Self-Reported and Actual Involvement of Community Pharmacy Professionals in the Management of Childhood Diarrhea: A Cross-Sectional and Simulated Patient Study at two Towns of Eastern Ethiopia

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ABSTRACT

BACKGROUND: Role of community pharmacy professionals is observed in the prevention and treatment of diarrhea and the associated problem of dehydration in children. The aim of this study was to assess self-reported knowledge and actual practices of community pharmacy professionals toward the management of diarrhea in Harar town and Dire Dawa city administration.

METHODOLOGY: Community-based cross-sectional study was conducted on community pharmacy professionals practicing in community drug outlets of the two towns. Structured questionnaires and simulated patient were used to collect data.

RESULTS: A total of 105 community pharmacy professionals from 105 community pharmacies were invited, out of which 69.5% were men. Age was the most frequently taken history in both studies and none of the participants take history about weight of the child, medication history, and nutrition condition in the simulated study. Even though more than 90% of the participants reported to recommend oral rehydration salt (ORS) plus zinc, above 85% of them dispense antimicrobial agents for the simulated patient. Dose (96%), frequency (98%), how to prepare ORS (98%), and duration (98%) were the most frequently given information in the questionnaire survey. However, the simulated study revealed that information about common side effects and major interactions were not given to the patient.

CONCLUSION: The study identified that there is a great difference between self-reported knowledge and actual practices on the management of childhood diarrhea in community pharmacies.

KEYWORDS: Self-reported, simulated study, children, diarrhea, community pharmacy

Introduction

Due to their accessibility, community drug retail outlets are frequently visited by the public to answer health-related queries. They have been considered the preferred source of health information, advice, and services for common health problems in local communities.[1,2] Pharmacists and pharmacy technicians, hereafter known as pharmacy professionals, in the community play an important role, in providing health services for the common problems like diarrhea, which leads to morbidity and mortality particularly in children below the age of 5 years in developing countries.[3] They play an integral role in the management of diarrhea through self-treatment recommendations or referrals for medical evaluation.[4]

Pharmacy professionals need to ask adequate questions to reach a diagnosis and determine whether to treat or to refer to medical care and what to give if treatment was appropriate. The current recommendations for treating childhood diarrhea in developing world are set by the United Nations international children and World Health Organization (WHO) statement 2004. The treatment focuses around fluid replacement to prevent dehydration, zinc supplementation, increased amounts of appropriate fluid, and continued feeding. Antimicrobials should not be used routinely in management of diarrhea without differential diagnosis of the causative agent.[5]

As a health professional, community pharmacists should be involved in the prevention and treatment of diarrhea and the associated problem of dehydration in children. As the treatment protocol of diarrhea is changing every time, knowledge and skills of community pharmacies should be assessed.[2]

In Ethiopia, pharmacy professionals are involved in the management of childhood diarrhea by prescribing and dispensing over the counter drugs such as oral rehydration salt (ORS) and zinc and give advice to treat and prevent rehydration. But these professionals are not allowed to prescribe

prescription-only medications such as antibacterials before the causative agents are identified, and if they suspect infections, they will refer the patient for further diagnosis. So, this study was aimed to assess self-reported and actual involvement of community pharmacy professionals in the management of diarrhea by using self-administered questionnaire and simulated patient method. Simulated patient method has been used around the globe to identify issues in current pharmacy practices and inform interventions to shape practice behavior of pharmacists and their staff. The pharmacists are unaware that these particular clients are participating in a study.[6] This method provides a way to document unconscious real behavior and practice from the client's perspective, and it is a simple method for assessing the community pharmacists' dispensing practices.[7] It is a tested and well-accepted method for evaluating community pharmacists' professional behaviors, by reducing potential selection bias and Hawthorne effect, using simulated patient. A simulated patient (also known as pseudo patron, standardized patient, or mystery shopper) is an individual who is trained to go to a pharmacy and enact predetermined scenarios, while being indistinguishable from genuine patients, to assess aspects of customer care provided by pharmacy staff.[8]

The simulated patient method has been shown to help overcome the methodological problems of other quantitative methods like self-reported questionnaires and interviews and has become a useful and objective tool for evaluating professional performance. It focuses on actual behaviors, which can be compared with self-reported descriptions of pharmaceutical services.[9] The reason for choosing a simulated patient method in this study was to acquire feedback in a safe and effective way that can be compared with self-reported responses by the same practitioner.

The findings of this study will help to formulate strategic plan to confront the problem associated with it. It will help regulatory bodies such as Food Medicine and Health Authority Control Agency (FMHACA) for planning to develop strategy to fill the gap found in the community pharmacies.

Methods

Study area and period

The study was conducted in community pharmacies located in Dire Dawa city administration and Harar town, which are located in Eastern part of Ethiopia. In Dire Dawa city administration, there were 2 governmental hospitals, 5 private hospitals, eighty private clinics, and fifty community pharmacies. In Harar town, there were 4 governmental hospitals, 8 health centers, 2 private hospitals, and 55 community pharmacies. The study was conducted from August 1 to 30, 2017.

Study design

Community-based cross-sectional study was conducted with simulated patient visit (simulated case) and structured self-administered questionnaires.

Populations

Pharmacy professionals working in the community pharmacies of the 2 towns were the source populations and pharmacy professionals who were working in the community pharmacies of the 2 towns during the study period were the study populations.

Selection criteria

For simulated case

- In community pharmacies that had more than one pharmacy professional, only one of them (who contact the simulated case) was included in the study.

For questionnaire-based study

- The pharmacy professional who contacts the simulated case and willing to participate in the study was included.

Sample size determination and sampling procedure

As there were only 105 community pharmacies and only one pharmacy professional was included from each community pharmacy, 105 pharmacy professionals were included in the study. Random and purposive sampling methods were used for the simulated and questionnaire-based studies, respectively.

Data Collection

For simulated case

The simulated patient was a 3-year-old child who had acute watery diarrhea, and the mother of this child was visited community pharmacies to get treatment for her child. She was a graduate of pharmacy and before starting the visit, she was trained by clinical pharmacists about how to approach the community pharmacy professionals, the response that should be given when asked, and the information that should be recorded on the abstraction format after leaving each community pharmacy. The guideline for assessing the appropriateness of evaluation of patients, treatment, and instruction on food and fluid intake was adopted from a booklet by WHO Diarrhea Disease Control Programs.[10]

For the questionnaire-based study

A structured self-administered questionnaire was prepared in English language, pretested, and administered for those community pharmacists who had involved in the simulated patient study. To identify them, the data collector entered to the community pharmacy after the simulated patient and had noticed who was participating in the simulated study and gave the questionnaire after the simulated patient had left the community pharmacy.

Table 1. Sociodemographic characteristics of study participants.

CHARACTERISTIC	CATEGORIES	FREQUENCY	PERCENT (%)
Sex	Male	73	69.5
	Female	32	30.5
Age in years	20-30	45	42.9
	31-40	46	43.8
	>40	14	13.3
Marital status	Single	46	43.8
	Married	57	54.3
	Divorced	2	1.9
Religion	Orthodox	61	58.1
	Muslim	28	26.7
	Protestant	15	14.3
	Catholic	1	0.9
Qualification	Pharmacist	31	29.5
	Pharmacy technician	74	70.5
Work experience	≤5 years	44	41.9
	>5 years	61	58.1
Responsibility	Employee	66	62.9
	Owner	39	37.1
Monthly income (USD)	<200	48	45.7
	>200	18	17.1
	Owner	39	37.1

Table 2. History taken by pharmacy professionals.

HISTORIES TAKEN	QUESTIONNAIRE-BASED SURVEY N (%)	SIMULATED PATIENT STUDY N (%)
Age	103 (98.1)	103 (98.1)
Weight	67 (63.8)	0 (0.0)
Onset and duration of diarrhea	101 (96.2)	21 (20)
Frequency of diarrhea	102 (97.1)	26 (24.8)
Medication history	86 (81.9)	0 (0.0)
Nutrition condition	75 (71.4)	0 (0.0)
Presence of blood or mucus	94 (89.5)	46 (43.8)
Appearance of diarrhea	41 (82.0)	73 (69.5)
Presence of vomiting	95 (90.5)	20 (19.0)
Presence of fever	94 (89.5)	26 (24.8)
Dehydration symptom	85 (81.0)	1 (0.0)

Data processing and analysis

After conduction of the survey, the completed questionnaire and the simulated patient visit form were organized for analysis. The data were checked, edited, organized, coded, and entered into SPSS version 20 for analysis. Descriptive analysis was used to analyze the data and it was presented using tables and a figure.

Results

Sociodemographic characteristics

A total of 105 pharmacy professionals were included in the study in the community pharmacies of Harar town and Dire Dawa city administration. From these, 69.5% were men and 70.5% were pharmacy technicians. From the study participants, 58.1% had more than 5 years of work experience and 37.1% of them were owners of the community pharmacies (Table 1).

Types of history taken

A total of 11 history taking components were used to asses both the knowledge and practice of study participants. Age was the most frequently taken history (98.1%) in both self-reported survey and the simulated patient study. None of the pharmacy professionals asked about weight, medication history, nutrition condition, and dehydration symptom in the simulated patient study (Table 2).

Recommendations and information given

Three pharmacologic groups of medications were recommended to alleviate acute diarrheal symptoms, which include antimicrobials, antispasmodic, and ORS. On the simulated visits, about 86.7% of the participants dispensed antimicrobials from which 97.8% was cotrimoxazole, and on the questionnaire-based study, 50.5% of them reported as they recommend antimicrobials for this condition (Figure 1). Dose (96%), frequency (98%), how to prepare ORS (98%), and duration (98%) were the most frequently given information in the questionnaire survey. However, the simulated study revealed that dose (84%), frequency (66%), and duration (44%) were the most frequently given information. Information about common side effects and major interactions were not given in the simulated study, whereas common side effects and major interactions were reported to be informed by 48% and 54% of the participants, respectively, in the questionnaire survey (Table 3).

Instructions for food and fluid intake

Regarding instructions on fluid and food intake, 86.7% and 71.4% of the respondents reported that they would recommend
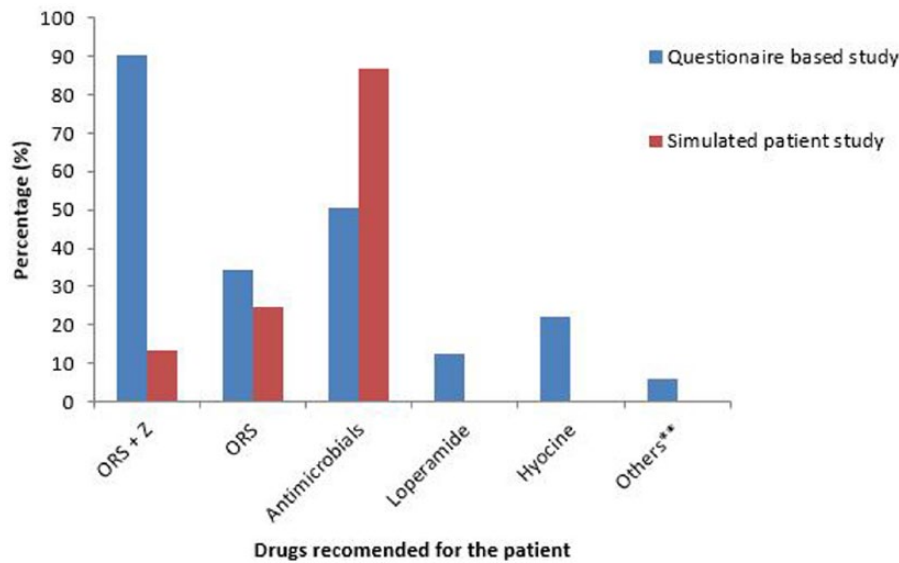
Figure 1. Recommendation of drug product by pharmacy professionals in community pharmacies of Harar town and Dire Dawa city administration from August 1 to 30, 2017. ORS indicates oral rehydration salt.

increase in fluid and food intake, respectively. But almost none of the respondents advised to increase fluid and food intake in the simulated study.

Discussion

Pharmacy professionals, as part of most accessible health professionals, are responsible in solving great deal of public health problems.[11] This study aimed to explore knowledge of the community pharmacy professionals on the management of acute watery diarrhea in children using self-administered questionnaire and compare with their actual practice by using simulated patient study. Nowadays, simulated patient study becomes the best way to assess the actual practices of community pharmacy professionals without the awareness of the practitioners and used to overcome the methodological problems of other

Table 3. Information given by pharmacy professionals.

RECOMMENDATIONS GIVEN	QUESTIONNAIRE-BASED SURVEY N (%)	SIMULATED PATIENT STUDY N (%)
Name of medication	77 (73.3)	2 (1.9)
Dose	102 (97.1)	95 (90.5)
Frequency	104 (99)	87 (82.9)
Duration	101 (96.2)	65 (61.9)
Route of administration	99 (94.3)	23 (21.9)
Side effects	65 (61.9)	0 (0.0)
Major interactions	65 (61.9)	0 (0.0)
Storage conditions	82 (78.1)	4 (3.8)
ORS preparation	101 (96.2)	29 (27.6)

Abbreviation: ORS, oral rehydration salt.

quantitative methods.[2,7,9,12] This study mainly focused on knowledge and actual practices of community pharmacy professional toward history taking, drug recommendation, drug information, and food and fluid instruction skills to manage acute watery childhood diarrhea.

To assess children with diarrhea, WHO recommends taking history on the presence of blood in the stool, duration of diarrhea, number of watery stools per day, number of episodes of vomiting, presence of fever, pre-illness feeding practices, type and amount of fluids and food taken during the illness, drugs or other remedies taken, and immunization history.[11] Based on this recommendation, 11 history-taking components were used to assess the knowledge and actual practice of community pharmacy professionals on the management of childhood diarrhea in this study. Age was the most frequently taken history in both self-reported and simulated patient study, which is similar to a study done in community pharmacies in 5 towns of Ethiopia[2] and private pharmacies of Ujjain, India,[7] but lower than for a study done in Thailand.[13]

According to WHO-stated goals to manage acute watery diarrhea, number of watery stool per day and onset with duration of the diarrhea are mandatory to control dehydration.[11] History about onset, frequency, and duration of diarrhea was taken by most of the participants in the self-reported study, but more than three-fourth of the participants did not actually take history about these conditions on the simulated study, which is similar to a simulated study done in Turkey.[14] Moreover, none of the pharmacy professionals asked about weight, medication history, nutrition condition, and dehydration symptoms in the simulated patient study, which is lower than from a study done in 3 towns of Ethiopia[2] and Thailand.[13]

Questions about the medication history of the patient, which can be used to rule out drug-induced diarrhea, were also not asked by either pharmacists or pharmacy technicians in the

study done in Turkey.[14] The discrepancy between self-reported knowledge and actual practice in evaluation is consistent with earlier studies done in Thailand,[13] Midi-Pyrénées region,[15] Pakistan,[16] and Nigeria.[10] This indicates that even though the community pharmacy professionals had good knowledge about history taking, they practice it less often. Periodic short-term training on how to evaluate childhood diarrhea is needed to scale-up both knowledge and practice of practitioners. For instance, a training intervention study has found that significant improvement was noted in the knowledge of dehydration symptoms for diarrhea from 19% to 88% after engaging pharmacy personnel on a knowledge-bearing workshop[17] and another pretest-posttest survey indicates that training programs play important roles in increasing pharmacists' knowledge and therefore improving their practice in recommending the appropriate over-the-counter (OTC) medicines.[18]

As shown in the scenario, the patient is affected by acute watery diarrhea on both questionnaire and simulated study. Antimicrobial agents should be recommended in cases of dysentery (blood in stool) and 89.5% of the pharmacists reported that they asked about the presence of blood/mucus in the diarrhea but more than half of them recommend antimicrobials for this patient without any manifestation for infectious diarrhea. Moreover, 86.7% of them actually dispense antimicrobials for the simulated patient, which indicates that antimicrobials are dispensed inappropriately. The routine use of antimicrobials for infectious diarrhea in children is to be avoided, because it brings little benefit in most cases (as diarrhea is of viral cause) and is associated with the risk of increasing antimicrobial resistance. In addition, overuse of antimicrobials leads to increased costs and side effects for individuals and their families.[19]

WHO main recommendations in childhood acute diarrhea include dehydration prevention (through providing more appropriate fluids such as ORS), treating dehydration (ORS) prevention of nutritional damage (feeding during and after diarrhea) and reducing the duration, and severity and occurrence of future episodes by giving supplemental zinc.[11,19] More than 90% of the pharmacists reported that they recommended ORS plus zinc, but only 13.3% of them actually dispense this product for the same patient, which is similar to a study done in Turkey[14] and lower than a study done in 3 towns of Ethiopia[2] and Thailand.[13] The difference in recommendation of ORS plus zinc for acute childhood diarrhea might be due to difference in the availability of the product and professional training or knowledge about the use of the product.

The WHO emphasized continued feeding or increased breastfeeding during, and increased feeding after, the diarrheal episode.[19] In this study, most of the community pharmacy professionals reported that they recommended to increase fluid intake during diarrhea episodes but the actual practice indicates that only 7.6% recommended to increase fluid intake and none of them recommended to increase food intake. The main

problem in diarrheal disease comes from loss of high amount of fluid, which may cause severe dehydration if not replaced on time. To prevent this, pharmacy professionals should advise mothers to increase fluid and food intake during and after diarrheal episodes.

The rational use of medicines requires patients receive medications appropriate to their clinical needs, in doses that meet their own individual requirements, for an adequate period of time at the lowest cost to them and community. Dispensing refer to the process of preparing medicines and distributing to users with provision of an appropriate information.[20] When dispensing drugs, the pharmacy professional should give the right information on how, when, and for how long to take, the right amount of the drug to take, major side effects, and interaction that might occur during administration of the drug. In this study, more than 90% of the pharmacy professionals reported that they informed the patient about the dose, frequency, duration, route of administration, and how to prepare the drug in case of ORS. But in the simulated study, only dose and frequency were the most frequently given information, whereas route of administration, ORS preparation, and storage condition were informed by less than one-third of the professionals. Poor patient counseling can definitely contribute to noncompliance and therapy failure. While counseling, it is important to note the possible side effects and major interactions, which helps to develop methods for prevention and early diagnosis. However, in this study, the simulated patients received no information on side effects and major interactions of dispensed drugs, which is similar to a study done in Quatar[21] and Brazil.[22] Improper or lack of counseling/labeling can be a cause of medication errors and lead to the incorrect medication, dose, or timing.

Limitation of the study

The aim of the study was to compare the knowledge and actual practices of pharmacy professionals working in community pharmacies. As the questionnaire was distributed to the pharmacy professional who contact the simulated patient and the same case was presented in both cases, he or she might have noted the surrogate patient and then been extra careful with the questionnaire answers.

Conclusions

The study identified that there is a great difference between self-reported knowledge and actual practices on the management of childhood diarrhea in community pharmacies. Even though most of the study participants reported that they would take complete history before recommending drugs, the simulated patient study showed that most of them take incomplete history. With respect to management of childhood diarrhea, the participants reported to recommend ORS plus zinc to manage the problem but the actual practice showed most of

them dispense antimicrobial agents. This misuse of antimicrobials might facilitate drug resistance and also affect the patient. The findings of this study revealed that simulated patient study is better to measure the actual practices of community pharmacy professionals.

Author Contributions
GM and KG conceived the original idea and drafted the proposal. GM, KG, MS, FA, BH, and DM were involved in data acquisition, analysis, interpretation, and write up of the paper. GM drafted the manuscript and prepared it for publication. All authors read and approved the final version of the manuscript.

Availability of Data and Material
Data are all contained within the manuscript.

Ethics Approval and Consent to Participate
The ethical clearance and study approval were obtained from Haramaya University, College of Health and Medical Sciences, School of Pharmacy (C/AC/R/D/01/164/17). Permission letters were also received from Harari regional health offices and Dire Dawa city administration health office to conduct this study. Verbal informed consent was obtained from the study participants for the questionnaire based after the objectives of the study were made clear. Names of study participants were omitted from the data collection form to ensure confidentiality.

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