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Evaluation of the Prescription Skills of the Fifth Year Dentistry Program in Babol University of Medical Sciences

[1]Neda Babaei, [2]Iman Jahanian, [3]Ali Akbar Moghadamnia and [4]Iman Gooran

[1]Dental Material Research Center, Faculty of Dentistry,
Babol University of Medical Sciences, Babol, Iran
[2]Department of Medical Education, Education Development Center,
Babol University of Medical Sciences, Babol, Iran
[3]Neuroscience Research Center, Department of physiology and pharmacology,
Faculty of medicine, Babol University of Medical Sciences, Babol, Iran
[4]Facultyof dentistry, Babol University of Medical Sciences, Babol, Iran

Abstract: Prescription has principles and rules that regarding to them can cause more efficiency. Education is a key element for success in health program, one such an education methods is using educational pamphlets.This study is aimed to determine the level of knowledge and abilities of dentistry students inBabol University of medical sciences students at their end of the fifth year about principles and rules in prescription and the effectiveness of educational pamphlets on their academic activities. For accelerating the patients treating and prevention of medical complications, dentists should have knowledge about prescription errors such as mistakes in writing the prescribed medicines, their pharmaceutical forms or dosage of use. Present work is aimed to evaluate the prescription skills of the fifth year dentistry students and effectiveness of their education.This research is an analytical study which was performed on 37 dentistry students of the fifth year in second academic semester of 2014-2015 at Babol University of medical sciences. The students were given evaluation sheets and asked to prescribe a different version for each of the referred cases and imagine that it is for a real patient and all tips must comply with principles. Then all necessary information piled in SPSS spread sheet for statistical analysis. The information consists of number of prescribed medicines, date, the patient's name, signature, spelling the name of the medicine, dosage and the number of medicine usage. All the prescriptions were collected and their information in terms of the overall structure of prescription, instruction of prescription and ingredients of medicines were evaluated. After one month the prescription test and comparison of obtained results, educational intervention according to educational pamphlets were performed. Using non-parametric tests (T-test) and Wilcoxon test in relation to medicine dosage ($p<0.0001$) and spelling mistakes ($p=0.018$) showeddiscrepancies for before and after distribution of pamphlets was significant. Also in other cases according to averages there were significant improvements when the number of participants was big. The results showed that that the prescription skills required reinforcement methods like use of educational pamphlets that can be effective with improvement in knowledge of dentists; that is eventually steps taken to improve public health.

Key words: Prescription · Dentistry · Educational training Pamphlets

INTRODUCTION

Medicine is a strategic commodity as it has direct relations with people's health. It is required to pay special attention to its administration and consumption in any healthy community. Inappropriate and excessive use of medicines not only cause financial losses, but also can end up to serious side effects. Therefore, prescription is one of the most important levels for the use of appropriate medicines for efficient and effective medications [1]. The

Corresponding Author: Neda Babaei, Dental Material Research Center, Faculty of Dentistry,
Babol University of Medical Sciences, Babol, Iran.

heart of medicinal communication applications from prescriber to pharmacist and eventually to the patient is prescription. A good prescription should be reasonable, according to observation, complete, clear and shouldbe helpful to improve the patient's treatment process. The componentsof a perfect prescription are: date, the patient's name, age, weight, admission number, the type of medication, dosage and how often patient use the medication, period of treatment, indications, name and signature of prescriber who is eligible to prescribe [2]. An error in prescription is consist of any kind of mistakes that lead to errors in amount and instruction to use the medicine, methods or period of treatment, reducing efficiency or increasing damages to the patient, doubling the therapeutic medicines and prescribing without paying attention to the possible interactions as side effects [3]. Most medical errors are medicinal errorsand more than two-third of medicinal errors are due to physicians errors [4]. This is despite the fact that the indiscriminate use of drugs in the country has increased over the past decade, following the increase of medicine consumption, shortage and lack of some medicines created addition problem [5]. One of the medical errors in country is inappropriate prescription of antibiotics that in addition to microbial resistance, has cost heavily to the patient and medication and therapy system [6]. Drug interactions are another problem originated from prescriptions [7]. In a research conducted in France [8] on 23080 prescriptions in 2003 showed, about 40% of prescriptions had drug interactions and inappropriate dosage. In Iran according to reports from Food and DrugAdministration Department of the Ministry of Health and Medical Education, 8% of admissions in hospitals faced to medicinal side effects [9]. Almost half of medicinal errors are preventable. In global studies errors rate of incidence in prescriptions are variable between 1 to 40% [10]. Oral diseases make up a relatively more patients problems and also initiation of a lot of systematic diseases can cause oral complications that requires addition health care. Hence administrations are considering prescription principles as effective on treatment outcome [11]. Also most of the dentistry treatments are practical, but a lot of dentistry measures need medicine administration. So dentists in addition to providing health cares have roles on society's health improvement.

Some students believedthat at practical stage after their graduation their prescription skills would improve. However, conducted research showed that prescription skills after entering practical stage in normal job did not change, because of changing improper prescription habits is not convenient [12]. Therefore, proper education before any bad habits become prevalent is very important. It seems that during academic years dentists may not receive proper education about prescription, because available education is mostly concerned about basic principles of pharmacology, classification of medicines and side effects. That is most probably due to prescription principles are ignored. Because of these reasons there should be sufficient educations about proper ways of prescription for the students to be trained to handle it in professional manor [13]. Conventional trainings are like participating in seminars, workshops, conferences, congresses, professional short-term training courses and written plans and distance like internet, posting magazine, booklet, Book, educational CD, brochure and pamphlet.

Hence this research with interventional procedures is intended to investigate the effectiveness of educational pamphlets on Babol University of medical sciences dentistry students prescription principles. This work may lead to finding solutions for reducing rampant errors in prescription and increasing productivity space and improving the level of health care.

Procedure: This research is an interventional study that is performed on dentistry students (second semester of fifth year, 2014-2015) in Babol University of medical sciences. Because the senior students were not available and their lack of cooperation on the second phase of the fifth year students were chosen.

Before the original prescription test, one test was performed for 15 students in their last year; so with investigation of their defects and errors, cases and pamphlets were designed. Given all of these students prescribed the known medicines including: Amoxicillin 500, Metronidazole 250, Gelofen 400, it was decided in original test to design cases that students prescribe other medicines to check their proper spelling, dosage and frequency. In fact, these features of those medicines are known even for uneducated people they cannot be proper cases for this research.

In case of performing the prescription test, a sheetof paper is designed as two cases are described in the footer and the students are asked to prescribe two different versions in separate boxes.

Case 1: "The visited patient was a 35 years old gentleman, without underlying disease, teeth in agony on the right maxilla. After examination and radiography,decay, irreversible pulpitis and upper right

premolars were detected, abscess or cellulitis was not observed and endodontic therapy was performed in one session." Since these kinds of cases are very prevalent and according to references about randomized controlled clinical trial (RCT) do not need antibiotics and eventually a non-steroidal anti-inflammatory drugs (NSAID) is recommended, it was chosen.

Case 2: "The visited patient is a 30 years old lady without underlying disease, with a history of penicillin allergy, in agony and progressive inflation on the left maxilla. After examination and radiography, top left first molar necrosis was diagnosed. Cleaning and forming the canals was performed and calcium hydroxide was placed in the canals and the tooth was dressed". This case was designed so that the students avoid prescribing the medicines like amoxicillin as everyone is familiar with it; their knowledge about dosage, frequency and proper spelling of medicines can be evaluated. In this case unlike the first one the patient needs antibiotic.

The students were given the sheets and asked to prescribe a different version for each of the referred cases and imagine. That was so far a real patient and all tips must comply with principles, then all the versions collected and information such as: number of prescribed medications, date, the patient's name, signature, spelling name of the medicine, dosage and the number of medicine used were extracted.

Then educational intervention with educational pamphlets such as "general principles of prescribing in dentistry", "prescribing antibiotics for dental treatment", "analgesics in dentistry", "knowledge of the names, pharmaceutical forms and dosage of some common medicines" were performed. Pamphlets were designed and published using resources such as: Ministry of health website and dentistry references in color, A4 size in adobe photoshop cs4 software. Pamphlets were handed to the students and students were asked to review the concepts discussed in the pamphlet; after one month, prescription test was repeated and outcomes were compared with the initial results.Finally, data were analyzed using SPSS software.

RESULTS

The referred study after training with educational pamphlets was performed on a batch of 37 students (2010) incoming dentistry students of Babol University of medical sciences on two phases. The mean was 23.49 with 54 and 46% male and female, respectively. Considering all of these 37 students participated in both phases and 4 students who participated only in one of the phases were removed.

- In the evaluation of the right prescribed dosage, before use of pamphlets was 24% of participated students in the test were able to prescribe the right dosage while 76% of participates failed. In the second phase after distributing the educational training pamphlets among students and repeating the test the improvement for successful group was significant (73%) and the percentagesoffailed reduced to 27%.
- In evaluation of the frequency of usage of medicines, before educational pamphlets were 30% of participated students. After training by the use of pamphlets, the frequency improved to 70%.
- About spelling the name of medicines, in the first phase without pamphlets were 54% had no typo errors while 46% were faced to typos. The significant improvements were observed with the aid of pamphlets and the obtained results were 73 and 27% for without and with typo errors, respectively.
- In about the legibility of the prescriptions, before using pamphlets the percentage was 84% and after using pamphlets the figure improved to 92%.
- In evaluation of the prescriptions about having the patient's name, date and signature, before training pamphlets, none of the students considered this point. It was probably due to not specifying a place for these features on the test sheet. After receiving the pamphlets, 68% of the prescriptions had the patient's name, date and signature.
- About prescribing unnecessary antibiotics, before the use of pamphlets 8% of the participants prescribed unnecessary antibiotics and after using pamphlets it has reached 11% that was due to not paying attention to the antibiotics chapter of the pamphlets.
- For evaluation of the parameter on number of the medicines in two versions prescribed by the students, the mean of the number of the medicines in the first version was 1.35 and after receiving the pamphlets on second phase it deducted to 1.32. Also in second version of the prescription the mean of the number of the medicines was 2.30 and after using pamphlets it became 2.27.

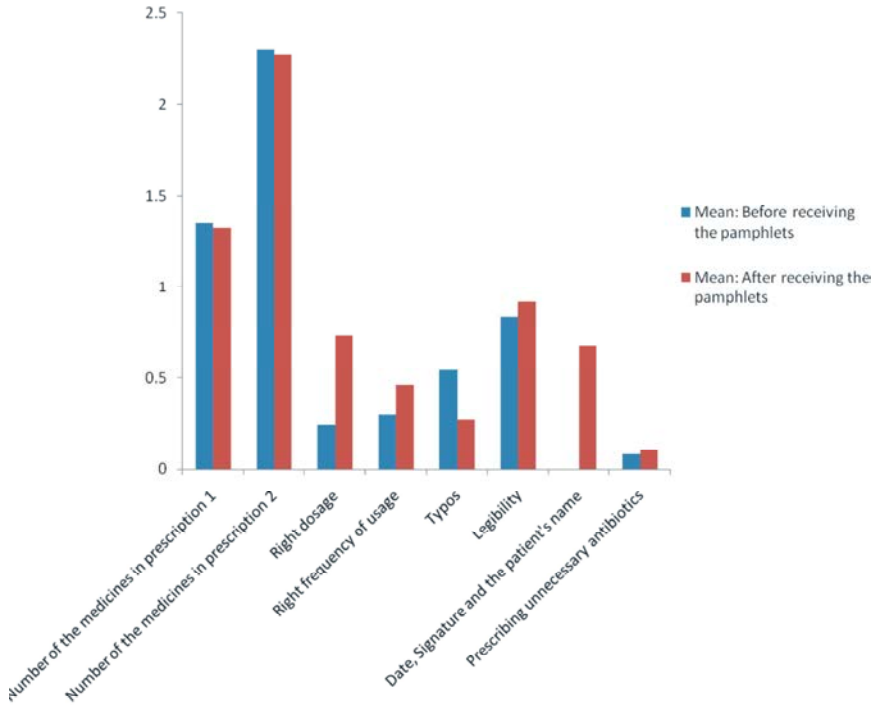

Fig. 1: The mean of the different parameters of the students' ability before and after use of pamphlets

Table 1: Frequencies distribution of the student's ability of prescription before use of training pamphlets

	Correct		Incorrect	
Before receiving the pamphlets	Number	Percentage	Number	Percentage
Dosage	9	32.24	28	75.68
Frequency of usage	11	72.29	26	70.28
Medicine's name	17	45.95	20	54.05
The suitability of prescriptions	31	78.83	6	16.22
Having the patient's name, date and signature	0	0	37	100
Prescribing unnecessary antibiotics	34	91.89	3	8.11

Table 2: Frequencies distribution of the student's ability of prescription after using pamphlets

	Correct		Incorrect	
After receiving the pamphlets	Number	Percentage	Number	Percentage
Dosage	27	72.97	10	27.03
Frequency of usage	17	45.94	20	54.06
Medicine's name	27	72.97	10	27.03
The suitability of prescriptions	34	91.89	3	8.11
Having the patient's name, date and signature	25	67.57	12	32.43
Prescribing unnecessary antibiotics	33	89.18	4	10.82

Using non-parametric tests(T-test) and Wilcoxon test in relation to the dosage ($p<0.0001$) and spelling errors ($p=0.018$) showeddiscrepancies between before and after distribution of pamphlets was significant. Also in other cases according to the mean there were significant improvements on number of participants. Table 1 shows the frequently distribution of the students ability of prescription before use of pamphlets. Table 2 shows the frequency distributions of the students' ability on prescription after use of training pamphlets. Figure 1 demonstrates themean of the different parameters of the students' ability before and after use of the pamphlets.

DISCUSSION AND CONCLUSION

In this study, the overall ability of the students about the principles of prescribing was low; only 13.51% of them presented a perfect prescription during the first phase. On the second phase after receiving the educational training pamphlets; their abilities improved to 40.54%.

In evaluation of the right prescribed dosage, before using pamphlets was only 24%. After use of educational pamphlets the percentage of students participated in the test were able to prescribe the right dosage has improved to 73%. In a research in 2009 in India Jay *et al*. [14] showed 95% of the graduated students and students during graduation were able to prescribe the right dosage, the medicine according to the disease, frequency and duration of treatment.

It was a significant increase in prescribing the correct dosage($p<0.0001$)and suggests that the pamphlet "understanding the names, pharmaceutical forms and doses of some common medicines" has attracted the attention of students and has been effectively used. Due to harmful effects of prescribing incorrect, under or overdose that can lead to decreasing or increasing side effects or defect in insure prescription, extensive use of other methods such as pamphlets in education should be considered.

In the evaluation of the frequency of medications, before use of pamphlets was 30% while students participated in educating pamphlets were 46%. This improvement was not significant in statistically tests but it can show the usefulness of pamphlets and is believed to be enhanced by increasing the number of cases and then be significant. In an investigation conducted by Safaeiyan *et al*. [2]; they have determined inAlzahra teaching hospitalinterns of Isfahan University of medical sciences the principles of prescription written in 2011 only 18.3% of prescriptions were written correctly. In Bagheri *et al*. [15] studied in the same year 70.9% of the students didn't know much about prescription principles. In Wingert *et al*. [11] showed 95% of the prescriptions were imperfect about the medicines administration time and special training of the proper use of medicines.

Lack of instruction for usage and patient's understandings about medicines can have dangerous consequences and it may lead to not receiving the desired effects of medicines and the dentist is forced to prescribe more and stronger or even broad-spectrum medicines.About evaluating the parameter of the number of medicines in two versions prescribed by the students, the mean of the number of medicines in the first version was 1.35 and after receiving the pamphlets on second phase it deducted to 1.32. The first prescription is about a patient that according to dentistry references does not need a special sort of medicine and eventually if necessary an analgesic like NSAID is recommended. However, the mean of prescribed medicines looks good and there has been a decrease in after receiving pamphlets that shows a positive effect.

Also in second version of the prescription the mean of the number of medicines was 2.30 and after using pamphlets it became 2.27. The second version of prescription has been written for a patient that needed antibiotic and an analgesic and the mean of 2.3 medicines in each prescription is considered desirable. In second version after receiving the pamphlets also we had a decrease in the mean of the number of medicines that although is not statistically significant¸ it shows a positive effect.In Rashidi *et al*. [9] studied the meanof medications written on each prescription was 2.1. In evaluation of the prescriptions about having the patient's name, date and signature, on the first phase none of the students considered them. It was probably due to not specifying a place for these features on the test sheet. After receiving the pamphlets, 67.57% of the prescriptions had the patient's name, date and signature. It is clear that the patient's name, date and signature will ease providing medicines and also they prevent problems such as: translocating the patients prescriptions and likely legal issues.

A study performed by Oshikoyaetal. [12]in Nigeria in 2008, showed 50% of prescriptions had name, gender, age and doctor's signature. In 2011, Radii *et al*. reported that, 44.1% of the patient's name insertion on prescriptionwas correct. In relation to typo errors on prescribed prescriptions the outcomes from the first research was 45.95% without spelling problems in writing the medicines names. After using pamphlets prescriptions without typo errors became 73% and this was significant ($p=0.018$). In 20125, Noor *et al*. [6] reported about 42% of prescriptions had misspelling.

In about the legibility of the prescriptions, before using pamphlets the percentage was 83.78% and after use of educational pamphlets it became 91.89%. In a study performed by Rashidi *et al*. [16] on the legibility of prescriptions and non-line corrosion evaluated 87.2% and 84.7%, respectively. The legibility and non-line corrosion

prevent pharmacy problems and failure to read the name of the medicines by pharmacists; while considering the importance of training and education as emphasizing are more necessary than before.

Suggestions: The obtained results suggest that the prescription skills need reinforcement and methods like usie of educational pamphlets can be useful and effective. That can improve knowledge of the dentists in future eventually steps taken to improve public health.Based on these results, the following suggestions are offered:

- Teaching the principles of prescription to the dentistry students should be considered as an agenda of dentistry faculty course for the students in the last semesters.
- Continual education of dentists after graduation in the form of educational training programs regularly and reminding problems caused by increasing unnecessary consumption of medicines.
- Authoring a pocket book containing pharmaceutical forms, dosage, contradictions and other features of common dentistry medicines and distributing them between senior students.
- It seems collection of standard treatment protocolsin dentistry treatments is an effective strategy for prescription.
- Strengthening the role of the pharmacist and practical training of pharmacists as a link between dentists and patients. The key role in treating, in interaction with dentists can be an effective role in the correct use of medicines.

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