

**DRUG INFORMATION IN COMMUNITY PHARMACY AND OUTPATIENT PHARMACY IN AL AIN CITY, U.A.E.: A DESCRIPTIVE STUDY**

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***Corresponding authors e-mail:** Moawia.Altabakha@aau.ac.ae**ABSTRACT**

The purpose of this study was to find out if the pharmacists working in community pharmacy and outpatient pharmacy have undergone any formal education regarding drug information, and to describe the drug information resources available, utilization of Internet as drug information resource and whether the available resources are sufficient to answer the types of questions received from the patients. After a pilot study, self administered eleven-question survey, open and close-ended, was distributed by a personal visit to a total of 40 pharmacies located in Al Ain city, UAE. Only one pharmacist of each visited pharmacies was eligible to complete the survey if he/she was licensed and have at least one year of experience at the same site. About 40% of the surveyed pharmacists did not have drug information resources as a course or topic in their formal education. In the pharmacies, all had the "British National Formulary", followed by the "Drug Information Handbook". Tertiary hospital outpatient pharmacy contained generally greater variety of drug information tertiary resources. About one third of the time spent surfing the internet was allocated for drug information. More than half of the surveyed pharmacists (55.6%) used the internet for at least 1 hour to obtain drug information. Drug safety in pregnancy and lactation was among the most frequently received questions (19.5%). The most difficult question the pharmacists received was related to the foreign drugs not available in UAE. There is a need to include a course "Drug Information Resources" in modern pharmacy program syllabi and to have online access to a reliable online database in the community pharmacy in order to allow the pharmacist to adequately provide accurate drug information.

Keywords: Drug Information Resources, Pharmacists, United Arab Emirates (U.A.E.).**INTRODUCTION**

There is continuing development and emphasis on the need to provide adequate pharmaceutical care to the patients.^[1-4] The pharmacist plays a major role where services such as counseling and answering drug information (DI) requests are provided resulting in cost saving and treatment effectiveness.^[5-7] While doctor of pharmacy programs usually include a course that tackle DI resources and provide the future pharmacists with tools to answer reliably DI requests, many traditional bachelor of pharmacy programs do not include such course even as a topic. Moreover, there is no guarantee that the pharmacist will come across or be trained for professionally utilizing DI resources in his/her continuing education.

In UAE, the ministry of health demands that at least one current (or one edition old) international pharmacopoeia is available and that the pharmacy has Internet access. This will allow for regular questions to be answered, but without the knowledge of how to assess a DI resource and therefore the validity of the obtained information especially those from the internet, incomplete or wrong information may be unintentionally given to the patient. Pharmacists working in hospitals have an increased need for adequate information and library services compared to community pharmacy, therefore it is expected that outpatient pharmacy of tertiary hospitals would have more investment in DI resources than in community pharmacy.^[8]

Tertiary resources (including general internet website information) are commonly used in community pharmacy setting and are often considered adequate for answering general questions from laypersons, but they differ in quality, update frequency and in their suitability to answer specific DI requests.^[9, 10] While internet may be an initial place to search for unfamiliar questions, many internet websites are either commercial or contain information that lack supporting evidence for the information provided and therefore can not be relied on. Certain areas of medication have proved to be challenging to find sufficient information for including herbal remedies, vitamins, minerals, and natural products.^[11, 12] A study of the DI resources at community pharmacies in the West Bank (Palestine) indicated that their quality is poor and do not qualify to provide adequate information to both the patients and the prescribers with similar study results obtained in Kuwait and in Jordan.^[13-15] In the contrary, a study conducted in Singapore showed the availability of adequate resources to answer different DI requests whether in hospital or community pharmacy settings.^[10] During our search using Pubmed and Google Scholar, no such study was carried out in UAE.

The objectives of this study were to find out if the pharmacists surveyed have undertaken any course (or topic) regarding DI in their formal education during their first degree and to look at whether there are adequate DI resources available to them in the community pharmacies and outpatient hospital pharmacies to answer adequately the kind of questions they routinely receive.

METHODS

A questionnaire was first developed to obtain some demographic data, available DI resources, the frequency of accessing them, the availability of computer and Internet access at the visited pharmacies, the use internet for DI purposes, the method to check if the website information is reliable, the type of questions the surveyed pharmacists receive from the patients, and the type of challenging questions, the pharmacists normally receive. The questionnaire was pre-tested, optimized, and used over a period of four months (October-2011 to January-2012).

A total of 40 pharmacies were visited comprising of 37 community pharmacies and 3 outpatient private tertiary hospital pharmacies. The pharmacist at the counter was handed the questionnaire if he/she has the professional license and have at least one year of

experience at the same pharmacy. The person visiting waited till the survey was completed and collected the survey at the same visit to achieve highest response rate. In order to avoid social desirability bias, the distributed questionnaires were anonymous and the participants were asked to hand them in the supplied envelopes after sealing them to be opened only after all completed questionnaires were received. Additionally, the person visiting kept a distance to allow the pharmacist to answer comfortably while at the same time available to clarify questions when needed.

The data collected were tabulated and analyzed using Excel for the different items in the questionnaire.

RESULTS

Participants

Among the 37 community pharmacy visited, 2 did not participate in the study and were not included further in the analysis. The reasons were because in one pharmacy, no licensed pharmacist was available at the time of the visit, while in the other pharmacy the pharmacist declined to participate because he wanted first to have permission from the pharmacy owner to answer the survey. On the other hand, all of the 3 private outpatient hospital pharmacies participated in the study, making overall participation 95%.

Those participated in the survey consisted of 36.8% female. The participants have graduated since an average of 13.3 years (range from 4 to 33 years) from Universities in Egypt (39.5%), UAE (15.8%), Jordan (15.8%) and India (15.8%). The rest have graduated from countries like Palestine, Russia, Romania, Philippine and Pakistan. When asked about whether a DI resources course or as a topic was included in their formal pharmacy education 39.5% answered no, while 7.9% did not answer the question.

Available tertiary textbooks

The available tertiary resources in the pharmacy were the "British National Formulary" (BNF) (100%) followed by "Drug Information Handbook" (47.4%). The "Middle East Medical Index" (MEMI) was available in the 7.9% of the pharmacies visited. Other resources also existed in some cases as shown in Figure 1.

The number of resources available to the community pharmacy was less than that in the outpatient pharmacy. For example while all the three outpatient pharmacies contained more than 3 different tertiary resources, only 22.9% of the community pharmacy did. The resources were used "frequently" by the

pharmacists in the outpatient hospital pharmacies (66.7%) compared to the pharmacists in the community pharmacy (25.7%).

Use of the Internet

The internet access was available in all participating pharmacies except 2 community pharmacies which were excluded from further analysis when it comes to using the Internet. The Internet was used by all pharmacists during the working hours, but 5.6% never used it for DI purposes. While 38.9% of the surveyed pharmacists spend more than 2 hours surfing the Internet for general purposes, only 13.9% (about one third) spent it for DI purposes (see Figure 2). General search engines were used most of the time to search for DI (36.7%) such as Google and Yahoo, while Wikipedia was relied on by 29.1%, Drugs.com by 13.9% and Medscape.com by 11.4%. Fewer percentages were relying on the governmental website in UAE.

When the pharmacists were asked about how they make sure that the DI they get from the Internet are trustworthy, the open-end answer was: 1) by double check with another website or book (40%), 2) only use trustworthy websites such as the FDA and approved studies (40%) and 3) comparing the obtained information to their own professional knowledge (11.4%).

DI Requests

The most commonly type of questions received from the patients was those related to drug safety in pregnancy and lactation (19.5%) followed by the dosage forms and routes of drug administration (18.8%) as shown in Figure 3.

The most challenging type of questions the surveyed pharmacists are asked was regarding the availability of some drug products (65.2%). This happens when the product is a drug that is not registered in UAE, out of stock and drugs available to hospitals only such as narcotic drugs. About 17.4% had problems answering drug-drug interactions especially when it comes to herbal drugs.

DISCUSSION

More than 50% of the surveyed pharmacists indicated that they have either had a course in DI resources or at least it was included as a topic. This was unexpected since all of them had bachelor of pharmacy degree and none had doctor of pharmacy. When comparing answers of graduates from the same university, discrepancies were found in the answers of graduates from four universities out of 20

universities. To explain this, the year of graduation was compared to see if this had an influence on the answer and was found that older graduates answered negatively regarding the presence of DI resources as a course or as a topic. This indicates that the program may have been updated reflecting the positive answer of new graduates.

BNF (British Medical Association and Royal Pharmaceutical Society) is published twice a year (March and September). It provides authoritative and practical information on the selection and clinical use of medicines in a clear and concise manner. It contains information about the medicines available in UK including pharmacology, indications, contraindications, side effects, doses, legal classification, proprietary and generic names along with the prices of medicines in UK. The study conducted in Jordan revealed that the monthly index of medical specialties (MIMS) was the top DI resource (64.7%) with the pharmacists.^[15] MIMS was also used frequently (80.4%) by physicians in Singapore.^[16] In contrast, this accounted for (5.3%) in our study. In the study conducted in Kuwait, BNF was available with only 15% and was ranking fourth with the surveyed community pharmacies.^[14] Partial explanation for the availability of the BNF is that most pharmacists in UAE are familiar with it and is cheaper for example than the Drug Information Handbook (Lexicomp).

Drug Information Handbook is a quick reference to commonly used drugs in concise format arranged alphabetically by generic drug name and includes brief information about some combination drugs.^[17] The handbook covers over 5,500 medications and each monograph encompasses several fields of information, including dosage, drug interactions and adverse reactions with pharmacotherapy information for healthcare professionals. In the study conducted in Kuwait, this handbook ranked the seventh (5% availability) while it was second in our study (47.4%). Whether BNF or Drug Information Handbook, both lack specific information about pharmaceutical products manufactured in the Middle East.

Martindale: The Complete Drug Reference (Pharmaceutical Press) from the Royal Pharmaceutical Society of Great Britain is a comprehensive book having about 6,000 drug monographs and 160,000 preparations. Proprietary preparations from over 40 countries are included. Herbals, diagnostic agents, radiopharmaceuticals, pharmaceutical excipients, toxins, and poisons are included. The textbook is relatively expensive and

heavy in the print format. This resource is available as a module for online databases such as Lexicomp and Micromedex. Subscription to these databases to obtain up-to-date information of the Martindale and other modules may be expensive for the pharmacy to maintain which explain why the pharmacies (28.9%) had the resource in print format. Criticism has been raised over the provision of complete information for specific issues whether in the BNF or Martindale and the recommendation was to consult high quality secondary resources such as systematic reviews in the Cochrane Library or the primary resources themselves.^[18] This means the need for ready access to such resource, adequate analyzing skills and sufficient time, which may not be feasible in the community pharmacy setting.

Pharmacotherapy: A pathophysiologic Approach (McGraw-Hill) is published every three years. It is a comprehensive, evidence-based pharmacotherapy text. It is categorized into 17 main disorders. The textbook is cheaper than Martindale but is heavy in the print format and may not be suitable as a quick reference. Probably because clinical pharmacy courses in bachelor of pharmacy programs rely on this textbook that the students become familiar with the textbook explains why 28.9% of the pharmacies had this textbook.

MEMI (CCM Middle East) is updated yearly listing 2675 products from 118 manufacturers. The index is organized into five sections to facilitate the retrieval of information. The sections are the product name index, manufacturers/distributors index, generic name index, therapeutic category index and the product information by manufacturer section. The publisher of the index claims that the index to be the most comprehensive drug reference in the Middle East Arab world. Although the index is freely distributed, the main target is the prescriber and this may explain why its availability in the pharmacies is not as wide as the BNF. On the other hand, the study conducted in Kuwait revealed that MEMI ranked the first (100%) which indicate that the publisher or its subagent was distributing the index to the pharmacies free of charge.^[14]

The investigation into the availability of tertiary references indicated the absence of references that are used for compounding such as the British Pharmacopoeia in contrary to the study conducted in the West Bank, Palestine.^[13] This may be because the prescriptions received by the pharmacists in UAE do not include compounding drug recipes. Also, none of the pharmacists indicated the availability of periodicals as the primary source of information,

which may be understandable given the fact that the practice setting does not normally encounter questions requiring primary source of information. Also additional expenses will burden the pharmacy, especially that the internet could be searched for any specific request.

The two community pharmacies that did not have Internet access were not following the current standards regarding practice in community pharmacy. About one third of the pharmacists time spent on the Internet was allocated for DI related purposes. Although the Internet may contain mass of DI that may not be readily available in textbooks, their quality in many cases is questionable.^[19-21] Two of the pharmacists indicated that although they used the Internet in the pharmacy, they did not use it for DI purpose. This may be because they did not need to or because they have little believe in the information available via Internet. Relatively large percentage (29.1%) indicated that they use Wikipedia as a source of Internet DI, but a study published in 2008 indicated that in comparison to Medscape, it has a more narrow scope, is less complete, and has more errors of omission.^[22] Other studies have indicated that Wikipedia can be a reliable source of DI.^[23, 24]

In an open question regarding how the pharmacist evaluates if the website information is trustworthy, the answer by relatively large proportion is that they would double check with another site or textbook. This indicates the common belief that the textbooks contain high quality information, but this also means that if the textbook was available then they would not surf the Internet for DI.^[10] Double checking with another website should not be the method to check the validity of information. Internet websites that are offered by government, universities and non-profit organizations may offer good quality of DI. The information provided should be supported by appropriate references and the information should be up-to-date. Only 40% accurately answered this question, although the answers were not detailed.

While the most common type of questions encountered by the pharmacists were those related to drug safety in pregnancy and lactation (19.5%), this was not the case in another study conducted in Palestine where the most encountered question was those related to drug price (30%).^[13] In the later study the questions related to drug safety in pregnancy and lactation (6%) ranked 7th among 8 categories of questions. This may indicate that patients having different concerns in these different locations.

The most commonly type of challenging questions received by the pharmacists were those related to drugs not available in the pharmacy or in UAE. This is mainly because the patients ask about a medication they used to have in their home country, since the majority of residents in UAE are not local but foreign skilled workers. The pharmacists may not have heard about the medication and therefore unable to answer.

This study is the first of its kind to be conducted in UAE. It reveals the need to educate the pharmacists about the different DI resources, how to assess the resource and how to formulate and respond to DI requests. Among the limitations of this study is the uncertainty that the results would represent the whole UAE, but covering wider geographical location by personal visits in order to achieve high response rate would require extensive time and higher resources. Another limitation is the number of the outpatient pharmacies of the tertiary hospitals is not sufficient to

make adequate conclusion. This may be understood when not many tertiary hospitals are in the city. We also did not attempt to find out how recent is the tertiary resources held in the pharmacy as we were trying to limit the number of questions in the questionnaire to minimum.

CONCLUSIONS

This study illustrates the need to educate the pharmacist about the different DI resources and how to evaluate obtained information, especially via the Internet. We recommend that an online subscription to databases such as Lexi-comp and Micromedex become available to the community pharmacy through the health authority in the country as service for a reduced fee. This will allow the pharmacist to rely on evidence-based information covering aspects that may be challenging to tackle using current available resources.

Figures

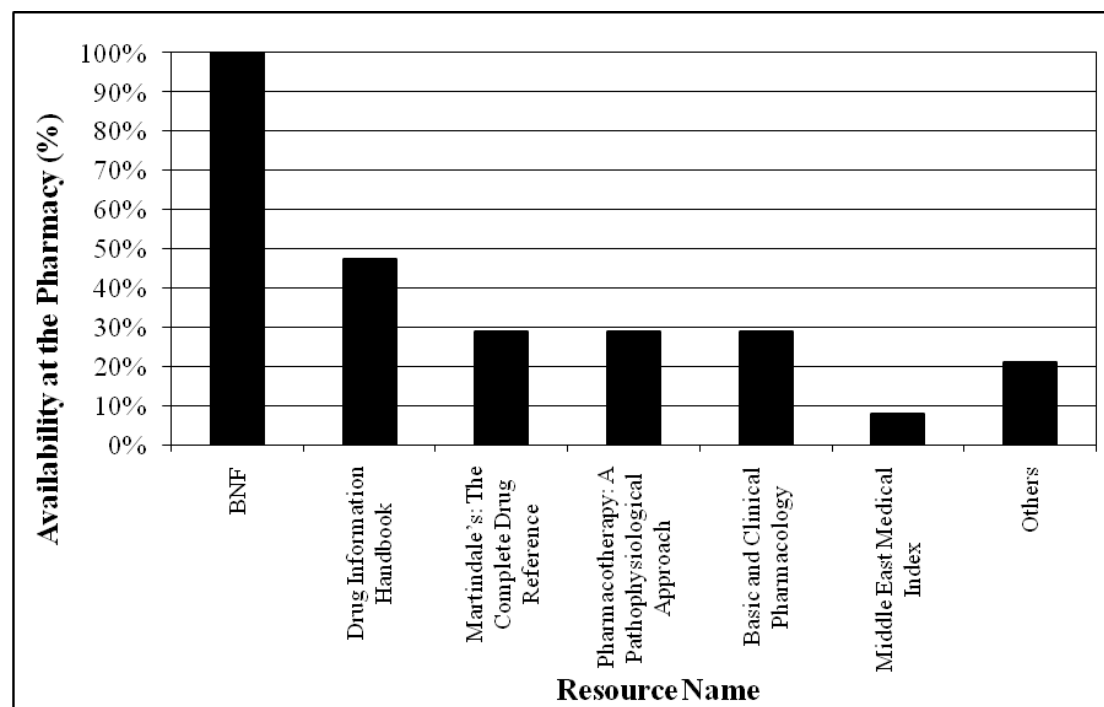


Figure 1: Availability of reference textbooks in the community pharmacy and outpatient pharmacy.

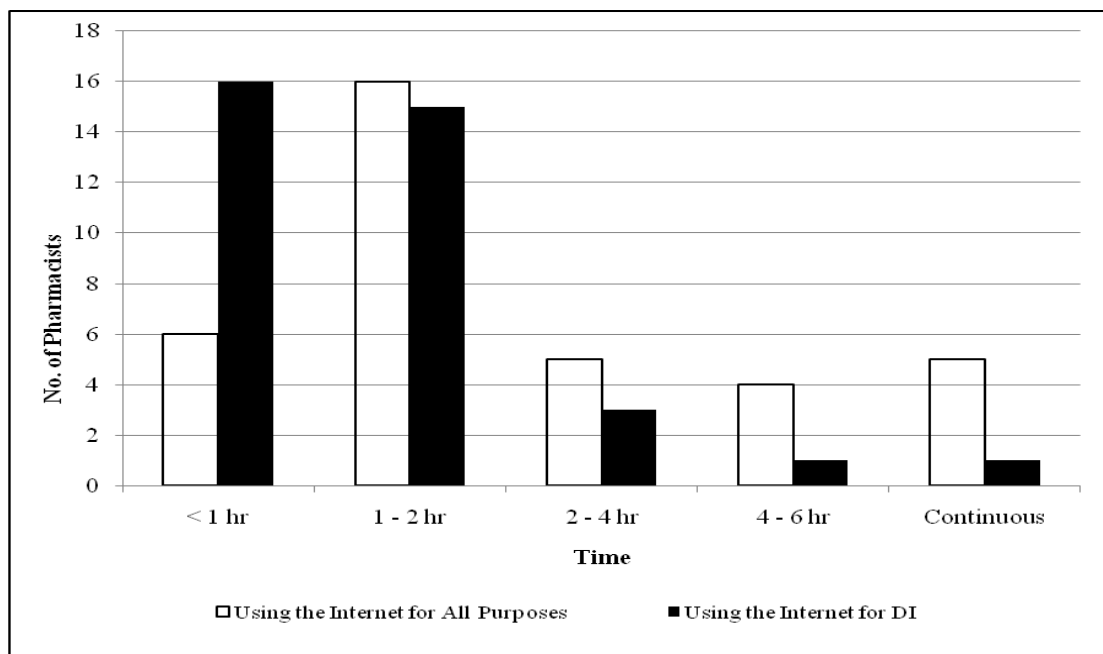


Figure 2: The time spent on the use of internet by the participating pharmacists for general purposes and for DI related purposes.

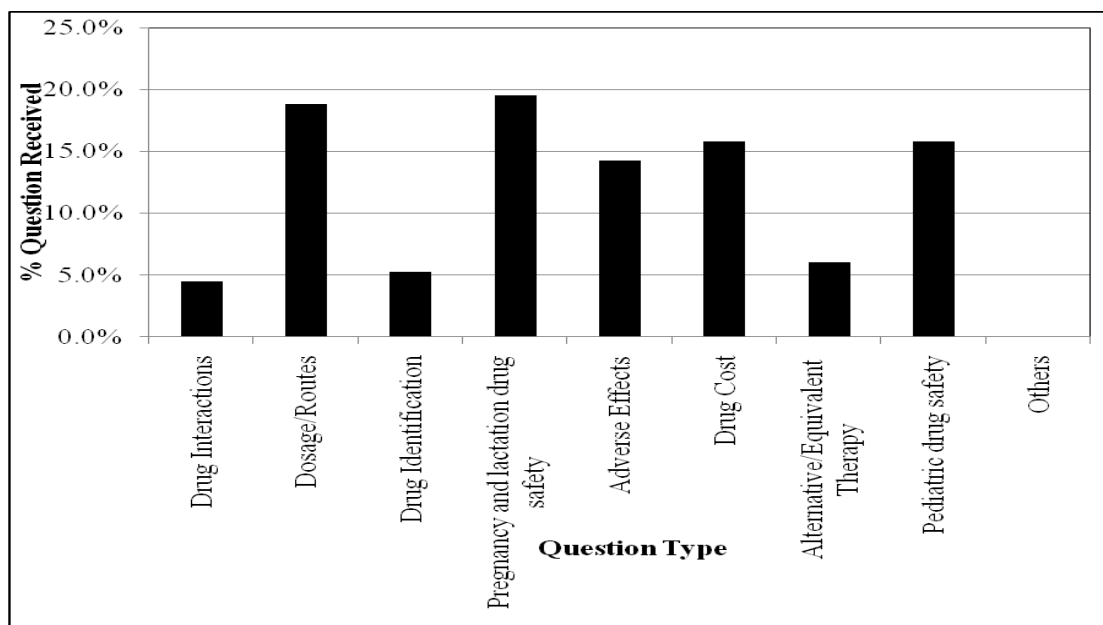


Figure 3: The type of DI requests from the patients and received by the participating pharmacists.

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