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Community Pharmacists' Responses to Acute Gastroenteritis

Inas Rifaat Ibrahim

College of Pharmacy, Uruk University, Baghdad, Iraq.

phm.enas@yahoo.com

Abstract Gastroenteritis (GE) is a life-threatening disease caused by several infectious pathogens. The main goal of this study is to evaluate community pharmacists' response to acute GE cases in terms of counseling, dispensing, and labeling. The study employed a novel approach using simulated patients (SP) to evaluate how community pharmacists responded to GE cases. A population sampling technique involved selecting pharmacies within Baghdad, Iraq, from March to July 2024. The SP simulated the symptoms of acute diarrhea and asked the pharmacist to manage his condition, then recorded all interactions with the pharmacists using a validated data collection method. The differences between variables were found through Chi-square tests; any alpha level less than 0.05 was considered significant. The study found variations in pharmacists' responses about counseling, dispensing, and labeling across demographic characteristics. Regarding counseling practice, almost all males outperformed females in this practice. Also, those working part-time or from the Rusafah region performed better for counseling services than their counterparts. The most common drugs dispensed included metronidazole, loperamide, domperidone, ceftriaxone, ondansetron, metoclopramide, paracetamol, and hyoscine butyl bromide. Regarding labeling, female pharmacists and those working in the Rusafah region and with part-time schedules were more proactive in writing the required medicine information on the label sheet than their counterparts. Further, variations in labeling practices were also found across different demographic characteristics. Targeted interventions are needed to enhance patient care and medication education in community pharmacy settings.

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Keywords: *Gastroenteritis, pharmacists, diarrhea, counseling, labeling, Baghdad.*

1. INTRODUCTION

S GE is a common disease associated with high morbidity rates in the developing world [1]. It involves inflammation of the stomach, small intestine, or large intestine. This leads to cramps, abdominal pain, nausea, and vomiting as well as diarrhea [2]. Different infectious microorganisms can cause various forms of GE: viruses (50-70%), bacteria (15-20%), and parasites (10-15%) [2, 3]. However, viruses are the leading cause of acute GE in developed and developing countries [4]. Assessing the actual cause is difficult due to the lack of reporting the illness by the infected individual and self-management of the infection. Thus, the diagnosis is primarily based on clinical signs and symptoms shown by patients. Additionally, its management does not necessarily need awareness about what led to it because it usually goes away on itself without any drugs being dispensed for treatment [3]. The main goal of managing GE is to reduce the accompanied dehydration using oral rehydration fluid and age-appropriate nutrition [5]. Although GE is nearly self-limiting, some people were seeking treatment to relieve the symptoms. There is a concern about overprescribing medicines; when this happens, it does not improve the outcome. The global health policy now focuses on patient's self-care, and different strategies have been advocated to encourage individuals to take an active role in self-care [6]. This has enabled correct dispensing practices among community pharmacists who also ensure rational utilization of medicines. Pharmacists handle patients' requests for advice and treatment for minor ailments daily. They are now central players in providing healthcare services to the public as they treat more illnesses than ever before. The question beckons whether they manage minor illnesses correctly, though. Research often explores pharmacist-patient interaction outcomes but rarely delves into the interaction mechanism. Previous studies conducted in developing countries have shown that the quality of pharmacy services is not up to the standards [7-9]. The provided service is still product-oriented, dispensing and selling medicines [10]. Inconsistent information gathering and poor recommendations were also reported [11]. Nevertheless, information about community pharmacy practices dealing with GE has yet to be investigated. This study aims to assess how community pharmacies respond to cases of GE, including counseling, dispensing, and labeling, which is essential for understanding and improving the management of this condition.

2. METHODOLOGY

2.1 Design of the Study

The study employed a mystery patient technique (also known as a simulated patient method) in assessing how community pharmacists in Baghdad, the capital city of Iraq,

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responded to acute cases of GE. The study was conducted on one hundred and forty (140) community pharmacies conveniently selected from the two significant parts of Baghdad, Karkh and Rusafah. This technique assesses the professional behavior in pharmacy practice, such as dispensing medication in the community. It remains a popular method among researchers as it is an effective and reliable tool used in such studies. The design opens an avenue through which actual unconscious consumer behavior can be documented firsthand when viewed from their perspective coupled with standardization.

The College of Pharmacy review board at Uruk University approved the study, and ethical guidelines were observed. At the end of the study, the participant pharmacists were informed about the research and its thoroughness. They were also told that their identities would be kept confidential and that the collected information would be used for academic purposes. All of them gave their consent to the study and the collected data.

2.2 Study scenario

The SP (the investigator) entered the selected community pharmacy complaining of diarrhea since yesterday, vomiting, and light fever accompanied by abdominal cramp pain. Then, the SP asked the pharmacist about any drugs that could manage his health condition and carefully observed the pharmacist's activities sequentially. The observations included details about the advice given (pharmacological and non-pharmacological) and referral to a physician. However, if they prescribe medicines, the SP looks for the details on the prescribed medicine and any dispensed antibiotics (if not, the SP asks for it). Before leaving the pharmacy, the SP thanked the pharmacist and exited the pharmacy. After leaving a distance from the pharmacy, the SP documented all the observed information in the data collection form. The form covered pharmacists' counseling, dispensing, and labeling practices. For standardization, SP followed a consistent behavior throughout each interaction. The SP was a specialized clinical pharmacist with an academic background trained to act like patients and create situations that might mimic real life.

2.3 Evaluation Form

The form was adopted, developed, and validated according to a previous study that evaluated pharmacists' responses to GE Qatar [13]. This study form comprises four sections assessing a particular professional practice the pharmacist provides. The first part contains demographic information about pharmacists' gender and other information about selected pharmacies, such as location and type of pharmacy (part-time or full-time opening hours). The second part encompassed counseling practices, such as questions regarding drug information, onset of action, duration of use, patients' history, and discussing benefits and side effects. Clarity and appropriateness were used as criteria for rating the recommendations made by the pharmacist. Part three focused on dispensing practice; it investigated medicine selection, referrals for specialized physicians, additional advice that may have been offered, and some things observed by SP while attending the pharmacy. During the assessment, the selection of alternative drugs and the ability of the pharmacist to respond to concerns or questions concerning them were assessed in terms of accuracy. The last section assessed labeling practice, which should contain accurate information written by the pharmacists on the label sheet. These included the medicine name, drug strength, date of dispensing, dose, dosing frequency, and course duration.

2.4 Data analysis

Descriptive statistics such as mean (±SD) and frequencies (%) were used to collate and analyze data gathered by the evaluation forms. The responses from the community pharmacists in different pharmacies were compared to establish any patterns and variations in the pharmacist's practice. Chi-square statistical analysis was performed at an alpha level of < 0.05 to compare pharmacists' responses according to the differences in demographic characteristics. The Statistical Package for Social Sciences Program (SPSS) version 22 was used for data analysis.

3. RESULTS

3.1 Demographic characteristics

The SP visited 140 community pharmacies in total. The gender of the pharmacist in charge was slightly higher among males (57.1%) than female respondents. Places of selected pharmacies were equally distributed between Karkh and Rusafah (50%) regions. The majority of visited pharmacies were operating on a part-time basis (75.7%). The consultation time with the pharmacists was extended from 7 to 20 minutes (Mean=13.67+3.7). Demographic characteristics are shown in Table 1.

3.2 Counseling practice

The findings indicated substantial variations in the pharmacists' counseling responses considering various demographic characteristics; more insights into this are seen in Table 2. In community pharmacies, male and female pharmacists varied in counseling approaches for GE. As far as informing about medication names, indications, dosages, and routes of administration are concerned, male pharmacists were considerably more proactive (90%) than their female counterparts (43.3%), $P< 0.001$. To explain how long it would take for the medicine to start working, both genders (100%) did not respond and failed to provide information about this. When explaining to patients how long they might have to undergo drug therapy, male pharmacists were significantly better again (75%) giving such an account as opposed to female colleagues (30%), $P< 0.001$. Concerning asking about allergies and other treatments, there were almost similarly low rates between genders (25% of males and 23.3% of female pharmacists). Finally, male and female pharmacists overlooked the

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advantages, side effects, interactions, or contraindications of medications. None of them considered these fundamental points; hence, their ignorance was reflected 100%.

Findings also showed differences in counseling practice for GE according to the place of community pharmacies. Community pharmacies in the Rusafah region (100%) were more diligent than those in Karkh (40%) about giving information on the name, indication, dosage, and route of administration of drugs, P< 0.001. Regarding how long it would take for the medicine to work, there was no explanation (100%) from any pharmacist from Karkh and Rusafah about this. In explaining how long it would take the patient to use that drug, much has been done by the pharmacists at Rusafah (97.1%), compared with that done by pharmacists at Karkh (14.3%), P< 0001. In addition, pharmacists in Karkh and Rusafah (28.6% and 20%, respectively) exhibited similar conduct by asking about allergies and other treatments. Lastly, all pharmacists (100%), whether in Karkh or Rusafah, did not talk about the benefits, side effects, adverse reactions, or contraindications of drugs.

The study also compared counseling practices to the type of pharmacies (part-time or full-time opening hours) that handle GE cases. Pharmacists working at part-time pharmacies (75.5%) were more likely than those working full-time (52.9%) to provide information on the name, indication, dosage, and route of administration of medications than full-time pharmacies. To explain the time of taking the drug to show the effect, none of the pharmacists (100%) did this counseling practice during part or full-time working hours. To explain the time before an effect from the medication could be observed, the rates were comparable between part-time (56.6%) and full-time (52.9%) pharmacies. Again, a low rate of counseling response was obtained concerning asking about allergies and other treatments (26.4% of pharmacists in part-time pharmacies and 17.6% of pharmacists in full-time pharmacies). Lastly, the discussion concerning benefits, adverse effects, reactions, or contraindications that might be associated with drugs was ignored by all pharmacies (100%), regardless of whether they were part-time or full-time pharmacies.

3.3 Dispensing practice

All the dispensed medicines in response to GE cases of this study are presented in Table 3. The highest cases of gastroenteritis were duly treated using Metronidazole 500 mg tablets, accounting for 21.81% (n=36). Then, 12.12% of cases (n=20) provided Loperamide 2 mg tablets, while 9.72% (n=14) dispensed Domperidone 10 mg tablets. Ceftriaxone 1 gm vials were supplied in 8.33% of cases (n=12), and Ondansetron 8 mg tablets were given out in 7.64% of cases (n=11). Other notable drugs included Paracetamol 500 mg tablet and Hyoscine butyl bromide 10 mg tablet dispensed by 6.94% (n=10). In addition, Metoclopramide 10 mg tablets were dispensed in 6.25% of cases (n=9), Diphenoxylate HCL 2.5mg/Atropine sulfate 0.02mg tablets in 5.56% of cases (n=8), Amikacin, in 4.17% of cases (n=6). Less common medications included Trimethoprim 80mg/Sulfamethoxazole 400 mg tablet 2.79% (n=4), Metronidazole vial 2.09% (n=3); Prochlorperazine 5mg tablet, and Ringer lactate solution at this percentage 2.09% (n=3). Normal saline solution, Ciprofloxacin 750 mg tablet, Paracetamol 1000 mg/Vitamin C 500 mg tablet, and Oral Rehydration Salts (ORS) at this percentage 1.39% each (n=2), respectively. The medications dispensed with the lowest frequency of 0.69% (n=1) included Ondansetron 4mg tablet, Domperidone 10mg/Pantoprazole 40 mg tablet, Dicyclomine HCl 20 mg tablet, Omeprazole 40mg capsule, Pantoprazole 40 mg capsules, Ranitidine 50 mg vial, Paracetamol 1000mg caplet, and Tinidazole 1000mg tablet.

3.4 Labeling practice

Differences in labeling practices across demographic characteristics were noted, as presented in Table 4. While writing medicine names on labels, there was a significant variation between genders where female pharmacists did not neglect this practice (100%) compared to males, P< 0.05. On indicating drug strength, this was done more by female than male pharmacists (53.3% vs. 35.0%). However, both genders rarely stated the date of dispensing the medicine on the label sheet (16.7% females and 7.5% males). Regarding dosage information, female pharmacists incorporated dosing schedules into the prescriptions more often than male peers (83.3% vs 50.5%). In addition, labeling dosing frequencies occurred at a higher rate among females (80%) than males (52.5%). Finally, female pharmacists considered writing the course duration (90.0%) more than their counterparts (57.5%).

Notably, for a place of pharmacy, pharmacists working in Rusafah (68.6%) were more diligent in writing the name of the medicine on the label sheet than their peers in Karkh (48.6%). Still, those working in this area performed better in labeling the drug's strength (45.7%) than their colleagues from Karkh (40.4%). Nevertheless, very few pharmacists wrote the date of dispensing on prescription sheets (14.3% of Rusafah and 8.6% of Karkh). There was a higher rate of labeling dispensed medication doses by pharmacists in Rusafah (74.3%) compared to pharmacists working in the Karkh region (37.1%). Besides, writing dosing frequency was more significant among pharmacists of Rusafah (97.1%) compared to their peers in Karkh (82.9%). Moreover, the course duration was also higher for pharmacists in Rusafah (57.1%) than those working in Karkh (45.7%).

For the type of pharmacy, 50.9% of pharmacists who worked part-time (50.9%) were more diligent in writing the name of the drug on the label sheet than their counterparts working full-time (11.8%). They also had better ability in writing medication strength (66.0%) than their peers on a full-time basis (29.4%). However, the date of dispensing is seldom labeled by pharmacists under both schedules (11.3% and 11.8% for part-time and full-time, respectively). The rate of labeling the dose of dispensed medicine was higher (50.9%) among pharmacists

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working part-time than those working full-time (23.5%). Additionally, writing dosing frequency was higher among pharmacists working part-time (88.7%) than their peers working full-time (5.9%). They were also better at writing the course duration of medicine (56.6%) than those working on full-time schedules (35.3%).

4. DISCUSSION

For the first time in Iraq, this study provided substantial information on counseling, dispensing, and labeling by community pharmacists regarding GE. It indicates significant disparities among pharmacists' responses to GE cases across gender, regional areas, and type of pharmacy, thereby pointing out where focus could be made on patient-care enhancement and medication education in a community pharmacy setting.

Findings indicated that there were significant differences in counseling practices between genders. Male pharmacists appeared more proactive than females when offering fundamental medication information such as names, indications, dosages, and administration routes. Males were also better than females in other counseling practices, like explaining how long the patient might take the medication, asking about allergies, and other treatments. It was found that male pharmacists were more likely to engage in comprehensive medication reviews than female pharmacists, who tended to focus more on dispensing roles [14]. However, women often face time limitations that may inhibit their ability to offer detailed counseling [15]. The study also found that none of the pharmacists (regardless of gender) explained to the patient when the drug showed the effect, nor did they discuss benefits or side effects. As a result of this inadequate information, many patients become frustrated and fail to follow their medication programs properly. It was noted that patient-centered counseling can significantly benefit adherence rates and health outcomes [16].

Regarding pharmacies' locations, community pharmacies in Rusafah were significantly more diligent in providing comprehensive medicine information than those at Karkh. Further, they were better in other counseling practices, such as explaining the duration course of the treatment. This strong contrast indicates a significant gap between counseling practices in different regions within Baghdad. Earlier research pointed out regional disparities in pharmacy practices, often attributed to differences in training, resources, and healthcare infrastructure [17]. Pharmacists from Karkh or Rusafah were seldom asked about medication allergies, and neither explained how long it would take for the medicine to work nor discussed benefits or contraindications. This was aligned with previous research, which found that many pharmacists do not provide sufficient information on medication risks and benefits, which can negatively impact patient understanding and adherence [18].

The type of pharmacy also affected the counseling practice; pharmacists working in part-time pharmacies were more diligent than full-time practitioners in providing comprehensive medication information. They also better explained how long the patient might take the drug. Earlier studies have reported regional discrepancies in pharmacy practices often associated with workload, availability of resources, and variations between training levels [19]. Moreover, pharmacists in both types of working schedules rarely asked about drug allergies. Furthermore, they did not explain the onset of action, nor did they discuss the benefits and risks of the treatment. This aligns with earlier research findings that many pharmacists do not adequately inform patients about medication risks, which can negatively affect understanding and adherence [20, 21]. Generally, using evidence-based counseling techniques and addressing the Identified gaps would enable pharmacists to provide better patient care and improve health outcomes.

Several key trends in the dispensing of medications were found. The most dispensed medication was metronidazole 500 mg tablets, which reflected adherence to the treatment guidelines for infections caused by gastroenteritis [22]. However, it is a prescription-only drug that should not be available as an OTC treatment. Other widely dispensed drugs were loperamide, a combination of diphenoxylate and atropine sulfate tablet, domperidone, ondansetron, metoclopramide, hyoscine butyl bromide indicating correct symptomatic management of diarrhea, nausea, and vomiting, and abdominal cramps. It is important to note that domperidone, diphenoxylate, atropine sulfate tablet, ondansetron, and metoclopramide are unavailable as OTC and should be dispensed following a physician's referral. Further, paracetamol was dispensed widely, effectively controlling headache and mild fever if present in GE. Nonetheless, there was an inappropriate dispensing of ceftriaxone, amikacin vial, metronidazole vial, and ringer lactate. Despite being prescription-only medications, they are typically indicated for more complicated situations of gastrointestinal infections. Furthermore, dispensing drugs such as trimethoprim/sulfamethoxazole, prochlorperazine, and pantoprazole illustrates caution because they must be reserved for other clinical scenarios. It is necessary to note that oral rehydration salt was among the least dispensed treatment in the study. However, it is strongly recommended to be dispensed as a first-line treatment for rehydration in GE [23]. Generally, the dispensing practice observed in this study showed pharmacists' inappropriate management of GE, especially for medications that require a physician referral. Continued adherence to clinical guidelines and protocols will further enhance pharmacists' quality of care, ensuring that treatment is appropriate and aligned with established medical standards.

Demographic variables also affected labeling practice. Female pharmacists consistently indicated the name of the medicine on labels with its strength, whereas most male pharmacists failed to reveal this information. Prior studies have found inconsistent labeling accuracy, usually attributed to training, attention to detail, and communication skills that vary

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between genders [24]. However, both genders seldom specified the date of dispensing on the label sheets. Previous research has emphasized the importance of including dispensing dates to help patients manage their medication schedules effectively [25]. Concerning dosage information, female pharmacists were likelier than males to provide dosing schedules and frequencies on the labels. Detailed labeling, especially about dosage instructions, is crucial in improving patient compliance, thus reducing errors associated with medication [26]. Lastly, female pharmacists were more diligent in including course duration on labels than their male counterparts. This practice is essential for ensuring patients understand and adhere to the treatment's duration [27].

A notable distinction was noted between pharmacists working in the Rusafah and Karkh regions. Writing the drug's name on the label was done more by pharmacists working in Rusafah than their peers in Karkh. This diligence could be attributed to regional differences in training and resources mentioned earlier in this discussion. Further, pharmacists of both regions outperformed writing drug strength and dosage indications on the labels. This thoroughness ensures that patients use the drug properly. The study also found that pharmacists of both regions showed a low frequency of labeling the dispensing date, a gap affecting medication management and patient adherence. However, pharmacists in the Rusafah region labeled the dosing information and course duration better than their counterparts, a practice that may decrease medication errors.

Notably, labeling practice was also affected by the type of pharmacies. Part-time pharmacists took more care when writing prescription drug names than their full-time counterparts. As mentioned in this paper, part-timers may have more focused interactions with patients or different workload dynamics, leading to greater written information accuracy [19]. Additionally, part-time pharmacists were more likely to indicate drug strength on labels than full-time working ones. Checking all the details closely is very important when dealing with patients, as it ensures they are given clear and accurate medicine instructions. However, there was almost a neglect of labeling the dispensing date by either group, which underlies a problem related to medication management. Part-time pharmacists also demonstrated higher rates of labeling dosing information, dosing frequencies, and course durations than full-time pharmacists. Addressing these disparities is essential for improving patient outcomes and ensuring consistent quality of care across different regions.

5. CONCLUSIONS

The study demonstrated that community pharmacy responses to acute cases of GE are affected widely by demographic characteristics. Overall, male pharmacists, pharmacists working in Rusafah, and pharmacists on part-time schedules were more assertive in counseling practice. This suggests that increased training and standardized protocols for community pharmacies are needed. Further, non-adherence to the management protocols of GE was seen, and several non-OTC drugs were dispensed. The regular dispensing of such medications shows an increase in vigilance to ensure they are given based on patient referral rather than self-medication, which may lead to complications later. Lastly, the findings highlighted demographic-related variations in attention to detail in labeling practices. Generally, female pharmacists, pharmacists working in the Rusafah region, and those on a part-time schedule were more proactive in providing labeling practice. These variations underscore the need for standardized labeling practices to ensure patients receive complete and accurate medication information, enhancing patient compliance and reducing the risk of medication errors.

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