Original Article

Prescription writing skills of preclinical medical and dental students in a medical college

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Abstract

Introduction: Prescription is a clinician's written order to dispense drugs. Prescription writing is one of the basic competencies to be learned by medical and dental students, who are more prone to make prescription errors during the early stages of their training.

Methods: It was a cross sectional study conducted in NMCTH, Jorpati, Kathmandu. Medical and dental students in the first and second year were included in the study. Students were given common clinical conditions to write prescriptions. Prescriptions were analyzed for physician and drug related components.

Results: The total number of medical and dental students that participated in this study was 326. The percentage of different physician related components in the prescriptions of first year medical students ranged from 61.4 to 100%, from 74.1 to 100% in second year medical students, from 55 to 100% in first year dental students and from 66.7 to 100% in second year dental students. The percentage of different drug related components of prescriptions was from 73.7% to 90% in first year medical students, from 79.3 to 94.8% in second year medical students, from 57.5 to 80% in first year dental students and from 74.1 to 92.6% in second year dental students.

Conclusion: Prescription writing skills of preclinical medical and dental students are lacking in its various components. Evaluation of their prescription writing skill should be done frequently to find out the deficiencies which must be corrected by better training to reduce prescription errors and to increase adherence to improve rational prescribing.

Keywords: prescription skills, medical students, dental students

Introduction

Prescription is a clinician's written order for a dispensary to dispense drugs to the patient. Prescription was comprehensively defined as "a written order which includes detailed instructions of what medicine should be given, to whom, in what formulation and dose, by what route, when, how frequently, and for how long" by Aronson.[1,2] Prescription writing is one of the basic competencies that has to be learned by medical and dental students.[3] In our part of the world, prescription writing skill is taught to medical and dental students by Pharmacology department during the first two years of medical and dental school. Nepal Medical College Teaching Hospital (NMCTH) is affiliated to Kathmandu University where medical and dental students are trained in rational prescribing using the World Health Organization (WHO) guidelines to good prescribing as the reference standard.[4,5]

Medical and dental students are more prone to make prescription errors during the early stages of their training in prescription writing.[6-9] Many medical students are not prepared for skilled prescribing, while many feel that enough time has not been dedicated to therapeutic teaching.[10,11,12] According to Aronson, a prescription error is 'a failure in the prescription writing process that results in a wrong instruction about one or more of the

normal features of a prescription'. The 'normal features' include the identity of the recipient, the identity of the drug, the formulation, dose, route, timing, frequency, and duration of administration.[13] Prescription writing skills of medical students should be assessed regularly during their initial years of training to reduce errors in prescription writing and to promote correct and rational drug prescription.[14,15]

Methods

It was a cross sectional study conducted in NMCTH, Jorpati, Kathmandu in November 2017. All first year and second year students of Bachelor of Medicine and Bachelor of Surgery (MBBS) and Bachelor of Dentistry (BDS) were included in the study. The total number of students was 326 (249 MBBS and 67 BDS). Students were given common clinical conditions to write the prescriptions according to their syllabus by lottery method. Prescriptions were analyzed using preformed checklist for physician and drug related components.[4,6] The physician related components includes 15 components namely prescriber's identity, professional degree, registration number, prescriber's address, prescriber's contact number, date of prescription, patient's identity, patient's age, patient's sex, patient's address, patient's contact number, diagnosis, the symbol R_X, prescriber's signature, information, instruction and warning to patients. The drug related components includes 5 components namely appropriateness of drugs selected, strength of drugs, dosage forms, quantity to be dispensed and direction for use of drugs. Data was analyzed with IBM SPSS Statistics version 16.0. Comparison of prescription skills of first and second year students was done by Chi square test and p-values <0.05 were considered statistically significant. Ethical approval for the study was obtained from Research and Institutional Review Committee of NMCTH.

Results

The total number of students that participated in this study was 326, out of which 114 were first year MBBS students, 135 were second year MBBS students, 40 were first year BDS students and 27 were second year BDS students.

The number and percentage of MBBS students that included the different physician related and drug related components in their prescriptions is given in table 1.

Table 1. Number of MBBS student prescriptions containing different prescription components

S.N.	Prescription components	First year MBBS n=114 number (%)	Second year MBBS n=135 number (%)
A. Physician related components			
1	Prescriber's identity	114 (100.0%)	135 (100.0%)
2	Professional degree	111 (97.4%)	131 (97.0%)
3	Registration number	109 (95.6%)	132 (97.8%)
4	Prescriber's address	113 (99.1%)	131 (97.0%)
5	Prescriber's contact number	111 (97.4%)	132 (97.8%)
6	Date of prescription	112 (98.2%)	133 (98.5%)
7	Patient's identity	114 (100.0%)	135 (100.0%)
8	Patient's age	114 (100.0%)	135 (100.0%)
9	Patient's sex	114 (100.0%)	135 (100.0%)
10	Patient's address	113 (99.1%)	132 (97.8%)
11	Patients contact number	109 (95.6%)	123 (91.1%)
12	Diagnosis	113 (99.1%)	135 (100.0%)
13	R_X symbol	112 (98.2%)	134 (99.3%)
14	Prescriber's signature	106 (93.0%)	135 (100.0%)*
15	Information, instructions and warning to patients	70 (61.4%)	100 (74.1%)*
B. Drug related components			
16	Appropriateness of drug(s) selected	103 (90.4%)	128 (94.8%)
17	Strength of drug(s)	98 (86.0%)	125 (92.6%)
18	Dosage form(s)	97 (85.1%)	123 (91.1%)
19	Quantity to be dispensed	98 (86.0%)	126 (93.3%)*
20	Directions for use of drug(s)	84 (73.7%)	107 (79.3%)

* statistically significant

The percentage of first year MBBS students that mentioned the different physician related components in their prescription ranged from 61.4 to 100% where as in the second year MBBS students, the percentage ranged from 74.1 to 100%.

Out of 15 physician related components, only 4 components - prescriber's identity, patient's identity, patient's age and patient's sex were written in their prescription by 100% of first year MBBS students. In second year MBBS, 5 components - prescriber's identity, patient's identity, patient's age, patient's sex and diagnosis were written in their prescription by 100% of students. The most commonly missed physician related component was information, instructions and warning to patients in both first year and second year MBBS students. It was written in the prescriptions by only 61.4% of first year MBBS students and 74.1% of second year MBBS students. This difference was statistically significant. Among the physician related components, prescriber's signature was present in 93% and 100% of first year and second year MBBS students respectively, which was also statistically significant difference.

The percentage of first year MBBS students that mentioned the different drug related components in their prescription ranged from 73.7 to 90.4% where as in the second year MBBS students, the percentage ranged from 79.3 to 94.8%. Out of 5 drug related components, none was written by 100% of MBBS students. The appropriate drug(s) were selected by 90.4% of first year MBBS students and 94.8% of second year MBBS students, which were the highest percentages observed among the drug related components. Only 86% and 93.3% of first year and second year MBBS students respectively mentioned the quantity to dispense in their prescription, the difference was found to be statistically significant. The drug related component that was most commonly forgotten in the prescription was directions for use of drug(s) in both first year and second year MBBS students. It was written in their prescriptions by only 73.7% of first year MBBS students and 79.3% of second year MBBS students, but the difference was not statistically significant.

The mean scores of physician related, drug related and all components of prescription for MBBS students are given in table 2.

Table 2. Mean scores of MBBS students in different components of prescription

S.N.	Prescription components	Mean scores	
		First year MBBS	Second year MBBS
1	**Physician related components (15)**	14.34	14.50 *
2	**Drug related components (5)**	4.21	4.51 *
3	**All components (15+5=20)**	18.55	19.01 *

* statistically significant

The mean scores of students in prescriber related components (out of 15) were 14.34 and 14.50 in first year and second year MBBS students respectively. The mean scores of students in drug related components (out of 5) were 4.21 and 4.51 in first year and second year MBBS students respectively. The mean scores of students in total components (out of 20) were 18.55 and 19.01 in first year and second year MBBS students respectively. These differences were statistically significant.

The number and percentage of BDS students that included the different physician related and drug related components in their prescriptions is given in table 3.

Table 3. Number of BDS student prescriptions containing different prescription components

S.N.	Prescription components	First year BDS n=40 number (%)	Second year BDS n=27 number (%)
A. Physician related components			
1	Prescriber's identity	40 (100.0%)	27 (100.0%)
2	Professional degree	39 (97.5%)	26 (96.3%)
3	Registration number	40 (100.0%)	26 (96.3%)
4	Prescriber's address	37 (92.5%)	22 (81.5%)
5	Prescriber's contact number	39 (97.5%)	27 (100.0%)
6	Date of prescription	38 (95.0%)	27 (100.0%)
7	Patient's identity	40 (100.0%)	26 (96.3%)
8	Patient's age	40 (100.0%)	27 (100.0%)
9	Patient's sex	40 (100.0%)	27 (100.0%)
10	Patient's address	38 (95.0%)	27 (100.0%)
11	Patients contact number	38 (95.0%)	26 (96.3%)
12	Diagnosis	40 (100.0%)	27 (100.0%)
13	R_X symbol	36 (90.0%)	27 (100.0%)
14	Prescriber's signature	39 (97.5%)	26 (96.3%)
15	Information, instructions and warning to patients	22 (55.0%)	18 (66.7%)
B. Drug related components			
16	Appropriateness of drug(s) selected	32 (80.0%)	25 (92.6%)
17	Strength of drug(s)	25 (62.5%)	23 (85.2%)*
18	Dosage form(s)	32 (80.0%)	23 (85.2%)
19	Quantity to be dispensed	28 (70.0%)	24 (88.9%)
20	Directions for use of drug(s)	23 (57.5%)	20 (74.1%)

* statistically significant

The percentage of first year BDS students that mentioned the different physician related components in their prescription ranged from 55 to 100% where as in the second year BDS students, the percentage ranged from 66.7 to 100%.

Out of 15 physician related components, only 6 components - prescriber's identity, registration number, patient's identity, patient's age, patient's sex and diagnosis were written in their prescription by 100% of first year BDS students. In second year BDS, 8 components - prescriber's identity, prescriber's contact number, date of prescription, patient's age, patient's sex, patient's address, diagnosis and R_X symbol were written in their prescription by 100% of students. The most commonly missed physician related component was information, instructions and warning to patients in both first year and second year BDS students. It was written in the prescriptions by only 55% of first year BDS students and 66.7% of second year BDS students.

Out of 5 drug related components, none was written by 100% of BDS students. The percentage of first year BDS students that mentioned the different drug related components in their prescription ranged from 57.5 to 80% where as in the second year BDS students, the percentage ranged from 74.1% to 92.6%. Only 62.5% and 85.2% of first year and second year BDS students respectively mentioned the strength of drug(s) in their prescription, the difference was found to be statistically significant. The drug related component that was most commonly forgotten in the prescription was directions for use of drug(s) in both first year and second year BDS students. It was written in their prescriptions by

only 57.5% of first year MBBS students and 74.1% of second year BDS students, but the difference was not statistically significant.

Table 4 Mean scores of BDS students in different components of prescription

S.N.	Prescription components	Mean scores	
		First year BDS	Second year BDS
1	**Physician related components (15)**	14.15	14.30
2	**Drug related components (5)**	3.50	4.26
3	**All components (15+5=20)**	17.65	18.56

The mean scores of students in prescriber related components (out of 15) were 14.15 and 14.30 in first year and second year BDS students respectively. The mean scores of students in drug related components (out of 5) were 3.50and 4.26 in first year and second year BDS students respectively. The mean scores of students in total components (out of 20) were 17.65 and 18.56 in first year and second year BDS students respectively. These differences were not statistically significant.

Discussion

Present study highlights the prescribing skill of undergraduate MBBS and BDS students by analyzing the various components of a prescription. Each and every component of a prescription has its own significance. Absence of or error in components of prescriptions can create confusion in drug dispensation and lead to compromise in patients' health and safety. The results of this study have shown that both MBBS and BDS students have missed out many of the components in both physician related and drug related components of prescription.

In this study, most of the physician related components like prescriber's identity, professional degree, registration number, prescriber's address, prescriber's contact number, date of prescription, patient's identity, patient's age, patient's sex, patient's address, diagnosis and R_X symbol, prescriber's signature were mentioned by both MBBS and BDS students (>90%) except patient's address by second year BDS students (81.5%).

Prescriber's identity, address, contact number and signature are the important components that verify the authenticity of prescription. They prevent misuse and also help patient and pharmacist to contact the prescribing physician if needed. Patient's identity, address and contact number are also important to make sure that the right person receives the correct treatment. They are also important to maintain proper record keeping.

The most commonly missed physician related component, in both MBBS and BDS students, was information, instructions and warning to patients. This finding is similar to the studies done by Rauniyar[6] and Kumar[7]. Information, instructions and warning to patients is the important component of prescription that helps to ensure compliance, increases success of given therapy and educates patients about the possible adverse events related to treatment.

This study also revealed that prescriptions of both medical and dental students were deficient in different drug related components. Similar findings were also seen in studies by Chapagain[8] and Paudel[9]. Here, second year medical students' choice of appropriate drug, strength, dosage form and quantity to be dispensed were correct in >90% of prescriptions. This shows their good understanding of pharmacological approach towards various clinical conditions. Emphasis on teaching and practicing the steps of rational prescribing set by WHO[4] along with traditional pharmacology education can facilitate development of good skills of prescription writing in the students.

In comparison to first year students, second year students were better in both physician and drug related component mean score. Similar findings were also seen in previous studies where second year students are better than first year students[6-9] .Longer duration of prescription writing practice of second year students than that of first year students seems to be the underlying reason behind the better performances of second year students of both MBBS and BDS.

Conclusion

Our study concludes that the prescription writing skills of preclinical medical and dental students are lacking in its various components. Evaluation of prescription writing skill among preclinical medical and dental students should be done frequently to find out the defects among them. The deficiencies thus encountered must

be corrected by better training to reduce prescription errors and to increase adherence to improve rational prescribing.

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