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Research

The Effectiveness of Learning Methods by Measuring Accuracy and Rationality in Prescription Writing by Medical Students

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ABSTRACT

Background: Writing prescriptions accurately and rationally is a competency that must be achieved by medical students during medical education. This capability includes detailed knowledge of the components of the recipe and details of the components of the drug. This study aims to determine the description of the prescription writing practicum learning method carried out in the Pharmacology section of Faculty of Medicine in Unissula.

Subjects and Method: This research is a descriptive study by looking at the prettest and posttest values. It was conducted in March 2020. The subjects of this study were 159 students who were registered participants of the psychiatry module in semester 6 in the undergraduate medical education study program at Faculty of Medicine in Unissula. 159 students were randomly divided into 20 SGD (Small Group Discussion), batch 1 SGD 1-10 and SGD 11-20 in batch 2. Each batch carried out practicum for 100 minutes. The activity begins with a pretest / giving case scenarios, then the discussion and discussion session ends with a posttest. The data in this study are numerical data and analyzed descriptively.

Results: The results of the study indicated that the improvement across categories and those assessed was both the detailed component of the recipe and the detail component of the drug. The detail component of the prescription had the highest score increase in the patient name category by 27% higher posttest than pretest. In the detail component of the prescription, there was the highest increase in the category of Sedian Medicine (BSO) by 20.7% and that was a higher posttest value when compared to the pretest value.

Conclusion: Clinical-based special learning methods with small class discussions are needed in an effort to improve the ability to write prescriptions appropriately and rationally by adjusting the level of education years.

Keywords: prescription, rational, medical student

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BACKGROUND

Prescription writing skills are one of the important competencies expected of medical graduates (Sudha, 2016; Khaja, 2013; James, 2016). As it is known, prescriptions not only show the name of the drug, dose and duration of treatment, but can be used as instructions for patients and pharmacists (Sudha, 2016). Prescriptions are also the end result of consulting a patient with a doctor so that rational prescription writing skills are a competency that must be mastered during education (James, 2016). Mistakes in prescribing can lead to errors in medication. It has been reported that in the

United States, prescription errors are the number eight cause of death (Sudha, 2016).

The World Health Organization (WHO) has made several recommendations for appropriate and rational prescription writing. WHO recommendations contain prescribing including patient identity, method of administration, name of generic drugs, dosage and frequency of use and duration of treatment (Álvarez, 2012; Sudha, 2016). Therefore, it is necessary to have an appropriate education-based intervention to help improve competency determination.

Learning methods related to improving the ability to write rational prescriptions have made many developments. Either it is through large classes (lectures) or small classes (discussions). This method can vary depending on the educational phase of preclinical medical students, the medical profession, and internships (James, 2016). One of the research results reported that the small class method has many advantages over the large class, however this method has disadvantages such as it requires a lot of resources (James2016).

The Department of Pharmacology, Faculty of Medicine in Unissula Semarang periodically has a curriculum and methods in an effort to increase the ability to write recipes. One such effort is the provision of material related to the basis of prescription writing in the first year of education followed by dry practicum / case discussion in small groups and expert lecturers by pharmacology lecturers who are divided into modules in various years of education. This study aims to see the extent to which the 6th semester medical students of Faculty of Medicine in Unissula are able to write correct and rational prescriptions and assess the success of the practicum method using small class discussions that have been carried out in the Pharmacology section of Faculty of Medicine inUnissula.

SUBJECTS AND METHOD

1. Study Design

This study is a descriptive study by looking at the differences in the pretest and posttest scores.

2. Population and Sample

The sample population of this study includes students who were registered participants of the psychiatry module in the 6th semester in the undergraduate medical education study program at the Faculty of Medicine at Unissula. The number of samples in this study was 159 students. The inclusion criteria for this study were medical students who took the fourth semester psychiatry module and attended the activity. The exclusion criteria are for students who did not follow pharmacology practicum until completion. The number of samples is randomly divided into 18 SGD (Small Group Discussion), batch 1 SGD 1-9 and SGD 10-18 batch 2.

3. Study Variable

This study was conducted by the pharmacology department at the Faculty of Medicine of Unissula Semarang. The research was conducted in March 2020.

Each batch carries out a practicum for 100 minutes, which is divided into the following sessions:

a. In the first 10 minutes, a pretest was carried out by giving 4 questions related to pharmacotherapy in the field of psychiatry, and in the end 1 question writing a prescription.
b. In the next 80 minutes the students who were divided into SGD each discussed with their SGD friends and were guided by 1 pharmacology laboratory assistant discussing the scenario / case given during the pretest. The discussion includes: basic basics of prescription

writing, knowledge of drug classification in the field of psychiatry, pharmacokinetics and pharmacodynamics, selection of drug forms. The laboratory assistant in charge of this activity had previously participated in equating perceptions with a pharmacology lecturer as the person in charge regarding the material.

c. In the last 10 minutes, a posttest was carried out with a scenario / case given the same number as the pretest. Both pretest and posttest students are provided with a prescription paper exercise format.

4. Operational Definition of Variable

The accuracy and rationality of prescribing based on the WHO prescription indicators, including the detailed components of the drug, namely the name of the doctor, the name, age, and sex of the patient; publication date; signature of, date, while the detailed components of the drug, namely the name of the drug (generic), dosage, form of provision, and frequency of administration; instructions for use.

5. Data Analysis

Students' knowledge about the prescription was analyzed descriptively using SPSS to see the differences in the category of the detailed components of the prescription and the detailed components of the drug between the pretest and posttest.

6. Research Ethics

Ethical clearance was obtained from the Bioethics Unit of the Faculty of Medicine, Unissula Semarang with No. 278 / VIII / 2020 / Bioethical Commission

RESULTS

1. Samples Characteristics

After making observations, there were 159 students who were the samples of this study which can be summarized in the table below. The number in the table is the number of students who can write correctly according to WHO guidelines regarding rational prescription writing.

Table 1.Samples Characteristics

Characteristics	n	Mean	SD	Minimum	Maximum
Age					
19-21	114	20.90	0.29	19	21
22-24	45	22.17	0.49	22	24

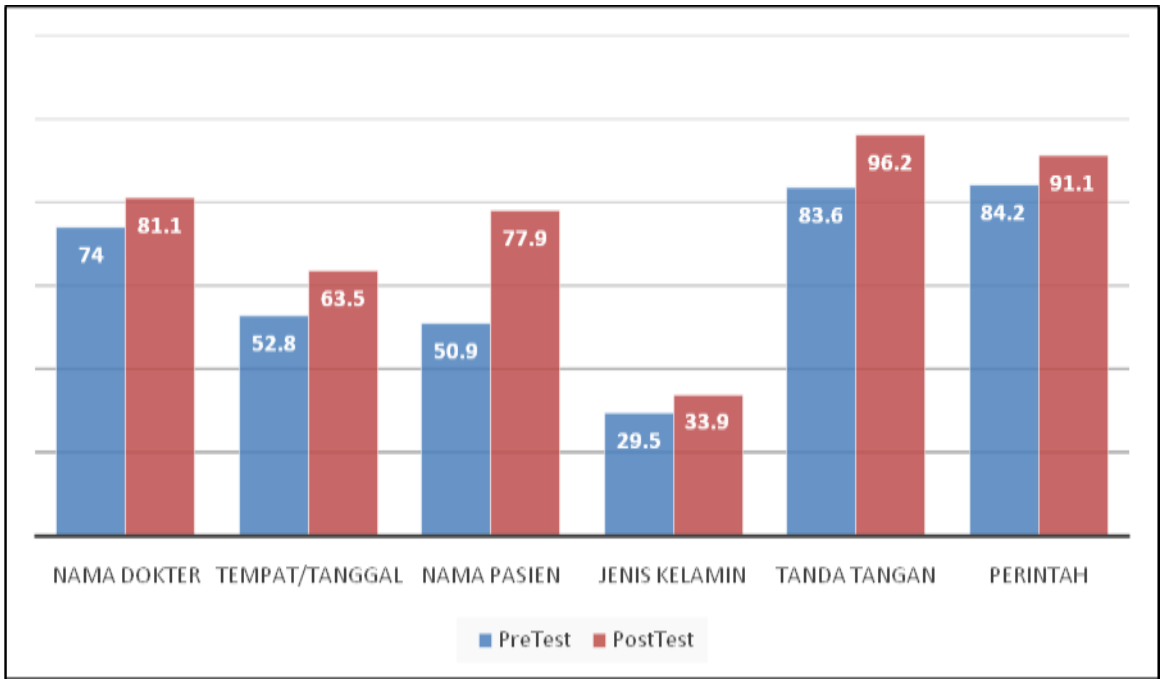
Table 2. Samples Characteristicsof Categorical Data

Characteristics	n	%
Gender		
Male	49	30.4
Female	110	69.6

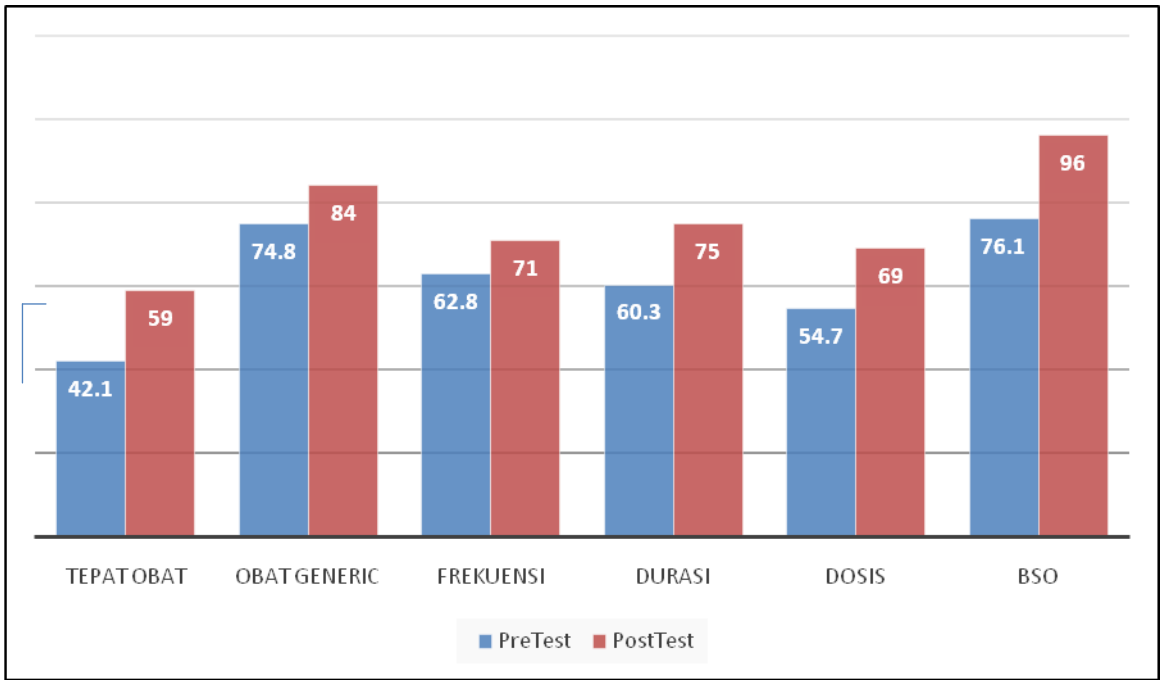
2. Overview of PreTest and Post-test Results

Most of the subjects were 19-21 years with an average of 20.90 years. Most of them are women 60.90%. In general, for the details of the recipes in this study, there was an increase in all categories assessed (graph 1). The highest increase in the detail component of the recipe was in the category of patient names, which was 27% higher in the pretest score than the posttest score and the lowest was in the gender category, which was 4.4%. Likewise with the detailed components of the drug, there was an increase in all the categories assessed. Likewise, for the assessment of the detailed components of the drug there is an increase in all components (Figure 2). The detail component of the drug has the highest increase in the category of Sedian Medicine (BSO) by

20.7%, which is higher in the posttest score when compared to the pretest score and the lowest is in the frequency category of 8.8%.



Graph 1. Component prescription detail



Graph 2. Detail drug components

DISCUSSION

The ability to write prescriptions is a competency that must be mastered properly by medical students. This ability includes knowledge, decision making and skills (Sudha, 2016). Seeing the results of this study that the assessment of the detailed prescription categories includes doctor's

name, place and date of prescription, patient name, gender, doctor's signature and usage orders, not all students wrote in full, both before the discussion session and after. Only 35.68% of doctors did it in Bangladesh according to the prescription format (Begum, 2013). One of the student pretest categories with the lowest score was only 47 students (29.5%) who wrote down the patient's gender on the prescription. The posttest results for writing the gender of the patient increased (4.4%).

Inaccuracy in writing details of prescriptions or patient identities, in this case gender, is often done by medical students. It was reported in a study in Kerala India that 90% of dentistry and general medicine students did not write down the patient's identification including gender (Sudha, 2016). Patient identification is very important because it will ensure that the drug is received by the correct patient. Learning methods at the medical education level have a good effect on the ability to write prescriptions as in the research of The Arabian Gulf University (AGU) Bahrain, discussions in small classes are better than large classes (James, 2016). It is necessary to have a good learning method related to the basis of prescription writing that refers to WHO standards at the medical education level. However, as the times advance with the latest technology, manual prescription methods will slowly be replaced by computerized prescriptions (e prescriptions), so that patient identification errors can be minimized (Al Khaja, 2013).

An equally important part of prescription writing is the detail component of the drug. The results of this study showed an increase in accuracy before and after the discussion session. It was reported that before the discussion session was given, the score for the accuracy of writing details of the drug was a mean of 61.8%. However, for the accuracy of choosing the drug, it had the lowest value, namely 42.1% prior to discussion. This result is in line with research at the National University of Malaysia, that errors were still found in writing down the details of the drug in the prescription in several sections of clinical education (Yaman, 2012).

This is also experienced by medical students in the UK, reported by Arny Heaton et al that they still experience problems in writing prescriptions related to the detailed components of medicine, especially students in the early stages of education (Heaton, 2008). Another study conducted in India on interned medical students at Rajasthan Hospital showed that they felt very little knowledge related to clinical phamacologhy therapy (CPT) so they felt insecure in writing prescriptions (Upadhyaya, 2012). The writing of generic drugs on prescriptions in this study before and after the discussion session has increased (10%), however, there are still students who write down the names of drugs with patent names, likewise, the frequency of drug administration, duration / amount of drug, dosage and BSO. The study, which was conducted in Nepal, showed that medical students in year 1 and 2 did not differ significantly in the writing of dosages on prescriptions. Those who are precise in writing the dosage are around 70% (Kumar, 2012). It is in line with the results of this study that before the discussion session was held, 54.7% of students correctly wrote down the drug dose, and increased by 14.4% after the discussion. Calculation of dosage in prescription writing is very important because it can increase the risk of illness and even death, especially for drugs with narrow teraphy windows (Padjadhyaya, 2012).

In general, in this study students experienced an increase in the accuracy of

both the detailed components of the prescription and the detailed components of the drug after a case discussion. This shows that the level of understanding in prescription writing and student rational therapy has also increased. The right learning method will certainly help students' understanding in writing and choosing rational therapy. As research reports that 92% of students think that their abilities should be improved, they assess that the pharmacology learning method focuses on clinical cases (Upadhyaya, 2012).

The learning method with small groups is a good way to support the process of understanding prescription writing and rational therapy (James, 2015; Sequeira, 2015). However, it needs to be considered in terms of sufficient resources (James, 2016). Special training for prescription writing and rational therapy has been shown to be effective in increasing accuracy and rationality (Richir, 2008). One of the ways to achieve this is by using a special module containing learning about Drug Related Problems (DRP) and writing basic recipe components (Turner, 2010). In line with the results of this study, the scenario / case discussion session in a small group discussion accompanied by student assistants, followed by discussions in large classes by students and guided by laboratory assistants, was proven to improve accuracy in writing recipes rationally. As a general guideline in the accuracy of writing detailed drug components, it is actually available in the World Health Organization Essential Drugs List in full, which is a very useful list when becoming a doctor (Vries, 2000).

Limitations in this study do not fully reflect the emphasis on patient clinical problems associated with the choice of therapy/ rug, so there is a need for appropriate intervention and measurement. In addition, it is necessary to measure by comparing levels of medical education.

AUTHOR CONTRIBUTION

Bagas Widiyanto and Muhamad Riza measured accuracy and rationality in prescription writing in medical students, did data analysis, and wrote the paper.

CONFLICT OF INTEREST

There is no conflict of interest in this study.

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