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RESEARCH ARTICLE

Pharmacists' practice in providing pharmaceutical services of treating paediatric diarrhoea in pharmacies: A qualitative study

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Abstract

Background: Diarrhoea is a significant cause of morbidity and mortality in developing countries. Pharmacists in pharmacies are essential in managing the treatment of diarrhoea in children and its prevention, particularly in preventing dehydration in children with diarrhoea. **Objective:** This study aims to explore the practice of pharmacists in providing pharmaceutical services related to treating diarrhoea in children in pharmacies**. Method:** The research was conducted using a qualitative, non-experimental method through in-depth interviews. Interviews were conducted face-to-face. Informants were recruited until data saturation, and ten pharmacist informants were obtained. Data validity was assessed through credibility testing with member checking, transferability testing with a detailed description, dependability testing, and confirmability testing through peer debriefing. Interview results were analysed descriptively using an inductive reasoning process. **Result:** In practice, not all pharmacists obtain complete drug information, make recommendations for appropriate treatment of paediatric diarrhoea, and provide complete drug information. The inhibiting factors for the implementation of pharmaceutical services related to paediatric diarrhoea therapy in the pharmacy is the lack of up-to-date knowledge among pharmacists and the limited human resources in the pharmacy. **Conclusion:** Pharmacists have a role in preventing and treating diarrhoea in children because they are health professionals who can be found in pharmacies and whom the public can consult about treating diarrhoea in their children.

Introduction

Pharmacies are medical establishments frequently visited by individuals seeking treatment. Patients select pharmacies as their preferred healthcare providers due to the pharmacies' capacity to ensure the presence of high-quality medications that are safe and effective in treatment. Additionally, pharmacies offer convenient accessibility for patients (Moorthi *et al.,* 2011). Pharmacists at pharmacies can offer explanations and guidance on the proper usage of medications based on medical indications. They might offer elucidations about the storage and disposal of medications. As a result, people tend to favour pharmacy health services for addressing their health issues (Rasheed *et al.,* 2023).

Pharmacists in pharmacies play a crucial role in managing and preventing diarrhoea in children. Specifically, they help prevent dehydration in children with diarrhoea and refer patients to healthcare facilities if the diarrhoea persists for more than three days and the patient becomes dehydrated (Ogbo *et al.,*

2014). Pharmacists can utilise the treatment guidelines provided by the WHO (World Health Organization) and the Indonesian Ministry of Health to offer recommendations for treating and preventing paediatric diarrhoea for patients. Nevertheless, the treatment guidelines for paediatric diarrhoea in Indonesia are not revised yearly. Studies conducted in developing country indicate that pharmacists in the field of pharmacy often lack sufficient knowledge and expertise in the management of paediatric diarrhoea treatment (Hussain & Ibrahim, 2012).

Pharmacists frequently exhibited deficiencies in providing pharmaceutical services for paediatric diarrhoeal diseases in pharmacies, including an incomplete collection of drug information, inadequate guidance on management and prevention, and insufficient consultation between pharmacists and patients (Pham *et al.,* 2013; Mengistu *et al.,* 2019;). Currently there is a deficiency in training programmes aimed at enhancing pharmacists' understanding of how to manage and prevent paediatric diarrhoea in pharmacies. This training program can enhance pharmacists' understanding of paediatric diarrhoea therapeutic management and prevention. It has the potential to enhance the implementation of pharmaceutical services for infantile diarrhoea and its prevention in pharmacies (Pham *et al.,* 2013; Foroughinia & Zarei, 2016;). Research on pharmacists' practices in providing pharmaceutical services related to paediatric diarrhoea therapy in pharmacies in Indonesia is limited. There is still a paucity of literature on pharmacists' practices in providing pharmaceutical services related to paediatric diarrhoea treatment in pharmacies (Ningsih *et al.,* 2021). This study investigates the practice of pharmacists in delivering pharmaceutical services for the treatment of paediatric diarrhoea in pharmacies.

Methods

Research design and informants

The study was qualitative research with a phenomenological approach through semi-structured interviews. Research informants were selected using a purposive sampling technique by limiting informants who met the inclusion criteria. The informants in this study were pharmacists practicing in pharmacies in the greater Malang area. The criteria for pharmacists who participated in semi-structured interviews were pharmacists who had been practicing in pharmacies in the Greater Malang area for at least two years and had provided pharmaceutical services, both self-medication and prescription services related to paediatrics' diarrhoea, and pharmacists who were willing to participate in the study and signed an informed consent form. The researcher selected the informants according to the predetermined criteria, and then the researcher explained the purpose and process of the research to the informants. Ten informants agreed to participate in this study, and the researcher then arranged an interview visit to the informant's pharmacy at a mutually agreed-upon time. All informants were asked to complete an informed consent form before conducting the research.

Data collection method

Interviews were conducted between January and February 2023. Before the interview, the researcher requested information about the pharmacist's background (age, gender, pharmacy location, and length of time the pharmacist worked there). Were the interviews conducted using an interview guide with the central questions: 1) How do you provide pharmaceutical services in the pharmacy concerning managing paediatric diarrhoea therapy and its prevention?; 2) What barriers do you experience when providing information on managing and preventing paediatric diarrhoea to parents of children with diarrhoea?; 3) What is your opinion on pharmaceutical services related to the management of paediatric diarrhoea therapy and its prevention by a pharmacist in a community pharmacy? Depending on the answers the informant gave, additional questions were asked until it was considered that no new information could be obtained. The interviews were recorded. The interview lasted between 20 and 60 minutes.

Data analysis

Data analysis was conducted using the inductive thinking technique, in which a general conclusion is drawn from several specific cases. Each interview was transcribed verbatim; then, the coding was carried out to determine individual and research themes. To increase the validity of the research, the credibility test was carried out through member checking, the transferability test through detailed description, the dependability test, and the confirmability test through the peer debriefing process. Giving the informant the interview transcript results allowed for the member-checking test so that the informant could verify the accuracy of the data and its interpretation. The approval sheet serves as proof that the informant approved the transcript. The peer debriefing process was carried out by discussing the transcript results to determine the research themes among the research members and reach an agreement on the research findings.

Research ethics

The Health Research Ethics Committee (KEPK) of the Faculty of Medicine, Universitas Brawijaya, approved this study with ethical approval number 225/EC/KEPK/10/2022. All informants agreed to participate in the research by completing the informed consent form. Before completing and signing the consent form, informants were informed about the purpose of the study, their right to refuse to participate, and the confidentiality of research data.

Results

Demographic data

In this study, ten participants were interviewed. The majority of informants were female (8 pharmacists). The mean age of the informants was 34.4 years. Most informants had been practicing for >10 years. The average length of the interviews conducted by the researchers with the informants was 31 minutes and 01 seconds.

This research resulted in three main research themes: the role of pharmacists in providing pharmaceutical services related to the management and prevention of paediatric diarrhoea, pharmaceutical services related to the management and prevention of paediatric diarrhoea provided by pharmacists in pharmacies, and barriers to providing pharmaceutical services related to the management and prevention of paediatric diarrhoea.

The role of pharmacists in pharmaceutical services related to the management of paediatric diarrheal diseases and their prevention

Pharmacists have a role to play in providing information about medicines to patients both prescription and self-medication services.

> *"Pharmacists need to provide information on the therapeutic management of pediatric diarrhea and its prevention. Pharmacists are aware of the side effects of drugs. Therefore, we need to extract drug information..." (Informant A).*

> *"...for example, if a patient wants to buy medicine A, it is possible that the patient already knows or has a recommendation from other people, friends, and relatives, so the patient may not know how to use the medicine, how to treat diarrhoea" (Informant B).*

When providing pharmaceutical services, a pharmacist provides information not only about the medicines used but also about non-pharmacological treatments.

> *"...if possible, non-pharmacological information is also given, such as not to eat carelessly, because many children get diarrhoea from careless snacks at school" (Informant C).*

> *"...what is usually informed is washing hands, being vigilant if there are families who also have diarrhoea" (Informant F).*

Children with diarrhoea can become dehydrated if not treated properly. Pharmacists can provide information on signs of dehydration in paediatric diarrhoea.

> *"I always tell the patient about the signs of dehydration, because the parents of the patient do not know about the signs of dehydration, especially if they have diarrhoea more than five times, I give them information that the child should be taken to the doctor immediately.' (Informant I).*

Pharmaceutical services related to the therapeutic management of paediatric diarrhoea and its prevention by pharmacists in pharmacies

Pharmacists can provide pharmaceutical services for managing paediatric diarrhoea and its prevention, including obtaining drug information, making therapeutic recommendations, and providing drug information to patients. Below is a description of the themes identified in the written responses and verbatim examples of patient responses to illustrate these themes.

Assessment of the patient

Age, symptoms, consistency of diarrhoea, frequency of diarrhoea per day, duration of diarrhoea, fever, medication history, diet history, and signs of dehydration are drug information collected by informants at the pharmacy. The pharmacist explained this in the interview quote.

> *"…I ask the patient about the symptoms, whether there is blood/mucus/foam in the diarrhoea, whether there is a fever or not. I also ask about the diet history, if the child has changed formula milk..." (Informant B).*

> *"I still look for medication information, I ask how often the diarrhoea has occurred, how old the child is..." (Informant C).*

> *"I first ask how long they have had the diarrhoea, whether they have been to the doctor or not..." (Informant G).*

> *"I first ask how many days they have had diarrhoea, whether it is mild or not, whether they have taken any medication..." (Informant H).*

"I ask if there are any signs of dehydration" (Informant I).

Provision of treatment recommendations

The drugs recommended by informants can be either single drugs or combination drugs to treat children's diarrhoea. The pharmacist stated this in the interview excerpt.

"I recommend adsorbents such as kaolin-pectin syrup" (informant A).

"I recommend kaolin-pectin then I recommend probiotics" (Informant D).

"ORS (Oral Rehydration Solution), zinc and probiotic...sometimes at 5 - 6 years old I give kaolin-pectin" (informant E).

"Zinc, ORS, probiotics, if there is vomiting, domperidone" (informant F).

"I recommend probiotic" (informant G).

"Mostly, I recommend probiotics, and ORS. If it is severe, I add kaolin pectin. I recommend going to the emergency room/doctor if the child is defecating 6-7 times a day." (Informant H).

"Kaolin pectin, probiotics, zinc" (informant J).

Providing drug information to patients

Drug information provided by informants to patients is the dose of the drug, how to use the drug, how to make rehydration fluid at home, signs of dehydration, and beyond use date. The pharmacist stated this in the interview excerpt.

"I provide information about oral rehydration solution, beyond use date after opening 24 hours so if it can be spent as much as possible. how to take zinc for the age of 2 - 6 months ten mg 1x day, if six months and above 20 mg 1x day for ten days, I will explain why zinc needs to be given so that there is no recurrence of diarrhoea" (Informant B).

"I explain that if there is a fever, it is usually due to dehydration. If it is a child with nausea and vomiting, they must drink a lot; I also educate them that if the child becomes weak, they do not need to wait 2-3 days, take them to the doctor or emergency room" (Informant F).

"I provide information on foods and drinks that can treat diarrhoea and things that cause children to have diarrhoea" (Informant H).

"In addition to information on how to use the medicine, I also inform parents about the signs of dehydration so that they know if there is dehydration in the child, what steps parents should take" (Informant I).

Barriers to provide pharmaceutical services related to the management and prevention of diarrheal diseases in children

Limited human resources, lack of interest, patients in a hurry, and inadequate facilities for providing advice are barriers to providing pharmaceutical services. The pharmacist stated this in the interview excerpt.

"The obstacle I feel is that I forget what needs to be communicated regarding managing children's diarrhoea therapy. The crowded pharmacy is also an obstacle that I have felt so far" (Informant A).

"Human resources are limited, so counselling is limited" (Informant E).

"The obstacle from the patient himself still does not believe in the existence of a pharmacist. The patient still considers the pharmacy a place to buy and sell drugs, nothing like a retail store. He does not consider that pharmacists can provide drug information, help patients choose drugs, and direct for better dosage regimentation " (Informant B).

"Patients usually ask to be served quickly, I have been served quickly and given a brief information about the medicine, but patients don't seem to listen" (Informant D).

"The limitations are related to infrastructure, and I have not been able to document counselling. I do not have counselling media such as leaflets" (Informant F).

Discussion

Pharmacists play a crucial role in the prevention and treatment of diarrhoea in children. As healthcare professionals working in pharmacies, they are readily accessible to the public for consultation on managing diarrhoea in their children (Ibrahim *et al.,* 2018). A pharmacy is a specialised establishment where pharmacists engage in the business of dispensing medications and other pharmaceutical services. Individuals frequently visit pharmacies to get medications for both prescribed use and self-medication (Sanii *et al.,* 2016; Haddad *et al.,* 2023;). Several studies have shown that pharmacists are the source of information consulted by the public for self-medication (Akande-Sholabi & Akinyemi, 2023). Therefore, pharmacists play a crucial role in enhancing the implementation of self-medication by offering

suitable suggestions based on the patient's clinical condition (Ningsih *et al.,* 2021). The objective of this study was to investigate the implementation of pharmaceutical services by pharmacists in the treatment of paediatric diarrhoea in pharmacies.

Pharmacists are required to optimise diarrhoeal therapy for patients, and pharmacists are expected to advise on the correct therapy for paediatric diarrhoea. Counselling is a component of pharmaceutical services that must be implemented to improve therapeutic outcomes by maximising the use of appropriate medicines. The stages of counselling that pharmacists can carry out are obtaining drug information, making therapeutic recommendations, and providing drug information. Several questions need to be asked to obtain a complete history from a patient presenting with diarrhoea as a child. These questions usually include age, weight, symptoms (fever, abdominal pain, nausea, and vomiting), stool consistency (bloody stool, slimy stool, frothy stool, and watery stool), duration and frequency of diarrhoea, dietary history, medication history, food or drug allergies, and signs of dehydration (restlessness, sunken eyes, drowsiness, weakness, and extreme thirst) (Ogbo *et al.,* 2014; Sancar *et al.,* 2015; Mengistu *et al.,* 2019). According to the results of the interviews conducted with the respondents, not all pharmacists collect complete information. Most respondents collected information on the consistency of stools and the duration of diarrhoea. A study conducted in Brazil found similar results to this study, where most pharmacists extracted drug information related to the duration of diarrhoea in children (36%), the symptoms experienced by patients (36%), and the frequency of diarrhoea (12%) (Da Rocha *et al*., 2015). In this study, some respondents reported collecting information on age, symptoms, dietary history, frequency of diarrhoea, medication history, and signs of dehydration. To assess the severity of children's diarrhoea, a pharmacist needs to gather information on dehydration symptoms. Dehydration in children with diarrhoea needs to be treated appropriately because of the dangers of dehydration, which can be fatal due to fluid loss. Pharmacists have a role in preventing dehydration in children with diarrhoea by providing information about signs of dehydration (Munos *et al.,* 2010; Abbas *et al.,* 2018)).

The Ministry of Health of the Republic of Indonesia and WHO suggest the use of ORS and zinc for the treatment of paediatric diarrhoea. The management strategy prioritises fluid replacement by the administration of more suitable fluids, such as ORS, to prevent dehydration. Zinc supplementation replenishes the body's endogenous zinc levels and expedites the recovery process from diarrhea. Zinc supplementation enhances the immune system and mitigates the likelihood of recurring diarrhoea for a period of 2-3 months following the child's recovery from diarrhoea (Riaz *et al.,* 2019; World Health Organization, 2020).

Informant interviews yielded recommendations for the following therapies to be administered to children with diarrhoea in pharmacies: individual ORS; individual probiotic; individual adsorbent; individual anti-diarrheal herbal medication; a combination of ORS and zinc; a combination of kaolin-pectin and probiotic; a combination of ORS, kaolin-pectin, and probiotic; a combination of ORS, zinc, probiotic, and kaolin-pectin. Informants suggested the use of adsorbents as a treatment for children with diarrhoea, either on their own or in conjunction with other medications. Children should not be administered adsorbents. When a kid experience diarrhoea, the body responds by increasing motility, which refers to the frequency of bowel movements, from expel waste or toxins. There will be significant peristalsis and audible noises throughout the gastrointestinal tract. Adsorbents impede this motion, hence preventing the evacuation of stools that should be excreted. Furthermore, the use of anti-diarrhoeal medications might lead to a potential issue known as bowel prolapse. This condition is perilous and necessitates surgical intervention (Brandt *et al.,* 2015; Nedeljko Radlović, Zoran Leković, Biljana Vuletić, Vladimir Radlović, 2015).

Some informants in this study did not endorse the use of oral rehydration solution (ORS) and zinc, despite the recommendations made by the Ministry of Health of the Republic of Indonesia and the World Health Organisation (WHO). This finding aligns with research carried out in Gondar City, located in western Ethiopia, where it was shown that 32% of pharmacists advocated for a treatment regimen involving the simultaneous use of ORS and zinc (Erku & Aberra, 2018). Other studies in Pakistan reported that no pharmacists recommended ORS plus zinc for its management paediatric In Pakistan, Antibiotics were dispensed without prescription (Malik *et al.,* 2021). The variation in pharmacists' recommendations for treating paediatric diarrhoea stems from disparities in their expertise on the management of children with diarrhoea and the accessibility of items in pharmacies (Mengistu *et al.,* 2019).

A pharmacist delivers evidence-based treatment by ensuring that a patient receives medicine based on their clinical requirements, in a dosage that fulfils the course needs, within a suitable interval, and at a cost that is manageable for both the person and the community. Pharmacists should furnish pertinent details regarding the medication's usage, timing, duration, dosage, potential side effects, and possible interactions during administration (Foroughinia &

Zarei, 2016; Ibrahim *et al.,* 2018). The study collected patient information from informants, encompassing details such as medicine dosages, drug administration instructions, homemade rehydration fluid recipes, indicators of dehydration, and cessation guidelines for drug usage. The drug information given by informants is insufficient. This finding aligns with research carried out in five towns in northern Ethiopia, which revealed that 19% of pharmacists dispensed information on medicine dose and usage guidelines (Abegaz *et al.,* 2016). Pharmacists may contribute to non-adherence and treatment failure by providing incomplete drug information to patients with paediatric diarrhoea. When guiding patients, pharmacists must emphasise the potential adverse effects and drug interactions associated with the patient's medications. Nevertheless, the participants in this study failed to emphasise the significance of disclosing information regarding potential adverse effects and drug interactions that may arise with the use of medications. This aligns with research conducted in Brazil and Nigeria (Da Rocha *et al.,* 2015; Ogbo *et al.,* 2014). Insufficient counselling can result in prescription mistakes, including the incorrect administration of medications, incorrect dosages, and improper usage guidelines (Hussain & Ibrahim, 2012; Ibrahim et al., 2018). Pharmacists are required to offer counselling to patients to ascertain the patient's condition, determine the necessary information for the patient, and enhance their understanding of their therapy. Nevertheless, in practical application, pharmacists encounter several obstacles while guiding patients. The study identified several barriers that pharmacists perceive when providing advice on the treatment of children with diarrhoea. These barriers include limited human resources, lack of interest, patients in a hurry, and inadequate facilities for providing advice. Pharmacists must actively engage in continuous learning by participating in seminars, workshops, and training sessions in order to compensate for any gaps in their expertise (Albekairy, 2014). When counselling, it is important to have a distinct environment, as it might enhance the patient's receptiveness to the information given, hence improving patient adherence and satisfaction with the service. A necessary condition for the effective execution of counselling is the presence of a dedicated space for counselling. As far as possible the counselling room is located in a separate room, avoiding stressful rooms. Counselling is selectively provided to patients based on certain problems due to limited time availability (Ilardo & Speciale, 2020).

The fact that this study only spoke with pharmacists who worked in pharmacies limits it. Therefore, additional research is necessary to investigate the practices of pharmacists in providing pharmaceutical services for paediatric diarrheal treatment in other settings, such as clinics, hospitals, or health centres.

Conclusion

Pharmacists play a crucial role in the prevention and treatment of paediatric diarrhoea due to their expertise as healthcare professionals available in pharmacies, where individuals may seek advice on managing their diarrhoea in children. Practically, not all pharmacists acquire comprehensive medication knowledge, offer suggestions for the treatment of paediatric diarrhoea, and furnish complete drug information. Pharmacists face several obstacles when it comes to providing pharmaceutical services for children's diarrheal diseases in pharmacies. These barriers include a lack of up-to-date knowledge, limited staffing, inadequate consultation space, time constraints due to impatient patients, the absence of patient medication records, and patients' lack of trust in the information provided by pharmacists.

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