A Critical Review on Acute Diarrhea in Children—Management and Prevention

Mohd Muzamill

Assistant Professor, Khwaja Bande Nawaz University, Kalaburagi (Karnataka) India

Email id: drmuzzammil7777@gmail.com

Abstract

Acute diarrhea remains one of the leading causes of illness and mortality among children under five years of age, particularly in low- and middle-income countries. Despite considerable progress in reducing diarrhea-related deaths, it continues to place a significant burden on children, families, and healthcare systems. This literature review examines current evidence on the clinical management, prevention strategies, challenges, and policy implications of acute diarrhea in children. The findings indicate that oral rehydration therapy (ORT) with low-osmolarity oral rehydration solution (ORS), zinc supplementation, and continued feeding remain the cornerstone of clinical management. Adjunctive therapies, including probiotics, ondansetron, and selective antibiotic use, may be beneficial in specific clinical situations but should be guided by current evidence and local recommendations. Preventive measures, particularly rotavirus vaccination, improved water, sanitation, and hygiene (WASH), breastfeeding promotion, and appropriate complementary feeding, play a crucial role in reducing the incidence and severity of diarrheal disease. The review also highlights several ongoing challenges, including inconsistent adherence to treatment guidelines, inappropriate antibiotic use, variations in the effectiveness of zinc and probiotic therapies, and the management of children with severe acute malnutrition. Evidence suggests that sustainable reductions in childhood diarrhea require integrated approaches that combine effective clinical care with public health interventions, caregiver education, and supportive health policies. Continued research is needed to strengthen the evidence base for adjunctive therapies and to improve the implementation of evidence-based interventions, particularly in resource-limited settings.

Keywords: Acute diarrhea; Children; Oral rehydration therapy; Oral rehydration solution; Zinc supplementation; Rotavirus vaccine; Water, sanitation and hygiene (WASH); Probiotics; Prevention; Pediatric gastroenteritis.

1. Introduction

Acute diarrheal disease remains a leading cause of morbidity and mortality in children under five globally, though significant progress has been made in reducing deaths through simple, evidence-based interventions. The core management pillars include rapid rehydration, maintenance of nutrition, and timely administration of micronutrients such as zinc, with adjunctive options (e.g., probiotics, antiemetics, and selective antibiotics) considered in specific etiologies or settings. Prevention efforts foreground vaccination (notably rotavirus), improved water, sanitation and hygiene (WASH), and feeding practices. The body of evidence across diverse settings consistently supports a standardized management framework, while highlighting the importance of context-specific adaptations and policy-enabling environments. This synthesis draws on guidelines, reviews, and policy analyses to delineate current understanding of management and prevention strategies for pediatric acute diarrhoea.

2. Core Principles of Clinical Management

Rehydration is the cornerstone of treatment for children with acute diarrhea and dehydration. Oral rehydration therapy (ORT), particularly with low-osmolarity oral rehydration solution (ORS) containing 75 mmol/L of sodium, is consistently recommended by international guidelines because it effectively restores fluid and electrolyte balance while reducing the risk of hypernatremia and other complications (Farhat et al., 2018; Guarino et al., 2014; Mberu et al., 2024). Children with mild to moderate dehydration can usually be managed successfully with ORT in outpatient or community settings. In contrast, severe dehydration requires intravenous fluid therapy with careful monitoring and correction of electrolyte imbalances (Leung & Hon, 2021; Pieścik-Lech et al., 2012; Shane et al., 2017). The consistent recommendation across clinical guidelines highlights ORT as the first-line treatment for acute diarrheal illness in children (Guarino et al., 2020; Pieścik-Lech et al., 2012; Viegelmann et al., 2021).

Alongside rehydration, maintaining adequate nutrition is an essential component of management. Current guidelines recommend continuing breastfeeding and resuming age-appropriate feeding as soon as possible during and after the diarrheal episode. Early refeeding helps maintain nutritional status, promotes intestinal healing, and supports normal growth and recovery. This approach is routinely recommended together with ORS and zinc supplementation by the World Health Organization (WHO), UNICEF, and other international organizations (Billah et al., 2019;

Farhat et al., 2018; Gaensbauer et al., 2017; Guarino et al., 2020; Ogbo et al., 2022; Vecchio et al., 2016).

Zinc supplementation is another key component of the treatment of acute diarrhea, particularly in low- and middle-income countries where zinc deficiency is common. Studies have shown that zinc can reduce the duration and severity of diarrheal episodes and may lower the risk of subsequent episodes. However, the effectiveness of zinc supplementation varies according to factors such as age, nutritional status, and baseline zinc levels. Consequently, while zinc is strongly recommended in populations at high risk of deficiency, its benefits may be less pronounced in regions where zinc deficiency is uncommon (Gaensbauer et al., 2017; Huicho et al., 2019; Leung & Hon, 2021; Ogbo et al., 2022; Pieścik-Lech et al., 2012).

Several pharmacological agents may be used as adjuncts to standard therapy in selected cases. Ondansetron has been shown to reduce vomiting, thereby improving the success of oral rehydration therapy and decreasing the need for intravenous fluids and hospital admission. In contrast, many other antiemetic drugs have not demonstrated consistent benefits and may be associated with adverse effects (Farhat et al., 2018; Huicho et al., 2019; Leung & Hon, 2021; Mathieson, 2015). Other adjunctive treatments, including racecadotril and smectite, have also been incorporated into some clinical guidelines because they may shorten the duration or severity of diarrhea. However, recommendations regarding their routine use differ across regions because of variations in available evidence and local healthcare practices (Guarino et al., 2014; Pieścik-Lech et al., 2012; Polanco et al., 2008).

Probiotics have also been investigated as supportive therapy for acute gastroenteritis in children. Certain probiotic strains, particularly *Lactobacillus rhamnosus* GG and *Saccharomyces boulardii*, have been associated with modest reductions in the duration of diarrhea, especially in settings where viral infections such as rotavirus are common. Although European guidelines support the use of selected probiotics in pediatric acute gastroenteritis, the evidence remains inconsistent across low- and middle-income countries, where differences in nutritional status, infectious agents, and healthcare resources may influence treatment outcomes (Farhat et al., 2018; Guarino et al., 2014; Huicho et al., 2019; Pieścik-Lech et al., 2012).

The routine use of antibiotics is not recommended for children with uncomplicated acute watery diarrhea because most cases are caused by viral infections and resolve without antimicrobial therapy. Unnecessary antibiotic use provides little clinical benefit and contributes to antimicrobial resistance. Antibiotics should therefore be reserved for specific conditions, including dysentery, cholera, confirmed bacterial infections, or persistent diarrhea when clinically indicated and supported by local treatment guidelines (Cleghorn et al., 2012; Guarino et al., 2014, 2020; Jaisue et al., 2017; Leung & Hon, 2021; Shane et al., 2017; Vecchio et al., 2016). This selective approach is consistent with international recommendations promoting responsible antibiotic stewardship.

Children with severe acute malnutrition (SAM) require specialized management because they are at greater risk of dehydration, electrolyte imbalance, and poor clinical outcomes. Treatment should include carefully tailored rehydration therapy, appropriate feeding regimens, and the use of ready-to-use therapeutic foods when indicated. These children often respond differently to standard ORS and zinc therapy, making individualized treatment protocols and close clinical monitoring essential to ensure safe and effective recovery (Huicho et al., 2019; Iannotti et al., 2014; Joseph et al., 2017; Vecchio et al., 2016).

3. Prevention: Vaccines, Nutrition, WASH, and Policy

Rotavirus vaccination is one of the most effective strategies for preventing severe acute diarrheal disease in children. Since its introduction into national immunization programs, many countries have reported substantial reductions in hospitalizations, severe diarrhea, and diarrhea-related mortality. The vaccine has been particularly effective in decreasing the burden of rotavirus-associated gastroenteritis, making it a key component of childhood diarrhea prevention programs (Gaensbauer et al., 2017; Guarino et al., 2020; Huicho et al., 2019; Mokomane et al., 2017). Evidence from countries such as Bangladesh and Peru indicates that increasing rotavirus vaccine coverage, together with improvements in water, sanitation, hygiene (WASH), and child nutrition, has contributed to significant declines in childhood diarrheal deaths (Billah et al., 2019; Huicho et al., 2019).

Water, sanitation, and hygiene (WASH) interventions are equally important in preventing diarrheal diseases by interrupting fecal-oral transmission of enteric pathogens. Access to safe

drinking water, improved sanitation facilities, and proper hand hygiene has consistently been associated with lower rates of childhood diarrhea. Large-scale public health analyses have shown that WASH interventions, when implemented alongside oral rehydration therapy (ORS), zinc supplementation, and vaccination, substantially reduce childhood morbidity and mortality. A policy analysis conducted in Kenya also highlighted the need to strengthen WASH programs, improve surveillance and diagnostic systems, and better integrate environmental and pathogen-related factors into national diarrhea prevention strategies (Billah et al., 2019; Huicho et al., 2019; Mberu et al., 2024).

Appropriate infant feeding practices are another essential component of diarrhea prevention. Exclusive breastfeeding during the first six months of life, followed by continued breastfeeding with timely and appropriate complementary feeding, helps protect children against gastrointestinal infections while supporting normal growth and immune function. These nutritional practices not only reduce the incidence and severity of diarrheal illness but also improve recovery when illness occurs. When combined with ORS, zinc supplementation, vaccination, and other public health interventions, breastfeeding promotion contributes to further reductions in childhood morbidity and mortality (Billah et al., 2019; Huicho et al., 2019; Mberu et al., 2024).

Successful control of childhood diarrhea requires coordinated public health policies that combine preventive and treatment strategies. Evidence from several countries demonstrates that the greatest improvements have been achieved through integrated approaches that expand rotavirus vaccination, increase the availability of ORS and zinc, promote breastfeeding and adequate nutrition, improve WASH infrastructure, and strengthen public health education. Bangladesh has achieved substantial reductions in childhood diarrheal mortality through coordinated efforts involving widespread ORS and zinc distribution, breastfeeding promotion, sanitation improvements, and strong cross-sector collaboration (Billah et al., 2019; Huicho et al., 2019; Jaisue et al., 2017). Similar progress has been reported in Peru, where early disease-specific interventions gradually evolved into broader multisectoral programs that combined healthcare, nutrition, sanitation, and community-based strategies. These experiences demonstrate that sustained reductions in childhood diarrhea are most likely to occur when prevention and

treatment measures are implemented together within comprehensive national health programs (Huicho et al., 2019).

4. Current Challenges and Evidence Gap

Although zinc supplementation is widely recommended as part of the management of acute diarrhea in children, its effectiveness is influenced by several factors, including age, nutritional status, and the prevalence of zinc deficiency within a population. Studies conducted in low- and middle-income countries generally report that zinc shortens the duration and severity of diarrhea, particularly among children with underlying zinc deficiency. However, the benefits are less consistent in populations where zinc deficiency is uncommon, suggesting that recommendations should consider local nutritional and epidemiological conditions (Guarino et al., 2014; Huicho et al., 2019; Leung & Hon, 2021; Pieścik-Lech et al., 2012). Similar variation has been reported for probiotic therapy. While selected probiotic strains have demonstrated modest benefits in reducing the duration of acute gastroenteritis, treatment outcomes differ according to the probiotic strain used, the causative pathogen, and the characteristics of the study population. As a result, routine probiotic use cannot be universally recommended, particularly in resource-limited settings where the available evidence remains inconsistent (Guarino et al., 2014; Huicho et al., 2019; Leung & Hon, 2021; Pieścik-Lech et al., 2012).

Another challenge is ensuring that recommended treatment guidelines are consistently followed in clinical practice. Although oral rehydration solution (ORS) and zinc supplementation are widely recognized as the standard treatment for acute diarrhea, studies have reported inconsistent adherence to these recommendations. In many settings, antibiotics continue to be prescribed unnecessarily for uncomplicated diarrheal illness despite limited clinical benefit and increasing concerns about antimicrobial resistance. These findings highlight the need for stronger antibiotic stewardship, continued professional education for healthcare providers, and improved caregiver awareness regarding the appropriate management of childhood diarrhea (Cleghorn et al., 2012; Jaisue et al., 2017; Ogbo et al., 2022).

The management of children with severe acute malnutrition (SAM) or complicated diarrheal disease presents additional challenges. Standard treatment protocols may not be appropriate for these children because they are more vulnerable to dehydration, electrolyte disturbances, and

poor clinical outcomes. Management often requires modified rehydration protocols, specialized nutritional support, and close clinical monitoring. Although community-based management of acute malnutrition (CMAM) has shown promise in improving outcomes, evidence supporting several adjunctive therapies in children with SAM remains limited. Further research is needed to establish the most effective treatment strategies for this high-risk group (Huicho et al., 2019; Iannotti et al., 2014; Joseph et al., 2017).

Caregiver knowledge and home management practices also play a major role in determining the outcome of childhood diarrhea. Studies have identified gaps in caregivers' understanding of the correct preparation and administration of ORS, appropriate zinc use, and the early recognition of dehydration. These shortcomings can delay treatment and increase the risk of complications. Strengthening caregiver education through community-based health programs and public health campaigns can improve home management practices, encourage timely treatment, and promote preventive behaviors, ultimately reducing the burden of diarrheal disease among children (Dujaili et al., 2021; Khaliq et al., 2023).

5. Synthesis: An Integrated Framework for Management and Prevention

The management of acute diarrhea in children follows a structured, evidence-based approach that prioritizes early assessment, prompt rehydration, nutritional support, and appropriate adjunctive therapies. The first step is to assess the severity of dehydration, as this determines the appropriate treatment strategy. Children with mild to moderate dehydration can usually be managed effectively with oral rehydration therapy (ORT), whereas those with severe dehydration, hypernatremia, or significant electrolyte disturbances require intravenous fluid therapy and close clinical monitoring (Leung & Hon, 2021; Pieścik-Lech et al., 2012; Shane et al., 2017).

Once the child's hydration status has been assessed, treatment should begin with low-osmolarity oral rehydration solution (ORS), which is recommended because of its effectiveness in restoring fluid and electrolyte balance while minimizing complications. Continued breastfeeding and age-appropriate feeding should be encouraged throughout the illness to maintain nutritional status, promote intestinal recovery, and support normal growth (Farhat et al., 2018; Guarino et al., 2014; Mberu et al., 2024).

Zinc supplementation should be provided according to current clinical guidelines, particularly in settings where zinc deficiency is prevalent. During treatment, children should be monitored for ongoing vomiting, hydration status, and clinical response to therapy. Although the benefits of zinc supplementation vary across populations, it remains an important component of diarrhea management in many low- and middle-income countries (Huicho et al., 2019; Leung & Hon, 2021; Pieścik-Lech et al., 2012).

In children with persistent vomiting that interferes with successful oral rehydration, ondansetron may be considered as an adjunctive treatment to improve ORS tolerance and reduce the need for intravenous fluid therapy. Its use should follow local clinical guidelines and be based on individual patient assessment, taking into account the potential benefits and safety considerations (Farhat et al., 2018; Huicho et al., 2019; Leung & Hon, 2021).

6. Implications for Research and Practice

Additional research is needed to strengthen the evidence on the management of acute diarrhea in children, particularly in low- and middle-income countries (LMICs), where the disease burden remains highest. Future studies should evaluate the optimal zinc supplementation regimens, identify the most effective probiotic strains, and examine the benefits of combining adjunctive therapies in different pediatric populations, including malnourished children. Research should also focus on the practical challenges of implementing diarrhea prevention and treatment programs, such as limited healthcare resources, financing, accessibility of oral rehydration solution (ORS), zinc supplementation, and vaccines. Understanding caregivers' knowledge, attitudes, and home-management practices will also be important for designing interventions that improve treatment adherence and health outcomes (Billah et al., 2019; Leung & Hon, 2021; Mberu et al., 2024; Ogbo et al., 2022; Pieścik-Lech et al., 2012).

From a clinical and public health perspective, effective management of childhood diarrhea requires greater emphasis on evidence-based interventions that are both affordable and widely accessible. Healthcare providers should promote the use of low-osmolarity oral rehydration solution together with zinc supplementation as the standard treatment for acute diarrhea, encourage continued feeding during illness, and educate caregivers on appropriate home management and the early recognition of dehydration. At the population level, expanding

rotavirus vaccination coverage, improving water, sanitation, and hygiene (WASH), and integrating diarrhea management with nutrition, malaria prevention, and other infectious disease control programs can substantially reduce childhood morbidity and mortality. Coordinated efforts across healthcare systems and public health programs are therefore essential to improve outcomes and reduce the burden of diarrheal diseases among children (Billah et al., 2019; Farhat et al., 2018; Guarino et al., 2020; Huicho et al., 2019; Mberu et al., 2024).

7. Conclusion

Acute diarrhea remains a major cause of childhood morbidity and mortality despite the availability of effective and affordable preventive and therapeutic interventions. The evidence reviewed demonstrates that early assessment of dehydration, prompt administration of low-osmolarity ORS, zinc supplementation, and continued feeding are the key components of successful clinical management. Adjunctive therapies such as ondansetron and selected probiotics may provide additional benefits in specific clinical situations, whereas antibiotics should be reserved for clearly defined indications to minimize antimicrobial resistance.

Prevention remains equally important in reducing the burden of childhood diarrhea. Rotavirus vaccination, improved water, sanitation, and hygiene (WASH), breastfeeding promotion, appropriate complementary feeding, and caregiver education have consistently been associated with lower rates of diarrheal disease and improved child survival. However, disparities in healthcare access, inconsistent adherence to treatment guidelines, limited availability of essential therapies, and socioeconomic barriers continue to affect outcomes, particularly in low-resource settings.

Overall, the evidence supports an integrated approach that combines evidence-based clinical management with preventive public health strategies and strong health system support. Strengthening healthcare delivery, expanding access to ORS, zinc, and vaccines, promoting rational antibiotic use, and improving caregiver education should remain public health priorities. Continued research and context-specific policies will be essential to optimize the management and prevention of acute diarrhea and further reduce its impact on child health worldwide.

References

- Billah, S. M., Raihana, S., Ali, N. B., Iqbal, A., Rahman, M. M., Khan, A. N. S., Karim, F., Karim, M. A., Hassan, A., Jackson, B., Walker, N., Hossain, M. A., Sarker, S., Black, R. E., & Arifeen, S. E. (2019). Bangladesh: a success case in combating childhood diarrhoea. Journal of Global Health, 9(2). https://doi.org/10.7189/jogh.09.020803
- Cleghorn, G. J., Boey, C. C. M., Wittenberg, D. F., Fuchs, G. J., Oliver, M., Buttery, J., Polanco, I., & Román, E. (2012). Acute Infectious Diarrhea Lessons Learned From the Past? Journal of Pediatric Gastroenterology and Nutrition, 55(5), 489–493. https://doi.org/10.1097/mpg.0b013e318272acc6
- Dujaili, J. A., Blebil, A. Q., Jayasinghe, D., & Sivanandan, N. (2021). Knowledge, attitudes, and practices of mothers on the use of oral rehydration salts in children with diarrhoea: a cross-sectional survey in Malaysia. Journal of Pharmacy Practice and Research, 51(4), 321–327. https://doi.org/10.1002/jppr.1696
- Farhat, A., Shaukat, A., & Sadiq, N. (2018). Comparison Of Clinical Efficacy Of Combined Versus Monotherapy Of Oral Zinc And Probiotic In Pediatric Acute Diarrhoea At Benazir Bhutto Shaheed Teaching Hospital, Abbottabad. Journal of Bahria University Medical and Dental College, 08(04), 210–213. https://doi.org/10.51985/jbumdc2018061
- Gaensbauer, J., Melgar, M., Calvimontes, D. M., Lamb, M. M., Asturias, E. J., Contreras-Roldan, I. L., Dominguez, S. R., Robinson, C. C., & Berman, S. (2017). Efficacy of a bovine colostrum and egg-based intervention in acute childhood diarrhoea in Guatemala: a randomised, double-blind, placebo-controlled trial. BMJ Global Health, 2(4), e000452. https://doi.org/10.1136/bmjgh-2017-000452
- Guarino, A., Aguilar, J., Berkley, J. A., Broekaert, I., Vázquez-Frías, R., Holtz, L. R., Vecchio, A. L., Meskini, T., Moore, S. R., Rivera, J., Sandhu, B., Smarrazzo, A., Szajewska, H., & Treepongkaruna, S. (2020). Acute Gastroenteritis in Children of the World. Journal of Pediatric Gastroenterology and Nutrition, 70(5), 694–701. https://doi.org/10.1097/mpg.0000000000002669
- Guarino, A., Ashkenazi, S., Gendrel, D., Vecchio, A. L., Shamir, R., & Szajewska, H. (2014). European Society for Pediatric Gastroenterology, Hepatology, and Nutrition/European Society for Pediatric Infectious Diseases Evidence-Based Guidelines for the Management of Acute Gastroenteritis in Children in Europe. Journal of Pediatric

Gastroenterology and Nutrition, 59(1), 132–152. https://doi.org/10.1097/mpg.0000000000000375

- Huicho, L., Tavera, M., Huayanay-Espinoza, C. A., Béjar-Díaz, M., Rivera, M. C., Tam, Y., Walker, N., & Black, R. E. (2019). Drivers of the progress achieved by Peru in reducing childhood diarrhoea mortality: a country case study. Journal of Global Health, 9(2). https://doi.org/10.7189/jogh.09.020805
- Iannotti, L., Trehan, I., Clitheroe, K. L., & Manary, M. (2014). Diagnosis and treatment of severely malnourished children with diarrhoea. Journal of Paediatrics and Child Health, 51(4), 387–395. https://doi.org/10.1111/jpc.12711
- Jaisue, S., Phomtavong, S., Eua-anant, S., & Borlace, G. N. (2017). Dispensing pattern for acute non-infectious diarrhoea in children at community pharmacies in Thailand. Journal of Pharmacy Practice and Research, 47(5), 383–388. https://doi.org/10.1002/jppr.1345 Joseph, A., Odimayo, M. S., Oluwayemi, I. O., Fadeyi, A., & Dada, S. A. (2017). An overview of the aetiologic agents of diarrhoea diseases in children: How far have we gone in management and control? Medical Journal of Zambia, 44(4), 266–275. https://doi.org/10.55320/mjz.44.4.298
- Khaliq, A., Holmes-Stahlman, R., Ali, D., Karatela, S., & Lassi, Z. S. (2023). Assessment of Determinants of Paediatric Diarrhoea Case Management Adherence in Pakistan. https://doi.org/10.20944/preprints202302.0053.v1
- Leung, A. K. C., & Hon, K. E. (2021). Paediatrics: how to manage viral gastroenteritis. Drugs in Context, 10, 1–11. https://doi.org/10.7573/dic.2020-11-7
- Mathieson, L. (2015). Vomiting and diarrhoea in children. Innovait Education and Inspiration for General Practice, 8(10), 592–598. https://doi.org/10.1177/1755738015592916
- Mberu, B., Simiyu, S., Gutema, F. D., Sewell, D. K., Busienei, P. J., Tumwebaze, I. K., & Baker, K. K. (2024). Landscape analysis of the Kenyan policy on the treatment and prevention of diarrheal disease among under-5 children. BMJ Open, 14(8), e081906. https://doi.org/10.1136/bmjopen-2023-081906
- Mokomane, M., Kasvosve, I., Melo, E. de, Pernica, J. M., & Goldfarb, D. A. (2017). The global problem of childhood diarrhoeal diseases: emerging strategies in prevention and management. Therapeutic Advances in Infectious Disease, 5(1), 29–43. https://doi.org/10.1177/2049936117744429

- Ogbo, P. U., Ainaf, B. A., & Owoborode, O. E. (2022). The Prescription of Medicines for Childhood Acute Diarrhoea: A Retrospective Study at Four Secondary Healthcare Facilities in Lagos State, Nigeria. Nigerian Journal of Pharmaceutical Research, 17(2), 257–265. https://doi.org/10.4314/njpr.v17i2.11
- Pieścik-Lech, M., Shamir, R., Guarino, A., & Szajewska, H. (2012). Review article: the management of acute gastroenteritis in children. Alimentary Pharmacology & Therapeutics, 37(3), 289–303. https://doi.org/10.1111/apt.12163
- Polanco, I., Salazar-Lindo, E., & Goulet, O. (2008). Acute infectious diarrhoea in children: new insights in antisecretory treatment with racecadotril. Acta Paediatrica, 97(8), 1008–1015. https://doi.org/10.1111/j.1651-2227.2008.00830.x
- Shane, A. L., Mody, R. K., Crump, J. A., Tarr, P. I., Steiner, T. S., Kotloff, K. L., Langley, J. M., Wanke, C., Warren, C. A., Cheng, A., Cantey, J. R., & Pickering, L. K. (2017). 2017 Infectious Diseases Society of America Clinical Practice Guidelines for the Diagnosis and Management of Infectious Diarrhea. Clinical Infectious Diseases, 65(12), e45–e80. https://doi.org/10.1093/cid/cix669
- Vecchio, A. L., Dias, J. A., Berkley, J. A., Boey, C., Cohen, M. B., Cruchet, S., Liguoro, I., Lindo, E. S., Sandhu, B., Sherman, P. M., Shimizu, T., & Guarino, A. (2016). Comparison of Recommendations in Clinical Practice Guidelines for Acute Gastroenteritis in Children. Journal of Pediatric Gastroenterology and Nutrition, 63(2), 226–235. https://doi.org/10.1097/mpg.0000000000001133
- Viegelmann, G., Dorji, J., Guo, X., & Hy, L. (2021). Approach to diarrhoeal disorders in children. Singapore Medical Journal, 62(12), 623–629. https://doi.org/10.11622/smedj.2021234