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ORIGINAL RESEARCH

Community Pharmacy Professionals' Knowledge and Counseling Skills for the Treatment of Acute Diarrhea in Children in Qassim Region, Saudi Arabia: Questionnaire Based and Simulated Client Study

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Objective: The study aimed to evaluate the knowledge and counseling skills of community pharmacy professionals regarding managing acute diarrhea in children in the Qassim region of Saudi Arabia.

Methods: A cross-sectional study consisting of a questionnaire and simulated client scenario was conducted to collect data from pharmacy professionals working in community pharmacies over a period of 3 months in the Qassim region of Saudi Arabia. Pharmacy professionals were assessed for evaluating cases using 5 indicators (the age of the child, the frequency of diarrhea, fever and the presence of mucus or blood) and also for their recommendations and counseling.

Results: The data were collected from 60 pharmacy professionals after site visits. In the questionnaire, 60% of the pharmacy professionals used all 5 indicators, while in the simulation, 13.3% used at least 3 indicators and 80% used 2 or fewer indicators (p = 0.35). An oral rehydration solution was recommended alone by 35% of the pharmacy professionals and with other drugs by 13.3% in the questionnaire, while in the simulation, an oral rehydration solution alone was recommended by 15% and other drugs by 48.3%. Approximately 86.7% of the pharmacy professionals did not give any dietary advice, and 50% did not counsel the simulated client on the recommended drug.

Conclusion: The community pharmacy professionals in the study did not ask enough questions to evaluate a child suffering from acute diarrhea appropriately in the simulation. More questions were asked in the questionnaire; however, the difference is not significant. Additionally, they did not provide proper dietary advice, and their recommendation of an oral rehydration solution was insufficient.

Keywords: acute diarrhea, fever: community pharmacy, actual practice, questionnaire: simulated client, knowledge

Introduction

Diarrhea in children can be defined as loose or watery stools that occur three or more times per 24 hours. Diarrhea mainly has four subtypes: severe diarrhea with water, severe diarrhea with blood, diarrhea that lasts more than 14 days, and diarrhea associated with malnutrition. When suffering from severe diarrhea, the main goal for treatment is to prevent and treat dehydration.[1] In Europe, children younger than three years are exposed to 0.5 to 2 episodes of acute diarrhea per child yearly.[2] However, children within the same age group were exposed to an average of three episodes yearly in developing countries.[1]

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Acute diarrhea in children could be caused either by viruses, bacteria, or protozoa. The treatment for each case is based on a causative organism.[1] Several previously published articles have shown that diarrhea occurred mainly by viruses in more than 30% of Saudi children.[3–5] A study in the Qassim region tested the fecal specimens of 284 children with acute gastroenteritis, and viruses were detected in 50% of specimens as the causative agent.[6]

In many countries, many patients preferred seeking treatment for their common diseases, including diarrhea, from community pharmacies rather than going to the hospitals to avoid crowdedness and wasting their time due to their confidence in receiving good treatment in a pharmacy.[7,8] However, the quality of treatment of severe diarrhea in children by community pharmacists is questionable and has been the objective of many published studies.[9–11]

In order to evaluate the case of a child with acute diarrhea appropriately, pharmacists or other health care practitioners should ask the child's caretaker several questions. These questions include the age of the child, number of episodes and the duration of diarrhea, the symptoms experienced by the patient, which include fever, vomiting and the presence of blood in the stool. Also, it includes questions about the most recent medical and medication history for the child, and the child's feeding status.[1,2] Inadequate or incomplete histories taken by pharmacists in evaluating children with acute diarrhea have been reported by some studies.[10–12]

The recommendation by the World Health Organization (WHO) in treatment of acute diarrhea is to use low osmolarity oral rehydration solution (ORS) as the first option in the treatment.[1] However, many pharmacists still do not follow this recommendation and prefer to dispense unnecessary or inappropriate medications or other natural products. A high variation was noted among pharmacists in dispensing ORS to patients with diarrhea, which ranged from 5%[12] to 70%.[13] The inability to evaluate the case correctly and poor knowledge of the suitable treatment of acute diarrhea were the main causes for the low dispensing rate of ORS by pharmacy professionals.[12,13]

In breastfed infants with acute diarrhea, breastfeeding should be continued while the infant is on rehydration therapy. In older children, several studies have revealed that early refeeding after rehydration may give better outcomes than late refeeding.[2] For dietary consultation, previous studies found that only a small percentage of pharmacists were able to provide appropriate advice, while others provided inappropriate instructions such as stopping milk or recommending soda intake.[10,12]

While using a questionnaire is an appropriate tool to assess the knowledge for any topic, such as the management of acute diarrhea in our study, earlier studies, such as Ogbo et al[11] used an additional method, simulated clients, to assess pharmacists' real approaches for treating acute diarrhea. In our study, by using both a questionnaire and simulated clients, we aimed to assess the knowledge, real practice, and counseling of community pharmacy professionals in treating acute diarrhea in children in Qassim Region, Saudi Arabia, and to study the association between demographic factors and pharmacy professionals' practices.

Methodology

Study Area and Period

The study was conducted in community pharmacies that located in Buraidah and Unaizah governorates, Qassim region, Saudi Arabia, between January 2020 and March 2020.

Study Design and Population

A cross-sectional study design was used. It is divided into two parts: a structured self-administered survey and a simulated client method. This design is similar to the 2014 study of Ogbo et al[11].

These methods were used to collect data from pharmacy professionals (pharmacy technicians and pharmacists) working in community pharmacies in the Qassim region. Every selected pharmacy was visited two times, the first to give the survey to the pharmacy professional, and for the second visit was to apply the simulated client method.

Inclusion and Exclusion Criteria

During the data collection period, pharmacy professionals working in community pharmacies in the Qassim region were included, while those professionals working in hospitals or primary health care centers pharmacies were excluded.

Sample Size Determination and Sampling Procedure

Using Raosoft software for calculating sample size, 95% was set as confidence level considering 5% as a margin of error. The response rate of 94.5% was used, as reported in a published study.[14] Based on the latest report from the Ministry of Interior, the population size of the Qassim region is approximately 1,016,000 residents, with over 60% living in Buraidah and Unaizah.[15] According to MOH statistics in 2018, there were approximately 450 community pharmacies in the Qassim region.[16] The estimated minimum sample size number was 68 pharmacy professionals. The non-responses from the targeted population were set to be 10%, and the required sample size was calculated to be 74 pharmacy professionals. During the designated study period, 60 questionnaires had been obtained, resulting in a response rate of 81.1%. A convenient sampling of community pharmacies was used and each governorate, Buraidah and Unaizah, was divided into several areas and the community pharmacies in these areas were visited.

Data Collection Instrument and Procedures

A survey and simulated client scenario were used to assess the pharmacy professionals' knowledge and practices. The questionnaire on the first visit was given to the pharmacy professional to give answers for the questions. The same pharmacy professional who answered the questionnaire was then subject to a simulated client scenario. The process of how we ensured that the same pharmacy professional was tested with the simulation is described below under the simulated client section.

Questionnaire

The survey used in this study was adopted from a published study in Nigeria after obtaining permission from the authors Ogbo et al in October 2019 to adapt their Questionnaire.[11]

Using an anonymous, structured, validated questionnaire, the investigators entered the pharmacy and then the verbal informed consent was obtained from the pharmacy professional to answer the survey questions and participate in the study. The survey questions were pretested on 10% of pharmacy professionals (≈6 pharmacies). The pilot study aimed to ensure that there were no difficulties or ambiguities in understanding and responding to the survey. Six pharmacy professionals completed the questionnaire, and all indicated the clarity of the questions and that they could answer them quickly.

The questionnaire was given to the pharmacies by three investigators. The investigators divided the visited pharmacies into three groups (A, B, and C), each consisting of 20 pharmacies; this was performed to facilitate and organize the subsequent simulated client method.

The survey questions were divided into three sections: (1) demographic data of the community pharmacy professional (age, gender, qualification degree, country of graduation, years of experience, and job status); (2) the community pharmacy professional's attitude and knowledge about the management of acute diarrhea in children, which included questions about oral rehydration solutions (ORSs); (3) the community pharmacy professional's practice for the treatment of acute diarrhea in children, which included questions about the recommended drugs or products and why they recommended them, the use of indicators to evaluate the child case (child's age, onset, duration or frequency of diarrhea, presence of blood in stool, presence of mucus in stool and fever), and counseling regarding the recommended product and dietary advice.

Simulated Client

The same three investigators who gave the questionnaire conducted the simulated client visit; however, the investigator posing as the simulated client went to a different group of pharmacies from the one they had visited during the questionnaire phase. For example, investigator 1 visited Group A pharmacies during the questionnaire phase but then went to Group B pharmacies during the simulation. This was performed to prevent the possibility of the pharmacy professionals identifying the simulated client. To ensure that the simulated clients tested the same pharmacy professional who completed the questionnaire, the simulation visits were conducted at the same time on the same day of the week the questionnaire visit was performed three weeks later. Additionally, the simulated client had the demographic data of the

pharmacy professional and comments on their physical characteristics written by the investigator who visited this pharmacy during the questionnaire.

The simulated clients entered the community pharmacy using a scenario of a 2-year-old nephew or brother who suffers from acute watery diarrhea without any accompanying symptoms. When the simulated client entered the pharmacy, they only said, "My brother/nephew has diarrhea", no other information was provided to the pharmacy professional unless they asked. The following information was provided upon asking: age of 2 years; no fever; no vomiting; no blood or mucus in stool; and four episodes of diarrhea since the previous day.

Since the simulated clients were already investigators in this study, they had adequate knowledge about the subject. However, they were additionally trained by experienced clinical pharmacists on acute childhood diarrhea management before conducting the visits. After leaving the pharmacy, the simulated clients completed data collection forms with all responses obtained.

Data Analysis

After completing all the questionnaires and simulation data collection, the data were analyzed using Statistical Package for Social Sciences software (SPSS, version 21, SPSS, Chicago, IL, USA). Descriptive and inferential analyses were applied. The chi-square test assessed association significance between categorical variables. A p-value less than 0.05 was considered statistically significant. To assess the strength of the relationship between two nominal variables in larger contingency tables, Cramer's V was used. A Cramer's V value greater than 0.25 is typically regarded as indicative of a very strong relationship.

Results

Demographic Data

A total of 60 pharmacy professionals answered the questionnaire thoroughly. However, during the simulation, four pharmacies were closed; they were visited three times on different days and hours, but they were permanently closed. Thus, 56 pharmacies were visited during the simulation. Of those 56 pharmacy professionals, only 7 (12.5%) were not the same pharmacy professionals visited during the questionnaire.

All participating pharmacy professionals were male; 48.3% were aged from 31 to 40 years and 31.7% from 21 to 30 years. Pharmacy Manager (71.7%) was the most common job title for pharmacy professionals. Fifty-five percent of the pharmacy professionals stated they have "more than five years of experience." Almost all pharmacy professionals hold a bachelor's degree, except a pharmacy technician who holds a diploma degree and a pharmacy owner who holds a master's degree. The other demographic data are shown in Table 1.

Evaluation of Cases

Regarding history taking and the use of the evaluation indicators, 36 (60%) pharmacy professionals reported using all of the five indications in the questionnaire, 14 pharmacy professionals (23.3%) used at least three indicators, and 15% used two or fewer indicators (Table 2). On the other hand, seven pharmacy professionals (11.7%) did not ask any questions in the simulation, eight pharmacy professionals (13.3%) used at least three indicators, and 41 (68.3%) used two or fewer indicators. The age of the child was asked by all the pharmacy professionals who asked questions (Table 3).

Table 4 shows that there was no statistically significant difference between the questionnaire and simulation results concerning using these evaluation indicators ($p = 0.35$).

Drug Recommendations

The data from the questionnaire show that 35% of pharmacy professionals gave an ORS alone, 13.3% prescribed an ORS plus other drugs, while 51.7% chose other drugs, such as kaolin, as suggested by 40% of the pharmacy professionals (Tables 2). In the simulation, 15% gave an ORS alone, 30% gave an ORS plus other drugs, and 48.3% dispensed other agents. These other products included kaolin 21.7%, metronidazole (10%), loperamide (1.7%), probiotics (5%), and lactose-free milk (8.3%).

Table 1 Demographic Data of the Pharmacy Professionals. (n = 60)

Age:	**n (%)**
21–30 Y	19 (31.7%)
31–40 Y	29 (48.3%)
41–50 Y	9 (15.0%)
Older than 50	3 (5.0%)
Qualification	**n (%)**
Pharmacy Technician	1 (1.7%)
Bachelor of Pharmacy	58 (96.6)
Other	1 (1.7%)
Country of Graduation	**n (%)**
Egypt	48 (80%)
India	2 (3.3%)
Yemen	2 (3.3%)
Sudan	3 (5.0%)
Other	5 (8.4%)
Experience as a community pharmacy professional in Saudi Arabia	**n (%)**
Less than one year	4 (6.7%)
1 to 3 years	7 (11.7%)
3 to 5 years	16 (26.6%)
More than five years	33 (55%)
Job-status	**n (%)**
Owner of Pharmacy	1 (1.7%)
Pharmacy Manager	43 (71.7%)
Staff pharmacy professional	16 (26.6%)

Regarding the prescription of ORSs, either alone or in combination with other drugs, the difference between the questionnaire and simulation results was not statistically significant ($p = 0.467$) (Table 5).

Educational Advice

While 93.3% of pharmacy professionals reported that they would explain the recommended medicine to the patient in the questionnaire, only 43.3% explained the simulated client.

Regarding dietary advice, more than half of the pharmacy professionals (58.3%) advised increasing fluid intake in the questionnaire, 1.7% advised continuing regular feeding, and 28.3% provided more than one piece of advice. However, in the simulation, 3.3% gave appropriate dietary advice and 3.3% gave inappropriate advice. In addition, 86.7% did not provide any advice regarding the diet (Tables 2 and 3).

Other Information

With respect to the response of pharmacy professionals to the questions related to the recommendation of antibiotics to a child with diarrhea, 32 pharmacy professionals (53.3%) answered yes, while the remaining 28 answered no. Twenty-three pharmacy professionals (38.3%) identified the correct function of ORSs (replacing the fluids and electrolytes lost), while 19 (31.6%) added increased energy to these two options. When pharmacy professionals were asked if they knew about the quantity of salt, sugar, and water in the ORS packs, the result was that 45 pharmacy professionals (75%) did not answer.

Regarding associations, the country of graduation had a significant association with the recommended product ($p = 0.010$) and the evaluation indicators ($p = 0.042$) in the questionnaire, while the Cramer's V values obtained for both variables were 0.362 and 0.366, respectively, which indicates a strong relationship between these variables. The

Table 2 Questionnaire Results. (n = 60)

Recommended product	**n (%)**
ORS alone	21 (35%)
ORS + other drugs	8 (13.3%)
Other drugs	31 (51.7%)
Why this product?	**n (%)**
It works better	20 (33.3%)
Recommended by WHO	19 (31.7%)
It works faster	7 (11.7%)
Other	8 (13.3%)
More than one option	2 (3.3%)
Missing	4 (6.7%)
Do you explain the medication to patients?	**n (%)**
Yes	56 (93.3%)
No	4 (6.7%)
Indicators (History Taking)	**n (%)**
Use of 2 or less indicators	9 (15.0%)
Use of at least three indicators	14 (23.3%)
Use of all five indicators	36 (60.0%)
Missing	1 (1.7%)
Advice about feeding during diarrhea	**n (%)**
Reduce intake of food until the child recovers	3 (5.0%)
Continue normal feeding	1 (1.7%)
Increase fluid intake	35 (58.3%)
Other	3 (5.0%)
More than one option	17 (28.3%)
Missing	1 (1.7%)
Use of ORS	**n (%)**
All the time	41 (68.3%)
Sometimes	19 (31.7%)
Do you stock ORS packs in the pharmacy	**n (%)**
Yes	55 (91.7%)
No	5 (8.3)
Agree with the use of ORSs only	**n (%)**
Yes	27 (45.0%)
No	32 (53.3%)
Missing	1 (1.7%)
Awareness of new osmolality ORSs	**n (%)**
Yes	24 (40%)
No	31 (51.7%)
Missing	5 (8.3%)

Abbreviation: ORS—Oral rehydration solution.

simulation results showed a significant association between years of experience and the number of questions asked (p = 0.026) and the Cramer's V value was 0.0.329 which reflects the strong relationship between these two variables.

Additionally, subgroup analyses were conducted on pharmacy professionals working for more than 5 years to find out its effect on the improvement of indicators for both questionnaire and simulated client. For questionnaire participants

Table 3 Simulation Results. (n = 60)

Indicators (History Taking)	**n (%)**
Use of none of the indicators	7 (11.7%)
Use of 2 or fewer indicators	41 (68.3%)
Use of at least three indicators	8 (13.3%)
Missing	4 (6.7%)
Recommended Product	**n (%)**
ORS alone	9 (15.0%)
ORS + other drugs	18 (30.0%)
Other drugs	29 (48.3)
Missing	4 (6.7%)
Explain the recommended product	**n (%)**
Yes	26 (43.3%)
No	30 (50%)
Missing	4 (6.7%)
Education regarding diet	**n (%)**
Appropriate	2 (3.3%)
Inappropriate	2 (3.3%)
None	52 (86.7%)
Missing	4 (6.7%)

Table 4 Difference Between Questionnaire and Simulation Results in the Use of Evaluation Indicators

Evaluation of Use of Indicators	**Questionnaire**		**Simulation**		***p*-value ***
	N	%	**N**	%	
Use of 2 or fewer indicators	9	15.0	48	80.0	0.350
Use of 3–5 evaluation indicators	50	83.0	8	13.3	

Note: *Chi-square analysis.

Table 5 Difference Between Questionnaire and Simulation Results for Overall ORS Recommendation

Product Recommendation	**Questionnaire**		**Simulation**		***p*-value ***
	N	%	**N**	%	
ORS alone	21	35.0	9	15.0	0.467
ORS + other drugs or other drugs alone	39	65.0	47	78.3	

Note: *Chi-square analysis.

working for more than 5 years who asked 5 options of question indicators were (58.3%), next to this, 3–5 years (27.8%), 1–3 years (5.6%); less than I year (8.3%). While for simulation client, participants working for more than 5 years who asked 4 options of question indicators were (50%), next to this, 3–5 years (25%), 1–3 years (25%); less than I year (0%). These results advocate the role of pharmacy professionals' experience in the improvement of indicators.

Discussion

The primary concern observed in the results was the severe lack of adequate history-taking by the pharmacy professionals in actual practice. While 83% of the pharmacy professionals chose to ask 3–5 indicators in the questionnaire to

evaluate a child with diarrhea, 80% used two or fewer indicators during actual practice (simulation scenario). This difference in the response between questionnaire questions related to knowledge and real practice agrees with many other simulated client studies,[11,12,17] including a recent study conducted in Jazan, Saudi Arabia, where pharmacy professionals' knowledge in the questionnaire was significantly better than their practice with the simulated client.[18] The suitable management of acute "watery" diarrhea in children is based on accurate evaluations, recommendations of ORSs alone, and appropriate instructions on consumption of fluid and food.

The evaluation indicator questions are fundamental because they can help the pharmacy professionals assess the risk level of dehydration and identify if the child requires a referral or not. The WHO recommends ORSs as an essential component in treating acute diarrhea in children.[1] In the questionnaire, 21 pharmacy professionals (35%) agreed to give an ORS alone, while in real practice, only nine pharmacy professionals which represent (15%) were dispensed it alone. The percentage of pharmacy professionals who gave an ORS alone during the actual practice agrees with that found in a study conducted in Nigeria by Ogbo et al[11]. This low percentage of ORS recommendations in real-world settings demonstrates the urgent need for pharmacy professionals and other healthcare providers to conduct an education campaign about ORS use. The low dispensing rate of ORS in the previous studies was contributed to many reasons, these include poor evaluation of the cases, lack of knowledge of the appropriate management of acute diarrhea, selling more expensive products to achieve higher profits and dispensing antibiotics under the pressure of the patients or their parents.[12,13] Kaolin, which is available on the market as suspension, was the most recommended medication that can be used as monotherapy by the pharmacy professionals in both the questionnaire and actual practice in percentage of (40%) and (21.7%), receptively. In the simulation, some pharmacy professionals complained that there was a shortage in kaolin suspension in their pharmacies for many months. If kaolin were available in those pharmacies, we would have expected that there is a high chance for pharmacy professionals to dispense this medication inappropriately during real practice. The WHO and the European Society for Pediatric Gastroenterology, Hepatology, and Nutrition recommendations do not support using kaolin to manage diarrhea in children.[1,2] The only benefit noted with kaolin is the improved consistency of the stool. Nevertheless, it does not decrease the duration or frequency of diarrhea or the amount of water loss; it can also interact with and decrease the activity of antibiotics. Hence, it is not recommended.[19] In the questionnaire, the pharmacy professionals were asked if they would prescribe antibiotics to a child with acute diarrhea, 32 pharmacy professionals (53.3%) favored prescribing antibiotics. However, only 6 pharmacy professionals (10%) gave antibiotics (all were metronidazole) during the actual practice. Consistent with these results, a previous study done in Saudi Arabia in 2011 found that pharmacists dispensed antibiotics directly to 90% of the simulated clients who complained of diarrhea.[20] This severe reduction in antibiotic dispensing by the community pharmacy professionals in our study can be attributed to the recent regulations and new laws that were implemented by the "Ministry of Health" in Saudi Arabia in 2018 that included license withdrawal and considerable fines for those pharmacists who dispense antibiotics without a prescription.[21] The benefits of these new laws have also been shown by a recent study in the Qassim region of Saudi Arabia.[14] One pharmacist gave loperamide; although it can be helpful for diarrhea in adults, it is neither safe nor effective in children and thus should be avoided.[1]

Probiotics, which can help decrease the duration of diarrhea,[2] were recommended by three pharmacy professionals (5%) in our study. These results are inconsistent with other studies[10,22] in which probiotics were the most commonly recommended products by community pharmacists. Five pharmacy professionals (8.3%) gave the simulated client lactose-free milk. A Cochrane review has shown that a change to lactose-free milk may decrease the duration of diarrhea by 18 hours. However, most of the trials in this review involved hospitalized children.[23]

One of the main tasks of community pharmacists is to counsel patients on how to use their medication. A study in Kuwait found that patients expect pharmacists to educate them about how to use their medicines.[24] In this study, in the questionnaire interview, most of the pharmacy professionals (93.3%) revealed that they would give the patient an illustration about the recommended medication. However, only 46.4% of the pharmacy professionals counseled the simulated client about the recommended product. These results are in line with a study conducted in Ethiopia.[17] In the questionnaire interview, most participants were given appropriate dietary advice related to increasing fluid intake and to continue the regular feeding or to do both. On the other hand, only two pharmacy professionals told the simulated client to increase amount of fluid intake, while two other pharmacy professionals offered inappropriate dietary advice. These findings are in line with the results from the study conducted by Mengistu et al[17]. Other studies on pharmacists' dietary

advice revealed that up to 50% of the advice, such as stopping milk intake, was inappropriate.[9,25] Although pharmacy professionals in this study exhibited acceptable knowledge in all aspects in the questionnaire part, they asked the visitors a few numbers of questions and showed poor counseling skills during the real practice. Despite the fact that some pharmacists have sufficient knowledge about certain diseases, they may tend to practice based on their personal experience rather than their knowledge as suggested in the previous study.[26] The discrepancy in information between the questionnaire and simulation data indicates that the questionnaire alone might not be a trustworthy way to evaluate pharmacy professionals' actual practice. Educational programs and professional training workshops can effectively improve the knowledge and counseling skills of community pharmacy professionals in the Qassim region.[27] Regarding managing acute diarrhea in children, Pham et al found that educational interventions successfully improved pharmacists' practice of taking history and dispensing ORSs.[28] The working hours and the employment location may be significant obstacles to pharmacist education.[25] However, a study showed that educational interventions have no significant effect on advice dispensed.[29]

Strengths and Limitations

Like any other study, this study has its own strengths and limitations. The main strength is using a questionnaire and simulation methods to assess the knowledge and practice of the community pharmacy professionals about the treatment of acute childhood diarrhea. The simulated client method gives us a better and more realistic picture of the actual practice of pharmacy professionals. One of the study limitations is that the sample population may not have been well representative of the population due to the convenient sampling method. Moreover, this study was conducted in Qassim region therefore the results of this research cannot be generalized to other regions of Saudi Arabia. Also, since few pharmacies refused to participate in the study, the use of the convenience sampling method might have resulted in the occurrence of selection bias. Furthermore, the difference in asking adequate indicator questions between the questionnaire and simulation results would have become statistically significant with a larger sample size.

Conclusions

The community pharmacy professionals participating in this study did not ask enough indicator questions to evaluate the case and manage a child with acute diarrhea appropriately. However, the difference in their history between the questionnaire and simulation results was not statistically significant. Furthermore, community pharmacy professionals did not give appropriate dietary advice and less than half of them gave an ORS for treating children's severe diarrhea, and they inappropriately gave other drugs in a simulated scenario of 2 years old child with acute watery diarrhea with a duration of one day.

Recommendations

The findings of the present study highlight the dire need for community pharmacy professionals in the Qassim region of Saudi Arabia to deliver educational programs that can improve the treatment of acute watery diarrhea. Additionally, mandatory professional development workshops should be conducted for community pharmacy professionals to improve their knowledge in managing acute watery diarrhea. Also, increasing the awareness of oral rehydration solution importance through media campaigns that target both health care providers and families can improve patients' outcomes. Further studies are recommended to cover other governorates in the Qassim region and also to assess pharmacy professionals' knowledge and practice regarding other diseases that might help improve the overall pharmaceutical care provided by community pharmacy professionals.

Institutional Review Board Statement

This study complies with the Declaration of Helsinki. During our visit to each pharmacy, verbal informed consent from the pharmacy professionals was obtained before dispensing the questionnaire. The verbal informed consent process was acceptable and approved by the Subcommittee of Health Research Ethics at Qassim University. Ethical approval was

acquired from the Subcommittee of Health Research Ethics, Deanship of Scientific Research, Qassim University (document number 06/04/19).

Data Sharing Statement

The datasets used for this study were available from the corresponding author on reasonable request.

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Author Contributions

All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis and interpretation, or in all these areas; took part in drafting, revising or critically reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

Disclosure

The authors declare no conflicts of interest in this work.

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