

## Assessment of Sources of Drug Information Use Among Physicians for Prescribing Medications

Abdulwase Ibrahim<sup>1</sup>, Muhammad Ahmad Suleiman<sup>1</sup>, Jamilu Ya'u<sup>2</sup>, Shafiu Mohammed<sup>2</sup>

**How to cite this article:** Ibrahim A, Suleiman MA, Ya'u J, Mohammed S. Assessment of Sources of Drug Information Use Among Physicians for Prescribing Medications *Glob J Med Therap.* 2022;4(4):1-7. <https://doi.org/10.46982/gjmt.2022.105>

**Copyright:** This is an open access journal published under the Creative Commons Attribution Non-Commercial License (CC-BY 4.0), which permits unrestricted use, distribution, and reproduction, provided the original work is properly cited and its authors credited.

**Abstract– Background:** Irrational drug usage is a serious issue around the world. According to the World Health Organization (WHO), more than half of pharmaceuticals are prescribed, administered, or sold incorrectly, and a high percentage of patients do not take their medications properly. Anecdotal evidence from community pharmacies within the study site showed an alarming rate of prescribing errors. Pharmacists can influence prescribing physicians' behavior by providing appropriate drug information. This study aims to examine the most common sources of drug information among physicians in Kaduna Metropolis, Nigeria and its influence on physician prescription decisions. **Methods:** A cross-sectional survey was conducted among physicians in two tiers of facilities, secondary and tertiary hospitals. A self-administered questionnaire was distributed to physicians working at both public and private hospitals. Data were analyzed using frequencies and percentages, while inferences were made using chi-square at  $p$ -value  $\leq 0.05$  and cross-tabulation. **Results:** We retrieved 93 questionnaires. About 60% of respondents were within the age of 20 to 30 years and had more than 5 years of experience. Physicians' preference for drug information sources were consulting drug monographs 66%, refer to medical peers 68% and ask pharmacists 39%. In secondary and tertiary hospitals respectively 47% and 53% of respondents selected official monographs as their source of drug information, while 43% and 57% considered pharmacists for advice. Dosing regimens and safety concerns were the two primary factors driving the demand for drug information, whereas pharmaceutical dosage forms received less attention. Internet was the most preferred choice when drug safety is a concern. **Conclusion:** Pharmacists were merely considered as drug information providers as physicians preferred to seek

drug information from physician colleagues, monographs, and the internet. Endorsement of the valuable role of pharmacists to physicians as drug information providers is essential. This could be through better communication with physicians and conducting awareness meetings and workshops.

**Keywords:** Drug information, sources of drug information, pharmacist, physician, drug safety, prescribing medication, prescription.

### 1. INTRODUCTION

The World Health Organization (WHO) estimates that more than half of medications are prescribed, dispensed, or sold inappropriately, and about half of patients fail to take their drugs properly. The overuse, underuse, or misuse of medicines results in wastage of resources and widespread health hazards [1,2].

In developing countries, many factors have been identified as the main contributors to the problem of irrational use of drugs [3]. These factors include lack of regular and reliable facilities which provide up-to-date and unbiased drug information, the influence of pharmaceutical sales representatives, and inadequate training and professional development [4]. Other factors include poor communication between pharmacists, health professionals and patients regarding proper use of drugs [5].

The irrational use of medicine has many consequences such as development of antimicrobial resistance, reduction in patients' adherence to treatment, drugs interactions, wasting of limited resources, disease relapse, prolongation of treatment duration, increased side effects, and increased treatment costs [6,7]. According to WHO data, health spending from 2000 to 2019 is mostly from out-of-pocket spending with about 50% of the total expenditure, while government and external aid covers 21% and 29% respectively [8]. Schneider et al reported an estimated global health expenditure for pharmaceuticals and other medical non-durable goods at 178USD per capita in 2017 [9]. Besides, the WHO has also reported an increase in total health expenses as a result of the covid-19 pandemic [8]. There is evidence from published observational studies that,

<sup>1</sup> Kaduna State University, Kaduna, Nigeria

<sup>2</sup> Ahmadu Bello University, Zaria, Nigeria

\*Corresponding Author: Muhammad Ahmad Suleiman

Email address: [almukarramin@gmail.com](mailto:almukarramin@gmail.com)

Received: 08 October 2022

Accepted: 28 November 2022

Published:

eligible patients have not always been prescribed the medicines indicated for their condition which is considered overuse or misuse of drugs [10]. A study by Gray J suggested that educational approaches to influence physicians prescribing behavior include interactive educational activities; teaching based on identified learning needs; sequenced and multifaceted interventions; enabling tools such as flow charts, patient education programs, and reminders; a academic detailing or educational outreach; in addition to feedback and a audit to prescribers [11].

This study aims to examine the most common sources of drug information among physicians in hospitals within the Kaduna metropolis, Nigeria and its influence on physician prescribing decisions.

## 2. MATERIALS AND METHODS

A descriptive cross-sectional study was conducted in the Kaduna State Metropolis, Nigeria. This state was selected because it is one of the largest metropolises in northern Nigerian with many health facilities both in urban and peri-urban areas, including a university teaching hospital, an Army referral hospital, and many other governments and private owned secondary health care facilities [12]. We involved practicing physicians in Kaduna metropolis secondary or tertiary hospitals with pharmacy departments who agreed to participate in the study.

Convenience sampling was used to select and recruit both hospitals and research participants to acquire a significant number of responses due to physicians' low response to surveys and the limited number of physicians available at health facilities during study time due to the Covid-19 pandemic [4,13].

A semi-structured questionnaire was adapted from Theodorou et al., 2009, Kamuhabwa and Kisoma (2015) [4,10] as there is no universally accepted standard instrument for that purpose.

The questionnaire consisted of three (3) sections. Section A covered demographic data such as age, sex, years of post-graduation experience, cadre, employment status, how often they prescribe medicine for patients, and the rate of their prescribing skills. Section B consisted of questions on factors influencing drug prescribing where physicians were asked to tick their top five best answers. This section included sources of drug information physicians consider before prescribing a drug and the most common reasons to seek drug information. Section C contained seven questions on attitude statements that physicians normally consider on a patient-by-patient basis before prescribing any drug. Each question was coded using the Likert scale for correct answers with SA representing strongly agree, A representing agree, N for neutral, D for disagree, and SD for strongly disagree.

The adapted questionnaire was reviewed by experts to determine the validity of questions in terms of content, scope, and appropriateness of each item. Face validity was considered. Ten questionnaires were pre-tested within 2 days pilot study by distributing to 10 prescribing physicians. Ethical approval was obtained from the Health Research Ethics Committee (HREC) of Kaduna State Ministry of Health, with

reference number MOH/ADM/744/VOL.1/973.

Data were collected from November 2020 to May 2021 then entered into an Excel spreadsheet and exported into SPSS V22 for descriptive statistical analysis that included frequencies, mean, standard error of mean, and percentages. Chi-square and cross-tabulation were used to compare independent categorical variables with facility type, p-value of  $\leq 0.05$  was considered statistically significant.

## 3. RESULTS

Demographic characteristics: About 200 questionnaires were distributed, 110 were returned, and 93 were complete. The demographic characteristics of respondents were summarized in Table 1.

The age of most participants was between 20 to 30 years (56.9%), while those aged between 41 to 50 years were the least (3.2%). Majority of responders 37.6% had 6 to 10 years' experience, while 7.5% had 16 to 20 years' experience. Medical officers had the most responses (77.3%), while consultants accounted for only 2% of the occupational cadre. Most responses were from tertiary health facilities (55%) compared to secondary health facilities (45%).

**Table 1.** Demographic data

Demographics		N (%)
Age range (Years)	20-30	53 (56.9)
	31-40	26 (28.2)
	41-50	3 (3.2)
	51 & above	11 (11)
Gender	Female	34 (36.6)
	Male	59 (63.4)
Occupational cadre	House officer	1 (1.1)
	Consultant	2 (2.2)
	Junior registrar	10 (10.8)
	Medical officer	72 (77.3)
	Senior registrar	8 (8.6)
	Others	21 (22.8)
Speciality	Family medicine	2 (2.2)
	General practice	70 (75)
	Others	21 (22.8)
	0-5	18 (19.4)
	6-10	35 (37.6)
Years of experience	11-15	16 (17.2)
	> 15	16 (17.2)
	No response	8 (8.6)
	Full time	29 (31.2)
Employment status	Locum	35 (37.7)
	Others	7 (7.6)
	No response	22 (23.5)
Facility type	Tertiary	51 (54.8)
	Secondary	42 (45.2)
Type of institution	Public	81 (87.1)
	Private	12 (12.9)

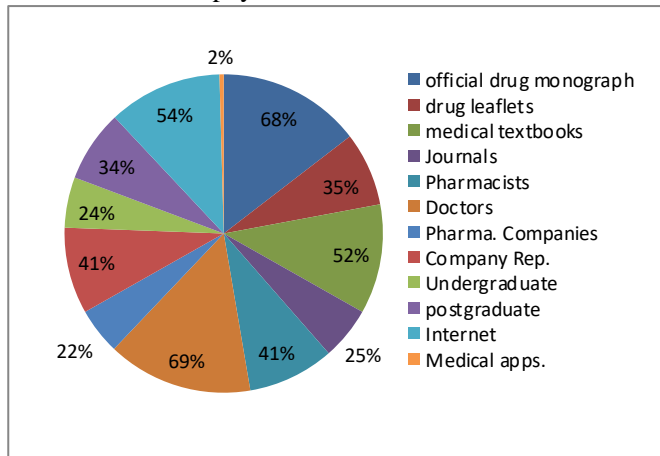
Sources of drug information: The majority of physicians got their drug information from fellow physicians 69% and official drug monographs 68%, while less than 40% of physicians considered pharmacists as a source of information. The least source of drug information was digital medical applications (2%) followed by pharmaceutical company representatives and advertisements. Sources of drug information presented in Figure 1.

About 60% of respondents from the tertiary hospitals preferred to obtain information from medical texts and

medical colleagues while nearly 60% of respondents from secondary facilities rather obtained their information from company representatives versus 40% from tertiary facilities. Around 50% of physicians from both facilities considered the official drug monographs as the source of drug information. About 43% and 57% of respondents from secondary and tertiary hospitals respectively referred to pharmacists. Table 2 represents the source of drug information based on facilities.

About 60% of respondents from the tertiary hospitals preferred to obtain information from medical texts and medical colleagues while nearly 60% of respondents from secondary facilities rather obtained their information from company representatives versus 40% from tertiary facilities.

Around 50% of physicians from both facilities considered



**Figure 1.** Sources of drug information

**Table 2.** Sources of drug information based on facilities

Sources of drug information	Facility Type		
	Tertiary n (%)	Secondary n (%)	Total n (%)
Official drug monograph	33(53)*	29(47)	62(66)
Drug leaflets	14(44)	18(56)*	32(34)
Medical textbooks	28(60)*	19(40)	47(50)
Journal Articles	10(44)	13(56)*	23(25)
Information from Pharmacists	16(43)	21(57*)	37(39)
Information from Doctors	35(56)*	28(44)	63(68)
Pharmaceutical Companies Representatives & advertisement	8(40)	12(60)*	20(21)
Undergraduate studies	10(46)	12(54)*	22(23)
Postgraduate studies	13(42)	18(58)*	31(33)
Websites pages and other internet sources	22(52)*	20(48)	42(45)
Medical applications	2(100)	0	2(2)
Total Responses	191	190	381

**Table 3.** Reasons for Drug Information Search by Facility

Reasons for drug information search	Facility Type		
	Tertiary n (%)	Secondary n (%)	Total n (% of 93)
Dosing Schedule	40 (57)*	37 (43)	77 (82.8)
Safety considerations	42 (52)*	39 (48)	81 (87.1)
Cost	25 (58)*	18 (42)	43 (46.2)
Special Populations such as Pregnancy, liver and renal disorder	38 (51)*	37 (49)	75 (80.7)
Drug Indications	36 (61)*	23 (39)	59 (63.4)
Pharmaceutical Delivery form e.g. Tablets and Injections	18 (56)*	14 (44)	32 (34.4)
Accessibility or Availability	26 (55)*	21 (45)	47 (50.5)
Others	2 (67)*	1 (33)	3 (3.2)
Total	227	190	417

\*Highest percentage

the official drug monographs as the source of drug information. About 43% and 57% of respondents from secondary and tertiary hospitals respectively referred to pharmacists.

Reasons for drug information search: Safety consideration was the highest 87%, followed by dosing schedule 82.8%, special populations as pregnancy, liver and renal disorder 80.6%, drug indications 63.4%, accessibility or availability 50.5%, cost 46.2% and dosage forms 34.4%. Table 3 summarize the reasons for drug information search by physicians.

Sources of drug information due to safety concern: Around 70% prescribing physicians generally consider consulting the internet to get informed about drug safety followed by medical App, professional colleagues and pharmacists, 44%, 36.6%, 31.2% respectively. Table 4 summarize the sources of drug information in regards to drug safety.

Attitude statements that influence physicians prescribing decisions: Around 56% of physicians strongly agreed that potential for adverse drug reaction (ADR) influence their decisions before prescribing a drug and 60% of physicians influenced by the previous experience. However, 37% were neutral to patient preferences. Table 5 summarize the physicians' attitude statements.

#### 4. DISCUSSION

Because of the low response rate to the questionnaire, a convenient sample was utilized. This is due to the Covid-19 pandemic, which overwhelmed most healthcare institutions, as well as a phobia of physical contact [13].

**Table 4:** Drug safety - Sources of Drug Information

Prescribing and Drug safety	Facility Type		
	Tertiary n (%)	Secondary n (%)	Total n=93 (%)
NAFDAC	1 (33.3)	2 (66.7)	3 (3.2)
Internet	37 (56.9)	28 (43.1)	65 (69.9)
Pharmaceutical Representatives	9 (52.9)	8 (47.1)	17 (18.3)
Pharmacists	9 (31)	20 (69)	29 (31.2)
Professional Colleagues	13 (38.2)	21 (61.8)	34 (36.6)
Medical Journal	6 (50)	6 (50)	12 (12.9)
Medical App	15 (36.6)	26 (63.4)	41 (44)
Medical Textbooks	9 (42.9)	12 (57.1)	21 (22.6)
Others	4 (30.8)	9 (69.2)	13 (14)
Total	103	132	235

NAFDAC National Agency for Food and Drug Control; responsible for drug safety data

**Table 5:** Attitude Statements that Influences Physicians Prescribing Decisions

Attitude Statements	Frequency (%)						Mean±SD
	1	2	3	4	5	No Response	
The cost of a drug generally influences my prescribing	2(2.2)	4(4.3)	12(13)	49(52.6)	25(26.8)	1 (1.1)	3.99±0.88
Knowing that a patient has insurance coverage influence my prescribing	3(3.3)	5(5.4)	10(10.8)	42(45.1)	32(34.3)	1 (1.1)	4.03±0.99
I consider the potential for adverse drug reactions before I prescribe it	0	2(2.2)	2(2.2)	36(38.7)	52(55.8)	1 (1.1)	4.50±0.66
My previous experience with a drug influences my subsequent prescribing decision	0	0	5(5.4)	31(33.3)	56(60.2)	1 (1.1)	4.55±0.60
I consider the pharmaceutical delivery mode of a drug e.g. oral or topical before prescribing	0	0	9(9.8)	39(41.9)	44(47.2)	1 (1.1)	4.38±0.66
I consider the dosing schedule of a drug e.g. once or twice daily administration before I prescribe it	0	2(2.2)	13(14)	36(38.7)	41(44)	1 (1.1)	4.26±0.78
I generally consider patient preferences before choosing to prescribe a drug	5(5.4)	13(14)	34(36.6)	29(31.1)	11(11.8)	1 (1.1)	3.30±1.04

In this analysis, with regards to demographic characteristics, most of the physicians attempted the questionnaires had 6 to 10 years of experience which could be attributed to a lack of permanent placement of work and always shifting place on locum bases. Physicians in the public sector such as tertiary health institutions and secondary health institutions owned by the government responded more than their private counterpart. This might be related to job security, the training and teaching programs available in the public health facilities mainly the tertiary health that offer opportunity for career development. Similarly, the study highlighted that the majority of prescribing physicians obtain drug information from other physician colleagues and official drug monographs, with less coming from digital medical applications, journal articles, internet sources, pharmaceutical company representatives, and advertisements. Although this is the same in a similar study carried out by Oshikoya et al., (2011) [5] in a teaching hospital in Ibadan, Nigeria where over half of the doctors would regularly seek drug information from their colleagues compared to less than a half that would occasionally consult reference books. From previous studies, it has also been shown that reliance on colleagues was the most highly ranked information source preference by rural and urban primary care physicians in the United States of America and the general practitioners in Ireland as reported by McGettigan et al., (2011) [14-16]. This practice was referred to by Williams as a preference for human sources rather than paper sources [17].

Similarly, pharmacists were rarely used as a source of information, as less than 40% of respondents refer to them as a drug information provider. Mukattash et al. (2014) reported similar findings in a study, stating that pediatricians seldom utilize pharmacists as a source of drug information [18]. Maneerat et al. supported our findings with another study in Thailand to demonstrate that pharmacists were rarely used as a source of drug information. However, in the same survey, physicians considered pharmacists as an unbiased information source as opposed to representatives from pharmaceutical companies and reveal that pharmacists should be well-equipped with current drug knowledge, have some "moral courage" about the details of the drugs, and know how to communicate effectively with individual physicians [19]. With pharmacists training and advisory role as a member of healthcare team, they should be involved in seeking appropriate drug information as highlighted by Kalfoglou [20].

Our study also revealed limited use of journal publications as source of information which is considered as a primary source. This might be attributed to the cost implication of getting drug information from journals, where some publishers may require access fees which is not practical in countries with limited resources like Nigeria. In contrast, a study conducted by Theodorou et al. in Greece and Cyprus, where physicians claimed to obtain drug information from

publications such as journals, conference proceedings, and textbooks [10].

Because of limited access to evidence-based publications in medical journals that may require financial subscriptions and due to insufficient number of pharmacists in public and private hospitals, most of physicians in Kaduna were seeking drug information from their doctor colleagues and official books or monographs rather than journals and pharmacists.

Although adverse drug reactions may not occur frequently, they do have a significant impact on a physician's prescribing habits [10]. A study revealed that doctors frequently consult the internet for drug safety-related information [10] which conforms to our finding.

In this study physicians merely consider cost and patient preferences to affect their decisions, given that the majority of patients at the research location had low-income. While in a recent study by Fadare et al., over 90% of physicians believe that drug cost is an essential consideration when writing prescriptions [21]. Daviri et al noted that [22] utilization of reliable practice guidelines could proffer solutions to most of the inconsistencies of drug information sources.

Limitations of the study: The survey had few consultant-level physicians since the majority of responders are house officers or medical officers. Furthermore, most of the respondents are less experienced hence their behavior may be skewed toward seeking drug information. Because the poll was conducted during the Covid-19 period, the physicians were likely already preoccupied, and the questionnaire may not have been filled out adequately. There is a need for further research to establish a correlation between different sources of drug information on medication errors.

The strength of the study: Relatively few studies were recently published on this topic and paucity of data from countries such as Nigeria will help on a global scale.

## 5. CONCLUSION & RECOMMENDATIONS

The study results showed that physicians prefer to seek information from fellow colleagues and official monographs rather than from pharmacists. The dosing schedule and safety of medication were considered by physicians before prescribing and the internet was the most preferred source of drug information in this regard.

The effective use of reliable practice guidelines as a source of information might lessen the harmful effects of a variety of variables and encourage sensible prescribing. Physicians should be encouraged by hospital pharmacists through effective communication such as clinical meetings, bulletins, discussions, seminars, and the development of hospital drug information centers to consider pharmacists as drug information providers.

**Conflict of Interest:** None declared

**Author contributions:** Abdulwase Ibrahim; Concept and design of the study, Had full access to all of the data in the study. Prof. Jamilu Yau and Prof. Shafiu Mohammed; Technical and material support. Muhammad Ahmad S.; Statistical Analysis, Drafting of the manuscript. All Authors; Acquisition, analysis and interpretation of data, Abdulwase

Ibrahim and Muhammad Ahmad S; critical revision of the manuscripts for intellectual content.

**Funding:** Self-funded

**Acknowledgment:** we would like to appreciate our medical colleagues that participated in this study.

## REFERENCES:

1. World Health Organization. Essential medicines and health products. The Pursuit of Responsible Use of Medicines: Sharing and Learning from Country Experiences. Published online 2017. Accessed November 14, 2021 <https://apps.who.int/iris/bitstream/handle/10665/75828/WHO?sequence=1>
2. World Health Organization. Spending on health: A global overview. Published 2017. Accessed November 14, 2021. <https://www.who.int/news-room/fact-sheets/detail/spending-on-health-a-global-overview>
3. Hoffman D, Botha J, Kleinschmidt I. An assessment of factors influencing the prescribing of antibiotics in Acute Respiratory Illness: A questionnaire study. *South African Family Practice*. 2003;45(6):20-24. [An assessment of factors influencing the prescribing of antibiotics in Acute Respiratory Illness: A questionnaire study | South African Family Practice \(ajol.info\)](#)
4. Kamuhabwa AA, Silumbe R. Knowledge among drug dispensers and antimalarial drug prescribing practices in public health facilities in Dar es Salaam. *Drug, healthcare and patient safety*. 2013;5:181. DOI:10.2147/DHPS.S50071
5. Oshikoya KA, Oreagba I, Adeyemi O. Sources of drug information and their influence on the prescribing behaviour of doctors in a teaching hospital in Ibadan, Nigeria. *Pan African Medical Journal*. 2011;9(1). DOI: 10.4314/pamj.v9i1.71188
6. Holloway K, Van Dijk L. The world medicines situation 2011. Rational use of medicines. World Health Organization. Published online 2011. <http://narst.dmsc.moph.go.th/manuals/The%20World%20Medicines%20Situation%202011%20-%20Rational%20Use%20of%20Medicines.pdf>
7. Otoom SA, Sequeira RP. Health care providers' perceptions of the problems and causes of irrational use of drugs in two Middle East countries. *International journal of clinical practice*. 2006;60(5):565-570. doi/10.1111/j.1742-1241.2005.00808.x
8. World Health Organization. Global expenditure on health: public spending on the rise? Published online 2021. [Global expenditure on health: Public spending on the rise? \(who.int\)](#)
9. Schneider MT, Chang AY, Chapin A, et al. Health expenditures by services and providers for 195 countries, 2000–2017. *BMJ Global Health*. 2021;6(7):e005799. doi:10.1136/bmjgh-2021-005799
10. Theodorou M, Tsiantou V, Pavlakis A, et al. Factors influencing prescribing behaviour of physicians in Greece and Cyprus: results from a questionnaire-based

- survey. BMC health services research. 2009;9(1):1-9. <https://doi.org/10.1186/1472-6963-9-150>
11. Gray J. Changing physician prescribing behaviour. The Canadian journal of clinical pharmacology= Journal canadien de pharmacologie clinique. 2006;13(1):e81-4. <https://www.jptcp.com/index.php/jptcp/article/view/111>
  12. AbdulAziz HO, Aminu M, Machido DA. Isolation and Characterisation of Esherichia coli O157 in Human Stool Samples from Parts of Kaduna Metropolis Nigeria. American Journal of Food Science and Technology. 2016;4(5): 125-128. DOI: 10.12691/ajfst-4-5-1
  13. Stratton SJ. Population Research: Convenience Sampling Strategies. Prehospital and Disaster Medicine. 2021;36(4):373-374. doi:10.1017/S1049023X21000649
  14. Dorsch JL. Information needs of rural health professionals: a review of the literature. Bull Med Libr Assoc. 2000;88(4):346-354. [Information needs of rural health professionals: a review of the literature - PMC \(nih.gov\)](#)
  15. Connelly DP, Rich EC, Curley SP, Kelly JT. Knowledge resource preferences of family physicians. J Fam Pract. 1990;30(3):353-359. [Knowledge resource preferences of family physicians - PubMed \(nih.gov\)](#)
  16. McGettigan P, Golden J, Fryer J, Chan R, Feely J. Prescribers prefer people: The sources of information used by doctors for prescribing suggest that the medium is more important than the message. Br J Clin Pharmacol. 2001;51(2):184-189. doi:10.1111/j.1365-2125.2001.01332.x
  17. Williams ME, Connolly NK. What practicing physicians in North Carolina rate as their most challenging geriatric medicine concerns. Journal of the American Geriatrics Society. 1990;38(11):1230-234. <https://doi.org/10.1111/j.1532-5415.1990.tb01504.x>
  18. Mukattash TL, Nuseir KQ, Jarab AS, Alzoubi KH, Al-Azzam SI, Shara M. Sources of information used when prescribing for children, a survey of hospital-based pediatricians. Curr Clin Pharmacol. 2014;9(4):395-398. doi:10.2174/157488470866613111205339
  19. Mukattash TL, Nuseir KQ, Jarab AS, Alzoubi KH, Al-Azzam SI, Shara M. Sources of information used when prescribing for children, a survey of hospital based pediatricians. Curr Clin Pharmacol. 2014;9(4):395-398. [doi:10.2174/157488470866613111205339](#)
  20. Layton MR, Sritanyarat W, Chadbunchachai S, Wertheimer AI. Sources of information for new drugs among physicians in Thailand. Pharmacy World & Science. 2007;29(6):619-627. doi:10.1007/s11096-007-9112-4
  21. Kalfoglou S. The Importance of Expert Witnessing: The Balkan Experience. İstanbul Yeni Yüzyıl Üniversitesi - Adli Tıp; 2020. ISBN: 978-605-85154-7-5
  22. Fadare JO, Enwere OO, Adeoti AO, Desalu OO, Godman B. Knowledge and Attitude of Physicians Towards the Cost of Commonly Prescribed Medicines: A Case Study in Three Nigerian Healthcare Facilities. Value in Health Regional Issues. 2020;22:68-74. doi:10.1016/j.vhri.2020.05.005
  23. Davari M, Khora sani E, Tigabu BM. Factors Influencing Prescribing Decisions of Physicians: A Review. Ethiop J Health Sci. 2018;28(6):795-804. doi:10.4314/ejhs.v28i6.15
  24. World Health Organization. Measuring Medicine Prices, Availability, Affordability and Price Components. World Health Organization; 2008. [https://apps.who.int/iris/bitstream/handle/10665/70013/WHO\\_PSM\\_PAR\\_2008.3\\_eng.pdf](https://apps.who.int/iris/bitstream/handle/10665/70013/WHO_PSM_PAR_2008.3_eng.pdf)