# Management of diarrhoea cases by community pharmacies in 3 cities of Pakistan

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معالجة حالات الإسهال من قِبَل الصيدليات المجتَمَعيَّة في ثلاثة مدن في باكستان

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الخلاصة: تحظى الصيدليات المجتَمَعيَّة بالتقدير نظراً لدورها المحتمل في معالجة الاعتلالات الشائعة. وقد هَدَفَتْ هذه الدراسة المستعرضة إلى توثيق معالجة المجتمع حالات الإسهال من قِبَل الصيدليّات المجتَمَعيَّة في ثلاثة مدن باكستانيَّة. وقد أجرى الباحثان 371 زيارة لصيدليات تم اختيارها عشوائياً، وقصدها الباحثان التماساً للمشورة حول حالات مُفتَرَضَة من الإسهال عند الأطفال. وقد قدَّر الباحثان للمعالجة أحرازاً وفقاً لقائمة تفقُّدية تتضمن أخذ القصّة المرضية، والنصائح، والمعلومات المقدَّمة من قِبَل الصيدليات. ووَجَدَ الباحثان أن من يقدم الخدمة في 97.2٪ من الزيارات هو مندوب المبيعات، في حين يقدّمها الصيدلي في 2.2٪ من الزيارات، وأن الأدوية تُصرَف في 77.1٪ من الزيارات، ومن بين الأدوية التي صُرِفت كان 58.7٪ من مضادات الأميبات، و14٪ من المضادات الحيوية، و18.9٪ من مضادات الإسهال، و8.4٪ فقط من أملاح تعويض السوائل عن طريق الفم. ولم يتوافق أيُّ نظام علاجي منها مع الوصفات المعيارية. ولم تكن تقدَّم أيُّ شُرُوحات للزبائن حول نظام الجرعات إلا في 52.6٪ من الحالات. واتضح للباحثين أن الأمور التي ينبغي التَّعاطي معها تشمل سلامة الدواء، والعاملين غير المؤهلين، وعدم أخذ القصّة المرضية، والمعالجة غير الملائمة، والتقصير في تقديم المشورة.

ABSTRACT Community pharmacies are valued for their potential role in the management of common ailments. This cross-sectional study aimed to document the management of diarrhoea by community pharmacies in 3 cities in Pakistan. Visits were performed to 371 randomly selected pharmacies to request advice for a simulated paediatric case of diarrhoea. The pharmacy's management was scored on a checklist including history taking and provision of advice and information. Customers were served by a salesperson in 97.3% of visits and by a pharmacist in only 2.2%. Medication was dispensed in 77.1% of visits. Of the medications dispensed, 58.7% were antiamoebics, 14.0% antibiotics and 18.9% antidiarrhoeals; only 8.4% were oral rehydration salts. None of the regimens matched with a standard prescription. The dosage regimen was explained to the customer in only 52.6% of cases. Drug safety, unqualified personnel, lack of history taking, inappropriate treatment and lack of counselling are concerns to be addressed.

**Prise en charge des cas de diarrhée en pharmacies communautaires dans trois villes du Pakistan**

RÉSUMÉ Les pharmacies communautaires sont précieuses pour leur rôle potentiel dans la prise en charge des affections courantes. La présente étude transversale visait à documenter la prise en charge des cas de diarrhée en pharmacies communautaires dans trois villes du Pakistan. Des visites ont été faites dans 371 pharmacies sélectionnées aléatoirement afin de solliciter des conseils sur un cas simulé de diarrhée chez un enfant. Une liste de vérification incluant l'interrogation sur les antécédents, et les conseils et les informations donnés a été utilisée pour évaluer la prise en charge au sein de l'officine. Les clients ont été servis par un vendeur dans 97,3 % des cas et par un pharmacien dans 2,2 % des cas. Par ailleurs, 77,1 % des visites se sont conclues par la délivrance de médicaments. Parmi ceux-ci, 58,7 % étaient des antiamibiens, 14,0 % des antibiotiques et 18,9 % des antidiarrhéiques ; seuls 8,4 % étaient des sels de réhydratation par voie orale. Aucun des schémas thérapeutiques proposés ne correspondait à une prescription normalisée. La posologie a été expliquée au client dans 52,6 % des cas uniquement. La non-garantie de l'innocuité des médicaments, le personnel non qualifié, l'absence d'interrogation sur les antécédents, un traitement inapproprié et l'absence de conseils sont des lacunes auxquelles il faut s'attaquer.

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## Introduction

Community pharmacies are valued for their potential role in the management of common ailments [1]. In many low-income countries, dispensers provide a variety of drugs, ranging from simple over-the-counter remedies to steroids and antibiotics [2–5], and also give injections to patients in their retail outlets [6]. Management of any ailment, however, requires appropriate history taking and counselling of patients by the dispensers and an understanding of when to refer patients with more serious conditions. Research from developing countries shows that dispensers working in community pharmacies rarely possess the adequate knowledge and skills for effective disease management, even though of necessity they are extensively involved in it [2,7–13].

Evidence about the quality of services provided by community pharmacies in Pakistan is limited. The available literature indicates that the standard of practice is low [14–16]. If pharmacies are to contribute effectively to health care, the barriers to the provision of higher quality care need to be identified, especially the problem of irrational prescribing. It has been reported that anti-diarrhoeal drugs (e.g. metronidazole, bismuth subsalicylate) and combinations of antidiarrhoeals and antibiotics (e.g. furazolidone and metronidazole) are recommended and sold by pharmacies without considering therapy with oral rehydration salts [7]. This research was conducted to document and compare the case management of diarrhoea by community pharmacies in 3 major urban areas of Pakistan.

## Methods

The cross-sectional survey was conducted between April and June 2008. Standard visits were performed to collect information on case management of diarrhoea in terms of history taking and provision of advice and information at community pharmacies. The study was approved by the panel of experts at the research and development wing of the Drug Control Organization at the Pakistan Ministry of Health.

### Sampling of pharmacies and respondents

The study population was all community pharmacy outlets selling allopathic medicines, or homeopathic or herbal medicines if sold alongside allopathic medicines. Any shop meeting this definition constituted the sampling unit; the sampling element included the dispenser and patients/customers visiting these pharmacies. Visits to request treatment advice for a patient were made to 371 pharmacies using convenience sampling in the 3 cities: Islamabad ($n = 118$), Peshawar ($n = 120$) and Lahore ($n = 133$).

### Data collection tool

The data collection tool was adopted from the World Health Organization manual *How to investigate drug use in health facilities* [17] and modified according to the objectives of the study. Focus group discussions were carried out with community pharmacists, drug inspectors, academics and members of consumer groups to discuss the content of the tool. Face and content validity were built through a panel of pharmacy research experts, community pharmacists and statisticians and by pilot testing. Cronbach alpha, applied to assess the reliability and internal consistency of the data, was 0.69 [18].

The observation form included 24 items covering: demographic characteristics of the patient, history of the illness, history of medication use, general medical history, outcome of the visit (medication dispensed or referral to physician) and advice regarding the dose, frequency, duration, use and side-effects of any medication dispensed.

Case management was assessed with 2 subscales. The first scored the pharmacy outlet's compliance with 5 items about history taking: patient's age, patient's weight, history of illness, history of medication use and other medical history. The second checklist scored the outlet's compliance with 5 items concerning provision of information about the medication dispensed in terms of: dose, frequency of doses, duration of use, effect of the drug and side-effects/precautions in use. In both scales the scores were computed on the basis of 1 = yes and 2 = no, so the total score was between 5–10 with lower scores indicating better management and better compliance. The 2 subscales were considered as the minimum standard of history taking and provision of medication information. The form included additional information such as provider type, location of pharmacy, type of licence, dispensing time, outcome of the visit (medication dispensed or referral to physician), suggestions of remedy, any additional questions asked by the dispenser and advice given by the dispenser.

### Data collection

Data was collected by trained data collectors after obtaining permission from the relevant drug inspectors. Local leaders of chemist and druggist associations were also contacted and informed about the study. The data collectors were local students in their final year of the Doctor of Pharmacy programme and were trained by the group of experts including the principal investigator who visited all 371 pharmacies. In Islamabad and Lahore data collectors were both male and females; however due to cultural norms in Peshawar only male data collectors were employed.

The data collector presented him/herself as the elder sibling of a 5-year-old male child with a complaint of diarrhoea and stated that he/she wanted to buy drugs for medical treatment. Other than the standard complaint/symptoms (abdominal cramping; watery diarrhoea with no blood present; no history of

fever), no information was presented unless asked for by the dispenser. One visit was made to each selected pharmacy and the data collectors recorded the management of the encounter at the end of each visit using the structured observation form. They documented any questions that the pharmacy attendant/dispenser asked before making a recommendation, including any discussion on the need for medication and on alternative therapy/advice, any explanation given about the product recommended; and any advice, such as how to treat the condition or when to see a doctor. Any product that was finally recommended was purchased in the quantities suggested. The principal investigator ensured that the observation forms of each pharmacy were compiled and labelled with the name and location of the pharmacy. The observation forms were brought back to the principal investigator the following day.

The therapy proposed by dispensers was compared for right drug, right dose, frequency, duration, strength and use with a standard rational prescription by a physician.

## Data analysis

The data were sorted for any missing data and coded and entered in *SPSS*, version 16. Statistical analysis was undertaken to compare case management of diarrhoea by community pharmacies with reference to independent variables such city, area (urban/rural), location of pharmacy (in supermarket, in small market or near hospital) and type of dispenser (salesperson, trained pharmacy assistant or pharmacist). Kruskal–Wallis and Mann–Whitney tests were performed to assess differences at 95% confidence interval.

## Results

### Background characteristics of pharmacies

Of the 371 community pharmacies visited, 118 (31.8%) were located in Islamabad, 120 (32.4%) in Peshawar and 133 (35.8%) in Lahore. Overall 77.4% were located in urban areas and 22.6% in rural areas. The community pharmacies were located near hospitals in 42.9% of cases, supermarkets in 37.0% or small markets in 20.2%. Just over one-quarter of the pharmacies (26.0%) had a type A licence, 50% type B and 18%. type C (6.0% did no display their license); narcotic licenses had been issued to 35.8% of community pharmacies. One-fifth of community pharmacies (20.2%) were doing extemporaneous compounding of medications. The simulated patients were served by a pharmacy salesperson in 97.3% of visits, by a pharmacist in 2.2% and pharmacy assistant in 0.5%.

### History taking

The scores on the history-taking observation checklist showed that patients' age was enquired about in 83.3% of visits to pharmacies and history of current illness in 28.6% of visits. Only rarely did the pharmacy personnel ask about history of medication use, medical history other than the current episode of illness or the patient's weight (i.e. the child in the simulated case) (Table 1).

### Outcome of visit

Medication was dispensed in 77.1% of the visits, while in 15.1% of cases the customer was referred directly to a physician; in a few cases the patient was referred but a remedy was also suggested and in some cases the patient was not referred and no remedy was suggested (Table 1).

### Medications dispensed

Of the visits where drugs were dispensed 58.7% were for antiamoebic drugs (e.g. metronidazole), 14.0% antibiotics (e.g. sulfamethaxazole, nalidixic acid) and 18.9% antidiarrhoeals (bismuth subsalicylate); oral rehydration salts

**Table 1** Management of acute diarrhoea by community pharmacies in 3 cities of Pakistan: history taking and outcome of visit

| Pharmacy action | Islamabad (*n* = 118) | | Peshawar (*n* = 120) | | Lahore (*n* = 133) | | Total (*n* = 371) | |
|---|---|---|---|---|---|---|---|---|
| | No. | % | No. | % | No. | % | No. | % |
| History taking | | | | | | | | |
| Patient's age | 88 | 74.6 | 96 | 80.0 | 125 | 94.0 | 309 | 83.3 |
| Patient's weight | 0 | 0.0 | 1 | 0.8 | 3 | 2.3 | 4 | 1.1 |
| Illness history | 36 | 30.5 | 30 | 25.0 | 40 | 30.1 | 106 | 28.6 |
| Medication history | 21 | 17.8 | 1 | 0.8 | 7 | 5.3 | 29 | 7.8 |
| Other medical history | 6 | 5.1 | 2 | 1.7 | 0 | 0.0 | 8 | 2.2 |
| Outcome of visit | | | | | | | | |
| Medication dispensed | 99 | 83.9 | 90 | 75.1 | 97 | 72.9 | 286 | 77.1 |
| Patient referred directly to physician | 15 | 12.7 | 19 | 15.8 | 22 | 16.5 | 56 | 15.1 |
| Patient referred but remedy also suggested | 4 | 3.4 | 1 | 0.8 | 3 | 2.3 | 8 | 2.2 |
| Patient not referred and no remedy suggested | 0 | 0.0 | 10 | 8.3 | 11 | 8.3 | 21 | 5.6 |

*n = number of visits to pharmacies.*

were given in only 8.4% of cases (Table 2). Of the total items prescribed 83.0% were prescription medicines (according to Pakistan's drug sale rules) and 17.0% were "over-the-counter" drugs (e.g. oral rehydration salts, kaolin pectin, attapulgite and bismuth subsalicylate). None of the regimens fully matched the standard prescription and 8.1% were judged to partially match with the standard therapy.

## Information given about medication

The scores on the medication information checklist showed that the appropriate dose of medicine for the treatment of diarrhoea was communicated to the customer in 52.6% of cases, frequency of treatment in 47.6%, duration of regimen in 7.3% and drug actions in 4.7%. Possible side-effects of the drug were communicated in none of the cases (Table 2).

## Management by type of pharmacy

The Kruskal–Wallis test was used to compare disease management by community pharmacies in the different cities (Table 3). History-taking was better performed in Lahore than in Islamabad and Peshawar, while information-giving was better in Islamabad. No significant difference was observed in terms of history-taking and provision of medication information from pharmacies in urban or rural settings in the 3 cities (Mann–Whitney test). No significant difference was observed in the medication information given by pharmacies situated in different locations (Kruskal–Wallis test) or different types of dispensers. However, there was a significant difference in history taking. Pharmacists were more efficient in history taking than other types of dispenser and pharmacies situated in supermarkets

were better at performing history taking than were pharmacies in other locations (Kruskal–Wallis test).

## Discussion

The study revealed that the management of requests of advice for simulated patients with acute diarrhoea at community pharmacies in Pakistan was unsatisfactory. Similar findings were reported by other studies showing that many dispensers prescribe ineffective, inappropriate drugs in inadequate doses with little or no counselling to customers [7–9,14].

The customers were served mostly by unqualified dispensers, a high percentage of whom readily prescribed prescription-only medicines. The drugs given for the treatment of diarrhoea in this study did not meet standard

**Table 2** Management of request for advice for a patient with acute diarrhoea by community pharmacies in 3 cities of Pakistan: medication dispensed and medication information provided to customers

| Pharmacy action | Total number of medicines dispensed | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Islamabad (*n* = 107) | | Peshawar (*n* = 117) | | Lahore (*n* = 131) | | Total in 3 cities (*n* = 355) | |
| | No. | % | No. | % | No. | % | No. | % |
| *Type of medication dispensed* | | | | | | | | |
| Antiamoebic | 73 | 68.3 | 78 | 66.6 | 57 | 43.6 | 208 | 58.7 |
| Antibiotic | 4 | 3.7 | 17 | 14.7 | 29 | 22.1 | 50 | 14.0 |
| Antidiarrhoeal | 21 | 19.6 | 7 | 5.9 | 39 | 29.8 | 67 | 18.9 |
| Oral rehydration salts | 9 | 8.4 | 15 | 12.8 | 6 | 4.5 | 30 | 8.4 |
| Total | 107 | 100.0 | 117 | 100.0 | 131 | 100.0 | 355 | 100.0 |
| *Medication was compliant with standard* | | | | | | | | |
| Partially compliant | 7 | 7.2 | 12 | 13.3 | 4 | 4.2 | 23 | 8.1 |
| Not compliant | 90 | 92.8 | 78 | 86.7 | 92 | 95.8 | 260 | 91.9 |
| Total cases in which drugs were dispensed | 97 | 100.0 | 90 | 100.0 | 96 | 100.0 | 283 | 100.0 |
| *Information given on medication dispensed* | | | | | | | | |
| Dose | 57 | 53.2 | 78 | 66.6 | 52 | 39.6 | 187 | 52.6 |
| Frequency | 62 | 57.9 | 67 | 57.2 | 40 | 30.5 | 169 | 47.6 |
| Duration | 9 | 8.4 | 15 | 12.8 | 2 | 1.5 | 26 | 7.3 |
| Drug action | 9 | 8.4 | 7 | 5.9 | 1 | 0.7 | 17 | 4.7 |
| Side-effects/precautions | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 |
| Total | 107 | 100.0 | 117 | 100.0 | 133 | 100.0 | 355 | 100.0 |

*n = total number of medicines dispensed.*

**Table 3** Management of request for advice for a patient with acute diarrhoea: history taking and information given about medication by type of community pharmacy

| Variable | History taking[a] | | | | Medication information | | | |
|---|---|---|---|---|---|---|---|---|
| | No. of pharmacies visited | Median scale score[a] | H-test | P-value[b] | No. of pharmacies visited | Median scale score[a] | H-test | P-value[b] |
| *City* | | | 6.43 | 0.04 | | | 30.60 | < 0.001 |
| Islamabad | 118 | 9 | | | 118 | 8 | | |
| Peshawar | 120 | 9 | | | 120 | 8 | | |
| Lahore | 133 | 9 | | | 133 | 10 | | |
| *Location of pharmacy* | | | 7.49 | 0.02 | | | 0.035 | 0.982 |
| Near hospital | 159 | 9 | | | 159 | 9 | | |
| Supermarket | 137 | 9 | | | 137 | 9 | | |
| Small market | 75 | 9 | | | 75 | 9 | | |
| *Type of provider* | | | 11.87 | 0.002 | | | 1.986 | 0.370 |
| Salesperson | 361 | 9 | | | 361 | 9 | | |
| Pharmacist | 8 | 7 | | | 8 | 9 | | |
| Pharmacy assistant | 2 | 8.5 | | | 2 | 8 | | |

[a]Range 5–10; [b]Kruskal–Wallis test.

treatment practice and were most frequently antiamoebics, antibiotics and antidiarrhoeals. Metronidazole and nalidixic acid were the preferred medicines, whereas oral rehydration salts was given in only a few of the cases. A similar poor pattern of case management of diarrhoea has been reported elsewhere [11,19]. Steps should be taken to restrict irrational drug prescribing by pharmacists, e.g. prescribing of antibiotics for diarrhoea or acute respiratory infections [14,19].

A study from Karachi, Pakistan, reported that dispensers working at community pharmacies had fragmentary knowledge but were willing to treat patients with diarrhoea [15]. The overall process of history taking by dispensers before product recommendation was ignored in all 3 cities in both rural and urban settings. The results of our study are in line with studies conducted in Kenya and Indonesia, where the incidence of history taking before making a product recommendation for diarrhoea was low [8].

The results of our study showed that the simulate patient's history was more frequently taken by the pharmacist if he/she was available. The pharmacies situated in supermarkets were relatively better in the process of history taking than those situated near hospitals or in small markets. This can be attributed to the fact that the pharmacist was more commonly present at pharmacies located in supermarkets. The process of history taking was performed comparatively more frequently at community pharmacies in Islamabad than in Lahore and Peshawar. Other studies have reported inappropriate diagnosis and treatment by unqualified and untrained pharmacy attendants, and that pharmacists tended to perform better than other staff [3,20].

Proper advice and information is an important determinant for an effective use of drugs by the patient. The information conveyed should include advice on appropriate use, when to expect symptom relief, potential side-effects, dose and frequency of the drug [21]. The results of our study showed that the overall process of advice and information giving at community pharmacies in the 3 cities was neglected in both rural and urban settings and irrespective of the type of dispenser and location of the pharmacy. The provision of advice for treating the common symptoms of diarrhoea was negligible or was not in accordance with standard therapy, indicating a deficit of qualified and trained personnel at these pharmacies. The observations in our study are in line with other studies showing that the quality of professional services from pharmacies is low and the provision of advice for common symptoms in middle-income countries is limited [22]. The situation in Pakistan is not an exception and similar patterns of counselling were observed in other countries [3,23–25].

## Conclusion

Case management of diarrhoeal disease by community pharmacies in Pakistan was poor. Sales of prescription-only medicines or even antibiotics without a prescription was common. Drug safety issues, unqualified personnel, lack of history taking, inappropriate treatment and lack of counselling were the major concerns to be addressed. Government interventions are needed to improve the quality of services and promote rational drug use through training of dispensers and provision of drug information to the public.

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