

Outpatient management of childhood acute diarrhea: survey among pediatricians from a children's hospital in the City of Buenos Aires

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ABSTRACT

Introduction. The management of acute diarrhea is based on preventing dehydration and reducing disease duration and severity.

The study objective was to establish the patterns for the outpatient management of acute diarrhea in children younger than 5 years.

Methods. Observational, analytical study using a self-administered survey among pediatricians from a children's hospital in the Autonomous City of Buenos Aires.

Age, sex, place of work, bibliographic sources, indication of drug and non-drug therapies, and preventive and hygiene measures were recorded. The association between drug prescription and the characteristics of surveyed pediatricians was assessed.

Results. In total, 182/216 pediatricians completed the survey. Their mean age was 42.4±10.24 years; 78.6% were females; 59.2% worked in the public sector; 22.4% worked in the emergency department; and 91.2% consulted guidelines and/or consensuses.

Also, 92.9% prescribed oral rehydration solutions; 46.2%, antiemetics; 43.4%, antacids and/or gastric protectors; 35.7%, probiotics; and 30.7%, zinc. Early food reintroduction was indicated by 91.7%; breastfeeding, by 96.7%; and preventive and hygiene measures, by 96-100%. The multivariate analysis showed an association between age >40 years and prescribing antacids/gastric protectors (*odds ratio* [OR]: 2.6; 1.22-5.61), probiotics (OR: 3.03; 1.34-6.83), and zinc (OR: 0.39; 0.17-0.87); between working in the private sector and prescribing probiotics (OR: 3.05; 1.56-5.94); and between working in the emergency department and prescribing antacids/gastric protectors (OR: 2.60; 1.22-5.54).

Conclusions. Treatment was mainly based on hydration, early food reintroduction, and breastfeeding. Age and work sector affected the prescription pattern.

Key words: childhood diarrhea, pediatricians, drug prescriptions, epidemiological surveys.

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INTRODUCTION

Acute diarrhea is a major public health problem worldwide. It is one of the leading causes of disease and death in early childhood, especially in developing countries and in children younger than 5 years.^{1,2} For the past 3 decades, its mortality rate has reduced thanks to the use of oral rehydration salts (ORS), breastfeeding promotion, a rapid food reintroduction, a better health status, and rotavirus vaccines.³ However, acute diarrhea is still one of the main causes of morbidity and outpatient visits in pediatrics.⁴

At present, with the emergence of new knowledge, mostly related to gut microbiota and pathophysiology,^{5,6} strategies are focused not only on dehydration prevention and treatment, but also on preventing nutritional damage, reducing disease duration and severity, and avoiding future episodes.⁷

In relation to the outpatient management of acute diarrhea, available data suggest that treatment indication varies significantly.⁸⁻¹¹ Although there are guidelines and recommendations available to approach it,^{7,12-16} certain treatment aspects have been controversial. In this setting, prescription habits¹⁷ applied by pediatricians to manage acute diarrhea may be more relevant.

The objective of this study was to establish the patterns used by pediatricians for the outpatient management of acute diarrhea in children younger than 5 years.

POPULATION AND METHODS

This was an observational, analytical, cross-sectional study to assess prescription patterns used in acute diarrhea.

An online survey was done among certified pediatricians from Hospital de Niños Ricardo Gutiérrez, in the Autonomous City of Buenos Aires, who worked in the outpatient and/or in the emergency department areas in both public and private sectors. Pediatric residents and fellows were excluded.

Every pediatrician who met the inclusion criteria was invited to participate based on the list of workers registered at the hospital. The submission of answers was documented as agreement to participate in the study.

The following variables were recorded: age, sex, having children, specialty, main place of work (private or public, on emergency department, outpatient care or hospitalization), time since their most recent scientific update, and type of bibliography reviewed to manage diarrhea.

A 5-option Likert scale was used based on the frequency of indication of drug and non-drug treatments (hydration and diet) and preventive and hygiene measures. Data were sent and collected using the REDCap^{®18} platform and exported to the STATA[®] statistical software, version 14, for statistical analysis.

The questionnaire was initially tested in 10 subjects to define the most adequate format to capture the expected information. *Annex* shows

the final survey in detail.

Quantitative variables were described as mean and median values, whereas categorical variables, as percentages and their corresponding 95% confidence intervals (CIs). The odds ratio (OR) and its corresponding 95% CI were estimated using univariate and multivariate logistic regression to establish the associations between certain characteristics of surveyed pediatricians (professional experience based on their age, having children, main place of work, and history of bibliographic update in the past 5 years) and drug prescription patterns. Sometimes, Often, and Always answers were regarded as drug use.

This study was approved by the hospital's Research and Teaching Committee and the Research Ethics Committee.

RESULTS

Between September and October 2020, 216 invitations were sent via email; 182 pediatricians completed the survey (response rate: 84%). The characteristics of the population are described in *Table 1*.

In relation to sources of information, most pediatricians selected more than 1, with the following percentages: recommendation guidelines or consensuses, 91.2%; other updates, 61.5%; original articles, 23.1%; and recommendations from colleagues and specialists, 17%.

In addition, 86.8% (n = 158) of pediatricians

TABLE 1. Characteristics of surveyed pediatricians (n = 182)

| Characteristic | Variable | Frequency | % |
|----------------------------|---|-----------|------|
| Age in years (mean and SD) | 42.48 ± 10.24 | | |
| Sex | Female | 143 | 78.6 |
| | Male | 39 | 21.4 |
| Children | Yes | 116 | 63.7 |
| | No | 66 | 36.3 |
| Other subspecialty | Yes* | 51 | 28.3 |
| | No | 129 | 71.7 |
| Main working sector | Outpatient care in the social security and private sector health insurance organizations and private health insurance companies | 50 | 27.9 |
| | Outpatient care in the public sector | 41 | 22.9 |
| | Hospitalization in the public sector | 38 | 21.2 |
| | Emergency department in the public sector | 27 | 15.1 |
| | Emergency department in the private sector | 13 | 7.3 |
| | Hospitalization in the private sector | 10 | 5.6 |

*Intensive care unit (5), Gastroenterology (4), Infectious Diseases (4), Pediatric outpatient medicine (4), Internal Medicine (2), Epidemiology (2), other (30).

SD: standard deviation.

referred that they had read bibliographic updates about acute diarrhea in the past 5 years; of these, 65.4% (n = 119) did so in the past 2 years.

Table 2 describes the frequency of drug prescription as a response percentage based on the Likert scale.

The frequency of indication of fluids to prevent dehydration and the recommendation of changes in diet are detailed in Table 3.

Table 4 shows the frequency of recommendation regarding preventive and hygiene measures.

In relation to the assessment of an association between drug prescription and the characteristics

of surveyed pediatricians, Table 5 provides an univariate analysis of the prescription of antiemetics, antacids and/or gastric protectors, probiotics, and zinc.

The multivariate analysis showed that working in the emergency department and age older than 40 years were significantly associated with the prescription of antacids and/or gastric protectors (OR: 2.60; 95% CI: 1.22-5.54; and OR: 2.6; 95% CI: 1.22-5.61, respectively).

Working mainly in the private sector and age older than 40 years were associated with prescribing probiotics (OR: 3.05; 95% CI: 1.56-5.94; and OR: 3.03; 95% CI: 1.34-6.83, respectively).

TABLE 2. Frequency (as percentage) of drug use (n = 182)

| Answers (expressed as percentage) | Never | Rarely | Sometimes | Often | Always |
|---|-------|--------|-----------|-------|--------|
| Oral rehydration solutions [†] | 2.7 | 4.4 | 19.8 | 53.3 | 19.8 |
| Antiemetics* | 18.1 | 35.7 | 37.4 | 8.8 | 0 |
| Antacids and/or gastric protectors [‡] | 29.1 | 27.5 | 33.5 | 9.9 | 0 |
| Probiotics [§] | 45.6 | 18.7 | 26.4 | 7.7 | 1.6 |
| Zinc | 46.8 | 22.5 | 27.5 | 2.7 | 0.5 |
| Antidiarrheal agent [°] | 92.4 | 6 | 1.6 | 0 | 0 |
| Empiric use of antibiotics | 95.6 | 4.4 | 0 | 0 | 0 |
| Antispasmodics | 98.9 | 1.1 | 0 | 0 | 0 |

[†] WHO salts: 84.5% (n = 147) and Pedialyte[®] 44.8% (n = 78).

* Metoclopramide 88.6% (n = 132) and ondansetron 23.5% (n = 35).

[‡] Ranitidine 72.70% (n = 93), proton pump inhibitors 21.90% (n = 28), aluminum hydroxide 20.30% (n = 26), sucralfate 15.60% (n = 20).

[§] *Saccharomyces boulardii* 71.1% (n = 69), *Bacillus clausii* 56.7% (n = 55), and other 7.20% (n = 7).

[°] Bismuth cream (n = 11), loperamide (n = 3), and activated charcoal (n = 1).

TABLE 3. Frequency (as percentage) of other fluids indicated to prevent dehydration and recommendations for changes in diet (n = 182)

| Answers (expressed as percentage) | Never | Rarely | Sometimes | Often | Always |
|---|-------|--------|-----------|-------|--------|
| Fluids to prevent dehydration | | | | | |
| Breast milk | 2.2 | 1.1 | 1.1 | 14.9 | 80.7 |
| Drinking water | 10.4 | 4.9 | 12.1 | 23.6 | 49 |
| Milk formulas | 18.1 | 9.9 | 23.1 | 26.9 | 22 |
| Isotonic drinks | 43.3 | 23.9 | 20.6 | 11.1 | 1.1 |
| Dairy product containing probiotics | 57.7 | 17.6 | 20.3 | 2.8 | 1.6 |
| Rice water | 56.3 | 16.6 | 16.6 | 8.3 | 2.2 |
| Strained broth (homemade) | 55.8 | 15.5 | 15.5 | 11.5 | 1.7 |
| Yogurt | 74 | 10.5 | 9.9 | 3.9 | 1.7 |
| Regular tea | 79 | 10.5 | 6.1 | 4.4 | 0 |
| Soda | 94.4 | 3.9 | 1.7 | 0 | 0 |
| Changes in diet | | | | | |
| Early food reintroduction (avoid fasting) | 6 | 2.2 | 4.4 | 35.7 | 51.7 |
| Low-fermentation diet | 3.8 | 5.5 | 17.6 | 33 | 40.1 |
| Lactose-free formula and milk | 25.3 | 33 | 34.1 | 6.6 | 1 |
| Cow's milk or diluted formula | 81.2 | 11.6 | 6.6 | 0.6 | 0 |
| Fasting | 86.1 | 9.4 | 2.8 | 1.7 | 0 |

Age older than 40 years showed an association with a lower prescription of zinc (OR: 0.39; 95% CI: 0.17-0.87). The remaining variables did not show a significant value in the multivariate analysis.

DISCUSSION

This study allowed to establish the prescription patterns applied by pediatricians for the outpatient management of acute diarrhea in children younger than 5 years.

Most surveyed pediatricians were females, and a little more than 50% were older than 40 years. Their main practice was in the outpatient area of the public sector.

In relation to the sources of information, most pediatricians referred that they reviewed recommendation guidelines or consensuses and also other updates (National Pediatric Update Program [*Programa Nacional de Actualización Pediátrica*, PRONAP], UpToDate, and Medscape, among others).

In relation to drug management, oral rehydration therapy was used as the first line of treatment to prevent dehydration.^{7,16,19} In this study, most surveyed pediatricians stated that they used oral rehydration solutions, which is consistent with international recommendations.

The recommendations for the treatment of associated symptoms, including nausea and vomiting, are controversial in terms of drug management. The World Health Organization (WHO) does not support the use of antiemetics;⁷ however, the European guidelines indicate that ondansetron may be effective because it has demonstrated a reduction in the rate of hospitalization and intravenous therapy use.¹² Notwithstanding this, they have also warned about certain adverse events, including increased bowel movements and cardiac alterations.¹³ In our study, the rate of antiemetics use was infrequent. Also, it is worth

noting that most pediatricians indicated that they prescribed metoclopramide, for which there is little evidence in relation to its effectiveness for diarrhea-associated vomiting, in addition to the fact that this drug has sedative effects that may interfere with rehydration.^{3,12}

In terms of antacids and gastric protectors indication for vomiting, although the guidelines do not specifically suggest their use, our study showed that ranitidine is used most of the times. In addition, this showed a significant association with working on call and an older age. This may be because these drugs are available for their eventual use in the emergency area in patients who have vomiting, in addition to health care providers' experience, whose goal is to improve oral tolerance.

In relation to probiotics, Guarino et al. conducted a study in children with mild diarrhea and observed that probiotics administration reduced diarrhea duration.²⁰ Other studies suggest that probiotics are useful to reduce acute diarrhea caused by rotavirus and prevent antibiotic-associated diarrhea, but they have not demonstrated to be useful in bacterial diarrhea.^{5,21-23} In general terms, probiotics play a major role in the gut immune balance.²⁴ Probiotic activities include improving an altered microbiota, inhibiting pathogens in a competitive manner, having immunomodulatory effects, and regulating intestinal motility. According to recent bibliography, probiotics have gained a bigger role as adjuvant therapy for childhood gastroenteritis.^{9,14,25}

In our study, probiotics were prescribed by one third of surveyed pediatricians and this was significantly associated with working in the private sector and an older age. Although we were not able to demonstrate the reason for such prescription pattern, most likely, access to this drug is more favorable among families attending

TABLE 4. Frequency of recommendations regarding preventive and hygiene measures for the outpatient management of acute diarrhea (n = 182)

| Answers (expressed as percentage) | Never | Rarely | Sometimes | Often | Always |
|---|-------|--------|-----------|-------|--------|
| Hand washing | 0 | 0.6 | 2.7 | 8.2 | 88.5 |
| Washing fruits and vegetables | 0 | 1.7 | 7.1 | 10.4 | 80.8 |
| Adequate food cooking and storing | 0.6 | 0.6 | 3.8 | 9.3 | 85.7 |
| Drinking water consumption | 0 | 0 | 3.3 | 7.1 | 89.6 |
| Diaper handling (if applicable) | 0.5 | 3.3 | 7.2 | 11 | 78 |
| Missing school until symptom resolution | 0 | 1.6 | 7.7 | 13.7 | 77 |

the private sector, in addition to health care providers' experience.

Other studies have demonstrated that zinc supplementation reduces diarrhea severity and duration among children younger than 5 years

in developing countries, where zinc deficiency is common.^{26,27} The WHO recommends zinc administration for 10-14 days in all children with diarrhea;⁷ however, this use gains relevance in the management of children with malnutrition and

TABLE 5. Association between drug treatment prescription and characteristics of pediatricians

| Prescription | | Yes (%) | No (%) | Odds ratio | 95% confidence interval |
|---|-----|------------|-------------|-------------|-------------------------|
| Antiemetics | | | | | |
| Age > 40 years | Yes | 43 (42.6%) | 58 (57.4%) | 0.65 | 0.36-1.18 |
| | No | 40 (49.4%) | 41 (50.6%) | | |
| Children | Yes | 54 (46.5%) | 62 (53.5%) | 1.04 | 0.56-1.91 |
| | No | 30 (45.4%) | 36 (54.6%) | | |
| Working in the private sector | Yes | 37 (50.7%) | 36 (49.3%) | 1.39 | 0.76-2.53 |
| | No | 45 (42.4%) | 61 (57.6%) | | |
| Update in the past 5 years | Yes | 74 (46.8%) | 84 (53.2%) | 1.23 | 0.51-2.94 |
| | No | 10 (41.7%) | 14 (58.3%) | | |
| Working in the emergency department | Yes | 22 (55%) | 18 (45%) | 1.6 | 0.79-3.2 |
| | No | 60 (43.2%) | 79 (56.8%) | | |
| Antacids and/or gastric protectors | | | | | |
| Age > 40 years | Yes | 55 (55.6%) | 44 (44.4%) | 3.07 | 1.65-5.7 |
| | No | 24 (28.9%) | 59 (71.1%) | | |
| Children | Yes | 60 (51.7%) | 56 (48.3%) | 2.65 | 1.39-5.05* |
| | No | 19 (28.8%) | 47 (71.2%) | | |
| Working in the private sector | Yes | 36 (49.3%) | 37 (50.7%) | 1.54 | 0.84-2.81 |
| | No | 41 (38.7%) | 65 (61.3%) | | |
| Update in the past 5 years | Yes | 65 (41.1%) | 93 (58.9%) | 0.49 | 0.20-1.19 |
| | No | 14 (58.3%) | 10 (41.7%) | | |
| Working in the emergency department | Yes | 23 (57.5%) | 17 (42.5%) | 2.12 | 1.04-4.34 |
| | No | 54 (38.8%) | 85 (61.2%) | | |
| Probiotics | | | | | |
| Age > 40 years | Yes | 46 (46.5%) | 53 (53.5%) | 2.92 | 1.53-5.58 |
| | No | 19 (22.9%) | 64 (77.1%) | | |
| Children | Yes | 49 (42.2%) | 67 (57.8%) | 2.18 | 1.16-4.47* |
| | No | 16 (24.2%) | 50 (75.8%) | | |
| Working in the private sector | Yes | 37 (50.7%) | 36 (49.3%) | 2.86 | 1.52-5.37 |
| | No | 28 (26.4%) | 78 (73.6%) | | |
| Update in the past 5 years | Yes | 56 (35.4%) | 102 (64.6%) | 0.91 | 0.37-2.22 |
| | No | 9 (37.5%) | 15 (62.5%) | | |
| Working in the emergency department | Yes | 17 (42.5%) | 23 (57.5%) | 1.4 | 0.68-2.87 |
| | No | 48 (34.5%) | 91 (65.5%) | | |
| Zinc | | | | | |
| Age > 40 years | Yes | 20 (20.2%) | 79 (79.8%) | 0.33 | 0.17-0.64 |
| | No | 36 (43.4%) | 47 (56.6%) | | |
| Children | Yes | 29 (25%) | 87 (75%) | 0.48 | 0.25-0.91* |
| | No | 27 (40.9%) | 39 (59.1%) | | |
| Working in the private sector | Yes | 20 (27.4%) | 53 (72.6%) | 0.76 | 0.49-1.47 |
| | No | 35 (33%) | 71 (67%) | | |
| Update in the past 5 years | Yes | 51 (32.3%) | 107 (67.7%) | 1.81 | 0.64-5.12 |
| | No | 5 (20.8%) | 19 (79.2%) | | |
| Working in the emergency department | Yes | 11 (20%) | 44 (80%) | 0.81 | 0.37-1.78 |
| | No | 29 (23.4%) | 95 (76.6%) | | |

* No significant differences in multivariate analysis.

SD: standard deviation.

persistent diarrhea.³ In our series, zinc use was infrequent. This may mean that its use may be based on the child's nutritional status, although such information was not collected in our study.

In relation to bismuth cream prescription, a review described its beneficial effect to relieve diarrhea caused by different factors, given its antisecretory, antiinflammatory, and antibacterial properties in adults with diarrhea.²⁸ An antibacterial effect has also been observed *in vitro* for Shiga toxin-producing *Escherichia coli*, among other enteropathogens.^{29,30} In their double blind study, Oviedo et al. demonstrated that children younger than 12 years treated with oral rehydration solution and bismuth hydroxide gel had a reduction in the number of bowel movements and duration of diarrhea compared to oral rehydration solution alone.³¹ Consistent with the little bibliography available in pediatrics, bismuth was not prescribed by the surveyed population. However, new recommendations for its use as an adjuvant therapy¹⁴ may be issued based on new evidence.

Antiperistaltic agents, like loperamide, are not recommended in children because they may increase disease severity and complications, especially in the case of invasive diarrhea,³ and their benefits have not been demonstrated.¹³ The above evidence depicts some of the reasons for the low prescription of antiperistaltic agents in our series.

Antibiotics are not indicated for most children with acute diarrhea. Their recommendation is limited to patients with systemic involvement or suspected sepsis, with immunosuppression, and based on local pathogen prevalence.^{12,15} An empiric prescription of antibiotics was uncommon in our series, in agreement with the current recommendations.

In relation to other fluids used to prevent dehydration, the WHO recommends indicating fluids containing salt to prevent hyponatremia. The following fluids are not recommended because they may have diuretic and laxative effect: soda, sweetened juices, coffee, tea, and herbal infusions.⁷ In this study, the most frequent indication was breastfeeding, drinking water, and milk formula, followed by isotonic drinks, strained broth, and rice water. Most likely, such prescription patterns are linked to the cultural factors of the patient population and health care providers' experience.

Early food reintroduction has been recommended to improve epithelial regeneration, promote disaccharidase recovery, nutrient

absorption, and weight gain. It provides a specially significant nutritional benefit to malnourished children.³² The WHO guidelines recommend early food reintroduction together with ORS.⁷ Consistent with this, most pediatricians stated that they indicated an early food reintroduction and no fasting.

In relation to the type of diet, the recommendation is to continue with the usual diet based on age;¹⁵ and a suggestion is to increase the number of daily servings and the calorie and essential micronutrient intake.³ However, in our series, most surveyed pediatricians referred that they indicated a low-fermentation diet, which may be low in calories and poor in fat and proteins.

Nowadays, the systematic use of lactose-free products during acute diarrhea is not recommended.¹² Most infants do not develop clinical signs or symptoms attributable to malabsorption caused by lactase deficiency.¹⁵ However, according to certain evidence, lactose-free products may shorten diarrhea duration, but this is limited in outpatient patients. In addition, diluted milk with lactose did not shorten diarrhea duration compared to undiluted milk or dairy products, but showed a potential to reduce the risk for prolonged or worsening diarrhea.¹² In our study, approximately one third of pediatricians sometimes indicated lactose-free formulas and most did not suggest milk dilution.

An important aspect is health education aimed at strengthening hygiene measures and thus reduce the impact of diarrhea, particularly in the case of bacterial diarrhea. Surveyed pediatricians referred that they adhered to preventive and hygiene measures during patient visits.

Prescription patterns do not depend only on the quality of the evidence supporting an indication; in addition, they are also affected by prior experiences, training, institutional culture, and family beliefs and expectations. In this regard, the study by Freedman found differences in the treatments indicated by American and Canadian physicians for the management of hydration and vomiting in acute diarrhea during childhood, with contextual variations.¹⁰

Our study has certain weaknesses, such as the fact that it was carried out in a single site. This may not be representative of other health care system settings, where certain guidelines, the type of population, and access to drugs may vary at the time of prescribing a treatment. In addition, we did not conduct a reliability analysis;

notwithstanding this, we performed validation processes for form, content, and questionnaire testing.

Our survey was an attempt to collect data about prescription patterns in “the real world,” i.e., to establish the gap between theory and practice in relation to what is actually prescribed and available recommendations and evidence. For this reason, our survey was anonymous in order to mitigate any reporting bias, especially based on prescriptions and patterns with a low level of evidence to warrant treatment effectiveness.

CONCLUSIONS

Oral rehydration solutions, early food reintroduction, continued breastfeeding or milk formula use were the most common indications, consistent with the current recommendations. Other adjuvant therapies, such as probiotics, were mentioned by one third of surveyed pediatricians. The prescription patterns for probiotics, antacids, and zinc may change based on health care providers' experience and their place of work. ■

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ANNEX ONLINE SURVEY

Survey for pediatricians about the outpatient management of acute diarrhea in children younger than 5 years

We would like you to provide information about your experience in the outpatient management of symptoms in patients younger than 5 years with acute diarrhea.

Your participation is voluntary, anonymous, and confidential. Completing the survey will take you 5 minutes. The results of this study will help to develop scientific evidence about a highly significant topic in everyday practice and may be published in the future; your information will remain anonymous.

If you agree, you may continue to the questionnaire.

1. Age (years old): ____
2. Sex: 1- Female 2- Male
3. Do you have children?
4. Number of children: .
5. Do you practice other subspecialty?: -No -Yes, which one? ____

6. In which sector do you work most of the time? (In terms of number of patients you see on a weekly basis, excluding the year of the pandemic)
 - Outpatient care in the sector of workers' unions health insurance organizations and private health insurance companies
 - Outpatient care in the public sector
 - Emergency department in the social security and private sector
 - Emergency department
 - Hospitalization in the social security and private sector
 - Hospitalization in the public sector
 - Other

7. Do you also work in other area? (Second in order of frequency in terms of number of patients you see on a weekly basis, excluding the year of the pandemic)
 - Outpatient care in the sector of workers' unions health insurance organizations and private health insurance companies
 - Outpatient care in the public sector
 - Emergency department in the social security and private sector
 - Emergency department in the public sector
 - Hospitalization in the in the social security and private sector
 - Hospitalization in the public sector
 - Other

8. What source of information do you use for the outpatient management of acute diarrhea? You may select one or more options.
 - Recommendation guidelines or consensuses (international organizations, scientific societies, hospital protocols)
 - Original articles (publications in scientific journals)
 - Recommendations from pharmaceutical sales representatives
 - Other updates (PRONAP, UpToDate, Medscape, etc.).
 - Recommendations from colleagues and specialists.
 - None

9. When did you read the most recent bibliographic update about acute diarrhea-related topics?

- In the past 2 years
- Between 2 and 5 years ago
- More than 5 years ago
- I did not do it
- I do not remember

10. To what extent do you recommend the following to prevent dehydration in the outpatient management of acute diarrhea in children younger than 5 years?

| | Never | Rarely | Sometimes | Often | Always |
|---|-------|--------|-----------|-------|--------|
| -Oral rehydration solution (WHO-Pedialyte®, etc.) | o | o | o | o | o |
| -Soda | o | o | o | o | o |
| -Isotonic drink (e.g., Gatorade®) | o | o | o | o | o |
| -Drinking water | o | o | o | o | o |
| -Rice water | o | o | o | o | o |
| -Breast milk (if the child is breastfeeding) | o | o | o | o | o |
| -Milk formulas | o | o | o | o | o |
| -Regular tea | o | o | o | o | o |
| -Strained broth (homemade) | o | o | o | o | o |
| -Yogurt | o | o | o | o | o |
| -Dairy product containing probiotics | o | o | o | o | o |
| -Other | o | o | o | o | o |

10.1 If you answered Sometimes, Often or Always to oral rehydration solution:

Which oral rehydration solution do you prescribe?

- WHO salts
- Pedialyte® oral rehydration solution

11. To what extent do you indicate drug therapy for vomiting in the outpatient management of acute diarrhea in children younger than 5 years?

| | Never | Rarely | Sometimes | Often | Always |
|-----------------------------|-------|--------|-----------|-------|--------|
| Antiemetics | o | o | o | o | o |
| Antacids/gastric protectors | o | o | o | o | o |

11.1. If you answered Sometimes, Often or Always to antiemetics:

Which antiemetics do you prescribe?

- Metoclopramide
- Ondansetron

11.2. If you answered Sometimes, Often or Always to antacids/gastric protectors:

Which antacids/gastric protectors do you prescribe?

- Aluminum hydroxide
- Sucralfate
- Ranitidine
- Proton pump inhibitors

12. To what extent do you indicate these drugs for the outpatient management of acute diarrhea in children younger than 5 years?

| | Never | Rarely | Sometimes | Often | Always |
|----------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Empiric use of antibiotics | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Probiotics | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Antidiarrheal agents | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Zinc | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Antispasmodics | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Other drugs | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

13.1. If you answered Sometimes, Often or Always to probiotics, please specify the one you use:

- *Bacillus clausii* (Enterogermina®)
- *Saccharomyces boulardii* (Floratil®)

13.2. If you answered Sometimes, Often or Always to antidiarrheal agents:

Which antidiarrheal agents do you prescribe?

- Bismuth cream
- Loperamide
- Activated charcoal

14. To what extent do you recommend each of the following changes in diet for the outpatient management of acute diarrhea in children younger than 5 years?

| | Never | Rarely | Sometimes | Often | Always |
|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Low-fermentation diet | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Lactose-free formula and milk | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Cow's milk or diluted formula | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Fasting | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Early food reintroduction (avoid fasting) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Other changes | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

15. To what extent do you indicate preventive and hygiene measures for the outpatient management of acute diarrhea in children younger than 5 years? You may select one or more options.

| | Never | Rarely | Sometimes | Often | Always |
|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Hand washing | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Washing fruits and vegetables | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Adequate food cooking and storing | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Drinking water consumption | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Diaper handling (if applicable) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Missing school until symptom resolution | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |