INNOVATION HEALTHY SNACK PEGAGAN (*Centella Asiatica*) CAN PREVENT STUNTING IN CHILDREN UNDER 6 YEARS OLD WITH PICKY EATER

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Abstracts

Background: *The incidence of stunting in Indonesia is still high with a prevalence of 21.6% in 2022. Stunting causes adverse effects both short and long term, One of the causes of stunting is picky eaters. Pegagan (Centella asiatica) food processing is one of the efforts to deal with picky eaters. Purpose: Knowing the effect of gotu kola food processing education as an effort to overcome picky eaters on the incidence of stunting.* ***Methodology:*** *This research is a pre-experimental study with one group pretest post-test design. The study was conducted at Mathla'ul Huda Kindergarten, Baleendah District, Bandung Regency, Indonesia in April – June 2023 The samples in this study were mothers and toddlers aged 3-6 years totaling 30 people with total sampling techniques. The study was conducted by conducting a pretest, then providing health counseling interventions on gotu kola food processing innovations as an effort to overcome picky eaters against stunting events, then after 4 days a post-test was carried out. The research instrument is a questionnaire. Data analysis was conducted univariately and bivariately with the Spearman Rank test.* ***Research findings:*** *In this study, there were 23.3% of stunted toddlers and 40% of toddlers experienced picky eaters. The results of bivariate analysis obtained a p-value of 0.000 with a coefficient correlation of 0.676 which shows a relationship between picky eater behavior and the incidence of stunting. The average pretest result showed 62.7% while the post-test average showed 82.7%. So that there is an increase in knowledge by 20% in all respondents. The results of the analysis showed a significant difference between the results before and after the intervention with a p-value of 0.000, so there was a relationship between gotu kola-based healthy food innovations in stunting prevention for children aged 3-6 years with picky eaters.* ***Conclusion:*** *Parents are advised to better understand children's eating behavior, especially children with picky eater behavior and are required to provide food intake that suits the needs and age of children so that children will get adequate nutrition. Continuous education related to the use of Pegagan (Centella asiatica) into processed healthy foods to prevent stunting is also recommended to increase public knowledge.*

Keywords: *Pegagan (Centella asiatica), Picky eater, Stunting*

1. Introduction

The incidence of stunting in Indonesia is still relatively high above the World Health Organization (WHO) standard. The Indonesian government has made various efforts to overcome stunting, but stunting still occurs a lot. According to UNICEF, WHO and the World Bank, globally there are 151 million children under five stunted, which is equivalent to 22.2% of children under five in the world

(Mulyaningsih et al., 2021). Referring to data from the Indonesian Nutritional Status Survey (SSGI), the prevalence of stunting in Indonesia in Indonesia decreased from 24.4% in 2021 to 21.6% in 2022 (Misdawita et al., 2023)This is still a problem because WHO has a prevalence target of less than 20% (de Onis et al., 2019).

Stunting or short toddlers is a chronic nutritional problem experienced by toddlers, especially in the First 1000 Days of Life (HPK). Stunting is a condition where toddlers have less body length or height compared to age (Margawati et al., 2022). The adverse effects that may occur due to stunting include short-term impacts including brain development, intelligence, growth delay, physiological disorders and disorders of the body's metabolism. As for the long-term impact, which can cause a decline in cognitive ability and learning ability, so a weak immune system makes it easier to get sick and at high risk of diabetes, obesity, cardiovascular disease, cancer, stroke, and disability in old age. All of this will reduce the quality of Indonesia's resources, productivity and competitiveness of the nation (Astarani et al., 2020).

Stunting is a health problem that describes growth and development failure in children due to chronic malnutrition (Laily &; Indarjo, 2023). One of the causes of stunted child growth can be influenced by picky eater behavior. Picky eaters have the characteristics of often choosing to eat, refusing food and only liking the food they choose (Pebruanti &; Rokhaidah, 2022).

Picky eater is an attitude of picky eating which is one form of eating difficulties in children where children only want the food they want (Arisandi, 2019). Picky eater is an eating disorder in children that must be handled by family or health workers because picky eater is bad for children (Lestari et al., 2019).

One of the efforts that can be done as a preventive measure against stunting is to reduce picky eater behavior where parents can prepare food for family members with balanced and diverse nutrition, so that children can consume more varied foods with an attractive appearance for children to eat (KemenkesRI, 2018).

Pegagan (Centella asiatica) is a plant that is widely used as a traditional medicine to cure various diseases. Pegagan og Gotu cola contains active ingredients alkaloids, saponins, tannins, flavonoids, steroids and triterpenoids. Three groups of boiactive, namely triterpenoids, steroids, and saponins include antioxidants that are beneficial to the health of the human body. These active ingredients are raw materials for traditional medicine that are useful as anti-senile, antistress, neuroweak drugs, fever, bronchitis, diabetes, psychoneurosis, hemorrhoids, and high blood pressure, as well as to increase appetite and maintain vitality (Sutardi, 2016) Some studies that have been developed previously by other researchers include the use of yard land as an effort to prevent and handle stunting, there are differences in the average nutritional intake of the use of home yards in stunted and non-stunted toddlers (Luthfiya, 2022). Development of gotu kola leaf processed products as Additional Staple Food / MPT as stunting prevention and economic improvement (Alwi et al., 2023).

This study aims to determine the effect of gotu kola food processing education as an effort to overcome picky eaters on the incidence of stunting in children aged 3-6 years in Mathla'ul Huda Kindergarten, Baleendah District, Bandung Regency. It is hoped that this research can

improve stunting prevention knowledge and skills in processing food.

2. Methods

2.1 Study Design

This research is a quantitative research with a pre-experimental method with a one group pre-test post-test design approach. The study was conducted at Mathla'ul Huda Kindergarten, Baleendah District, Bandung Regency, Indonesia in April – June 2023 The samples in this study were mothers and toddlers aged 3-6 years. The sampling technique used is total sampling with a sample size of 30 people. The inclusion criteria were children aged 3-6 years and the exclusion criterion was that children were sick when the study was carried out.

2.2 Data Analysis

The study was conducted by conducting a pre-test, then providing health counseling interventions on Pegagan (Centella asiatica) food processing innovations as an effort to overcome picky eaters against stunting events, then after 4 days a post test was carried out. Measurement of stunting data and picky eater behavior using checklist sheet questionnaires with Likert scale. The pearson product moment correlation was used to test the validity of the questionnaire with a result of 0.361. Then, to test the reliability of the questionnaire used Croncbach's Alpha value with a result of > 0.700. Data analysis was conducted univariately and bivariately. Hypothesis testing in this study used the Spearman Rank test. This research has received approval from the Health Research Ethics Commission of the Health Polytechnic of the Ministry of Health Bandung with number 04/KEPK/EC/X/2023.RESEARCH RESULTS.

3. Result

Analysis of respondents' characteristics based on gender, age, height, and weight of children under 5 years old in Mathla'ul Huda Kindergarten, Baleendah District, Bandung Regency is presented in the following table:

Tabel 1. Distribution of Respondent Characteristics

Characteristics	Respondent Account	
	n	%
Gender		
Male	15	50,0
Female	15	50,0
Age		
3 - 4 Years Old	2	6,7
4 Years old 1 month - 6 Years	28	93,3
Weight		
11 – 20 Kg	25	83,3
21 – 30 Kg	5	16,7
Height		
< 100 cm	8	26,7
≥ 100 cm	22	73,3

Based on the table, respondents consisted of 50.0% female toddlers and 50.0% male toddlers. Then based on age, almost all respondents aged between 5-6 years, which is around 93.3%. When viewed from their height, most respondents have a height of more than 100 cm, which is 73.3%, while when viewed from their weight, most respondents weigh between 11-20 kg, which is 83.3%.

The correlation between the incidence of stunting, namely TB respondents less than 2SD according to the z-core table (TB / U) and Picky Eater Behavior (based on questionnaire analysis on respondents) is presented in table 2 below :

Tabel 2.Distribution of Stunting Events and Picky Eater Behavior in Respondents

Characteristic	Number of Respondent	
	n	%
Stunting event		
Stunting	7	23,3
Not Stunting	23	76,7
Picky Eater Behavior		
Picky Eater	12	40,0
Not *Picky Eater*	18	60,0

The results showed that children aged 3-6 years in Mathla'ul Huda Kindergarten, Baleendah District, Bandung Regency were mostly not stunted, which was 76.7%. Then, when

viewed from the picky eater behavior, most children aged 3-6 years in Mathla'ul Huda Kindergarten, Baleendah District, Bandung Regency show picky eater behavior, which is as much as 40%.

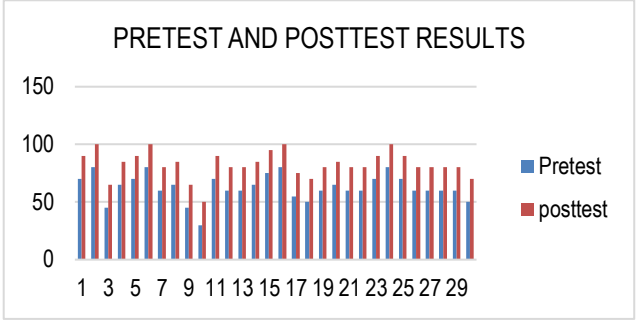
The results of the data normality test showed that the distribution of data on stunting events and picky eater behavior was abnormally distributed. So that the correlation analysis between the incidence of stunting and picky eater behavior uses the spearman rank correlation test and is illustrated in the following table 3 :

Tabel 3. Analysis of the correlation between the incidence of stunting and picky eater behavior

Variable	n	Normality Test (p-value)	Correlation test Spearman rank (sig 2-tailed)	Correlation Coefficient	Conclusion
Stunting	7	0,003	0,000	0,676	Ada Hubungan
Not Stunting	23				
Picky Eater	12	0,003			
Not Picky Eater	18				

Based on table 3 above, it is known that of 12 children aged 3-6 years in Mathla'ul Huda Kindergarten, Baleendah District, Bandung Regency who showed picky eater behavior (40%). While the incidence of stunting in respondents showed that 7 out of 30 around (23.3%) children had less height according to age. The data normality test shows that the data is not distributed normally (p value 0.000). The results of bivariate analysis with spearman rank correlation test obtained a p-value of 0.000 with a coefficient correlation of 0.676 which means there is a relationship between picky eater behavior and stunting events with a strong correlation strength in Mathla'ul Huda Kindergarten, Baleendah District, Bandung Regency.

The results of education about processed Pegagan-based healthy food (*Centella asiatica*) in respondents' parents showed significant results in the measurement of pre and post test interventions, illustrated in the following graph:



Grafik 1. Analysis Pre Test And Post Test Results

From the chart above, the average pre-test results showed 62.7% while the average post-test showed 82.7%. So that there is an increase in knowledge by 20% in all respondents. The analysis of the difference between pre-test and post-test results showed a significant difference between the results before and after the intervention with a p-value of 0.000. The relationship between Pegagan-based healthy food innovation (*Centella asiatica*) with the average test results of respondents' scores showed significant results with a p-value of 0.000 which can mean there is a relationship between gotu kola-based healthy food innovation in the prevention of stunting < 6-year-olds with picky eaters.

4. Discussion

The results showed that most children aged 3-6 years in Mathla'ul Huda Kindergarten, Baleendah District, Bandung Regency did not have picky eater behavior (60%) and were not stunted (76.7%). The results of the analysis of the relationship between picky eater behavior and the incidence of stunting in children aged 3-6 years at Mathla'ul Huda Kindergarten, Baleendah District, Bandung Regency with a spearman rank correlation test obtained a p-value of 0.000 with a coefficient correlation of

0.676 which means that there is a relationship between picky eater behavior and stunting events with a strong correlation strength in Mathla'ul Huda Kindergarten, Baleendah District, Bandung Regency. The results of this study are in accordance with research conducted in 2021 which found that there is a relationship between picky eater behavior and the incidence of stunting in toddlers (Pratiwi et al., 2021). Another study that is consistent with researchers is a study conducted by Parida Pebruanti and Rokhaidah in 2022 which found that there is a significant relationship between picky eaters and the incidence of stunting in preschool children (Pebruanti &; Rokhaidah, 2022).

Factors that can cause stunting in children, one of which is the level of parental education and low family income Low level of parental education can affect knowledge to understand children's eating behavior in providing and fulfilling adequate nutritional intake to provide food using ingredients that vary every day. On the other hand, low family income tends to be a difficulty for parents in meeting children's nutritional needs, which can be seen from the amount and variety of foods given to children (Cooper &; Stewart, 2021).

Children with picky eater behavior show most often picky eaters who like compared to what they don't like as well as adults. The habit of difficulty eating in children if it occurs for a long time can cause nutritional problems, especially the inhibition of child growth which in turn can cause stunting.

Parents, especially mothers, have a very big role in nurturing and regulating children's diets, and ensuring that their children get adequate nutritional intake from the food they consume (Mahmood et al., 2021). Parents must regulate children's eating behavior, for example if the child often consumes snacks, or sweet foods / drinks, or foods that are considered unhealthy, then parents need to change their diet to prevent obesity or malnutrition in children. Therefore, parents need to instill the importance of a healthy diet and food regarding what children can and cannot consume and should not be consumed early, so that in the future children do not consume unhealthy foods (Pebruanti &; Rokhaidah, 2022).

From the results of this study, a relationship strength value of 0.676 was also obtained which means strong and positive so that it can be interpreted that the incidence of picky eater is straight with the incidence of stunting, the higher the picky eater, the higher the potential for stunting. The same statement was stated by (Chao, 2018) which states that children with picky eater behavior tend to have short bodies and experience malnutrition compared to children who do not have picky eater behavior. This is in line with research which states that the incidence of stunting in children occurs due to lack of nutritional intake into the body (Pebruanti &; Rokhaidah, 2022).

The results also showed an average pretest of 62.7% while the average post test was 82.7%. So that there is an increase in knowledge by 20% in all respondents. The difference between pre-test and post-test results showed a significant difference between the results before and after the intervention with a p-value of 0.000. The correlation between gotu kola-based healthy food innovation (*Centella asiatica)* with the average test results of respondents' scores showed significant results with a p-value of 0.000. This can be interpreted as having a meaning between gotu kola-based healthy food innovations in the prevention of stunting < 6-year-olds with picky eaters.

Pegagan (*Centella asiatica*) is a

traditional plant that is widely used to cure various diseases, including stunting. Ridlayanti's research in 2021 showed that pegegan can increase height in zebrafish larvae through increasing BDNF expression (Ridlayanti et al., 2021). Wijayanti's research in 2019 also showed that Centella asiatica can reduce the expression of Bax and HsP 60 that cause free radicals so that it can increase the body length of zebrafish larvae that are stunted due to exposure to rotenon (Wijayanti et al., 2021).

Pegagan contains active ingredients alkaloids, saponins, tannins, flavonoids, steroids and triterpenoids. Three groups of boiactive, namely triterpenoids, steroids, and saponins include antioxidants that are beneficial to the health of the human body (Lisiswanti &; Fiskasari, 2017). These active ingredients have functions as antidimensional, antistress, neuroweak drugs, antipyretic, anti-inflammatory, antihypertensive, antiemetic, maintain vitality and can increase appetite (Sutardi, 2016). Empowering parents in processing gotu kola-based healthy foods can prevent stunting growth in children (Fatmawati, 2021). Gotu kola is a food that is easy to be cultivated by the community. The use of home yard land as one of the efforts to prevent and handle stunting, which shows the average nutritional intake in children under five whose yards are used to grow healthy and natural plants (Luthfiya, 2022). The development of gotu kola leaf processed products as healthy PMT for toddlers can be useful in stunting prevention and economic improvement also continues to be developed (Alwi et al., 2023; Ridlayanti et al., 2021).

5. Conclusion

The results of this study can be concluded that there is a significant relationship between picky eater behavior and the incidence of stunting in children aged 3-6 years in Mathla'ul Huda Kindergarten, Baleendah District, Bandung Regency. For parents, researchers suggest to better understand children's eating behavior, especially children with picky eater behavior and are required to provide food intake that suits the needs and age of children so that children will get adequate nutrition.

Continuous education to parents related to the use of Pegagan (*Centella asiatica*) into processed healthy foods to prevent stunting shows an increase in knowledge. This means that gotu kola-based healthy food innovation can be used as an alternative solution to stunting prevention in children aged < 6 years stunting with picky eaters.

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