

Exploring the Ready Knowledge of Drug Prescribing among Junior Doctors in Libya

Ahmed Atia, Sabrin Zanned¹, Nafisah Bakait¹

Department of Anesthesia and Intensive Care, Faculty of Medical Technology, Tripoli University, Tripoli, ¹Department of Pharmaceutical Sciences, University of Tripoli Alahlia, Janzur, Libya

Abstract

Background: Essential drug knowledge is a ready knowledge of frequently prescribed drugs acquired by the clinician for the rational prescription. The present study was undertaken with the aims of assessing the knowledge of Libyan junior doctors about commonly prescribed drugs that necessary for rational prescribing and to determine the level of their ready knowledge. **Methods:** A questionnaire was distributed to 162 junior doctors employed at primary health centers in the city of Tripoli, Libya, and were requested to answer questions about rational prescribing of three commonly prescribed drugs (bisoprolol, pseudoephedrine, and co-amoxiclav). All items were categorized into six sets of core knowledge: drug class, indications, method of administration, contraindication, interaction, and adverse effects. The knowledge level to which junior doctors answer these statements was examined with a face-to-face assessment. **Results:** A number of 19 statements per drug were considered to be ready knowledge important for rational prescribing. Overall, knowledge about “drug class” (74.5%) and “Methods of administration (86.4%)” comprise most of the essential ready knowledge. Items concerning “interactions” (23.8%) and “contra-indication” (36.1%) were little acknowledged. **Conclusion:** Junior doctors’ ready knowledge, in our population sample, seems to be insufficient to good prescribing. Our findings could be used in measuring the prescribing skills of future junior doctors in Libya.

Keywords: Doctors, junior, prescribing, prescribing, skill

INTRODUCTION

Rational prescription implies the need of fundamental knowledge required to ensure that the prescriber aware precisely about drug preparation and dosage to be prescribed, and the patient has received clear instructions regarding self-administration of medication prescribed.^[1] Drug prescribing is a crucial and challenging task written in a legal document to give guidance to confirm harmless use and to fulfill with governmental regulations and policies.^[2] It requires a comprehensive knowledge of the clinical pharmacology, pharmacotherapeutics, and the pathophysiology of disease.^[3]

Rational prescribing that is efficiently, securely, and cost-effectiveness, is an important skill for junior doctors to minimize the incidence of drug side effects and reactions, as well as drug prescribing errors.^[4] Unfortunately, several studies have reported insufficient skills in drug prescribing by junior doctors that possibly make various avertible prescribing faults, resulting in inadequate care of the patient and even harm patient safety.^[5,6] Studies have revealed significant inconsistencies

between the prescriber’s intent to treat and the real handwriting, particularly among junior doctors.^[7] Medication faults in health-care settings are common, and many are avoidable.^[8]

There is considerable evidence that the main factor responsible for the presence of prescribing errors is the insufficiency of basic knowledge of pharmacology and pharmacotherapy among fresh graduate students.^[9-11] Thus, enhancing the pharmacology and pharmacotherapy knowledge of medical students might avert or diminish the number of these errors in future.^[12]

The rational prescription requires physicians to know which information about each specific drug should be gained as

Address for correspondence: Dr. Ahmed Atia, Department of Anesthesia and Intensive Care, Faculty of Medical Technology, Tripoli University, Tripoli, Libya. E-mail: elbadri83@yahoo.com

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“ready knowledge” and which can be searched for (e.g., by accessing the electronic system or a mobile device). The previous study recommends that medical students should expand knowledge of an essence list of frequently prescribed medicines, such as student drug formulary or the essential drug list; thus, they can prescribe these medications rationally under the direction of experts. This prescribing skill and drug knowledge should be evaluated and tested to enable students to be graduated.^[13-15]

Up to date, there is no study assessed the “ready knowledge” of Libyan junior doctors on drug they prescribe; hence, the aim of this study is to verify the ability of such a cohort of Libyan doctors to know information about frequently prescribed drugs acquired to perform rational prescription of medications.

METHODS

Study design

This is a cross-sectional exploratory study conducted during February 2019 in nine clinical health-care centers in Tripoli city of Libya.

Questioner development and data collection

A pre-tested questioner was constructed containing specific information that itemizes three selected drugs from different classes, which makes the base of this study. The selected drugs are as follows: bisoprolol (beta-blocker), pseudoephedrine (sympathomimetic amine), and co-amoxiclav (antibiotic). Junior doctors in the city of Tripoli are expected to have knowledge about these drugs because these drugs are widely used drugs by doctors in Tripoli.^[16,17]

For each drug, a questioner was constructed containing essential information regarding the selected drug. Nineteen items for each drug were extracted from the British National Formulary,^[18] with the total list of 57 items. All items were categorized into six sets of core knowledge: drug class, indications, method of administration, contraindication, interaction, and adverse effects.

Participant selection

A total of 162 junior doctors who recently graduated from Libyan universities were invited to contribute to this exploratory study. About 116 of the total participants agreed to be involved in this questionnaire study, making a total of 71.6% respondents. The participants were from different specialties, such as internal medicine, surgery, pediatric, cardiology, gynecology, oncology, otolaryngology, and rheumatology. As inclusion criteria, all invited participants had to presently work as a junior doctor, and have at least 3 years of clinical experience. Respondents received written instruction about the objective of the study and were willing to voluntarily participate in the study. The confidentiality of information tendered was guaranteed to the participants.

To verify which information about frequently prescribed drugs junior doctors should have acquired to prescribe

judiciously in daily practice, a questionnaire was distributed. The questionnaire distributed during their morning session, on different days, at different departments. Participants were asked to fill in the questioner instantly to assess their ready knowledge about the selected drugs. Participants were allowed to modify their answers of each item if the item realized to be valuable.

Ethical approval

This study was approved by ethical committee of Department of Pharmaceutical Sciences, University of Tripoli Alahlia, Janzur, Libya.

Statistical analysis

The returned questionnaires were collected in excel sheet, analyzed using simple descriptive statistics by using the Statistical Package Software System (SPSS) software version 20.0 (Chicago, Illinois, United States).

RESULTS

Demographic characteristics

Overall, 116 junior doctors (71.6%) completed the circulated questionnaire. Most of these participants were female (94; 81%), and they had a median clinical experience of 2.3 years.

Essential drug knowledge

In total, items in the categories “drug class” (74.5%) and “methods of administration” (86.4%) were the most acknowledged, and little knowledge about “interactions” (23.8%), and “contra-indication” (36.1%) was identified as being essential. Averages of 19 statements per drug were considered to be essential ready knowledge to good prescribing. The number of statements per category is described in Table 1. Knowledge regarding drug classes and method of administration comprise most of the essential ready knowledge. With regard to the essential knowledge on bisoprolol, our findings demonstrated that the majority of junior doctors had a good knowledge related to drug classes, drug indication, and methods of administration. Poor knowledge was reported on drug interaction and contraindication. When we assess the ready knowledge of participated junior physician on pseudoephedrine, we have found that only “methods of administration” was in a good knowledge by the respondents, while the other statements' knowledge was insufficient. Concerning co-amoxiclav statements, items in the categories “drug class” (84.4%) and “Methods of administration” (84.4%) were the most acknowledged.

DISCUSSION

With the upraising global access to electronic database and online resources such as, guidelines, eBooks, and National Formularies, it is not been easy to know what ready knowledge on a specific drug doctors should gain or what they can search for. This is the only study in Libya up to date aimed to assess the essential ready drug knowledge of Libyan junior physician that allow them to prescribe efficiently and rationally.

Table 1: Number of statements and junior doctors' level of total identified ready knowledge, per category (Junior doctors' level: mean percentage of maximum score)

Category	Drug class	Indication	Method of administration	Contra indications	Interactions	Side effects
Knowledge on bisoprolol						
Number of statements	1	4	1	3	3	7
Junior doctors' level (%)	98.2	79.3	94.8	50.8	33.3	54.3
Knowledge on pseudoephedrine						
Number of statements	1	4	1	3	3	7
Junior doctors' level (%)	41.3	28.1	50.8.1	35.1	12.3	31.5
Knowledge on co-amoxiclav						
Number of statements	1	4	2	3	3	7
Junior doctors' level (%)	84.4	70.6	84.4	22.4	25.8	25.8

After circulating a questioner containing instructions about commonly prescribed drugs, the author concluded which items were the most acknowledged.

To reflect the overall population of doctors in primary health-care setting, we assessed the essential drug knowledge from junior doctors in various practice settings and departments. Our findings in the current study revealed that, from the total tested 116 junior doctors, items in the categories “drug class” (74.5%) and “methods of administration” (86.4%) were the most acknowledged, and items concerning “interactions” (23.8%), and “contra-indication” (36.1%) and were the lowest. The study in line with previous study conducted by Brinkman *et al.* 2015 were the items in the categories “drug class” (52%) were the most known, and items about “side effects” (9%) and “interactions” (14%) were the fewest acknowledged items.^[19]

Earlier studies of essential drug knowledge of generally prescribed medicines have been mostly based on the professional opinion of either clinical pharmacologists or local instructors.^[20] Several studies reported a comprehensive outline of a list of therapeutic drugs that junior doctor should know to practice the clinical alternative medicine safely.^[21] Nevertheless, as in another studies, the overview provided a somewhat general and superficial explanation of what should be gained about these drugs (e.g. “identify their adverse effects”).^[19] Another study failed to evidently describe what essential knowledge students and doctors need to recognize to prescribe judiciously. Brinkman *et al.* provided, in their study, detailed list of information that students and junior doctors should know. This list could probably add into the earlier literature core skills in basic and clinical pharmacology for afresh skilled doctors.^[19]

Our findings in the current study stated that respondent's knowledge on method of administration and drug class was the most acknowledged statements (86.4%, 74.5%, respectively). This was not surprising as the clinicians required to distinguish the drug class and method of drug administration for the proper selection and use of a particular drug. On the other hand, our results clearly showed that knowledge of drug interaction and contraindications was considered the lowest known statements, which could be danger to the patient's health and

safety. A possible reason why junior doctors, in our study, lack the knowledge of potential drug-drug interactions (23.8%) is that doctors may have no access to some supportive material when checking for drug-drug interactions. However, prescribers should actively confirm the appropriateness of drug treatment for the individual patient (i.e. checking for both contraindications and possible drug interactions) to prescribe rationally.^[22] This needs a wider knowledge base gained by the junior physician. Furthermore, we think that syllabuses of medical colleges should be stressed on the knowledge of drug interactions and contraindications, particularly in the case of emergency drug prescribing conditions.^[23]

Rational prescribing is not merely based on gaining knowledge, but rather it through judgment and skilled prescribing practices.^[24] Accordingly, curricula for medical education should be emphasized not only on acquisition of border knowledge in pharmacology and pharmacotherapy but also on the implementation of suitable training in prescribing practice, for instance using the World Health Organization 6-step instructions.^[25] Some investigators have stated that basis (intern) year doctors lack essential prescribing skills of various groups of medications with most of them reported that undergraduate teaching in general pharmacology and pharmacotherapeutics had not prepared them sufficiently for rational use of medicines.^[26] The inclusive purposes of medical school training are to give the basis for a medical career and to offer junior doctors with suitable skills and knowledge for the first phase of their post-qualification career.^[27] Even though a variety of curriculum tactics in medical schools is encouraged, the ministry of higher education in Libya is accountable for the design and regulation of undergraduate medical education in Libya. Medical education in Libya extents a minimum of 6 years, but it is in the 4th year onward that clinical exercise starts. This is the period where undergraduate pharmacology courses including topics in general and clinical pharmacology as well as therapeutics are taught.

The study had some limitations. Initially, the number of participants who decided to be involved in the study was probably low. Moreover, the three selected drugs may not have sufficiently explicit the scope of knowledge usable to the higher number of frequently prescribed drugs. Finally, the

results could not be generalized to other cities in the country, where medications other than the three chosen in this study may be among the most frequently prescribed.

CONCLUSION

To the best of our knowledge, this is the first published study in Libya to determine the sufficient knowledge intern doctors know about the core list of commonly prescribed drugs. Our findings have reported gaps in knowledge that junior doctors have about the prescription practice. Insufficient knowledge and experience with prescribing medicines are more likely to cause prescribing errors, which may cause of patient harm. Our results could be used in the updating of curricula and developing training programs in our country, and for evaluating the prescribing ability of future junior doctors.

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Conflicts of interest

There are no conflicts of interest.

REFERENCES

1. Sandilands EA, Reid K, Shaw L, Bateman DN, Webb DJ, Dhaun N, *et al.* Impact of a focussed teaching programme on practical prescribing skills among final year medical students. *Br J Clin Pharmacol* 2011;71:29-33.
2. Ajemigbitse A, Omole M, Ezike N, Erhun W. Assessment of the knowledge and attitudes of intern doctors to medication prescribing errors in a Nigeria tertiary hospital. *J Basic Clin Pharma* 2014;5:7-14.
3. Khan A, Rashed M, Muneersha T, Rahiman O. Assessment of the prescribing knowledge, attitude and skills of medical students and interns in a large teaching hospital of Southern India. *Biomed Pharmacol J* 2013;6:63-9.
4. McLellan L, Tully MP, Dornan T. How could undergraduate education prepare new graduates to be safer prescribers? *Br J Clin Pharmacol* 2012;74:605-13.
5. Celebi N, Weyrich P, Riessen R, Kirchhoff K, Lammerding-Köppel M. Problem-based training for medical students reduces common prescription errors: A randomised controlled trial. *Med Educ* 2009;43:1010-8.
6. McCarthy RM, Hilmer SN. Teaching junior medical officers safe and effective prescribing. *Intern Med J* 2013;43:1250-3.
7. Oshikoya KA, Senbanjo IO, Amole OO. Interns' knowledge of clinical pharmacology and therapeutics after undergraduate and on-going internship training in Nigeria: A pilot study. *BMC Med Educ* 2009;9:50.
8. Garbutt J, Highstein G, Jeffe D, Dunagan W, Fraser V. Safe medication prescribing: Training and experience of medical students and house staff at a large teaching hospital. *Acad Med* 2005;80:594-9.
9. Ross S, Ryan C, Duncan EM, Francis JJ, Johnston M, Ker JS, *et al.* Perceived causes of prescribing errors by junior doctors in hospital inpatients: A study from the PROTECT programme. *BMJ Qual Saf* 2013;22:97-102.
10. Lewis PJ, Ashcroft DM, Dornan T, Taylor D, Wass V, Tully MP. Exploring the causes of junior doctors' prescribing mistakes: A qualitative study. *Br J Clin Pharmacol* 2014;78:310-9.
11. Duncan EM, Francis JJ, Johnston M, Davey P, Maxwell S, McKay GA, *et al.* Learning curves, taking instructions, and patient safety: Using a theoretical domains framework in an interview study to investigate prescribing errors among trainee doctors. *Implement Sci* 2012;7:86.
12. Dean B, Schachter M, Vincent C, Barber N. Causes of prescribing errors in hospital inpatients: A prospective study. *Lancet* 2002;359:1373-8.
13. Orme M, Frolich J, Vrhovac B; Education Sub-Committee of the European Association for Clinical Pharmacology and Therapeutics. Towards a core curriculum in clinical pharmacology for undergraduate medical students in Europe. *Eur J Clin Pharmacol* 2002;58:635-40.
14. De Vries TP, Daniels JM, Mulder CW, Groot OA, Wewerinke L, Barnes KI, *et al.* Should medical students learn to develop a personal formulary? An international, multicentre, randomised controlled study. *Eur J Clin Pharmacol* 2008;64:641-6.
15. Ross S, Maxwell S. Prescribing and the core curriculum for tomorrow's doctors: BPS curriculum in clinical pharmacology and prescribing for medical students. *Br J Clin Pharmacol* 2012;74:644-61.
16. Atia A. Monitoring the level of antibiotic purchase without a prescription among Libyan young adults. *Indian J Pharm Pract* 2018;11:208-11.
17. Atia A. Physician trends of drug prescription in Libya: A pharmacoepidemiological study. *Pharmacophore* 2019;10:12-.
18. British National Formulary. Available from: <https://www.bnf.org/>. [Last accessed on 6 2019 Sept 06].
19. Brinkman D, Disselhorst G, Jansen B, Tichelaar J, van Agtmael M, de Vries T, *et al.* What should junior doctors know about the drugs they frequently prescribe? A delphi study among physicians in the Netherlands. *Basic Clin Pharmacol Toxicol* 2016;118:456-61.
20. Aronson JK. What do clinical pharmacologists do? A questionnaire survey of senior UK clinical pharmacologists. *Br J Clin Pharmacol* 2012;73:161-9.
21. Harding S, Britten N, Bristow D. The performance of junior doctors in applying clinical pharmacology knowledge and prescribing skills to standardized clinical cases. *Br J Clin Pharmacol* 2010;69:598-606.
22. Brinkman DJ, Tichelaar J, van Agtmael MA, de Vries TP, Richir MC. Self-reported confidence in prescribing skills correlates poorly with assessed competence in fourth-year medical students. *J Clin Pharmacol* 2015;55:825-30.
23. Brinkman DJ, Tichelaar J, Schutte T, Benemei S, Böttiger Y, Chamontin B, *et al.* Essential competencies in prescribing: A first European cross-sectional study among 895 final-year medical students. *Clin Pharmacol Ther* 2017;101:281-9.
24. Shrestha B, Dixit SM. The assessment of drug use pattern using who prescribing indicators. *J Nepal Health Res Counc* 2018;16:279-84.
25. Keijsers CJ, Segers WS, de Wildt DJ, Brouwers JR, Keijsers L, Jansen PA. Implementation of the WHO-6-step method in the medical curriculum to improve pharmacology knowledge and pharmacotherapy skills. *Br J Clin Pharmacol* 2015;79:896-906.
26. Heaton A, Webb DJ, Maxwell SR. Undergraduate preparation for prescribing: The views of 2413 UK medical students and recent graduates. *Br J Clin Pharmacol* 2008;66:128-34.
27. Weggemans MM, van Dijk B, van Dooijeweert B, Veenendaal AG, Ten Cate O. The postgraduate medical education pathway: An international comparison. *GMS J Med Educ* 2017;34:Doc63.