACCP Updates in Therapeutics 2018: Pharmacotherapy Preparatory Review and Recertification Course 7th edition. American College of Clinical Pharmacy, 2018.
5. Anandabaskar, N. Drug Information. In: Raj, G., Raveendran, R. (eds) Introduction to basics of pharmacology and toxicology. Springer, Singapore. 2019; 223 – 234.
6. Chauhan N, Moin S, Pandey A, Mittal A, Bajaj U. Indian aspects of drug information resources and impact of drug information center on community. J Adv Pharm Technol Res. 2013;4(2):84-93.
7. Oxman AD, Paulsen EJ. Who can you trust? A review of free online sources of trustworthy information about treatment effects for patients and the public. BMC Med Inform Decis Mak. 2019;19(1):35.
8. Asmelashe Gelayee D, Binega Mekonnen G, Birarra MK. The needs and resources of drug information at community pharmacies in Gondar Town, Northwest Ethiopia. Biomed Res Int. 2017; 2017:8310636.
9. Qadus S, Naser AY, Al-Rousan R, Daghash A. Utilization of drug information resources among community pharmacists in Jordan: A cross-sectional study. Saudi Pharm J. 2022;30(1):1-7.
10. Suleman S, Ketsela A, Mekonnen Z. Assessment of self-medication practices in Assendabo town, Jimma zone, southwestern Ethiopia, Research in Social and Administrative Pharmacy. 2009; vol. 5, no. 1, pp. 76–81.
11. Kebede M, Kebebe Borga D, Mulisa Bobasa E. Drug utilization in selected health facilities of South West Shoa Zone, Oromia Region, Ethiopia. Drug Healthc Patient Saf. 2015 ;7 :121 -127.
12. Fathelrahman AI. Issues on Source, Access, Extent, and Quality of Information Available Among Pharmacists and Pharmacy Personnel to Practice Effectively. Social and Administrative Aspects of Pharmacy in Low- and Middle-Income Countries. 2018;363-383.
13. Dolovich L, Austin Z, Waite N, et al. Pharmacy in the 21st century: Enhancing the impact of the profession of pharmacy on people's lives in the context of health care trends, evidence and policies. Can Pharm J (Ott). 2018;152(1):45-53.
14. Jaradat N, Sweileh W. Drug Information for Community Pharmacies: Survey on Needs and Use of Drug Information with Special Focus on New Information Technology. An-Najah Univ. J. Res. (N.Sc).2003;17(2):287-300.
15. Ghaibi S., Ipema H., Gabay M. ASHP guidelines on the pharmacist's role in providing drug information . Am J Health-Syst Pharm. 2015;72:573–7.
16. Rajiah K, Sivarasa S, Maharajan MK. Impact of Pharmacists Interventions and Patients Decision on Health Outcomes in Terms of Medication Adherence and Quality Use of Medicines among Patients Attending Community Pharmacies: A Systematic Review. Int J Environ Res Public Health. 2021;18(9):4392.
17. Mohammed SI, Abdul Al-Razaq AF. Knowledge and Attitude of Iraqi Pharmacists in Baghdad Community toward Adverse Drug Reactions Monitoring. Asian J Pharm Clin Res. 2017; 10(4), 219-222.
18. Al-Tabakha MM, Akoulah LH and Fahelelbom KM. Drug Information in Community Pharmacy and Outpatient Pharmacy in Al Ain City, U.A.E.: A Descriptive Study. Int J Pharm. 2013;3(2):316-322.
19. Ball DE, Al-Othman F. Drug information resources at private community pharmacies in Kuwait. Med Princ Pract. 2007;16(2):107-9.
20. Al-Taie A. Insights into Clinical Pharmacy Program in Iraq: Current Trends and Upgrading Plans. Jordan J. Pharma. Sci., 2020; 13(3):265-271.
21. Brunelti L, Hermes-De Santos E. The Internet as a Drug Information Resource . US Pharmacist, 2010; 35(1): Epub.
22. Polen HH, Zapantis A, Clauson KA, Jebrock J, Paris M. Ability of online drug databases to assist in clinical decision-making with infectious disease therapies. BMC Infect Dis. 2008;8:153.
23. Oxman AD, Paulsen EJ. Who can you trust? A review of free online sources of "trustworthy" information about treatment effects for patients and the public. BMC Med Inform Decis Mak. 2019;19(1):35.
24. Leung HY, Saini B, Ritchie HE. Medications and pregnancy: The role of community pharmacists - A descriptive study. PLoS One.2018;13(5):e0195101.