Review

Complementary Honey Therapy To Reduce The Frequency Of Diarrhea In Toddlers: Literature Review

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ABSTRACT

Background: *Diarrhea is a major health problem in children that still occurs frequently and even has the potential to become an outbreak (extraordinary event), which is often accompanied by death due to the release of fluid from the body caused by bacteria and causing dehydration in children. This literature review aims to determine the effect of honey complementary therapy on reducing the frequency of diarrhea in toddlers.*
Methods: *The method used in this article is a literature review using journal databases from Google Scholar, Pubmed, and Science Direct in the 2020-2023 period with the keywords "Diarrhea," "Honey Therapy," and "Children," resulting in 1,637 articles.*
Results: *Articles were selected according to the criteria, and the result was 15 articles ready to be reviewed. Providing complementary therapy with honey influences the frequency of diarrhea in children by giving it 3x5ml per day as long as the child has diarrhea until the frequency of diarrhea decreases.*
Conclusion: *This literature review shows that giving complementary honey therapy to children can reduce the frequency of diarrhea by inhibiting the growth and development of bacteria in the digestive system, helping to replace lost body fluids.*

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Introduction

Diarrhea is an endemic disease that is still often found in developing countries such as Indonesia, with high morbidity and mortality. Diarrhea is defined as a disease characterized by changes in the shape and consistency of feces from soft to liquid and an increase in the frequency of defecation more than three times a day (Saputri & Astuti, 2019).

Globally, there is an increase in cases of diarrhea, which causes death in children; WHO data (2017) states that almost 1.7 billion cases of diarrhea occur in children, with a death rate of around 525,000 in children under five each year (WHO, 2017; Wijayanti et al., 2023). In Indonesia, based on data from the Indonesian Ministry of Health, the prevalence of diarrhea in 2018 was 37.88% or around 1,516,438 cases in children under five. The prevalence

increased 2019 to 40% or around 1,591,944 cases in children under five (Directorate General of P2P, Indonesian Ministry of Health, 2022).

In general, diarrhea attacks toddlers more often because their immune system is still weak, and they are in the oral phase and tend to be more active in playing with foreign objects and putting them in their mouths, so toddlers are often vulnerable to the spread of bacteria that cause diarrhea (Wijayanti et al., 2023). Clinically, diarrhea can occur due to consuming food or drinks unknowingly contaminated by viruses or bacteria that can infect the intestines, causing diarrhea (WHO, 2016). Diarrhea in children is also influenced by maternal education, exclusive breastfeeding, food and drink sanitation hygiene, and behavioral factors seen from the scope of clean and healthy living behavior indicators (Melvani et al., 2019). Diarrhea can also be transmitted in 3 ways, namely through the environment through fecal or oral food or drink contaminated with germs, direct contact with the sufferer's dirty hands when touching food, through flies on uncovered food (Wijayanti et al., 2023). Apart from that, another way of transmitting diarrhea can also be the individual's behavior of not washing their hands or not using running water and soap before handling dirty or contaminated food or items.

Diarrhea can also be detrimental to the health of toddlers; many impacts arise due to diarrhea, including dehydration, acid and base imbalance, hypoglycemia, hypokalemia, nutritional status problems, and circulation problems (Adane et al., 2017). The homeostasis process will occur due to dehydration, resulting in an imbalance of fluids and electrolytes in the body. Dehydration can be prevented by consuming ORS (Oral Rehydration Salt), which can reduce the death rate (Kianmehr et al., 2016). Treating diarrhea Apart from using pharmacotherapy techniques, one can also use complementary techniques, namely using honey, which can be used to treat diarrhea because it has antibacterial effects and nutritional content that is easily digested (Suntin et al., 2021). Honey can inhibit 60 bacteria, fungi, and viruses that cause diarrhea (Samarghandian, Farkhondeh, & Samini, 2018; Andayani, 2020).

Methods

This article uses the literature review method. The article search was conducted in September-October 2023 using Science Direct, Pubmed, and Google Scholar journal databases. A systematic search for journal articles was carried out from the last three years, 2020-2023, using the search keywords "diarrhea, honey, and Children" to find relevant articles. Researchers will screen the articles from the selected references without exception based on the title and abstract so that they get more relevant articles.

The inclusion criteria for this systematic review were 1) respondents were pediatric patients with diarrhea, 2) the intervention focused on providing honey therapy, and 3) article selection did not limit methodological, population, and results. Meanwhile, the exclusion criteria for this systematic review are 1) research that is not related to honey therapy, 2) research that was not conducted on pediatric patients with diarrhea, 3) unpublished research such as final scientific work (thesis, dissertation), conference abstracts, and case study reports.

Articles that have been obtained from the database will be assessed using the PICO method by the inclusion and exclusion criteria, which contain 1) the Title of the article, 2) the Author and year of publication of the article, 3) the Research methodology

(population, sample, intervention, and analysis), 4) Research Results.

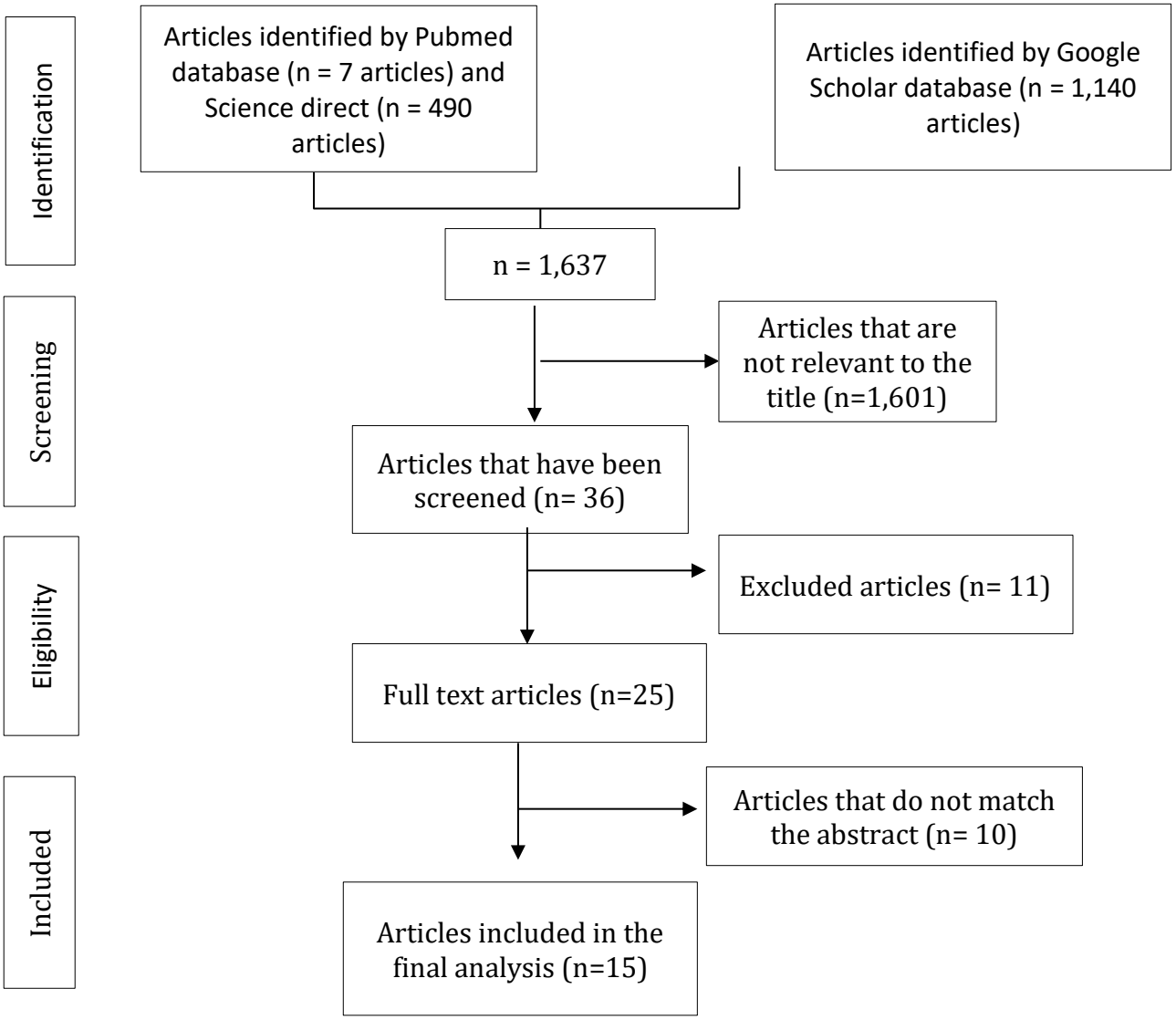

Figure 1. Literature Search Process

Results

The initial literature study found 1,637 articles (490 from science Direct, seven from Pubmed, and 1,140 from Google Scholar). After selection according to the inclusion criteria and removal of articles that were not suitable, 15 articles were reviewed.

Table 1. Data Distraction Method

No	Title, Author, and Year of Article Publication	Research Methodology (Design, Subjects, Variables, Instruments, Analysis)	Research result
1	Efek Suplementasi Madu terhadap Penurunan Frekuensi Diare Akut pada Anak di RSUD Dr. H. Abdul Moeloek Bandar Lampung (Meisuri et al., 2020)	**Design:** Quasi-Experimental with a non-equivalent control group design **Subject:** Child patients with diarrhea were divided into two groups, namely the intervention group and the control group, each group numbering 15 respondents **Variables:** giving honey supplementation and frequency of diarrhea **Instruments:** observation sheet on the frequency of diarrhea and procedures for giving honey orally 20 g/day divided into two times at 07.00 and 17.00 **Analysis:** unpaired samples t-test	- The results of the research on the first day between the control group and the intervention group showed no potential effect of honey supplementation on reducing the frequency of diarrhea with a p-value (0.408) > α (0.05) obtained. - On the second day, the mean was not much different between the control group and the intervention group; there was no potential effect of honey supplementation on reducing the frequency of diarrhea with a p-value (0.056) > α (0.05). - The third day produced a mean difference in the frequency of diarrhea between the intervention group and the control group with a p-value (0.005) < α (0.05) obtained. - On the fourth day, the mean difference in diarrhea frequency was quite large, namely two times in the intervention group and five times in the control group, with the obtained p-value (0.000) < α (0.05). - Measuring the frequency of diarrhea during the study resulted in a fairly large difference in the frequency of diarrhea, namely 19 times in the intervention group and 26 times in the control group, with a value of p (0.046) < α (0.05), indicating that there is a potential effect of honey

No	Title, Author, and Year of Article Publication	Research Methodology (Design, Subjects, Variables, Instruments, Analysis)	Research result
			supplementation on reducing acute diarrhea.
2	Pengaruh Pemberian Madu dan Oralit Terhadap Penurunan Frekuensi Diare Pada Balita Di BPM Ika Rianto (Wijayanti et al., 2023)	**Design:** Quasi-Experimental with two group pretest-posttest with control design **Subject:** Toddlers with diarrhea with a sample of 28 toddlers (14 treatment toddlers and 14 control toddlers) **Variables:** giving honey and ORS to reduce the frequency of diarrhea **Instrument:** questionnaire sheet **Analysis:** Wilcoxon and Man Withney	Based on the results of the Wilcoxon signed rank test, the statistical test was obtained = 0.001 < α (0.05), and the results of the Mann Whitney test statistical test obtained a value of p = 0.031, meaning the value of p < α (0.05), this shows that in the treatment group, there was an effect of giving honey and ORS as much as 3x5ml per day on reducing the frequency of diarrhea in toddlers.
3	Madu dapat Menurunkan Frekuensi Diare pada Anak (Nurjanah et al., 2022)	**Design:** Quasi-Experimental Design with non-equivalent control group pre-test post-test **Subject:** children who experienced diarrhea with a sample of 20 were divided into two groups (10 treatment groups and 10 control groups) **Variables:** honey and reducing the frequency of diarrhea **Instruments:** observation sheet **Analysis:** Wilcoxon signed the rank test	Results were obtained on the treatment group was -2.919 with a p-value of 0.003, p-value <0.05, and in the control group, it was -2.972 with a p-value of 0.004, p-value <0.05that there is an effect of giving honey on reducing diarrhea in children.
4	Madu sebagai Terapi Komplementer Mengatasi Diare pada Anak Balita (Andayani, 2020)	**Design:** Quasi-Experimental pre-test and post-test nonequivalent without a control group **Subject:** children with acute diarrhea with a sample size of 20 children **Variables:** Honey as a complementary therapy and treating diarrhea in children **Instruments:** questionnaire and observation sheet **Analysis:** paired t-test	The results obtained from the paired t-test (p<0.001) showed that the frequency of diarrhea decreased after giving honey therapy to children at 3x5ml per day as long as the child started being treated and until the child was allowed to go home.
5	Pengaruh Pemberian Madu terhadap Pola Defekasi Balita dengan Diare (Suryaningsih & Risma, 2023)	**Design:** pretest-posttest with control group **Subject:** toddlers with diarrhea totaling 34 respondents were divided into two groups (17	The results of the study showed that there was a significant change in defecation patterns in the control group with a value of p=0.004 and in the intervention group with a

No	Title, Author, and Year of Article Publication	Research Methodology (Design, Subjects, Variables, Instruments, Analysis)	Research result
		control groups and 17 intervention groups) **Variables:** giving honey and defecation patterns of toddlers **Instruments:** questionnaire Stool diary form and bristol stool chart form **Analysis:** Mc Nemar test	value of 0.002, which can be concluded that from the intervention in the control group giving water was also effective in improving defecation patterns. In contrast, the intervention in the intervention group was given honey 20ml/day, which also improved defecation patterns.
6	Terapi Komplementer Madu Pada Anak untuk Menurunkan Frekeunsi Diare (Suntin et al., 2021)	**Design:** Literature Review **Subject:**5 articles **Variables:** Honey Complementary Therapy and Diarrhea Frequency **Instruments:** Search for articles via Pubmed, EBSCO, Google Scholar, Scopus, and Science Direct database sources **Analysis:** Searches through journal databases were carried out using advanced search with full-text articles that met the inclusion criteria	The review of 5 articles that have been obtained shows that honey complementary therapy is effective in reducing the frequency of diarrhea by administering 3x5 ml/day for three days.
7	Terapi Pemberian Madu Untuk Menurunkan Frekuensi Diare Pada Anak Balita (Wulandari & Milindasari, 2023)	**Design:** Literature review **Subject:** 5 articles **Variables:** Honey administration and diarrhea frequency **Instruments:** Search for articles via the Google Scholar database and the Garuda portal **Analysis:** Searches through journal databases were carried out using advanced search with full-text articles that met the inclusion criteria	The results of a review of 5 articles in this literature review showed that honey therapy can reduce the frequency of diarrhea in toddlers.
8	Pengaruh Pemberian Terapi Madu terhadap Diare Akut pada Anak usia 13-35 Bulan di Puskesmas Delitua Kecamatan Deli Serdang Tahun 2022 (Arianto et al., 2023)	**Design:** Quasi-experiment with two group pretest and post-test control group design **Subject:** children with diarrhea 16 samples **Variables:** Honey therapy and acute diarrhea **Instruments:** Measuring cup, regular tablespoon, name, age, gender, and observation sheet	The results showed differences in the pretest and posttest diarrhea frequency in the experimental and control groups. The results of the average frequency of diarrhea in the experimental group showed a decrease in diarrhea before and after by 5.88, decreasing to 1.63. The T-test

No	Title, Author, and Year of Article Publication	Research Methodology (Design, Subjects, Variables, Instruments, Analysis)	Research result
		Analysis: Wilcoxon sign rank test	results obtained a p-value = 0.001. The control group showed an average frequency difference from 4.75, decreasing to 2.00. The T-test results obtained a p-value = 0.031, which means that the experimental group decreased diarrhea more quickly than the control group.
9	Madu dengan *Oral Rehydration Salts* dan Larutan Madu Efektif Terhadap Penurunan Frekuensi Diare dan Lama Rawat Pada Anak (Andayani, 2021)	**Design:** Randomized controlled trial with pre and post-test control group design **Subject:** 72 samples of children with diarrhea were divided into two groups (36 intervention groups and 36 control groups) **Variables:** honey, ORS, and frequency of diarrhea **Instruments:** Questionnaires and observation sheets **Analysis:** independent t-test and paired t-test	The results showed a difference between the frequency of diarrhea before and after being given honey and ORS in the intervention group (p<0.001). And ORS honey solution in the control group (p<0.001).
10	Pengaruh Terapi Madu Terhadap Penurunan Frekuensi Buang Air Besar Pada Anak Usia 0-2 Tahun yang Mengalami Diare di Rumah Sakit Umum Daerah Deli Serdang Lubuk Pakam Tahun 2020 (Simarmata et al., 2021)	**Design:** Quasi Experiment with a time series design model **Subject:** pediatric patients with diarrhea ten samples **Variables:** Honey Therapy and Reducing the frequency of diarrhea **Instruments:** observation sheet **Analysis:** t-test (paired sample t-test)	There were results that honey therapy affected reducing bowel movements in children with diarrhea with a statistical test result of p-value 0.005
11	Penurunan Frekuensi Buang Air Besar dan Konsistensi Feses dengan Menggunakan Madu (Novia & Sulistyawati, 2022)	**Design:** Descriptive **Subject:** 3 respondents **Variables:** Honey and decreased stool frequency and consistency **Instruments:** Bristol scale observation sheet and how to administer complementary honey therapy **Analysis:** Descriptive	Application of complementary honey therapy for five days with a dose of 3x5 ml can reduce the frequency of defecation and stool consistency.
12	*Honey Therapy to Reduce the Frequency of Diarrhea in Children* (Ifalahma et al., 2023)	**Design:** Quasy Experimental pretest and posttest nonequivalent without a control group	There is an effect of giving 3x5ml/day honey during treatment to reduce the frequency of diarrhea in

No	Title, Author, and Year of Article Publication	Research Methodology (Design, Subjects, Variables, Instruments, Analysis)	Research result
		Subject: 20 samples of children with diarrhea **Variables:** Honey therapy and diarrhea frequency **Instruments:** observation sheet **Analysis:** paired t-test	children with a statistical test result of p-value 0.001
13	*The Effect of Adding Honey to Zinc in the Treatment of Diarrhea in Children* (Mahyar et al., 2022)	**Design:** Randomize clinical trials **Subject:** 80 samples of children with acute diarrhea were divided into groups (40 trial groups and 40 control groups) **Variables:** the Effect of Honey on zinc and Diarrhea **Instruments:** checklist sheet **Analysis:** The chi-square test was used to compare qualitative variables of ability; the Student's t-test, the Mann-Whitney test, and the Wilcoxon test were used to compare quantitative variables between groups before and after the intervention.	The test results on 80 children in the test group and the control group showed that the duration of diarrhea, recovery time, and duration of hospitalization was significantly shorter in the test group (given only at a dose of 1.5 mL every 6 hours for children aged 1-3 years and 2 mL every 6 hours for children aged 3-5 years. To make it easy to swallow, honey is diluted in 15 mL of water each time) compared to the control group which was only given zinc syrup at a dose of 5 ml every 6 hours or 20 mg/day with a p-value of 0.001
14	Pengaruh Pemberian Madu untuk Anak Diare (Putu et al., 2022)	**Design:** Literature Review **Subject:** 9 articles **Variables:** The effect of giving honey and children's diarrhea **Instruments:** literature search via Google Scholar, PubMed, and Science Direct **Analysis:** Searches through journal databases were carried out using advanced search with full-text articles that met the relevant inclusion and exclusion criteria and excluded articles that did not match.	Based on the results of a review of 9 articles, it was found that giving honey therapy is effective in reducing the frequency of diarrhea in children by giving 3 x 5 ml/day or adding 10 ml of honey to the ORS liquid, which will produce ORS that is sweeter and preferred by toddlers.
15	Efektifitas Pemberian Terapi Komplemneter Madu Terhadap Kejadian Diare Pada Balita (Handayani, et, al, 2022)	**Design:** Literature review **Subject:** 7 articles **Variables:** giving complementary honey therapy and diarrhea in toddlers **Instruments:** literature search via Google Scholar, PubMed,	The results of a review of 7 articles concluded that honey is a complementary therapy that has important benefits in treating diarrhea and can help reduce the frequency of diarrhea, speed up recovery, and increase weight gain in

No	Title, Author, and Year of Article Publication	Research Methodology (Design, Subjects, Variables, Instruments, Analysis)	Research result
		Analysis: Searches through journal databases were carried out using advanced search with full-text articles that met the relevant inclusion and exclusion criteria and excluded articles that did not match.	toddlers who experience diarrhea.

Discussion

The results of the analysis of 15 journals that have been reviewed have proven that providing complementary therapy with honey can reduce the frequency of diarrhea in toddlers who are given 3x5 ml a day. Based on the analysis results of the 15 journals reviewed, most used a quasi-experimental design, seven journals.

Based on research results (Meisuri, N., 2020) design Quasi-Experimental with a non-equivalent control group design, the results of the study on the first day between the control group and the intervention group showed no potential effect of honey supplementation on reducing the frequency of diarrhea with a p-value obtained (0.408) > α (0.05). On the second day, the mean was not much different between the control group and the intervention group; there was no potential effect of honey supplementation on reducing the frequency of diarrhea with a p-value (0.056) > α (0.05). The third day produced a mean difference in the frequency of diarrhea between the intervention group and the control group with a p-value (0.005) < α (0.05). On the fourth day, the mean difference in diarrhea frequency was quite large, namely two times in the intervention group and five times in the control group, with a p-value (0.000) < α (0.05). Measuring the frequency of diarrhea during the study resulted in a fairly large difference in the frequency of diarrhea, namely 19 times in the intervention group and 26 times in the control group, with a value of p (0.046) < α (0.05), indicating that there is a potential effect of honey supplementation on reducing acute diarrhea.

Diarrhea is a condition where the stool consistency is soft or liquid, and the frequency is more than three times a day. Diarrhea is a symptom of infection in the digestive tract, which various bacteria, viruses, and parasites can cause. One intervention that can be done to treat diarrhea is complementary therapy, namely honey therapy. The results of laboratory studies and clinical trials show that pure honey has a bactericidal activity, which can fight several enteropathogenic organisms, including the E. Coli species as one of the bacteria that causes diarrhea (Wulandari & Milindasari, 2023)

Hydrogen peroxide, flavonoid compounds, essential oils, and other organic compounds influence the antibacterial activity of honey. The antibacterial properties of honey are influenced by the honey's high osmolarity, low water content, and low pH so that the acidity of the honey becomes higher. Honey has a high sugar content, which can increase osmotic pressure and inhibit the growth and development of bacteria. Diarrhea causes the intestinal mucosa to be damaged, disrupting the food absorption process. Giving honey can help form granulation tissue, improve the surface of intestinal crypts, and inhibit bacteria and viruses.

Improved intestinal mucous can increase food absorption, reduce bowel sounds, and reduce the frequency of diarrhea (Andayani, 2020).

Research conducted by (Findawati et al., 2022)states that honey has a low pH; this is proven if its acidity can inhibit pathogenic bacteria in the intestines and stomach. In several articles that have been reviewed, it is proven that within 1 to 2 days, there is a decrease in the frequency of diarrhea, and the consistency of the diarrhea becomes denser. When evaluating the child's condition, the condition gets better over time.

Another benefit of honey is that it helps replace body fluids lost due to diarrhea. In rehydration fluids, honey can increase potassium and water absorption without increasing sodium absorption. This helps repair damaged intestinal mucosa, stimulates new tissue growth, and acts as an anti-inflammatory (Findawati et al., 2022).

Consuming honey in high doses has a significant effect, as 1g/kg BW per day is administered in divided doses (Nurwahidah & Arbianingsih, 2019). The intervention was done by giving honey three times a day orally at 07.00, 15.00, and 21.00 WIB and giving 5 ml to the child (Andayani, 2020).

Conclusion

This literature review shows that giving complementary honey therapy to children can reduce the frequency of diarrhea by inhibiting the growth and development of bacteria in the digestive system, helping to replace lost body fluids. To provide complementary therapy, honey can be given 3 x 5 ml a day from when the child has diarrhea until the frequency of diarrhea and the consistency of the stool improves.

Authors Contributions

The author carries out tasks from data collection, data analysis, making discussions to making manuscripts

Conflicts of Interest

There is no conflict of interest

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