

Section: General Nursing

Guava leaf infusion for patients with acute diarrhoea

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Abstract

Diarrhoea is one of the main causes of death in various countries including Indonesia, both due to the poor condition of basic sanitation, physical environment and low community behaviour for clean and healthy living. The potential of guava leaves as an immunostimulatory agent is influenced by the type of active compounds that can contribute to immunostimulatory activity that is useful as a treatment for diarrhoea. The potential of guava leaf extract as an immunostimulatory agent is influenced by the type of active compounds that contribute to immunostimulatory activity not only polyphenol antioxidants. The high content of polyphenol and antioxidant compounds in guava leaves and high immunostimulatory activity can make guava leaves an excellent source of active compounds for additives of functional immunostimulatory ingredients. Guava leaves have great potential to be developed as functional ingredients. Guava leaves are widely available and the compounds in guava leaves are naturally occurring, and their extraction is relatively cost-effective. The purpose of this case study was to determine the effectiveness of guava leaf administration on the frequency of diarrhoea after being carried out for 3 days. Mrs. A, 22 years old, complained of loose stools 10x/day, when active and walking a lot, the patient complained of dizziness and nausea, vomiting, and abdominal discomfort. The patient's vital signs were blood pressure 112/83 mmHg, temperature 36.5 °C, pulse 112 x/minute and respiration 20 x/minute. The administration of guava leaf infusion to patients with diarrhoea has proven effective, as seen from the results of the implementation given for 3 days, the patient's bowel movement frequency decreased and stool consistency improved.

Keywords: Complementary therapy, diarrhoea, guava leaves, nursing care, symptoms management

Introduction

Diarrhoea is one of the most common debilitating infections that affects people of all age groups worldwide (Casburn-Jones & Farthing, 2004). Infectious diarrhoea is caused by various pathogens as the most common enteropathogenesis are *rotavirus*, *escherichia coli*, *Shigella sp.*, *Vibrio cholerae*, *Salmonella sp.*, *Campylobacter jejuni*, and *Cryptosporidium*. Acute diarrhoea is a type that lasts for a short time (Gore & Surawicz, 2003). Acute diarrhoea in adults is a common health problem, and many cases are associated with bacteria. This condition usually lasts about one or two days, but it can also last longer. A more serious issue is indicated by diarrhoea that persists for more than a few days. Acute diarrhoea can result in severe fluid loss if treatment is not received, which can cause problems and dehydration (Drancourt, 2017). It is critical that everyone recognizes troubling signs and seeks immediate treatment due to the serious repercussions of diarrhoeal complications. Treatment of acute diarrhoea depends on the suspected or known cause. In cases of acute diarrhoea, adjunctive loperamide therapy with antibiotics has been shown to increase the likelihood of clinical recovery within 24 and 48 hours.

Diarrhoea requires immediate treatment. When left untreated, it can lead to serious complications such as dehydration, electrolyte imbalances, and even organ damage. A natural resource is guava leaves, believed to contain active compounds like tannins and flavonoids that can help reduce diarrhoea symptoms, including frequent bowel movements. Guava leaves, which are rich in compounds such as alkaloids, flavonoids, tannins, phenolics, quinones, and saponins, have the potential to treat diarrhoea (Birdi et al., 2020; Liu et al., 2024; Gupta & Birdi, 2015). Furthermore, a 50% concentration of guava extract exhibited antibacterial properties, effectively inhibiting *E. coli*. Traditionally, diarrhoea medication is made from guava leaves. People commonly use guava leaves as a herbal remedy to treat digestive disorders by boiling 10 leaves in 2 cups of water for 15 minutes. Although these leaves can be processed as an antidiarrheal, Indonesians have not yet fully utilized this natural product. Lack of knowledge about how to utilize natural resources is one factor that causes people to prefer non-herbal medicines. The flavonoids present in guava leaf extract primarily determine its antibacterial activity, while quercetin, the most dominant flavonoid in guava leaves, exhibits potent antidiarrheal activity. Quercetin's antidiarrheal activity is attributed to its relaxing effect on the intestinal muscle layer, which prevents intestinal contractions.

A study conducted a case study on the application of guava leaf infusion to reduce diarrhoea, which was proven effective based on observations of clients who had solid bowel movements (Efrianty et al., 2022). The results of this study confirmed that the effects of guava leaf content have the most effective antidiarrheal activity in reducing epithelial cell colonization and enterotoxin production in bacteria that have the potential to cause diarrhoea. This is because guava leaves contain quercetin which can inhibit the release of acetylcholine which can increase intestinal contractions due to irritation by diarrhoea-causing bacteria and tannins which act as chelators by providing a spasmolytic effect, resulting in intestinal contraction and decreased peristalsis.

Case Description

Ms. A is 22 years old was taken to Tidar Regional Hospital on March 17, 2025. Ms. A's medical diagnosis was acute diarrhoea. From the assessment conducted on March 17, 2025, the results obtained Ms. A experienced the main complaint of feeling weak, dizzy when walking, nausea, vomiting and diarrhoea for 2 days and was taken to the hospital's emergency room on March 17, 2025. The patient complained of loose stools 10x / day, if there is a lot of activity and walking the patient complained of dizziness and accompanied by nausea, vomiting, stomach discomfort. The patient's vital signs are blood pressure 112/83 mmHg, temperature 36.5 °C, pulse 112 x / minute and respiration 20 x / minute. The patient has no history of genetic disease or other illness and no history of previous treatment. The treatment currently given is an infusion of asering 20 tpm, omeprazole injection 2x40 gr, mersibion injection 2x1 amp, arcapec tablet 3x2 tab, Inj. Metronidazole 3x500 mg IV. The patient's conjunctivae are not anemic, and the oral mucosa is dry due to excessive fluid loss. Skin turgor is elastic and appears dry. The patient remains weak and lies down frequently. The patient experiences gastrointestinal elimination problems. The patient has 4-5 loose bowel movements per day. The skin appears less moist, with skin turgor lasting less than 2 seconds, and feels warm. Patients experience sleep disturbances due to persistent stomach cramps, requiring frequent bathroom trips, resulting in irregular sleep patterns. Nurses and family members assist with daily activities such as eating, toileting, personal hygiene, and dressing. Clinical laboratory blood test findings revealed a normal haemoglobin level of 15.5 g/dL, a higher-than-normal leukocyte/white blood cell count of 12.5 that suggested an infection process, and a drop in serum sodium to 132 mEq/L in the blood electrolyte level analysis. In the stool examination, the results showed positive leukocytes, 3 positive bacteria which in normal examination should not be found with a liquid consistency and yellowish colour.

From the assessment data, a nursing diagnosis of diarrhoea related to the infection process can be established (D.0020) with sign of the patient said he was weak, had loose stools 5 times a day, had stomach cramps and was uncomfortable, the patient looked weak lying down, had loose stools >3 times a day, and the stool consistency was loose. In the diagnosis of diarrhoea related to the infection process, based on SLKI (Indonesian Nursing Outcome Standards), it is expected that the problem will be resolved with the faecal elimination outcome criteria (L.04033) for 3x24 hours of implementation with the aim of increasing faecal excretion control indicators, improving stool consistency, improving bowel frequency and improving intestinal peristalsis. The intervention carried out to achieve these outcome criteria based on SIKI (Indonesian Nursing Intervention Standards) is diarrhoea management (I.03101). Implementation given to patients for 3x24 hours takes several actions based on SIKI, namely identifying the cause of diarrhoea (e.g. gastrointestinal inflammation, gastrointestinal irritation, infection process, malabsorption, anxiety, stress, medication, giving milk bottles), monitoring the colour, volume, frequency, and consistency of faeces, monitoring signs and symptoms of hypovolemia (e.g. tachycardia, weak pulse, decreased blood pressure, decreased skin turgor, dry skin mucosa, slow CRT, decreased weight), monitoring the amount and output of diarrhoea, providing oral fluid intake (e.g. sugar salt solution, oralit, Pedialyte, renalyte), providing intravenous fluids (e.g. ringer acetate, ringer lactate), if necessary, recommending small and frequent meals gradually, recommending avoiding gas-forming, spicy, and lactose-containing foods, collaborating on giving antimotility drugs with guava leaf infusion, collaborating on giving antispasmodics/spasmolytics, collaborating on giving stool hardening drugs.

The authors collaborated to provide complementary therapy, namely a guava leaf infusion, which acts as an antispasmodic and can help treat the patient's diarrhoea. The guava leaf infusion was given to the patient twice daily for three days. Administering antimotility drugs with guava leaf infusion in the morning after taking medication. In theory, the dose in the human body should be constant, usually two hours before or four hours after other medications. After six hours, the blood concentration drops, necessitating another dose. The dose should be constant, and if the interval is inconsistent, the concentration will fluctuate. The patient had a soft, brownish-yellow bowel movement once a day, and the author observed the colour, frequency, and consistency of the stool on the third and last day of implementation. The patient's skin mucosa improved, and a weak pulse was found when the author checked for signs and symptoms of hypovolemia.

The patient reported feeling better, with no more cramps, burning, or heartburn, after consuming guava leaves. Less than three bowel movements per day indicated that the patient's acute diarrhoea had subsided, but the stool's composition remained loose. The patient experienced five loose bowel motions per day on the first day of examination on March 17, 2025. Following medicine and guava leaf infusion, the SLKI target started to rise. The patient continued to report having diarrhoea four times a day on the second day of implementation, but he claimed that after receiving medication and guava leaf infusion, his stomach no longer cramped and that he felt better. The patient stopped

complaining of diarrhoea and only had one morning bowel movement on the third day of treatment, indicating that the medication was effective in reaching the goal established by the SLKI.

Discussion

The assessment results showed that Mrs. A, a patient with diarrhoea, complained of loose stools 10 times a day, feeling weak and lethargic, experiencing nausea and vomiting, and difficulty sleeping. She felt anxious about having to use the bathroom frequently. The assessment findings indicated that the patient required immediate treatment to prevent further complications. In adulthood, health problems can arise due to stress and poor lifestyle habits, which can manifest as abdominal pain, diarrhoea, and other gastrointestinal symptoms (Guthrie & Thompson, 2002). This can exacerbate existing digestive disorders. Sensory nerves in the digestive system are connected to sensory nerves in the brain. When things are not going well, it can manifest patient's physics. Furthermore, acute and chronic gastrointestinal (GI) conditions also contribute to diarrhoea. Common causes of acute diarrhoea in patients include stomach and intestinal (gastrointestinal) infections (Graves, 2013), changes in nutritional habits (loss of anorexia), and vomiting. These pathogenic microorganisms can disrupt the normal balance of fluid and electrolytes in the intestine, which leads to increased secretion or reduced fluid absorption, leading to free stool or diarrhoea. Nausea in patients with diarrhoea can arise because diarrhoea can cause inflammation of the stomach and intestines, triggering excess fluid production and abdominal discomfort. Dehydration is common because diarrhoea causes the body to lose fluids and electrolytes faster than they can be replaced, especially if the diarrhoea is accompanied by vomiting (Florez et al., 2023). The intestines cannot absorb water properly, so fluid is excreted in loose stools. This excessive fluid loss, if not promptly addressed, can lead to dehydration. Dehydration in patients can also cause nausea. Viral, bacterial, or parasitic infections can irritate the stomach and intestines, causing nausea and vomiting. Signs include dry skin and dizziness. Frequent or chronic constipation can be debilitating and can arise from an unhealthy diet or insufficient exercise. Symptoms can include hard stools, abdominal pain, and irritability. Food allergies manifest as GI pain, diarrhoea, vomiting, and other related symptoms. Most cases are caused by viral infections. In secretory diarrhoea, bacterial and viral infections are common causes. In this case, loose stools are caused by injury to the intestinal epithelium. Epithelial cells line the intestinal tract and facilitate the absorption of water, electrolytes, and other solutes. Infectious aetiologies cause damage to the epithelial cells, leading to increased intestinal permeability. Damaged epithelial cells cannot absorb water from the intestinal lumen, resulting in loose stools.

Diarrhoea has major subjective signs and symptoms, such as the patient complaining of weakness and stomach cramps. Meanwhile, major objective symptoms and signs include grimacing, restlessness, increased pulse rate, and defecation >3 times in 24 hours. Regarding the cause/aetiology of the patient's diarrhoea, the author concludes that it is due to an infectious process caused by food intolerance, which also results in nausea and vomiting. Ms. A has the potential for excessive fluid loss. After being given guava leaf infusion, the patient's bowel movements decreased, but she still experienced diarrhoea on the second day of treatment. Therefore, interventions to manage diarrhoea can be implemented independently to improve stool consistency and reduce diarrhoea frequency. Therefore, the results of this assessment provide an important overview of the patient's diarrhoea and inform the planning of nursing interventions. The role of nurses in managing elimination disorders through a therapeutic approach and providing complementary interventions is part of the management carried out. The interventions provided to the patient received support from the patient's family, which influenced the patient's healing process. Diarrhoea nursing problems (D.0020) can be given a diarrhoea management nursing plan (I.03101) namely providing oral fluid intake (sugar salt solution, oralit, Pedialyte, renalyte), providing intravenous fluids (eg: ringer acetate, ringer lactate), recommending avoiding gas-forming, spicy, and lactose-containing foods, collaboration in administering antimotility drugs (eg: loperamide, diphenoxylate), collaboration in administering antispasmodics/spasmolytics (eg: papaverine, belladonna extract, mebeverine) and collaboration in administering stool hardening drugs (eg: atapugite, smectite, kaolin-pectin). As a complementary or complementary therapy, diarrhoea can be overcome with traditional medicine giving guava leaf infusion. The author took the nursing plan and applied it to the patient based on the signs and symptoms that appeared and the patient's problem-solving needs. This implementation was carried out as a complementary therapy and the results obtained were a decrease in the frequency of diarrhoea in Ms. A on the 2nd day of implementation.

After being given guava leaf infusion, the patient's frequency of bowel movements decreased, but the patient still experienced diarrhoea on the second day of implementation. Therefore, interventions to manage diarrhoea can be carried out independently to improve stool consistency and reduce diarrhoea frequency. Therefore, the results of this assessment provide an important overview of the patient's diarrhoea and form the basis for planning nursing interventions. On initial assessment, the patient appeared lethargic, pale, and had dry mucous membranes due to diarrhoea and fluid and electrolyte imbalance. Diarrhoea can cause dehydration because more fluid is lost than usual. It can also cause an imbalance in electrolytes (salts and minerals needed by the body to function properly). Ongoing diarrhoea can make it difficult to absorb nutrients from food and can lead to malnutrition. Modulating the immune response using medicinal plant products as a possible therapeutic measure has been the subject of active scientific investigation. On the first day of implementation, the patient complained of diarrhoea five times a day. The patient underwent nursing care and was given complementary therapy, including guava leaf infusion. On the second day, the

patient's diarrhoea decreased to four times a day. Data obtained indicated that the patient was still weak and her stomach was starting to feel better. Examination results showed a blood pressure of 110/79 mmHg, pulse rate of 85 beats/minute, and respiratory rate of 20 breaths/minute. On the final day of implementation, the patient reported no diarrhoea, had one loose stool, decreased weakness, and no nausea or vomiting. Objective data revealed no dryness of the oral mucosa, and the patient appeared to have improved, less weak than before. Vital signs showed a blood pressure of 120/80 mmHg, pulse rate of 83 beats/minute, and respiratory rate of 20 breaths/minute.

Several studies have found the potential of guava leaves as an immunostimulant containing active compounds that play a role in enhancing the body's immune system. The effectiveness of guava leaf extract in treating various diseases has been scientifically proven, but the mechanisms are not yet fully elucidated. In general, the biological properties of guava have been attributed to its polyphenolic compounds, such as protocatechuic acid, ferulic acid, ascorbic acid, gallic acid, caffeic acid, and quercetin. Polyphenols are secondary metabolites of plants. There is considerable interest in the potential health benefits of dietary plant polyphenols as antioxidants. Polyphenolic compounds in guava fruit and leaf extracts can act as immunostimulants, which can lead to an increase in the immune system. Improving the immune system can protect the body from various infectious diseases. A well-functioning immune system is essential for maintaining health. Therefore, the potential of natural substances to strengthen the immune system as immunostimulants. Immunostimulants from natural substances can enhance specific immune responses. The potential of guava leaf extract as an immunostimulant agent is influenced by the type of active compound. The active compounds in guava leaf extract that contribute to immunostimulant activity may not be solely polyphenol antioxidants. Guava leaves have a high content of polyphenolic compounds and antioxidants, and high immunostimulatory activity. Tannins have astringent or antiseptic properties. Astringents precipitate proteins in the mucous membrane and reduce intestinal motility. Antiseptics may also have some antibacterial effects. Pectin coats the digestive tract by forming a thin layer over the mucous membrane. Essential oils have antiseptic and antispasmodic properties. Tannins and essential oils are mostly found in the young leaves of *Psidium guajava* L. Therefore, young leaves of *Psidium guajava* L. are suitable in the treatment of diarrhoea. Therefore, it can be stated that guava leaves are an excellent source of active compounds for immunostimulant functional ingredient additives. Guava leaves have great potential to be developed as a functional ingredient. Guava leaves are widely available, the compounds in guava leaves are naturally occurring, and their extraction is relatively cost-effective.

Conclusion

The administration of guava leaves to patients was considered effective, as seen in the objective changes observed within three days. The guava leaf infusion was prepared using seven fresh, clean leaves, placed in a cup of teapot. Afterward, boiling water was poured into the cup and steeped for 5-10 minutes. The leaves were then strained and honey or lemon was added for a slight sweetener. The guava leaf infusion was administered twice daily for three days, and its antispasmodic effect effectively reduced the frequency of diarrhoea. By the third day, the patient had no diarrhoea and only experienced loose stools. Based on the results of the implementation given to patients, it can be concluded that guava leaves demonstrate strong antidiarrhoeal efficacy. Guava leaves, as a traditional remedy for treating diarrhoea, have been shown to reduce the frequency of bowel movements and improve stool consistency. Guava leaves have shown potential in treating diarrhoea due to their active compounds, particularly tannins and flavonoids, which have antidiarrhoeal properties. These compounds are believed to reduce the frequency of bowel movements and improve stool consistency.

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