

Section: Paediatric Nursing

Honey as a therapeutic agent for diarrhea treatment in children

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Abstract

Diarrheal disease is a significant cause of mortality and morbidity among children worldwide, particularly in those under five years old. According to the World Health Organization, diarrhoea is a leading cause of death in this age group, with approximately 760,000 children dying each year due to dehydration. If not properly managed, diarrhoea can lead to severe dehydration and death. In addition to pharmacotherapy, complementary therapies like honey administration have been explored for their potential benefits. At Soerojo Hospital Magelang, diarrhoea is a primary concern in the Tulip 2 Ward, particularly among infants and toddlers. A case study was conducted to implement nursing care for paediatric patients with diarrhoea who received complementary therapy through honey administration. The patient was diagnosed with acute diarrhoea, and an evaluation over three sessions revealed that the nursing diagnosis of diarrhoea related to intestinal malabsorption was successfully resolved. The patient's mother administered honey as a non-pharmacological therapy, which proved to be highly effective in managing diarrhoea due to its antibacterial properties against intestinal bacteria such as *Shigella*, *Salmonella*, *E. coli*, and *Vibrio cholerae*. The sweet taste of honey also made it more appealing to the child, making it an ideal supplement to conventional medication. Through this case study, the author aims to contribute knowledge on the innovative use of honey administration in managing diarrhoea in paediatric patients.

Keywords: Diarrhoea, honey, infection, intervention, paediatric care

Introduction

Diarrheal disease remains one of the most pressing global health challenges, particularly affecting children under the age of five (Mokomane et al., 2017). It is the second leading cause of death in this age group, with an estimated 370,000 fatalities annually, largely due to complications from dehydration (Liang et al., 2024). The condition is often triggered by viral, bacterial, or parasitic infections, and its severity can escalate rapidly in vulnerable populations (Hawash et al., 2017). In low-resource settings, limited access to clean water, sanitation, and healthcare services exacerbates the risk. Diarrhoea not only leads to fluid loss but also impairs nutrient absorption, contributing to malnutrition and weakened immunity (Meyer et al., 2025; Guerrant et al., 2008). The impact of recurrent diarrhoea on child development is profound, affecting growth, cognitive function, and school readiness. Standard treatment protocols typically involve rehydration therapy, zinc supplementation, and antimicrobial agents when indicated (Ihara et al., 2024; Shane et al., 2017). However, the integration of complementary therapies has gained attention for their potential to enhance recovery and reduce symptom duration. One such therapy is the administration of honey, which possesses natural antibacterial, antiviral, and anti-inflammatory properties. Honey has been shown to inhibit the growth of pathogens such as *Escherichia coli* and *Salmonella*, common culprits in paediatric diarrhoea (Kassym et al., 2024; Schell et al., 2022). Its soothing effect on the gastrointestinal tract and ability to promote mucosal healing make it a valuable adjunct to conventional treatment. Nurses play a critical role in identifying early signs of dehydration, educating caregivers, and administering both pharmacological and complementary interventions. Their holistic approach ensures that treatment is not only clinically effective but also acceptable and accessible.

The therapeutic use of honey in managing diarrheal disease is supported by a growing body of research. Studies have demonstrated that honey can reduce the frequency and duration of diarrhoea episodes, particularly when used alongside oral rehydration solutions (Mahyar et al., 2022; Shariatpanahi et al., 2018). Its high sugar content promotes sodium and water absorption in the intestines, aiding in rehydration. Additionally, honey contains bioactive compounds such as flavonoids and phenolic acids that contribute to its antimicrobial effects. In paediatric care, the palatability of honey makes it easier to administer compared to some bitter medications, improving compliance. Nurses are instrumental in assessing the suitability of honey for individual patients, especially considering age restrictions and allergy risks. For children over one year old, honey can be safely incorporated into dietary and therapeutic regimens. In clinical settings, nurses monitor the child's hydration status, stool characteristics, and overall response to treatment. They also provide education to parents on safe honey use, hygiene practices, and signs that

require medical attention. The integration of honey into diarrhoea management aligns with the principles of family-centered care, empowering caregivers to participate actively in their child's recovery. This case study underscores the need for interventions that resonate with local practices and beliefs. It also emphasizes the importance of interdisciplinary collaboration, where nurses, physicians, and nutritionists work together to optimize outcomes (Ullah et al., 2024). With documenting the effectiveness of honey in real-world settings, the case study contributes to the broader discourse on complementary therapies in paediatric nursing. It encourages further research and policy development to support safe and effective integrative care models.

The significance of this case study lies in its potential to inform clinical practice and public health strategies. In regions where access to pharmaceuticals is limited, honey offers a low-cost, readily available alternative that can be integrated into community health programs. Nurses, as frontline healthcare providers, are uniquely positioned to advocate for such interventions and ensure their safe implementation. Through health education and community outreach, nurses can disseminate knowledge about the benefits and limitations of honey in diarrhoea management. They can also collect data to evaluate outcomes and refine protocols based on local needs. The case study provides a framework for assessing the impact of complementary therapies on child health indicators, such as recovery time, nutritional status, and caregiver satisfaction. It also highlights the importance of training nurses in integrative care approaches, equipping them with the skills to evaluate and apply non-pharmacological interventions. In academic settings, this case can be used to teach nursing students about evidence-based complementary therapies and the role of cultural competence in paediatric care. The findings may also influence policy decisions regarding the inclusion of honey in national guidelines for diarrhoea treatment. The case study bridges the gap between traditional knowledge and scientific validation. It reinforces the idea that nurses are caregivers, educators, researchers, and advocates for holistic health.

Case Description

The patient was diagnosed with acute diarrhoea, characterized by 10 bowel movements in one day, and the nursing problem identified was diarrhoea related to gastrointestinal inflammation. The patient's general condition appeared weak, with dry mucous membranes, pink conjunctiva, elastic skin, and bowel sounds heard 34 times per minute during auscultation. The patient's extremity movements appeared lethargic. Vital signs recorded were: blood pressure 91/54 mmHg, pulse 121 bpm, temperature 36.5°C, and respiration 22 breaths per minute. Complete blood count results showed Haemoglobin 11.8 g/dL, leukocytes $15.8 \times 10^3/\mu\text{L}$, erythrocytes $5.28 \times 10^6/\mu\text{L}$, haematocrit 38%, platelets $249 \times 10^3/\mu\text{L}$, eosinophils 0.0%, segmented neutrophils 7.74%, lymphocytes 19.4%, monocytes 11.6%, RDW-SD 33.3 fL. Stool examination on November 11, 2024, showed brown colour, mucous consistency, presence of leukocytes, and bacteria positive (3+). Based on clinical manifestations and supporting examinations, the patient was diagnosed with gastroenteritis. The priority nursing diagnoses were: diarrhoea related to gastrointestinal inflammation, risk of hypovolemia evidenced by active fluid loss, and risk of nutritional deficit evidenced by impaired nutrient absorption. The primary nursing diagnosis was diarrhoea related to gastrointestinal inflammation. The objective of the intervention was to improve faecal elimination, with expected outcomes including increased control over stool output, improved stool consistency, reduced bowel movement frequency, and improved intestinal peristalsis. Interventions included identifying the history of diarrhoea, monitoring stool characteristics, providing oral and intravenous fluid intake, collecting blood and stool samples, recommending small and frequent meals, and advising avoidance of gas-producing, spicy, and high-lactose foods. The implementation included providing education, monitoring stool characteristics, administering prescribed medications, applying 5 ml honey therapy, and encouraging the family to continue honey therapy at home. Evaluation results showed that the patient's mother reported the child had four bowel movements since the previous afternoon, with mushy consistency and yellowish-brown colour, and on the final evaluation day, the patient had not had a bowel movement since the previous noon.

Discussion

In the case study, the identified nursing problem was diarrhea related to gastrointestinal inflammation. The patient appeared weak, had hyperactive bowel sounds (34 times/minute), with vital signs as follows: heart rate 121 bpm, temperature 36.8°C, respiratory rate 24 breaths/min. Diarrhea is the frequent passage of loose or unformed stools, which can be caused by physiological factors (infection), psychological factors (anxiety and high levels of stress), situational factors (exposure to contaminants, toxins, laxative abuse, substance abuse), medical treatments (thyroid agents, analgesics, stool softeners, ferrous sulfate, antacids, cimetidine, and antibiotics), as well as changes in water, food, and bacteria present in water. Major criteria of diarrhea include defecation more than three times in 24 hours and soft or liquid stools. Minor criteria include abdominal pain or cramping, increased peristaltic activity, and hyperactive bowel sounds. Management provided for the patient included both pharmacological and non-pharmacological therapies. The non-pharmacological therapy involved the use of honey. In Indonesian culture, honey is often used as a traditional remedy to enhance the healing properties of herbal medicine, particularly for infections in the digestive and respiratory tracts, and to boost overall physical fitness. Honey is also known for promoting the growth of new tissue. It contains many essential minerals such as sodium, calcium, magnesium, aluminum, iron, phosphorus, and potassium. The vitamins found in honey include thiamine (B1), riboflavin (B2), ascorbic acid (C), pyridoxine (B6), niacin,

pantothenic acid, biotin, folic acid, and vitamin K. Important enzymes present in honey are diastase, invertase, glucose oxidase, peroxidase, and lipase (Alaerjani et al., 2022). Additionally, honey has natural antibiotic or antibacterial properties (Ogwu & Izah, 2025).

One traditional method emphasized in the treatment of diarrhoea is the consumption of honey. Honey is a nutrient-rich substance containing carbohydrates, enzymes, amino acids, organic acids, minerals, aromatic compounds, pigments, and pollen. The link between honey therapy and diarrhoea lies in honey's bactericidal activity, which is effective against several enteropathogenic organisms, including species of *Salmonella*, *Shigella*, and *E. coli*. Pure honey can help in the formation of granulation tissue and repair damage (Mieles et al., 2022). The prebiotic effect of honey also stimulates the growth of beneficial gut flora by promoting adhesion to intestinal mucosal enterocytes (Kowalska et al., 2024). The World Health Organization (WHO) also recommends managing diarrhoea primarily with rehydration fluids (WHO, 2024). Although oral rehydration salts (ORS) significantly reduce the risk of death caused by diarrhoea, they do not affect the frequency of diarrhoea. One emphasized traditional approach in diarrhoea treatment is honey. Honey is a rich source of nutrients, containing carbohydrates, enzymes, amino acids, organic acids, minerals, and aromatic compounds. Honey has antibacterial effects on intestinal bacteria that cause diarrhoea, such as *Salmonella*, *Shigella*, *E. coli*, and *Vibrio cholerae*.

The mineral and carbohydrate content in honey can act as a rehydration therapy that helps reduce diarrhoea. The glucose in honey aids in the reabsorption of water and electrolytes secreted into the intestines during diarrhoea. This occurs through a co-transport mechanism between sodium and glucose. Additionally, this process improves water reabsorption in the intestines by reducing water concentration in the intestinal lumen, leading to improved stool consistency during diarrhoea episodes. Honey can be used to treat diarrhoea due to its antibacterial properties and easily digestible nutrients. Another benefit of honey is its ability to help replace lost body fluids due to diarrhoea. The primary therapy for diarrhoea is to replace lost fluids to prevent dehydration, typically using oral rehydration salts. Sugar in ORS enhances salt absorption. Replacing sugar with honey in oral rehydration therapy is found to be more beneficial, as honey contains fructose which increases water absorption and reduces sodium absorption, preventing sodium overload in the body. Additionally, fructose boosts potassium absorption, whereas sugar reduces it. Research has shown that administering honey positively impacts reducing defecation frequency and improving stool consistency in children with acute diarrhoea.

Conclusion

The evaluation conducted over three sessions showed that one nursing diagnosis was successfully resolved, namely diarrhoea related to intestinal malabsorption. This was evidenced by patient's cooperative behaviour and the mother's willingness to participate in the nursing care process. The mother provided non-pharmacological therapy using honey, which proved to be highly effective in managing diarrhoea throughout the three-day nursing care process. Honey's antibacterial effects against intestinal bacteria that cause diarrhoea, such as *Shigella*, *Salmonella*, *E. coli*, and *Vibrio cholerae*, contributed to its efficacy. Additionally, honey's sweet taste makes it more appealing to children, rendering it a suitable complementary treatment alongside medication. This innovative case of honey therapy administration enables the author to contribute knowledge to the field, highlighting the potential benefits of honey as a therapeutic agent in managing diarrhoea in children.

References

- Alaerjani, W. M. A., Abu-Melha, S., Alshareef, R. M. H., Al-Farhan, B. S., Ghramh, H. A., Al-Shehri, B. M. A., Bajaber, M. A., Khan, K. A., Alrooqi, M. M., Modawe, G. A., & Mohammed, M. E. A. (2022). Biochemical Reactions and Their Biological Contributions in Honey. *Molecules*, 27(15), 4719. <https://doi.org/10.3390/molecules27154719>
- Guerrant, R. L., Oriá, R. B., Moore, S. R., Oriá, M. O., & Lima, A. A. (2008). Malnutrition as an enteric infectious disease with long-term effects on child development. *Nutrition reviews*, 66(9), 487–505. <https://doi.org/10.1111/j.1753-4887.2008.00082.x>
- Hawash, Y. A., Ismail, K. A., & Almehmadi, M. (2017). High Frequency of Enteric Protozoan, Viral, and Bacterial Potential Pathogens in Community-Acquired Acute Diarrheal Episodes: Evidence Based on Results of Luminex Gastrointestinal Pathogen Panel Assay. *The Korean journal of parasitology*, 55(5), 513–521. <https://doi.org/10.3347/kjp.2017.55.5.513>
- Ihara, E., Manabe, N., Ohkubo, H., Ogasawara, N., Ogino, H., Kakimoto, K., Kanazawa, M., Kawahara, H., Kusano, C., Kuribayashi, S., Sawada, A., Takagi, T., Takano, S., Tomita, T., Noake, T., Hojo, M., Hokari, R., Masaoka, T., Machida, T., Misawa, N., ... Higuchi, K. (2024). Evidence-Based Clinical Guidelines for Chronic Diarrhea 2023. *Digestion*, 105(6), 480–497. <https://doi.org/10.1159/000541121>
- Kassym, L., Kussainova, A., Semenova, Y., & McLoone, P. (2024). Antimicrobial Effect of Honey Phenolic Compounds against *E. coli*-An In Vitro Study. *Pharmaceuticals*, 17(5), 560. <https://doi.org/10.3390/ph17050560>
- Kowalska, G., Rosicka-Kaczmarek, J., Miśkiewicz, K., Nowak, A., Motyl, I., Oracz, J., Brzozowska, A., Grzegorzczak, A., & Świniarska, Z. (2024). Influence of Novel Microcapsulates of Bee Products on Gut Microbiota Modulation and Their Prebiotic and Pro-Adhesive Properties. *Molecules*, 29(12), 2751. <https://doi.org/10.3390/molecules29122751>

- Liang, D., Wang, L., Liu, S., Li, S., Zhou, X., Xiao, Y., Zhong, P., Chen, Y., Wang, C., Xu, S., Su, J., Luo, Z., Ke, C., & Lai, Y. (2024). Global Incidence of Diarrheal Diseases-An Update Using an Interpretable Predictive Model Based on XGBoost and SHAP: A Systematic Analysis. *Nutrients*, 16(18), 3217. <https://doi.org/10.3390/nu16183217>
- Mahyar, A., Ayazi, P., Shaftaroni, M. R., Oveisi, S., Dalirani, R., & Esmaeili, S. (2022). The Effect of Adding Honey to Zinc in the Treatment of Diarrhea in Children. *Korean journal of family medicine*, 43(3), 188–192. <https://doi.org/10.4082/kjfm.21.0080>
- Meyer, R., Arpe, L., Kansu, A., Kelly, V., Lindley, K., O'Meara, M., Del Carmen Rivero, M., van Zundert, S., Vicente-Santamaría, S., Žaja, O., Oliveros, E., Olivier, L., & Joosten, K. (2025). Gastrointestinal changes in paediatric malnutrition that may impact on nutrition choice. *Frontiers in pediatrics*, 13, 1523613. <https://doi.org/10.3389/fped.2025.1523613>
- Mieles, Y. J., Vyas, C., Aslan, E., Humphreys, G., Diver, C., & Bartolo, P. (2022). Honey: An Advanced Antimicrobial and Wound Healing Biomaterial for Tissue Engineering Applications. *Pharmaceutics*, 14(8), 1663. <https://doi.org/10.3390/pharmaceutics14081663>
- Mokomane, M., Kasvosve, I., de Melo, E., Pernica, J. M., & Goldfarb, D. M. (2018). 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>
- Ogwu, M. C., & Izah, S. C. (2025). Honey as a Natural Antimicrobial. *Antibiotics*, 14(3), 255. <https://doi.org/10.3390/antibiotics14030255>
- Schell, K. R., Fernandes, K. E., Shanahan, E., Wilson, I., Blair, S. E., Carter, D. A., & Cokcetin, N. N. (2022). The Potential of Honey as a Prebiotic Food to Re-engineer the Gut Microbiome Toward a Healthy State. *Frontiers in nutrition*, 9, 957932. <https://doi.org/10.3389/fnut.2022.957932>
- Shane, A. L., Mody, R. K., Crump, J. A., Tarr, P. I., Steiner, T. S., Kotloff, K., Langley, J. M., Wanke, C., Warren, C. A., Cheng, A. C., Cantey, J., & 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>
- Shariatpanahi, V. Z., Jamshidi, F., Nasrollahzadeh, J., Amiri, Z., & Teymourian, H. (2018). Effect of Honey on Diarrhea and Fecal Microbiota in Critically Ill Tube-Fed Patients: A Single Center Randomized Controlled Study. *Anesthesiology and pain medicine*, 8(1), e62889. <https://doi.org/10.5812/aapm.62889>
- Ullah, M. K., Dayam, F., Ahmed, A., Ahmad, S., Munawar, M., Jahangir, S., Daftani, M. H., Ali, Z., Kakar, B., Farooq, A., & Ullah, N. (2024). A Multidisciplinary Approach in the Management of Infectious Diarrhea in the Emergency Department. *Cureus*, 16(8), e67788. <https://doi.org/10.7759/cureus.67788>
- WHO. (2024, March 7). *Diarrhoeal Disease*. Who.int; World Health Organization: WHO. <https://www.who.int/news-room/fact-sheets/detail/diarrhoeal-disease>