

Original Article

**ANALYSIS OF PRESCRIPTION INDICATORS FOR OUTPATIENTS WITH HEALTH INSURANCE IN
OUTPATIENTS DEPARTMENT AT CAN THO UNIVERSITY OF MEDICINE AND PHARMACY
HOSPITAL IN THE PERIOD 2017-2018**

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Received: 20 Mar 2019 Revised and Accepted: 17 May 2019

ABSTRACT

Objective: The main objective of this study was to evaluate the drug prescription parameters and to find out the elements had an influence on the prescribing practice of doctors'.

Methods: A descriptive cross-sectional study was conducted to collect 300 outpatient drug prescriptions and 30 questionnaires of physicians during the period of 2017-2018. The data were analyzed according to WHO's the guideline.

Results: Average number of drug per prescription: 3.73, percentage of drugs prescribed by generic or international name (INN): 100%, percentage of prescriptions with an antibiotic prescribed: 24%, of β -lactam antibiotics group, including cephalosporin (31.17%) and aminopenicillin (27.27%), accounted for the highest percentage of using in antibiotic groups with a total of 58.44%, of corticosteroid: 12%, of vitamin: 27.3%, of drugs prescribed including in the Essential Medicines List issued by the Ministry of Health: 35.3%. Average drug cost per prescription: 88,867 VNĐ. Percentage of drug costs for antibiotics (%): 7.48%, of corticosteroids (%): 1.85% and of vitamins (%): 5.25%.

Conclusion: The results of this research have identified some prescription indicators and elements affect the prescription indicators such as drug information, patient, drug, which may lead to intervention studies for evaluating changes in these issues in the outpatient clinic.

Keywords: Prescription, International name, Prescription indicators

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DOI: <http://dx.doi.org/10.22159/ijpps.2019v11i7.33168>

INTRODUCTION

In 2011, the World Health Organization (WHO) stated that the situation of unreasonable use of drugs is a serious global problem. The harmful consequences of irrational use of drugs include unnecessary drugs, increasing antibiotic resistance (due to excessive using antibiotics), and the spreading of blood-transmitted diseases such as HIV and B/C hepatitis (due to non-sterile injections), which causes severe illness and death and costs billions of dollars each year [1]. Many studies and surveys on drug use management have revealed shortcomings in drug prescriptions in hospitals [2]. A research on 550 prescriptions in Yemen in 2010 with the proportion of generic drugs was relatively low (39.2%) and the percentage of antibiotics was 28.8% [3]. Retnosari Andrajati *et al.* conducted the study in Depok, Indonesia on 28 doctors and 788 prescriptions showed that physicians who had attended training courses of rational drug use were 2.01 times more rational than those who had never attended training [4]. Like developing countries, the drug overuse in Vietnam is also an emerging issue. Understanding the importance of rational, safe, and effective prescriptions, we conducted this research in order to define prescription indicators and some elements that affect prescription indicators for outpatients with health insurance in Outpatients Department at Can Tho University of Medicine and Pharmacy Hospital from October 2017 to March 2018.

MATERIALS AND METHODS

Study subjects

Outpatient prescriptions with health insurance are prescribed by doctors at the Outpatients Department of the Can Tho University of Medicine and Pharmacy Hospital and doctors at the clinic for outpatients with health insurance in Can Tho University of Medicine and Pharmacy Hospital.

Study design

A descriptive cross-sectional study was conducted.

For prescription indicator survey: according to the guidelines of the World Health Organization (WHO), the sample size should be at least 100 prescriptions per medical facilities [5]. To increase the reliability and source of the database for the study, we collected over 300 samples.

Some elements affect the prescription of outpatients with health insurance: we conducted a survey with at least 30 doctors [5].

Sample collection methods: for research on prescription indicators: we made a tracking card for each patient, then selected samples which were convenient and matched the selection criteria and did not meet the exclusion criteria, collecting enough 300 patients for the study. Collecting the information about patient characteristics and the way patients use drugs. Besides, to survey some elements affect the prescription of outpatients with health insurance, we sent a survey to doctors who agreed to participate in the study and got the result as soon as they have completed it.

Sample inclusion criteria:

Prescription indicators: choosing the prescriptions for outpatients with health insurance and were recorded and printed at medical facilities where drugs were given to patients with health insurance. Besides, prescriptions must have been consent by patients or guardians and be ensured that drugs were given to patients.

Some elements affect the prescription of outpatients with health insurance: only doctors are working at the Department of Outpatients with health insurance at Can Tho University of Medicine and Pharmacy Hospital.

Data collection

Prescription indicators: average number of drug per prescription, percentage of drugs prescribed by generic or international name (INN) (%), percentage of prescriptions with an antibiotic prescribed

(%), percentage of prescriptions with corticosteroid prescribed (%), percentage of prescriptions with a vitamin prescribed (%), percentage of drugs prescribed including in the Essential Medicines List issued by the Ministry of Health (%), average drug cost per prescription, percentage of drug costs for antibiotics (%), percentage of drug costs for corticosteroids (%), percentage of drug costs for vitamins (%).

Some elements affect the prescription of outpatients with health insurance: the survey which was sent to doctors included multiple-choice questions with five levels of answers: very unaffected, does not affect, normal (Average), influential, very influential.

RESULTS

Prescription indicators.

Table 1: Summary of investigate drug prescription parameters

Prescription indicators	Result
1. Average number of drug per prescription	3.73
2. Percentage of drugs prescribed by generic or international name (INN)	100%
3. Percentage of prescriptions with an antibiotic prescribed	24% (β-lactam antibiotics group: 58.44%)
4. Percentage of prescriptions with corticosteroid prescribed	12%
5. Percentage of prescriptions with a vitamin prescribed	27.30%
6. Percentage of drugs prescribed including in the Essential Medicines List issued by the Ministry of Health	35.30%
7. Average drug cost per prescription (VNĐ)	88,867
8. Percentage of drug costs for antibiotics	7.48%
9. Percentage of drug costs for corticosteroids	1.85%
10. Percentage of drug costs for vitamins	5.25%

Some elements affect the prescription of outpatients with health insurance

Through the survey on over 30 doctors, the following results were obtained:

Drug information elements

Table 2: Frequency and percentage of answers related to drug information elements

Elements	1	2	3	4	5
	Frequency/Percentage (%)				
1. Treatment guidelines of the Ministry of Health and hospitals				20 66.67%	10 33.33%
2. Drug and Therapy Council at the hospital			18 60%	12 40%	
3. Training courses on the safe, rational and effective use of drugs			13 43.33%	17 56.67%	
4. Individual treatment experience				26 86.67%	4 13.33%
5. The role of drug introducers providing drug information (pharmacy representatives)			25 83.33%	5 16.67%	
6. Advertising drugs in hospitals		2 6.67%	22 73.33%	6 20%	

Patient elements

Table 3: Frequency and rate of answers related to patient elements

Elements	1	2	3	4	5
	Frequency/Percentage (%)				
1. Age				22 73.33%	8 26.67%
2. Gender			6 20%	24 80%	
3. Clinical examination				28 93.33%	2 6.67%
4. Additional disease			2 6.67%	26 86.66%	2 6.67%
5. Affordability of patients			25 83.33%	5 16.67%	
6. The patient's aspirations		5 16.67%	21 70%	4 13.33%	

Drug elements

Table 4: Frequency and rate of answers related to drug elements

Elements	1	2	3	4	5
1. Treatment effect			2 6.67%	25 83.33%	3 10%
2. Price		3 10%	21 70%	6 20%	
3. The availability of drugs			15 50%	15 50%	
4. Drug list of hospitals or Health insurance drug list			15 50%	15 50%	
5. Dosage forms and Route of administration			3 10%	23 76.67%	4 13.33%
6. Reputable manufacturer			15 50%	15 50%	
7. Side effects			3 10%	27 90%	
8. Drug interactions			4 13.33%	22 73.34%	4 13.33%

DISCUSSION

An average number of drug per the prescription of 3.73 was higher than WHO's the recommendation of 2-3 drugs per prescription, while lower than Akhtar's research of 5.61. [6]. There are many causes for prescribing many drugs such as patients with some complicated diseases, drug combination therapy and drugs that do not meet the requirements should be combined to increase treatment effectiveness. However, the increase in the number of drugs in a prescription can lead to an increase in the rate of ADR and drug interaction.

Percentage of drugs prescribed by generic or international name (INN) was 100%, which much higher than other results of 2.63% [6] and 76.34% [7]. It is better to write the generic name/international name and the brand name in order to limit the confusion as well as facilitate the selection of the drug with a suitable price for the patient. Due to the great support of computers, software, and adherence to the Ministry of Health's outpatient prescription regulations in 2017, the doctors prescribed drugs with the common name to maintain this ideal rate at the medical facility.

Percentage of prescriptions with an antibiotic prescribed was 24%, lower than WHO's the recommendation of 30% and the result of the study in A Tertiary Care Teaching Hospital of Bangladesh (children with 66%, adults with 44%) [8]. Taking antibiotics is recommended only when necessary and it should be used at a minimum amount. Therefore, the rate of the antibiotic combination at Can Tho University of Medicine and Pharmacy Hospital was not as high as some other hospitals, but it needs to note that even in Can Tho city, there are still medical facilities with low antibiotic combination proportion. The combination of an oral antibiotic and an external antibiotic may limit drug interactions. However, if two or more oral antibiotics are combined, it will be noteworthy to mention that the interactions between them may be losing their effects or cause toxicity.

β -lactam is one of the most commonly prescribed antibiotics in many outpatient clinics and patients can buy them easily in drugstores. In the world as well as in Vietnam, there have been various situations of resistance to this antibiotic so that with a high rate of use, whether for common diseases or serious illnesses, it is necessary to ask the doctor before using it.

Although the results were lower than WHO's recommendations as well as researches in some other hospitals, it still needs to be noticed. There are two reasons why the rate of using antibiotic in the prescription was lower than recommended. The first reason is that Can Tho University of Medicine and Pharmacy Hospital have many experienced and professional physicians, they are very cautious about prescribing antibiotics for patients. The second reason is that our study was conducted randomly in all outpatient clinics of the hospital, including Gastroenterology, Cardiology, Endocrinology and Obstetrics, so the antibiotic prescribing is not necessary. However,

this ratio also partly reflects the situation of proper use of antibiotics at Can Tho University of Medicine and Pharmacy Hospital.

Percentage of prescriptions with corticosteroid prescribed was 12%, which was lower than the average percentage of eight other hospitals in Can Tho city in 2017 [9]. We observed this group of drugs because this is one of the most abused ones besides antibiotics. Corticosteroids have a strong anti-inflammatory action and give a quick effect which makes patients feel comfortable. However, long-term treatment and abuse of these drugs cause serious and difficult-to-treat side effects such as Cushing syndrome, Osteoporosis, Skin problems, and gastrointestinal disease.

However, to assess steroids prescribing at its reasonable worthy or not, further researches are required including patients' diagnosis, treatment regimens, and dosage and duration of medication in order to have an accurate judgment.

Percentage of prescriptions with vitamin prescribed was 27.3%. According to WHO's recommendations, vitamins should account for 10% of drugs per prescription while the result of our study was higher than that and higher than study in Warangal, Indian in 2017 (19.1%) [10]. Vitamins are mostly prescribed in treatment to make patients think that they drink "tonic" to feel healthier. Taking vitamins when it is not necessary leads to not only drug waste but also drug costs increase as well as the number of drugs in each prescription that leads to drug interactions rising which is detrimental to the treatment of major diseases. Besides, vitamins in most cases are prescribed to supplement the treatment, not the main one. Therefore, a high percentage of vitamin prescribed needs to be limited and doctors should be informed about prescribing vitamins when necessary.

Percentage of drugs prescribed including in the Essential Medicines List issued by the Ministry of Health was 35.3%, while WHO's recommendation was 100%. This rate was much lower than the results of the study on Drug Use Indicators in Southeast Asian countries in 2012 (56-99.7%) [11]. The low percentage of prescribed drugs on the Essential Drugs List can be explained that the need for diagnostic medicine is not on the list or it has a different dosage on the regulatory category. This problem urges to update the list and takes lower-level health facilities to reflect on the upper levels for adjustment to ensure that people can use all essential drugs.

The average drug cost per prescription was 88,867 VND. With the average cost of 88,867 VND and the support of health insurance, this is a moderate level compared to the current economic situation of Vietnam. For instance, in some cases, drug costs were pushed up such as drugs for cancer patients, subcutaneous insulin for diabetics, inhaled salbutamol for asthma, and long days of treatment.

Percentage of drug costs for antibiotics was 7.48%. The percentage of antibiotics prices is high or low depending on the proportion of

antibiotic prescribed. Nowadays, antibiotics are available in drugstores with various brands containing the same active ingredient, same content, and low price. Although the percentage of antibiotic prescribed (24%) was lower than the recommended level, the cost of antibiotics is still higher than that of other hospitals in the same province. This matter indicated that there is a difference in antibiotic prices between brands. As can be seen, not only using antibiotics should be limited but also the selection of external ones may be effective and safe with reasonable price.

Percentage of drug costs for corticosteroids was 1.85%. It is a positive signal for restricting the use of corticosteroids in outpatients at hospitals. Patients, who require inhaled corticosteroids such as Symbicort (Budesonide and Formoterol), have a high cost of 286440 VND while this is a long-term control medication. High drug prices will burden the psychology of patients in adherence to treatment such as suffering illness but less follow-up examination, lowering drug dose, or arbitrarily reducing the number of doses used per day, etc. It is difficult for doctors to prescribe drugs for patients when their sickness is more complicated. Therefore, the use and selection of corticosteroids must be considered and limited.

Percentage of drug costs for vitamins was 5.25%. The percentage of vitamin prices accounted for 5.25% of total drug costs. Vitamin deficiency leads to illness, however, vitamin excess can harm the body, increase drug interactions in the prescription, and waste. For example, an excess of vitamin B6 causes sensory processing disorder while an excess of vitamin C causes nephrolithiasis. It is not necessary to prescribe vitamins to be good for patients. Physicians need to notice patient's conditions to consider the level of necessity as well as explain to them when is necessary to take vitamin supplements in order to avoid anxiety and distrust in the treatment when vitamins did not given in the prescription.

Some elements affect the prescription of outpatients with health insurance

100% of physicians agreed that treatment guidelines of the Ministry of Health and hospitals have "influential" and "very influential" effect on drug selection. The selection of drugs according to that guidelines will facilitate doctors in prescribing rationally for patients, assessing the effectiveness of drug treatment, adjusting the dosage, or changing drugs when necessary.

60% of doctors chose the "average" level for the Drug and Therapy Council element at the hospital. Can Tho University of Medicine and Pharmacy Hospital has an effective Drug and Therapy Council, which was expressed through the quick updating of the drug list, the availability of drugs on computers, and the useful recommendations that facilitate doctors in choosing drugs.

56.67% of physicians chose the "average" level for training courses on safe, rational, and effective use of drugs element. Doctors do not have time to attend training courses regularly, however, through various channels, such as the announcements from the Drug and Therapy Council or the reports from Drug National Centers, they can also update a lot of drug-related information.

100% of doctors said that the individual experiences of treatment have "influential" and "very influential" effects on drug selection. It contributed to the selection of drugs and dosages in accordance with specific conditions. In addition, personal experience also helps doctors avoid adverse drug interactions when prescribing and providing guidance for drug use to patients.

83.33% of doctors believed that the role of providing drug information of Medical Representative has an "average" impact on drug selection. However, it is only average because it is still necessary to prioritize the medication in accordance with the patient's condition.

73.33% of physicians said that the advertising of drugs in hospitals affects the "average" level of drug selection. Drug advertisement in hospitals provides an additional source of information about drugs for doctors to choose, however, it is not the main factor that influences drug choice.

100% of doctors said that the patient's age had "influential" and "very influential" impact on drug selection. Pharmacokinetic

parameters vary with age. Age affects not only the choice of drugs but also the choice of dosage and route of administration for the patient's condition.

80% of doctors said that the gender of the patient affected the choice of drugs. Women are often concerned with health care and less associated with bad habits such as smoking, alcohol drinking, etc. They also have a regular follow-up examination better than men, so this is a factor for doctors to consider when choosing a drug to ensure patient-related medication adherence.

93.33% of doctors said that 86.66% of clinical examination indicated that the accompanying diseases had "effects" on drug selection. Clinical examination and comorbidities evaluation are necessary to determine the severity of the disease, the patient's condition, and the priority of treatment. Since then, doctors can make the appropriate treatment plans and choose the right medicine for the condition as well as ensure adherence to the patient's treatment.

83.33% of doctors chose the "average" level for the patient's solvency. According to a study by Dr. Rakesh Kumar in India in 2016, 83% of doctors considered the patient's ability to pay while prescribing, but only 60% of them informed patients about drug costs [12]. In cases when patients have many complex diseases, doctors have to prescribe many expensive drugs. The patients in the research got health insurance, so they do not have to pay much for drug cost except when the payment exceeds the limit. It reduces pressure about the patient's economic condition element during prescribing.

70% of physicians chose "average" level for the patient's aspirations. Their expectations are for reference only because doctors make a decision to select drugs based on the actual medical condition.

93.33% of doctors said that treatment effects are "influential" and "very influential" impact on the choice of drugs. 70% of doctors chose the "average" level for the cost element. According to a study in Bangladesh in 2016, drug price was not the main factor that affects doctors' prescriptions [13]. In our study, doctors prioritize factors other than drug prices. The priority in severe diseases is the therapeutic effect rather than the drug cost. It has a similarity in economic condition, patients in the research got health insurance thus they do not have to pay much for drug cost except when the payment exceeds the limit, so patient partially reduces pressure on the price during the doctor's medication selection.

50% of doctors chose the "average" level for availability element. As a result of the support of the advanced information technology system, drugs are displayed on the computer during prescribing.

50% of doctors said that the list of available drugs of the hospital or the list of health insurance drugs had "influential" or "average" impact on drug selection. Sometimes doctors do not know this drug lists, so when they prescribe, they are interested in other factors and not sure about drugs are available in the lists or not.

76.67% of doctors chose "influential" level for the dosage form and route of administration elements. This is an important factor that ensure adherence to treatment of patients. For instance, asthma patients are forced to use inhalers and sprays while diabetics use subcutaneous insulin to treat diseases. To make sure that patients can use the special forms of medication properly, the doctor must carefully guide them and their families how to handle.

50% of physicians chose the "average" level for reputable manufacturer's element. This factor did not affect doctors very much because doctors only prescribe based on the lists on the computer. These drugs have been carefully examined and reviewed by the Pharmacy Faculty to ensure the quality of drugs and the reputation of the hospital. Therefore, most of the drugs used for prescribing are from reputable manufacturers.

90% of doctors said that side effects had an "influential" impact on the selection of drugs for patients. 10% of doctors chose the "average" level because there are cases when they have to make consideration between the effectiveness and side effects of the drug on the patient. In these cases, the doctor will have to give clear instructions to limit the side effects during the patient's medication.

73.34% of physicians chose the "influential" level and 13.33% took "very influential" level for drug interactions to select drugs for patients. 13.33% of doctors chose the "average" level because of their therapeutic effect on the condition when the drug interactions are considered negligible. The doctor will pay attention to the patient during using period to limit the effects of drug interactions and ensure treatment effectiveness.

CONCLUSION

In this study, we were successful in assessment of a total population of 300 prescriptions of outpatients and 30 doctors in the clinic at Can Tho University of Medicine and Pharmacy Hospital during the period of 2017-2018. A broad range of ten prescribing indicators were fully investigated and discussed. Briefly, most parameters were well satisfied and as predicted. However, some indicators were far beyond the suitable recommendations by WHO. Hence, by analyzing the data, we could draw out some concerned factors that affected the prescription of doctors including drug information elements, patient elements and drugs elements. As a consequence, to improve the quality, some recommendations were suggested. It's necessary to conduct an intervention study to enhance the quality of prescribing in the future. Our study might be a reference for healthcare administrator and manager in controlling as well as enhancing their policy in the South of Vietnam.

AUTHORS CONTRIBUTIONS

Hung Phuc Nguyen designed the study and collected the data. Huong Vo Thi My analyzed the data. Mai Nguyen Huynh Truc prepared the manuscript. All authors approved the final version submitted.

CONFLICTS OF INTERESTS

The authors do not have any conflict of interest.

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