

Research Article



THE ANALYSIS OF PHARMACEUTICAL ASPECT OF PRESCRIPTIONS FOR PEDIATRIC PATIENTS IN SUNGAI TUTUNG HEALTH CARE

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ABSTRACT

Background: Pharmaceutical care for pediatric patients requires high accuracy because drug dosage must be adjusted according to age, body weight, and physiological conditions. This study aimed to evaluate the validity of compounded prescriptions for pediatric patients at Sungai Tutung Public Health Center in 2024 based on pharmaceutical aspects, particularly dosage appropriateness.

Methods: This study used a descriptive observational design with a retrospective approach. The sample consisted of 60 pediatric compounded prescriptions with 162 drug items. Data were analyzed using descriptive quantitative analysis.

Results: The results showed that 42 prescriptions, or 70.0%, were categorized as valid, while 18 prescriptions, or 30.0%, were invalid. Children aged 2–5 years were the most frequent group receiving compounded prescriptions, accounting for 56.7%. Of 162 drug items, 140 items, or 86.4%, had appropriate dosages, while 22 items, or 13.6%, were overdosed. Dosage discrepancies were found in ranitidine, chlorpheniramine maleate, and guaifenesin.

Conclusion: This study concludes that the sensuality of pediatric compounded prescriptions was generally adequate; however, improved prescription accuracy and strengthened screening by pharmaceutical personnel are still needed.

Keywords: prescription, compound, prescription, pediatric patients, drug dosage, medication error.

INTRODUCTION

Pharmaceutical services at community health centers play an important role in primary healthcare by ensuring the safety, accuracy, and effectiveness of patient therapy. Community health centers, as primary healthcare facilities, function not only as places for medical services but also as centers for drug management and pharmaceutical services that must be carried out rationally and with quality standards [3], [9], [10]. In this context, pharmaceutical personnel have a strategic role in ensuring that medications prescribed to patients are appropriate to their clinical needs, dosage, dosage form, and proper directions for use [2].

Pediatric patients are a group requiring special attention in pharmaceutical services because they possess physiological characteristics different from those of adult patients. Differences in age, body weight, drug metabolism capacity, dosage forms, and communication limitations may increase the risk of medication errors. Errors at the prescribing stage, such as inaccurate dosage, unclear directions for use, or inappropriate dosage forms, may lead to ineffective therapy, overdose, or adverse side effects that can endanger patients [4], [7], [8]. Therefore, complete and proper prescription writing is an important aspect in supporting pediatric patient safety [6].

Medication errors at the prescribing stage remain a problem in pharmaceutical services, including in primary healthcare facilities. Several studies have shown that incomplete information in prescriptions, such as the absence of age, body weight, dosage, dosage form, quantity of medication, or clear directions for use, may increase the risk of medication administration errors [7], [11], [12]. A study conducted by Rahmi Nurhaini

et al. also found that outpatient pediatric prescriptions still demonstrated incompleteness in administrative and pharmaceutical aspects. Therefore, prescription screening by pharmaceutical personnel needs to be optimally implemented to prevent medication errors [5].

Prescription screening is an important process in pharmaceutical services to evaluate the appropriateness of prescriptions before medications are prepared and administered to patients. This process includes reviewing administrative completeness, pharmaceutical accuracy, and the appropriateness of medication use information. Through prescription screening, pharmaceutical personnel can identify potential errors at an early stage, provide clarification to physicians in cases of discrepancies, and ensure that the therapy received by patients is safe and appropriate [2], [5], [6].

Based on the description above, this paper discusses the appropriateness, particularly the dosage accuracy, of pediatric patient prescriptions at Puskesmas Sungai Tutung in 2024, with a focus on pharmaceutical aspects. The scope of the study includes the administrative completeness of prescriptions and the accuracy of pharmaceutical aspects in pediatric patient prescriptions. The approach used refers to the concepts of pharmaceutical services, prescription writing principles, and medication error prevention as the basis for assessing the quality of pharmaceutical services. This study is expected to provide an overview of the quality of physicians' prescription writing and serve as input for improving the quality of pharmaceutical services and pediatric patient safety at community health centers.

METHODS

Research Time and Location

This study was conducted at Sungai Tutung Health care, Kerinci Regency, Jambi Province. The location was selected based on the high number of pediatric patient visits, making this community health center relevant as a site for prescription evaluation, particularly in pharmaceutical and administrative aspects.

Research Design

This study employed a descriptive observational design with a retrospective approach. The research data were obtained from pediatric patient prescription documents from 2024 stored in the pharmaceutical service department of Sungai Tutung Health care. This approach was used to assess the completeness and accuracy of prescriptions based on existing data without providing any intervention to healthcare services or patient therapy [2], [5], [7].

Population and Sample

The population in this study consisted of all pediatric patient prescriptions at Sungai Tutung Health care during the January–December 2024 period, totaling 148 prescription sheets. The research sample consisted of compounded prescriptions for pediatric patients that met the inclusion and exclusion criteria. The inclusion criteria included compounded prescriptions for pediatric patients during the January–December 2024 period and prescriptions recorded at Sungai Tutung Health care. The exclusion criteria included incomplete prescriptions, illegible prescriptions, and non-compounded prescriptions for pediatric patients.

Sampling Technique

The sample size was determined using the Slovin formula with an error rate or margin of error of 10%. The Slovin formula used was as follows:

$$n = \frac{N}{1+N(e)^2}$$

Description:

n = sample size

N = population size

e = margin of error

Based on the population size of 148 prescriptions and an “e” value of 0.1, the sample calculation was as follows:

$$n = \frac{148}{1 + 148(0,1)^2} = 59.67$$

The calculation result was rounded to 60. Therefore, the total sample in this study consisted of 60 pediatric patient prescription sheets.

Data Collection Technique

Data were collected through a review of prescription documents using a data collection sheet. The recorded data included patient age and body weight when available, gender, medication name, dosage form, dosage, frequency of administration, directions for use, and other administrative completeness of the prescriptions. The evaluation of pharmaceutical aspects was conducted by assessing dosage appropriateness based on age or body weight, dosage form, directions for use, and the completeness of prescription writing

according to prescribing guidelines [5], [6], [12].

Research Instrument

The research instrument consisted of a prescription suitability checklist developed based on indicators of administrative completeness and pharmaceutical aspects. The instrument was adjusted according to indicators from relevant literature and tested on several prescriptions to ensure data clarity and consistency.

Data Analysis Technique

The data were analyzed descriptively and quantitatively by calculating the frequency and percentage of prescriptions that met and did not meet pharmaceutical aspect requirements. The evaluation results were categorized into appropriate and inappropriate prescriptions and then presented in tables to describe the level of suitability of physicians' prescriptions for pediatric patients at Sungai Tutung Health care.

Research Procedure

The research procedure included obtaining research permission, collecting pediatric patient prescription documents from 2024, selecting prescriptions based on inclusion and exclusion criteria, determining the sample size using the Slovin formula, recording data into the data collection sheet, evaluating pharmaceutical aspects, classifying prescriptions into appropriate and inappropriate categories, and conducting descriptive quantitative data analysis.

RESULTS

This study used secondary data in the form of compounded prescriptions for pediatric patients in 2024 at Sungai Tutung Health

care. A total of 60 prescription sheets containing 162 compounded drug items were analyzed. Prescription suitability was assessed based on pharmaceutical aspects, particularly the appropriateness of drug dosages for pediatric patients.

Suitability of Pediatric Patient Prescriptions

Based on the evaluation results, most pediatric patient prescriptions were categorized as appropriate. Of the 60 prescription sheets analyzed, 42 prescriptions or 70.0% were considered appropriate, while 18 prescriptions or 30.0% were considered inappropriate.

Table 1. Recapitulation of Pediatric Patient Prescription Suitability

Evaluation Category	Number of Prescriptions	Percentage
Appropriate	42	70%
Inappropriate	18	30%
Total	60	100%

These results indicate that the practice of prescribing compounded medications for pediatric patients at Sungai Tutung Health care generally fulfilled pharmaceutical aspect requirements. However, the presence of 30.0% inappropriate prescriptions indicates that discrepancies in prescribing still require attention. Such discrepancies may increase the risk of medication errors, especially in pediatric patients who require more precise dosage calculations compared to adult patients [2, 7, 11].

Characteristics of Pediatric Patients Based on Age

The characteristics of pediatric patients in this study were grouped according

to age. Based on the research findings, the 2–5 years age group was the largest group receiving compounded prescriptions, accounting for 34 prescriptions or 56.7%.

Table 2. Characteristics of Pediatric Patients Based on Age

Age (Years)	Number of Prescriptions	Percentage
0–1	9	15%
2–5	34	56%
6–12	17	28%
Total	60	100%

The high number of patients in the 2–5 years age group may be associated with the vulnerability of toddlers to various health disorders, such as fever, cough, colds, and respiratory tract infections. This age group requires special attention in medication administration because physiological body functions, including drug metabolism and elimination, are not yet fully developed. Therefore, prescriptions for pediatric patients need to include important information, especially age and body weight, so that dosage calculations can be performed accurately [4], [6].

Suitability of Compounded Drug Dosages

The dosage accuracy evaluation was conducted on 162 compounded drug items contained in 60 prescription sheets. The results showed that 140 drug items or 86.4% were in accordance with the recommended dosage, while 22 drug items or 13.6% were categorized as overdoses.

Table 3. Evaluation of Compounded Drug Dosage Suitability

Evaluation Category	Number of Drug Items	Percentage
Appropriate	140	86.5%
Overdose	22	13.5%
Total	162	100%

DISCUSSION

These findings indicate that most compounded drug items were prescribed at appropriate dosages according to recommendations. However, the presence of overdose cases indicates potential problems in the pharmaceutical aspects of prescriptions. Several drugs identified with inappropriate dosages included Ranitidine, Chlorpheniramine Maleate (CTM), and Guaifenesin. Dosage inaccuracies may be caused by several factors, such as errors in dosage calculations, the absence of patient body weight information, incomplete clinical information in prescriptions, and the complexity of drug compounding.

In pediatric patients, dosage errors carry a higher risk because drug dosages generally must be adjusted according to the patient's age or body weight. Excessive dosages may increase the risk of side effects and toxicity, while doses that are too low may result in ineffective therapy. The use of compounded medications in pediatric patients also carries greater pharmaceutical risks compared to manufactured drugs because it requires calculation, division, mixing, and dosage adjustment processes. Errors at any of these stages may affect the safety and effectiveness of therapy. Therefore, prescription screening and evaluation by pharmaceutical personnel are important steps in preventing medication errors [2, 5, 6].

These findings are consistent with research conducted by Rahmi Nurhaini et al., which showed that incompleteness and discrepancies in pediatric patient prescriptions are still found in primary healthcare services, indicating that prescription screening needs to be carried out optimally [5]. Other studies have also shown that medication errors at the prescribing stage may still occur when important information in prescriptions is not written completely, particularly in pediatric patients [7, 11, 12].

Based on the results of this study, improving the quality of pharmaceutical services at community health centers should be carried out through strengthening the prescription screening process, consistently including pediatric patient body weight information, and improving accuracy in prescription writing and dosage calculations. Optimizing the role of pharmaceutical personnel in prescription evaluation is expected to reduce the risk of medication errors, improve pediatric patient safety, and support the quality of pharmaceutical services at Sungai Tutung Health care.

CONCLUSION

Based on the results of the study, it can be concluded that the suitability of compounded prescriptions for pediatric patients at Sungai Tutung Health care in 2024, based on pharmaceutical aspects, was categorized as fairly good. Of the 60 prescription sheets analyzed, 42 prescriptions or 70.0% were considered appropriate, while 18 prescriptions or 30.0% were considered inappropriate. This indicates that most prescriptions met pharmaceutical requirements, although some discrepancies that may potentially lead to medication errors were still identified.

The 2–5 years age group was the largest group of pediatric patients receiving compounded prescriptions, accounting for 56.7%. This condition indicates that toddlers are a group requiring special attention in pharmaceutical services, particularly because determining drug dosages in children requires consideration of age, body weight, and the patient's physiological condition.

The evaluation results of 162 compounded drug items showed that 140 drug items or 86.4% had appropriate dosages, while 22 drug items or 13.6% were identified as overdoses. Dosage inaccuracies were mainly found in several medications, such as Ranitidine, Chlorpheniramine Maleate (CTM), and Guaifenesin. These findings indicate that dosage calculation remains an important aspect that requires attention in prescribing compounded medications for pediatric patients. Therefore, greater accuracy in prescription writing, consistent inclusion of pediatric patient body weight, and strengthening the role of pharmaceutical personnel in conducting prescription screening and evaluation are necessary. These efforts are important to minimize the risk of medication errors, improve pediatric patient safety, and support the quality of pharmaceutical services at Sungai Tutung Health care.

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