BJPS

Brazilian Journal of
Pharmaceutical Sciences

http://dx.doi.org/10.1590/s2175-97902022e20498

Article

Perceptions and Attitudes of Hospital' Prescribers towards Drug Information Sources and Prescribing Practices

Mohamed Mahmoud Abdel-Latif[1,2*], Hosny Ahmed Elewa[2,3], Amal Abd El.Moneim Soliman El-Kholy[2,4]

[1]Department of Clinical Pharmacy, Faculty of Pharmacy, Assiut University, Assiut, Egypt, [2]Department of Clinical and Hospital Pharmacy, College of Pharmacy, Taibah University, Al-Madinah Al-Munawwarah, Kingdom of Saudi Arabia, [3]Department of Pharmacy Practice, Faculty of Pharmacy, Horus University, Dominate City, Egypt, [4]Department of Clinical Pharmacy, Faculty of Pharmacy, Ain Shams University, Cairo, Egypt

Healthcare professionals use a variety of drug information sources to fulfill their clinical needs and medical practice. The aim of present study was to assess the sources of drug information among hospital' prescribers and evaluate their prescribing behavior in Saudi hospitals. A cross-sectional survey was conducted among randomly selected hospital' prescribers using a self-administered questionnaire. The response rate to the survey was 64.29%, with a ratio of 76.44% male and 23.56% female. The internet 137(60.89%) and textbooks 86(38.22%) were the prevalent sources for drug information used. Up-To-Date 107(47.56%), Medscape 105(46.67%) and FDA 74(32.88%) were the common electronic drug sources used. About 151(67.11%) of hospital' prescribers considered the pharmacist as a reliable drug information source. The most favored drug requests by hospital' prescribers from the pharmacists were drug alternatives 110(48.89%) followed by drug interactions 94(41.78%), side effects 78(34.67%) and indications 60(26.67%). Therapeutic efficacy 168(74.67%) and drug availability 73(32.44%) were the main factors contributed to the selection of drugs. This study shows some differences in hospital prescribers' perceptions of sources of drug information depending upon their background and clinical practice. Therefore, knowing appropriate drug information used by hospital' prescribers is fundamental for drug efficacy and safety in clinical practice.

Keywords: Hospitals' prescribers. Perceptions. Attitudes. Drug Information Sources. Saudi Arabia.

INTRODUCTION

The amount of medical information has grown considerably in recent years, and the search for appropriate drug information resources is of great importance for the rational use of medicines. Medicines are becoming more sophisticated and drug prescribing is increasingly complex, therefore, the provision of the information is a necessity to ensure rational drug use (Hogerzeil, 1995; WHO, 2002; Vijayakumar *et al.*, 2011). Poor prescribing in most countries is due to inappropriate or irrational prescribing, polypharmacy, and medication errors (Aronson, 2006). Irrational use of medicines is a major global problem. Worldwide more than 50% of all medicines are prescribed dispensed or sold inappropriately, while 50% of the patients take them correctly (WHO, 2002).

The World Health Organization produced the guide to good prescribing to overcome poor prescribing (WHO, 1994). This WHO's Guide is based on the concept of Rational Use of Medicines which requires patients to receive appropriate medications for their clinical needs, in proper individual doses for the correct period of time at a low cost for them and the community. The

***Correspondence:** M. M. M. Abdel-Latif. Department of Clinical Pharmacy. Faculty of Pharmacy. Assiut University. Assiut, Egypt. Phone: 002-0882331711. Fax: 002-0882332776. E-mail: m.abdellatif@aun.edu.eg. ORCID: https://orcid.org/0000-0002-6911-2487

correct prescription, accessibility to medications and adequate dispensing are among the factors to ensure good prescribing. Physicians are the major prescribers worldwide, and they may be considered as one of the major causes of prescription errors and poor prescribing (Pearson, Rolfe, Smith, 2002). Therefore, healthcare professionals are challenged to keep up to date of the new developments in drug therapy and the accessibility to drug information resources in the workplace.

Drug information resources can enhance one's ability to ensure safe and effective drug therapy for patients. Drug information from commercial sources is often biased, and independent resources are required. Furthermore, physicians frequently have insufficient familiarity with new drugs/combinations. Availability of concise and accurate information about drugs is therefore vital for prescribers to deliver optimal patient care. The lack of appropriate drug information was suggested as a possible cause of improper drug prescribing (Haayer, 1982).

Today, there are various information sources about drugs. These include computerized sources and printed materials to provide prescribers with specific drug information. Some drug sources are commercial and others are noncommercial. The internet is being increasingly used as a resource when answering drug information questions, and it is useful when timely information is required (Craan, Oleske, 2002; Coleman, McDowell, 2012). While many Websites are useful for obtaining information, one should be aware of the quality and reliability of drug information of those Websites. Some things to assess when determining whether the information contained on a website is trustworthy include the authors of the information, financial support of the site, presence of misleading advertisements, and the frequency of updates.

Knowledge about medicines and new drugs are constantly changing, where new drugs come in the market, experience with existing drugs expands and new indications of existing drugs are developed (Chauhan *et al.*, 2013). Drug information centers are useful resources to disseminate drug information. Drug information centers are established in many hospitals. In developed countries, the flow of drug information is quick and efficient due to the availability of drug information centers that offer drug informational services to healthcare professionals, but in developing countries, the flow of drug information is slow and ineffective and there are inadequate sources of drug information (Kale, 1994). The establishment of drug information centers in developing countries has become a necessary requirement for rational drug use (Kasilo, Nhachi, 1991; Joshi, 1997).

The attitudes of healthcare professionals toward the choice of a particular drug were affected by personal preference, usefulness of the source and place of work (Gaither *et al.*, 1994; Gaither *et al.*, 1997; McGettigan *et al.*, 2001; Saurabh *et al.*, 2011). These preferences are largely influenced by knowledge and attitudes, as well as gender and age. Physicians use a variety of sources when obtaining drug information such as medical journals, pharmaceutical sale representatives, colleagues, conferences, textbooks, newsletters and pharmacists to make their therapeutic decisions (Peay, Peay, 1990; Williams, Hensel, 1991; Lundborg, Hensjo, Gustafsson, 1998). Medical residents have varied preferences for drug information resources; and internet and technology pose a challenge for authentic drug information; thereby, continuous medical education and workshops are required to improve medical residents' drug information behaviors and literature search (Gandhi, Jadhav, 2017). A reliable drug information source that can provide the prescribers with unbiased drug information is essential (Hennigen *et al.*, 2009).

Pharmacists were also considered as the primary drug information users and frequent drug-related information inquirers; and it has indicated that drug information services can assist the role of pharmacists in addressing the drug-related needs of the patients (Tefera *et al.*, 2019). Most of the queries requested were therapeutic indications, adverse drug events, infectious or cardiovascular disease related requests.

The aim of the present study was to determine the sources of drug information used by prescribers practicing in hospitals, most important queries requested from the pharmacists and their attitudes in prescribing practices in hospitals in Saudi Arabia.

METHODS

Study questionnaire design

A cross-sectional, self-administered questionnaire was developed from previous studies based on an extensive literature review pertaining to drug information sources. The questionnaire comprised of questions on demographic data, knowledge of drug information resources and prescribing practices in hospitals. The survey questions were pre-tested by an expert in drug information. A draft of the survey was piloted on a number of practicing prescribers to check for understanding, question design and the content of the questionnaire. Based on the result of this pilot study the final questionnaire was used in the study through a face to face interview.

Ethical approval

The study was approved by the Ethical Committee of Taibah University. Hospital' prescribers were assured anonymity and that their answers would remain confidential. They were also assured that the findings would not identify them and only the aggregate data will be reported.

Study subjects

The study was conducted during 2015 in Al-Madinah Al-Munawwarah region, Saudi Arabia. The survey was conducted in eight hospitals (namely, King Fahd hospital, Madinah Cardiac Centre, Ohud hospital, Maternity and children's hospital, Prince Sultan Military hospital, Al Zahra hospital, Al Dar hospital and Madina National hospital) to examine the knowledge of prescribers of sources of drug information and their prescribing practices. The sample of hospital' prescribers used in the study was selected randomly and comprised of 350 prescribers. The total number of hospital' prescribers who agreed to participate in the study and the questionnaire was completed correctly by them was 225 participants. The reasons for some hospital prescribers' refusal to participate in the study were their unavailability or business.

Statistical analysis

The analysis of the data was carried out by analyzing the results of the valid questionnaire. The Statistical Package for Social Sciences software (SPSS 22.0, Chicago, IL, USA) was used for the analysis. Descriptive statistics (mean and percentage) were used to describe the data.

RESULTS

Demographic characteristics of hospital' prescribers

The survey was conducted in a number of public and private hospitals in Madinah region, Saudi Arabia. A total of 350 prescribers were approached for this study. Of 350 hospital' prescribers surveyed, 225 showed a willingness to participate in the survey, with a response rate of 64.29%. The percentage of respondents was greater for men than for women and for older (>40years; 57.33%) than younger (<30 years; 42.67%). Only about 68(30.22%) of hospital' prescribers possessed a master degree and 110(48.89%) had either a Doctor of Medicine degree (M.D.) or a Doctorate of Philosophy degree (Ph.D.). The non-Saudi hospital' prescribers 118(52.44%) were from Egypt, Syria, Jordan and Sudan. The distribution of hospital' prescribers by type of practice showed that most prescribers were of the pediatrics specialty, medicine and surgery. The years of experience for prescribers varied considerably, where 108(48%) of the respondents had a total experience of ≥10 years, and 117(52%) had an experience of <10 years. The socio-demographic characteristics of hospital' prescribers are shown in Table I.

TABLE I - Demographic characteristics of hospital' prescribers

Characteristics of respondents	Number (N=225) (%)
1- Gender	
Male	172 (76.44%)
Female	53 (23.56%)
2- Age	
20-29 years	37 (16.45%)
30-39 years	59 (26.22%)
40-59 years	70 (31.11%)
50-60 years	59 (26.22%)
3- Nationality	
Saudi	107 (47.56%)
Non-Saudi	118 (52.44%)
4- Qualifications	
B.Sc.	33 (14.67%)
Diploma	14 (6.22%)
Master	68 (30.22%)
M.D.	77 (34.22%)
Ph.D.	33 (14.67%)
5- Current position	
Assistant hospital	67 (29.78%)
Registrar	59 (26.22%)
Senior registrar	52 (23.11%)
Consultant	47 (20.89%)
6- Years of experience	
<5 years	48 (21.33%)
5-10 years	69 (30.67%)
10-20 years	65 (28.89%)
>20 years	43 (19.11%)
7- Area of practice	
Medicine	45 (20%)
Surgery	28 (12.44%)
Cardiology	20 (8.89%)
Pediatrics	46 (20.45%)
Gynecology	20 (8.89%)
Psychiatry	14 (6.22%)
Ophthalmology	11 (4.89%)
Oncology	9 (4%)
Others	32 (14.22%)

Sources of drug information used by the hospital' prescribers

There are several ways in which prescribers can seek and access drug information sources. These sources were greatly dependent on their availability and accessibility. The majority of the surveyed hospital' prescribers 137(60.89%) indicated that the internet was the most used as a source of drug information (Table II). The other sources of drug information used by the study participants were reference textbooks 86(38.22%), medical journals 70(31.11%), pharmacists 57(25.33%), drug sale representatives 38(16.88%), conferences 41(18.22%), and colleagues 26(11.56%) respectively. The survey also showed that 122(54.22%) of hospital' prescribers used one source for searching drug information, 40(17.78%) two sources, 32(14.22%) three sources, 16(7.11%) four sources and 15(6.67%) five or more than five sources of drug information. When the hospital' prescribers in this survey asked of their preferences of online/electronic sources that they were used for searching drug information, they stated that UP-To-Date 107(47.56%) and Medscape 105(46.67%) were the top online/electronic sources they used during their daily practice. Other sources used by hospital' prescribers were FDA 74(32.44%), Medline 41(18.22%), Epocrates 28(12.44%) and other sources 12(5.33%); as shown in Table II.

TABLE II - Drug information resources used by hospital' prescribers

Item	Number (N=225) (%)
Drug information resources used by the hospital' prescribers	
Internet	137(60.89%)
Reference textbooks	86(38.22%)
Medical Journals	70(31.11%)
Pharmacists	57(25.33%)
Drug representatives	38(16.88%)
Conferences	41(18.22%)
Colleagues	26(11.56%)

TABLE II - Drug information resources used by hospital' prescribers

Item	Number (N=225) (%)
Frequency use of drug information resources by the hospital' prescribers	
Once	122(54.22%)
Twice	40(17.78%)
Trice	32(14.22%)
Frice	16(7.11%)
Quince	15(6.67%)
Types of online drug information resources used by the hospital' prescribers	
Up-To-Date	107(47.56%)
Medscape	105(46.67%)
FDA	74(32.88%)
Medline	41(18.22%)
Epocrates	28(12.44%)
Others	12(5.33%)

Hospital prescribers' opinions of the pharmacist as a source of drug information

A majority of hospital' prescribers rely on pharmacists as reliable sources of drug information. About 48(21.33%) of hospital' prescribers strongly agreed, 103(45.78%) agreed, 65(28.89%) neutral, 5(2.22%) disagreed and 4(1.78%) strongly disagreed on pharmacist as a reliable information source on drugs (Figure 1). The types of drug-related questions that hospital' prescribers requested from the pharmacists were 110(48.89.3%) drug alternatives, 94(41.78%) drug interactions, 82(36.44%) drug costs, 78(34.67%) side effects and 60(26.67%) indications; as shown in Figure 2.

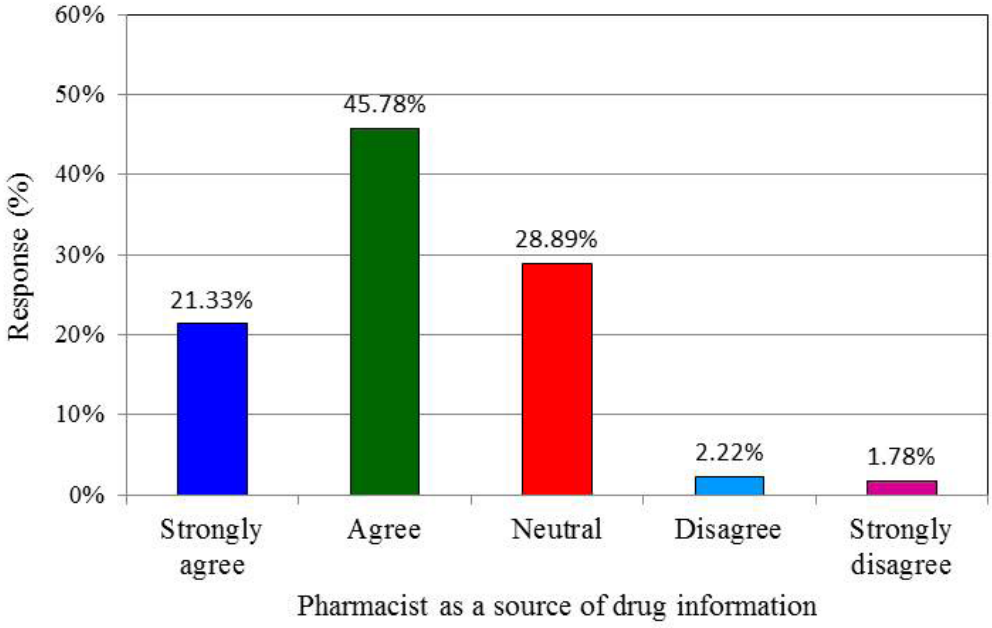

FIGURE 1 - Hospital prescribers' opinions of the pharmacist as a source of drug information.

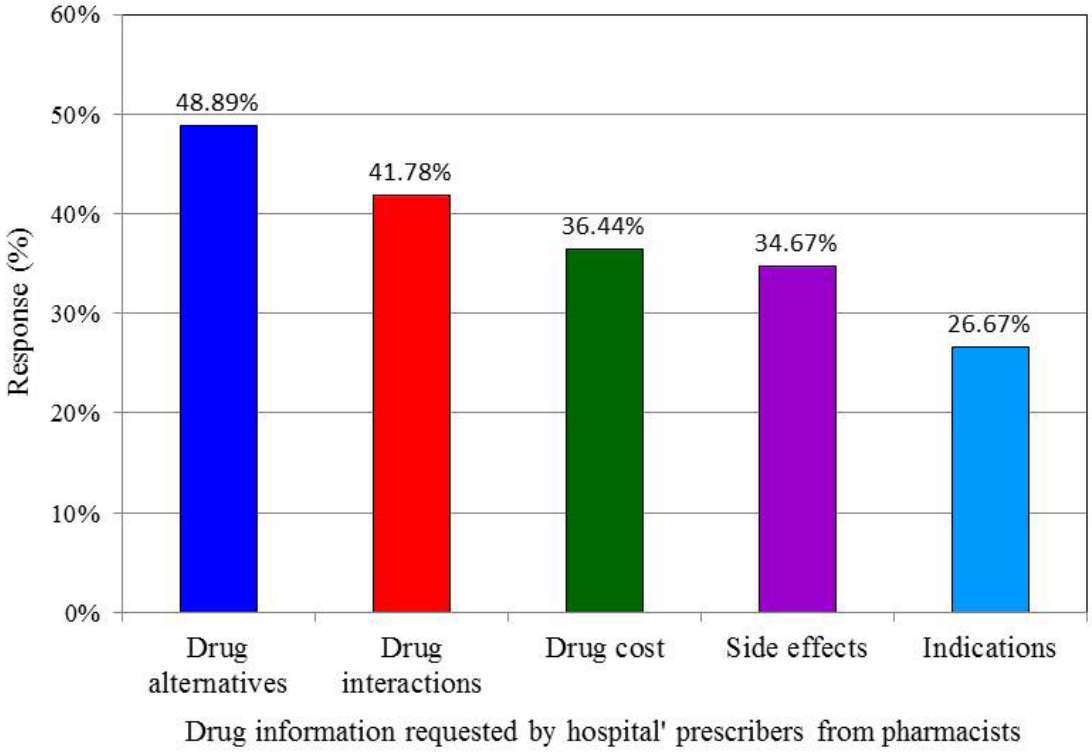

FIGURE 2 - Types of drug information requested from pharmacists by hospital' prescribers.

Hospital prescribers' sources of information about new drugs

As the number of pharmaceutical drugs increased and new drugs comes to clinical practice, therefore, prescribers are under pressure to get appropriate and correct information about new drugs and their entities. Here we assessed the sources of information on new drugs among prescribers in hospitals. Among 225 hospital' prescribers surveyed, the internet 140(62.22%) was the dominant source of information on new drugs (Figure 3). Other sources on new drugs represented 74(32.89%) medical journals, 58(25.78%) pharmaceutical drug representatives, 56(24.89%) pharmacists, 52(23.11%) conferences, 16.89% reference textbooks and 25(11.11%) colleagues; respectively.

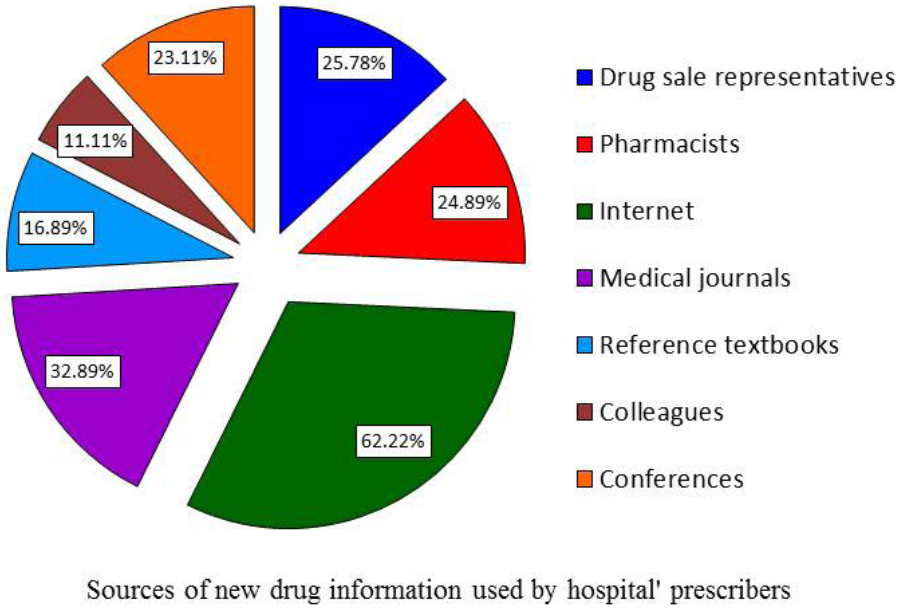

FIGURE 3 - Hospital prescribers' sources of information on new drugs.

Factors contributing to hospital prescribers' selection of drugs

About 168(74.67%) of hospital' prescribers stated that therapeutic efficacy was a priority for selecting drugs during their prescribing practices and second in rankings was the availability of the drugs 73(32.44%). Other factors that affected their selection of drugs to some extent were patients 39(17.33%), cost of drugs 38(16.89%), and company advertisement 15(6.67%); as shown in Figure 4.

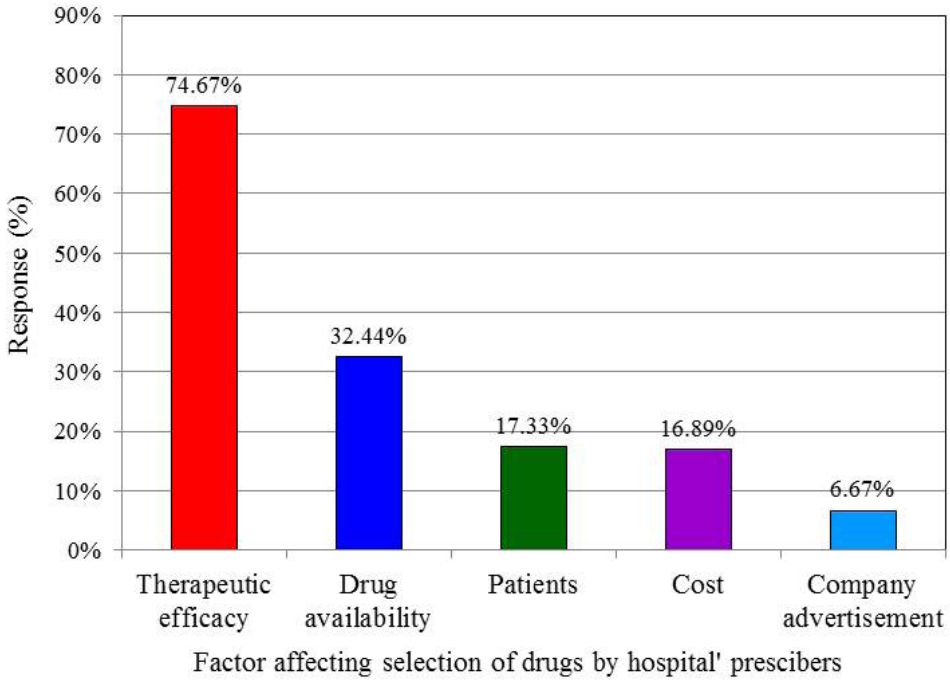

FIGURE 4 - Factors contributing to hospital prescribers' selection of drugs.

Patient demands for brand-name drugs during the prescribing process

We have also questioned the hospital prescribers' if they were asked by patients for a specific brand-name drug during the prescribing process. We found a small percentage of hospital' prescribers 32(14.22%) stated that they always feel pressurized by patients to prescribe branded drugs (Figure 5). About 107(47.56%) of hospital' prescribers stated sometimes and 55(24.44%) rarely felt pressurized by patients to do so, whereas only 31(13.78%) had never felt pressurized by patients to prescribe branded drugs.

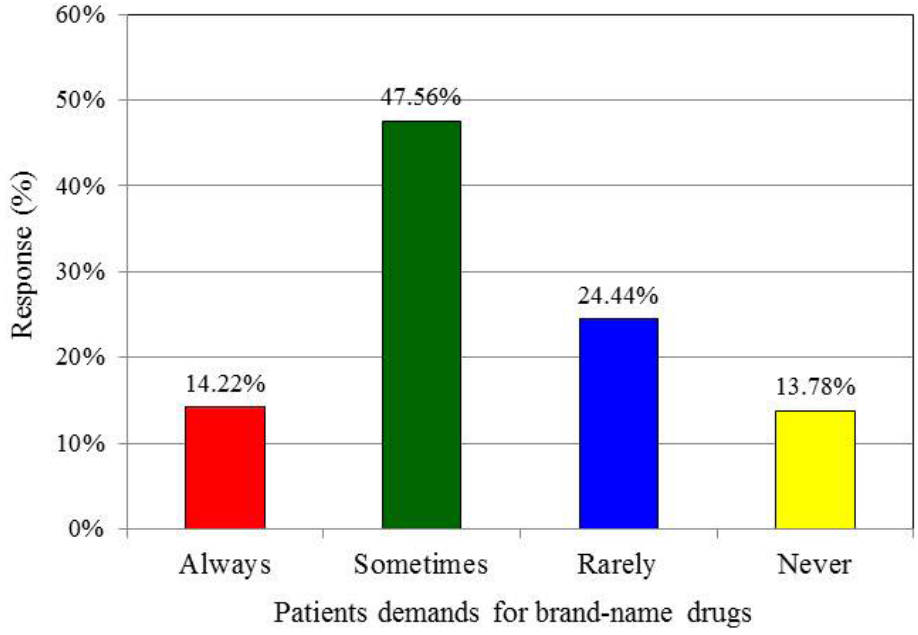

FIGURE 5 - Patient demands for brand-name drugs from hospital' prescribers.

Opinion of hospital' prescribers towards generic prescribing

Upon questioning the hospital prescribers' about their opinions towards generic prescribing, they have expressed negative opinions about generic drugs. Most hospital' prescribers 101(44.89%) stated that they do not support (disagree and strongly disagree) generic prescribing of drugs (Figure 6). Only 53(23.55%) hospital' prescribers expressed their support (strongly agree and agree) to generic prescribing. A high percentage of hospital' prescribers; 71 (31.56%) appear to be neutral in their response about the use of generic drugs.

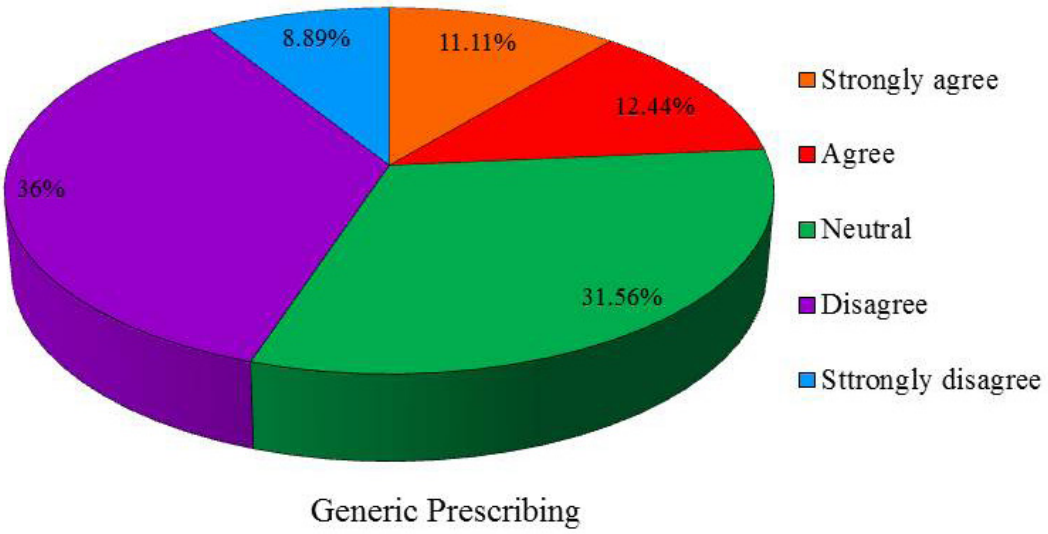

FIGURE 6 - Hospital prescribers' views of generic prescribing.

DISCUSSION

The amount of medical information has grown considerably over the last years. The quality and accessibility of drug information is becoming an essential element for the prescribers to promote rational use of medicines. Therefore, the use of the appropriate and correct drug information source is of great importance to practicing prescribers since it will directly affect the patient's health outcomes (Hands, Stephens, Brown, 2002). The present study described the sources of drug information used by hospital' prescribers and their attitudes in prescribing practices in Saudi hospitals. The survey revealed that there were some differences in hospital prescribers' perceptions and preferences towards the drug information resources in clinical practice. According to our survey the majority of hospital' prescribers ranked the internet (60.89%), first in their preference of drug information sources. The most frequent other information sources used were reference textbooks, medical journals and pharmacists. Up-To-Date (47.56%), Medscape (46.67%) and FDA (32.88%) were the common online resources used by prescribers working in hospitals. Our study also highlights the negative opinions by hospital' prescribers about support of generic drugs prescribing.

The drug information resources available to prescribers are numerous and prescribing decisions are greatly dependent on information derived from these resources. The question is of great importance which sources are widely used by hospital' prescribers in clinical practice. Today, the internet has become a critical component of how health care professionals seek medical information (Marra *et al.*, 1996a; Marra *et al.*, 1996b; Craan, Oleske, 2002; Coleman, McDowell, 2012). More than 60% of surveyed hospital' prescribers in our study stated that the internet was a searching tool for information on existing drugs and new drugs. Sixty nine percent of hospital' prescribers stated that they did not have a difficulty in searching online resources for drug information. In the present study; about 55% of hospital' prescribers used more than one source for getting drug information. It has been reported that healthcare providers use the internet most frequently to gather health, medical or prescription drug information (De Leo *et al.*, 2006; Podichetty *et al.*, 2006; Hartzband, Groopman, 2010; Younger, 2010). It has been reported that digital resources of drug information were used more frequently by healthcare professionals than traditional resources such as printed material, consulting a clinical pharmacist or calling drug information center despite the untrustworthy and unreliable of internet and electronic open-access resources (Alakeel, Almutairi, Layqah, 2020). McGettigan *et al.* (2001) reported that the sources of prescribing information of greatest

practical importance are those based on the medium of personal contact, primarily by hospital prescribers' peers in hospital settings. However, there are a number of barriers could pose accessing information on drugs via the internet such as availability, accessibility, and quality of information.

Prescribing decisions make a considerable impact on health and budget and it seems that those decisions are dependent on personal preferences concerning the choice of drug information resources. Several factors have been reported to influence prescribing decisions including the doctors' age and gender, level of education, experience and the practicing environment in hospitals (Bradley, 1992; Schumock *et al.*, 2004). A survey among dentists on drug information resources demonstrated that appropriate dental drug information resources can change the dentist's prescribing habits, prevent medication errors and lead to positive outcomes (Alomi, Alshammari, Alshammari, 2021). In a Singapore study, the choice of drug information sources was associated with physicians' age, place of practice, access to the internet, and clinical experience; and Singapore physicians used reference texts most frequently in the search for drug information (Lua, Sklar, Ko, 2011).

The process of prescribing a medication is complex and requires an evidence-based approach to drug selection. The drug use system varies from country to country as the healthcare systems and governance policies vary considerably from one country to another. Therefore, many different factors could affect the selection of drugs by health practitioners including prescribers, patients, the workplace environment, the industry influences, regulation and drug information. According to our survey results, about 74.67% of hospital' prescribers stated that therapeutic efficacy was a priority for selecting drugs during their prescribing practices. Other factors included the availability of the drugs (32.44%), patients (17.33%), cost of drugs (16.89%) and company advertisement (6.67%). Furthermore, on assessing the impact of patients on prescribers' decision, survey results indicated that 14.22% felt "always" or "sometimes" (47.56%) or "rarely" (24.44%) under pressure from patients to prescribe branded drugs. Only a small percentage of prescribers (13.78%) stated that they had never stressed by patients to prescribe branded drugs. Pharmaceutical sale representatives can also exert influence in the drug selection process among practicing prescribers. Only 17% of hospital' prescribers reported being affected by drug sales representatives. Prescribers may view pharmaceutical sales representatives as less knowledgeable because they are agents for sellers and therefore are not able to provide objective information on harmful effects of drugs. It has been indicated that pharmaceutical representatives were the most common source of drug information followed by electronic mail or e-journals; and engaging prescriber and non-prescriber personnel is important to provide relevant drug information (Hincapie *et al.*, 2021).

The pharmacists are the most comprehensive source of unbiased and authoritative drug information for the physicians and patients. In the present survey, hospital' prescribers rated the pharmacists fourth in their ranking of drug information resources used, and the pharmacists were considered as a reliable source of drug information. The types of drug information that were commonly requested from the pharmacists by hospital' prescribers were drug alternatives (48.89%), drug interactions (41.78%) and side effects (34.67%), while indications (26.67%) and cost alternatives (22.22%) were the least queries. In a study by Tefera *et al.* (2019), pharmacists were considered as the primary drug information users; and most of the queries requested were therapeutic indications, adverse drug events, infectious or cardiovascular disease related requests.

In most countries, namely USA and Europe, drug information inquiries were solved by the establishment of drug information centers which offer drug information services to healthcare professionals and patients (Markind, Stachnik, 1996; Rosenberg *et al.*, 2004). These drug information centers are operated by pharmacists who are experts in drug information services. However, the importance of the drug information centers for developing countries were underutilized by healthcare professionals (Kasilo, Nhachi, 1991; Joshi, 1997). Abou-Auda (2008) has indicated that only 70% of the physicians were aware of the existence of drug information centers in KSA and 33.9% have used this service. These centers were under-

utilized by health care professionals due to the lack of awareness of their existence by physicians.

The use of generic drugs has increased significantly in many countries (Suh, 1999; Kersnik, Peklar 2006; Tsiantou *et al.*, 2009; Decollogny *et al.*, 2011). Since generics are available at a lower cost, they might provide an opportunity for savings in healthcare expenditure over brand-name drugs. Some healthcare providers may not have enough knowledge about generics. Our study highlights the negative opinions held by hospital prescribers about support of generic drugs prescribing. About 23.55% of hospital prescribers strongly agreed or agreed to support prescribing of generic drugs. On the other hand, 45% of prescribers were not supportive to the use of generic drugs. In Saudi Arabia, about 79% of physicians supported generic substitution (Alghasham, 2009). In a survey by Theodorou *et al.* (2009) in Greece and Cyprus, only 25% of physicians in Greece indicated that they prescribed generic drugs instead of brand-name drugs versus 67% in Cyprus. In Turkey, a survey was conducted among physicians and revealed that around 32% of them believe that generic drugs did not differ from their brand name originals (Toklu *et al.*, 2012). The negative opinion of prescribers regarding generic drugs is probably due to multifactorial factors, such as prescribers' beliefs, patient preferences, effectiveness of generic drugs, availability of pharmaceutical dosage forms and price difference between generic and branded drugs which may hinder the practitioners from prescribing generic drugs. Most recently, a survey by Salhia *et al.* (2015) reported that 76% and 47% of physicians were knowledgeable about the terms "generic" and "bioequivalence" respectively, while 44% reported that they are able to explain bioequivalence to their patients. Low level of knowledge about generic drugs among physicians was the strongest predictive factor for low prescription.

CONCLUSION

There were some differences among prescribers towards the sources of drug information in hospitals. These differences might be due to differences in educational background of prescribers and cultural differences between countries. The most favored way of obtaining drug information was from the internet; and the common online sources were Up-To-Date and Medscape resources. Questions pertaining to drug alternatives, adverse drug reactions and drug interactions were the drug-related questions' prescribers most frequently requested from pharmacists. It was necessary for prescribers to have appropriate drug information sources with ease of accessibility and credibility of drug information resources to ensure the quality of information on drugs and thereby optimize patient outcomes.

ACKNOWLEDGEMENT

The author thanks all participants for their contributions to this study.

DECLARATION OF CONFLICTING INTERESTS

None declared

FUNDING

No declared

REFERENCES

Abou-Auda HS. Information-seeking behaviors and attitudes of physicians toward drug information centers in Saudi Arabia. Saudi Med J. 2008;29(1):107-115.

Alakeel YS, Almutairi D, Layqah L. Needs and utilization of drug-information resources of healthcare providers in an academic tertiary care center. Int J Pharm Pharm Sci. 2020;12(8):124-128.

Alghasham AA. Generic drug prescribing in central Saudi Arabia: Perceptions and attitudes of physicians. Ann Saudi Med. 2009;29(1):24-29.

Alomi YA, Alshammari AM, Alshammari KS. Perception of Dentists about Drug Information Resources in Saudi Arabia. Pharmacol Toxicol Biomed Rep. 2021;7(1):35-39.

Aronson JK. A prescription for better prescribing. Br J Clin Pharmacol. 2006;61(5):487-491.

Bradley C. Factors which influence the decision whether or not to prescribe: the dilemma facing general practitioners. Br J Gen Pract. 1992;42(364):454-458.

Chauhan N, Moin S, Pandey A, Mittal A, Bajaj U. Indian aspects of drug information resources and impact of drug information centre on community. J Adv Pharm Technol Res. 2013;4(2):84-93.

Coleman JJ, McDowell SE. The potential of the internet. Br J Clin Pharmacol. 2012;73(6):953-958.

Craan F, Oleske DM. Medical information and the internet: do you know what you are getting? J Med Syst. 2002;26(6):511-518.

De Leo G, LeRouge C, Ceriani C, Niederman F. Websites most frequently used by physician for gathering medical information. AMIA Annu Symp Proc. 2006;2006:902.

Decollogny A, Eggli Y, Halfon P, Lufkin TM. Determinants of generic drug substitution in Switzerland. BMC Health Serv Res. 2011;11:17.

Gaither CA, Bagozzi RP, Ascione FJ, Kirking DM. The determinants of physician attitudes and subjective norms toward drug information sources: modification and test of theory of reasoned action. Pharm Res. 1997;14(10):1298-l308.

Gaither CA, Bagozzi RP, Kirking DM, Ascione FJ. Factors related to physicians' attitudes and beliefs toward drug information sources. Drug Info J. 1994;28(3):817-827.

Gandhi K, Jadhav PR. Preference for utilization of drug information sources among postgraduate medical residents. Int J Basic Clin Pharmacol. 2017;6(12):2859-2863.

Haayer F. Rational prescribing and sources of information. Soc Sci Med. 1982;16(23):2017-2023.

Hands D, Stephens M, Brown D. A systematic review of the clinical and economic impact of drug information services on patient outcome. Pharm World Sci. 2002;24(4):132-138.

Hartzband P, Groopman J. Untangling the web-patients, prescribers and the internet. N Engl J Med. 2010;362:1063-1066.

Hennigen FW, Fischer MI, Camargo AL, Heineck I. Diagnosis of the availability and use of drug information sources in drugstores and pharmacies in southern Brazil. Braz J Pharm Sci. 2009;45(2):287-94.

Hincapie A, Schlosser E, Damachi U, Neff E, Llambi L, Groves K, et al. Perceptions of the provision of drug information, pharmaceutical detailing and engagement with non-personal promotion at a large physicians network: a mixed-methods study. BMJ Open. 2021;11(1):e041098.

Hogerzeil HV. Promoting rational prescribing: an international perspective. Br J Clin Pharmacol. 1995;39(1):1-6.

Joshi MP. University hospital-based drug information service in a developing country. Eur J Clin Pharmacol. 1997;53(2):89-94.

Kale R. Health information for the developing world. BMJ. 1994;309(6959):939-942.

Kasilo OJ, Nhachi CF. Recommendations for establishing a drug and toxicology information center in a developing country. DICP. 1991;25(12):1379-1383.

Kersnik J, Peklar J. Attitudes of Slovene general practitioners towards generic drug prescribing and comparison with international studies. J Clin Pharm Ther. 2006;31(6):577-583.

Lua HL, Sklar G, Ko Y. Identification and physicians' views of their commonly-used drug information sources in Singapore. Int J Clin Pharm. 2011;33(5):772-778.

Lundborg CS, Hensjo LO, Gustafsson LL. Drug information sources: Reported preferences by general practitioners. Drug Inf J. 1998;32(3):777-785.

Markind JE, Stachnik JM. European drug information centers. J Hum Lact. 1996;12(3):239-242.

Marra CA, Lynd LD, McKerrow R, Carleton BC. Drug and poison information resources on the Internet, Part 1: An introduction. Pharmacotherapy. 1996a;16(4):537-546.

Marra CA, Carleton BC, Lynd LD, Marra F, McDougal AR, Chow D, et al. Drug and poison information resources on the Internet, Part 2: Identification and evaluation. Pharmacotherapy. 1996b;16(5):806-818.

McGettigan P, Golden J, Fryer J, Chan R, Feely J. Prescribers prefer people: The source of information used by prescribers for prescribing suggest that the medium is more important than the message. Br J Clin Pharmacol. 2001;51(2):184-189.

Pearson AS, Rolfe I, Smith T. Factors influencing prescribing: an intern′s perspective. Med Educ. 2002;36(8):781-787.

Peay MY, Peay ER. Patterns of preferences for information sources in the adoption of new drugs by specialists. Soc Sci Med. 1990;31(4):467-476.

Podichetty VK, Booher J, Whitfield M, Biscup RS. Assessment of internet use and effects among healthcare professionals: a cross sectional survey. Postgrad Med J. 2006;82(966):274-279.

Rosenberg JM, Koumis T, Nathan JP, Cicero LA, McGuire H. Current status of pharmacist-operated drug information centers in the United States. Am J Health Syst Pharm. 2004;61(19):2023-2032.

Salhia HO, Ali A, Rezk NL, El Metwally A. Perception and attitude of physicians toward local generic medicines in

Saudi Arabia: A questionnaire-based study. Saudi Pharm J. 2015;23(4):397-404.

Saurabh MK, Biswas NK, Yadav AK, Singhai A, Saurabh A. Study of prescribing habits and assessment of rational use of drugs among prescribers of primary healthcare facilities. Asian J Pharm Clin Res. 2011;4(4):102-105.

Schumock GT, Walton SM, Park HY, Nutescu EA, Blackburn JC, Finley JM, et al. Factors that influence prescribing decisions. Ann Pharmacother. 2004;38(4):557-562.

Suh DC. Trends of generic substitution in community pharmacies. Pharm World Sci. 1999;21(6):260-265.

Tefera YG, Gebresillassie BM, Ayele AA, Belay YB, Emiru YK. The characteristics of drug information inquiries in an Ethiopian university hospital: A two-year observational study. Sci Rep. 2019;9(1):13835.

Theodorou M, Tsiantou V, Pavlakis A, Maniadakis N, Fragoulakis V, Pavi E, et al. Factors influencing prescribing behaviour of physicians in Greece, and Cyprus: results from a questionnaire based survey. BMC Health Serv Res. 2009;9:150.

Toklu HZ, Dülger GA, Hıdıroğlu S, Akici A, Yetim A, Gannemoğlu HM, et al. Knowledge and attitudes of the pharmacists, prescribers and patients toward generic drug use in Istanbul-Turkey. Pharm Pract. 2012;10(4):199-206.

Tsiantou V, Zavras D, Kousoulakou H, Geitona M, Kyriopoulos J. Generic medicines: Greek physicians' perceptions and prescribing practices. J Clin Pharm Ther. 2009;34(5):547-554.

Vijayakumar TM, Sathyavati D, Subhashini T, Grandhi S, Dhanaraju MD. Assessment of prescribing trends and rationality of drug prescribing. Int J Pharmacol. 2011;7:140-143.

Williams JR, Hensel PJ. Physicians' sources of pharmaceutical information: changes and implications. J Pharm Mark Manage. 1991;5(3):21-36.

World Health Organization. Guide to good prescribing. Geneva. 1994.

World Health Organization. WHO Policy Perspectives on Medicines-Promoting rational use of medicines: core components. Geneva. 2002.

Younger P. Internet-based information-seeking behaviour amongst prescribers and nurses: a selective review of the literature. Health Info Libr J. 2010;27(1):2-10.

Received for publication on 17th July 2020
Accepted for publication on 07th September 2021