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Effect of Guava Leaf Infusion on Diarrhea Frequency at Kalirejo Public Health Center

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ABSTRACT

Introduction: Diarrhea remains a major public health concern in Indonesia, particularly in rural areas. It is commonly caused by consuming food or drinks contaminated with microorganisms. While conventional treatments such as oral rehydration solutions and zinc are widely used, traditional herbal remedies like guava leaves (Psidium guajava) are increasingly gaining attention due to their antidiarrheal properties.
Objective: This study aimed to examine the effect of guava leaf infusion on reducing the frequency of diarrhea among patients at Kalirejo Public Health Center, Negeri Katon District, in 2024.
Method: A quasi-experimental study was conducted with two groups: an intervention group receiving guava leaf infusion and a control group receiving standard care. Thirty diarrhea patients were selected using accidental sampling and divided equally into both groups. The frequency of diarrhea was recorded before and after treatment.
Result: The intervention group showed a greater reduction in diarrhea frequency, from a mean of 7.33 to 5.47 episodes per day (mean reduction of 1.87). The control group experienced a smaller decrease from 7.07 to 6.20 episodes per day (mean reduction of 0.80). Statistical analysis revealed a significant difference between groups (ρ = 0.001), indicating the effectiveness of guava leaf infusion.
Conclusion: Guava leaf infusion significantly reduces the frequency of diarrhea, supporting its use as an effective complementary therapy. It offers a natural, accessible, and low-cost treatment option, especially in areas with abundant guava plants. Further research is recommended to explore additional herbal remedies and underlying causes of diarrhea in similar settings.

Keywords: diarrhea, guava leaf, psidium guajava

Introduction

Diarrhea is defined as the passage of three or more loose or watery stools per day, or more frequently than is normal for an individual. It is important to note that the frequent passage of formed stools is not considered diarrhoea, nor is the passage of loose, mushy stools in breastfed infants. Diarrhoea is typically a symptom of an infection in the intestinal tract caused by a variety of bacterial, viral, or parasitic organisms. Transmission occurs primarily through the ingestion of contaminated food or drinking water, or via person-to-person contact due to inadequate hygiene practices (World Health Organisation, 2024).

Globally, diarrhoeal disease is the third leading cause of mortality, with an estimated 2.4 billion cases annually—1.7 billion in children and 800 million in adults. The condition may persist for several days, potentially resulting in severe dehydration and loss of essential electrolytes, which can be fatal if untreated. Although dehydration was historically the principal cause of diarrhoea-related mortality, recent data suggest that septic bacterial infections are increasingly contributing to such deaths. Vulnerable populations, particularly malnourished children, individuals with compromised immune systems, and those living with HIV, face the highest risk of life-threatening diarrhoea (World Health Organisation, 2024).

In Indonesia, the prevalence of diarrhoea remains a major public health concern. In Lampung Province alone, there were 32,148 reported cases in 2018 (Riskesdas, 2018). By 2023, this number had decreased to 29,331 cases, ranking Lampung as the province with the 8th highest incidence of diarrhoea in Indonesia (Indonesian Health Survey, 2023). In Pesawaran District, diarrhoea cases totaled 4,953 in 2022, with Kedondong Sub-district reporting the highest number (804 cases), while Marga Punduh had the fewest (118 cases). In 2023, total cases declined slightly to 4,551, with Gedong Tataan Sub-district recording the highest incidence (759 cases), and Marga Punduh the lowest (143 cases). Negeri Katon Sub-district experienced an increase in diarrhoea cases, from 403 in 2022 to 523 in 2023 (BPS Pesawaran, 2024).

Management of diarrhoea typically involves pharmacological approaches, such as the use of antidiarrhoeal medications. However, non-pharmacological or traditional remedies are also widely practiced, including the consumption of oral rehydration solutions (ORS), herbal teas, ginger, bananas, kefir, and guava leaves (Hidayat et al., 2022). Among these, guava leaves (Psidium guajava) have drawn particular interest due to their rich phytochemical content, which has not yet been optimally utilized in public health applications (Aktono, 2020).

Guava leaves contain tannins, flavonoids, and alkaloids. The antidiarrhoeal effect is primarily attributed to tannins, which possess spasmolytic properties that reduce intestinal peristalsis, thereby decreasing bowel movement frequency. Tannins interact with proteins in the mucosal lining to form cross-links, resulting in a denser and less permeable mucosa—a mechanism known as adstringensia. This process inhibits the growth of pathogenic bacteria, including *Staphylococcus aureus*, contributing to firmer stool consistency. Additionally, the alkaloid content in guava leaves exhibits antibacterial activity through its acidic properties.

In many regions of Indonesia, including the Kalirejo Public Health Center service area in Negeri Katon District, local communities often resort to herbal remedies for managing diarrhoea. According to data from the Negeri Katon Public Health Center, there were 120 cases of diarrhoea recorded between January and October 2024. Given this relatively high number, researchers identified the need to explore alternative treatments that complement conventional medical therapy. The abundance of guava trees in the area presents an opportunity to harness local natural resources for public health interventions.

Objective

This study aimed to examine the effect of guava leaf infusion on reducing the frequency of diarrhea among patients at Kalirejo Public Health Center, Negeri Katon District, in 2024.

Method

This study employed a quasi-experimental design with a two-group approach, comprising an intervention group and a control group. The population consisted of 120 patients diagnosed with diarrhoea in the working area of the Kalirejo Public Health Center. The sampling technique used was accidental sampling, which involves selecting subjects who meet the inclusion criteria and are available during the study period. A total sample of 30 participants was obtained, divided equally between the two groups.

Result

This study assessed the effect of guava leaf (Psidium guajava) infusion on the frequency of diarrhea in patients at the Kalirejo Public Health Center, Negeri Katon District. The data compared the average frequency of diarrhea before and after treatment in both the intervention and control groups.

Table 1. Comparison of Mean Frequency of Diarrhea Before and After Treatment in Intervention and Control Groups

Group	Time Point	Mean	Std. Deviation	Mean Difference
Intervention Group	Before Intervention	7.33	0.976	1.87
Intervention Group	After Intervention	5.47	1.060	
Control Group	Before (No Intervention)	7.07	1.033	0.80
Control Group	After (No Intervention)	6.20	1.373	

As shown in Table 1, the intervention group experienced a notable reduction in diarrhea frequency from a mean of 7.33 times per day to 5.47 times per day after receiving guava leaf infusion, reflecting a mean decrease of 1.87 episodes/day. In contrast, the control group showed a smaller reduction from 7.07 to 6.20 episodes per day, with a mean difference of 0.80 episodes/day.

Table 2. Effect of Guava Leaf (Psidium guajava) Infusion on the Frequency of Diarrhea

Group	Mean Reduction	Std. Deviation	ρ-value
Control Group	0.80	0.775	0.001
Intervention Group	1.87	0.743	

Based on Table 2, the statistical test yielded a ρ-value of 0.001, indicating a significant difference in the reduction of diarrhea frequency between the two groups ($p < 0.05$). Thus,

the administration of guava leaf infusion had a significant effect in reducing diarrhea frequency, supporting the acceptance of the alternative hypothesis (H_a).

Discussion

Diarrhea is a common gastrointestinal disorder characterized by frequent loose or watery bowel movements occurring more than three times per day. This condition is predominantly caused by the ingestion of food or beverages contaminated with pathogenic microorganisms such as viruses, bacteria, or parasites. Although acute diarrhea often resolves with self-care, in some cases, medical treatment is necessary, especially when symptoms persist or are accompanied by dehydration or severe abdominal distress (Yulia et al., 2024).

In Indonesia, particularly in developing regions, diarrhea remains a significant public health concern due to its high morbidity and mortality rates (Supriadi et al., 2020). A major contributing factor is the widespread practice of consuming street food, which often lacks adequate hygiene controls. Street foods may be exposed to contaminants such as dust and pollutants, increasing the risk of gastrointestinal infections. Interventions aimed at preventing diarrhea, including improved sanitation, access to clean drinking water, and the practice of handwashing with soap, have been shown to reduce the incidence of diarrheal disease substantially .

World Health Organization recommends treating diarrhea with oral rehydration solution (ORS) composed of clean water, sugar, and salt to replace lost fluids and electrolytes. In addition, zinc supplementation for 10–14 days has been demonstrated to shorten the duration of diarrhea and improve clinical outcomes. However, the use of herbal remedies also plays a vital role in traditional and complementary medicine, particularly in rural or resource-limited settings (World Health Organisation, 2024) .

Guava leaves (Psidium guajava), derived from the Myrtaceae family, have long been used in traditional medicine for their antidiarrheal properties. Guava leaves contain several bioactive compounds, including tannins, flavonoids, saponins, and alkaloids. Among these, tannins are primarily responsible for their antidiarrheal effects. Tannins exert a spasmolytic effect, reducing intestinal peristalsis and thereby decreasing the frequency of defecation (Faiha, 2019). When tannins interact with mucosal proteins, they form complexes that reduce mucosal permeability and protect against irritation. This effect also inhibits the proliferation of *Staphylococcus aureus*, a bacterium commonly associated with intestinal infections (Aktono, 2020).

Furthermore, alkaloids present in guava leaves contribute antibacterial activity due to their acidic nature, which helps to eliminate pathogenic bacteria. Flavonoids and carotenoids also play roles in strengthening immune responses and further supporting antibacterial actions. These mechanisms together help to solidify feces and reduce the severity and frequency of diarrhea (Apriliani, 2019).

The findings of this study reinforce previous evidence regarding the efficacy of guava leaf infusion in treating diarrhea. The significant reduction in diarrhea frequency among the intervention group compared to the control group supports the hypothesis that guava leaves have a therapeutic effect. This is particularly beneficial for communities like those in the Kalirejo Health Center service area, where guava plants are abundant and readily accessible, offering a cost-effective and natural remedy for diarrhea management.

The varying characteristics of diarrhea patients observed in this study highlight the multifactorial causes of the disease, including environmental sanitation, food hygiene, and

personal behavior. The persistence of these risk factors among respondents suggests the need for comprehensive health education programs alongside herbal interventions. Moreover, the role of primary healthcare centers, such as Kalirejo Health Center, is critical in early diagnosis, treatment, and community health education to prevent the spread and recurrence of diarrheal disease.

Conclusion

Guava leaf infusion (Psidium guajava) is proven to be effective in reducing the frequency of diarrhea in patients at Kalirejo Health Center. Diarrhea sufferers were generally young adults, male, and had higher education levels. The intervention group showed a greater decrease in diarrhea frequency compared to the control group, with statistically significant results. It is recommended that the Health Center promote the use of guava leaves and involve Posyandu in education and planting efforts. Future studies should explore other natural remedies and factors contributing to diarrhea in the region.

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Authors' contribution

Each author contributed equally in all the parts of the research. All authors have critically reviewed and approved the final draft and are responsible for the content and similarity index of the manuscript.

Conflict of interest

The researchers stated that there is no conflict of interest related to the implementation and publication of the results of this research. The entire research process, from planning, data collection, analysis, to report preparation, was carried out independently without any influence or pressure from any third party. A commitment to research ethics is upheld throughout the research process, ensuring transparency, accuracy and honesty in reporting results. Respondents' participation was voluntary with informed consent, and their confidentiality and privacy were maintained in accordance with applicable research ethics standards. With this statement, researchers hope that the research results can be trusted and used as a valid reference for the development of science and health practices related to ethnomedicine and reproductive health.

Ethical consideration

Not applicable.

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