

CILOR innovation (cocos nucifera and moringa leaves) as an effort to prevent stunting in the Wanaraja Health Center work area, Garut Regency

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ABSTRACT

Results of the 2022 Indonesian Nutritional Status Survey (SSGI), the stunting rate in Indonesia is 21.6%. West Java contributes to the stunting rate of 20.2% while the stunting rate in Garut Regency in 2022 (23.6%). The incidence of stunting in Wanaraja District, Wanamekar Village in February 2024 there were 100 stunted toddlers. Provision of safe and quality Supplementary Food (PMT) by paying attention to aspects of quality and food safety to improve nutrition in stunted toddlers. Provision of processed foods with local wisdom with CILOR innovation. This study aims to develop CILOR innovations in efforts to prevent stunting in the work area of the Wanaraja Health Center, Garut Regency. Quasi Experiment Research Design with the One Group Pretest-Posttest design approach, One group of research subjects without a comparison group. The subjects of this study were children aged 24-59 months, subjects by quota sampling. The number of samples was 19 research subjects. Secondary data collection of observation sheets for 30 days, primary data of anthropometric measurements as much as 4 times. The results of the study showed that after the intervention was given to the treatment subjects, an increase in the height of stunted toddlers was obtained by 0.2 to 1.6 cm. The normality test before being given PMT was $0.104 > 0.05$ and after the intervention was $0.177 > 0.05$. This shows that the data is normally distributed and the results are significant so that there is an influence of Cilor Innovation on the height of stunted toddlers in the Wanaraja Health Center work area.

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INTRODUCTION

Stunting is a significant nutritional problem related to the nutritional status of toddlers who have a length or height that is classified as lacking when compared to their age (Febriani et al., 2020). Lack of nutritional intake for a long time and is not appropriate so that chronic nutritional problems occur (Sloane et al., 2008). Stunting due to malnutrition since in the womb causes delayed mental development and reduces intellectual capacity (Holden, 2007). Toddlers are one of the groups that

are vulnerable to nutrition who really need special attention because of the negative impacts caused by stunting (Branca & Ferrari, 2002). Stunting in toddlers can have an impact on intelligence levels, susceptibility to disease, reduce productivity and creativity and interfere with optimal physical and cognitive development (Jirout et al., 2019).

Globally in 2022 there are 22.3 percent or 148.1 million children under the age of 5 years experiencing stunting (Sumon et al., 2024)(Kusnadi et al., 2023). One of the goals of the Sustainable Development Goals (SDGs) is to end all forms of malnutrition, including achieving the targets of stunting and wasting in children under the age of 5 years (Grosso et al., 2020). (Organization, 2022) Based on data from the results of the 2022 Indonesian Nutritional Status Survey (SSGI), the stunting rate in Indonesia is 21.6%. West Java is one of the provinces contributing to the stunting rate of 20.2% while the stunting rate in Garut Regency in 2022 (23.6%) (Iriany et al., n.d.)(Astuti et al., 2023). The incidence of stunting in Wanaraja District, Wanamekar Village in February 2024 was 100 stunted toddlers (Grosso et al., 2020)(Naustion & Harahap, 2022). More intensive efforts are needed to achieve the global target of reducing the number of stunted toddlers to 89 million by 2030 (Tambuwun et al., 2021).

Supplementary Food Provision (PMT) is an activity of providing food in the form of safe and quality processed foods by paying attention to aspects of food quality and safety and containing nutritional value according to target needs (Pingault et al., 2017)(Kemiskinan, 2018). Efforts to improve nutrition in stunted toddlers by providing processed food with local wisdom (Choirunisa & Rindu, 2021)(Yulia et al., 2023). Several studies have shown that moringa leaves are very useful for overcoming malnutrition and strengthening complementary foods as local plants rich in protein and micronutrients (Dhakar et al., 2011). Moringa leaf preparations can be consumed in dry or wet form and mixed with other food ingredients. (Berawi, n.d.)(Sokhela et al., 2023)(Muflihatin et al., 2021). One of the developments of additional food preparations in the form of Cilor innovation is vegetable-based jelly pudding, animal protein and vegetable protein consisting of local moringa leaf food, coconut fruit, milk, eggs and corn flour. Milk and eggs have high nutritional content as well as moringa leaves are easily obtained in the surrounding environment, the complex nutritional content of jelly pudding can be used as an alternative source of protein, calcium and vitamins to meet the nutritional needs of toddlers.

The main target of providing additional food for toddlers aged 24 months–59 months is categorized as stunting based on the results of measuring length/height according to age (TB/U) with a value of less than minus two standard deviations (<-2 SD) with a duration of 30 days of feeding according to the rules. According to WHO, height increase from birth to 1 year is around 25 cm, from 1 year to 2 years is around 13 cm per year and from 2 years to 3 years is around 9 cm per year. While from 4 years to puberty is 5 cm per year by calculating the increase in 3 years, the average height of toddlers aged 2-5 years is around 0.5 cm per month (De Onis, 2006). Therefore, researchers are interested in researching the innovation of cilor (cocos nucifera and moringa leaves) as an effort to prevent stunting in the working area of the Wanaraja Health Center, Garut Regency.

This study aims to develop cilor innovation in the form of vegetable-based jelly pudding, animal protein and vegetable protein consisting of local moringa leaf food, coconut fruit, milk, eggs and corn flour. Milk and eggs have high nutritional content as well as moringa leaves are easily obtained in the surrounding environment, the complex nutritional content of the Cilor Innovation can be used as an alternative processed food source of protein, calcium and vitamins to meet the nutritional needs of toddlers.

RESEARCH METHOD

Quasi-experimental research design to investigate the effect of Cilor (Cocos Nucifera and Moringa Leaves) on increasing the height of toddlers aged 24-59 months (Ribek et al., 2021). The type of quasi-experimental research with a one group pre-test post-test design (Olowoyeye et al., 2019).

The subjects of this study only occurred in one group before and after treatment without a comparison group (Nursalam, 2016).

The hypothesis in this study is that there is an effect of Cilor Innovation on the height of stunted toddlers in the Wanaraja Health Center work area. The study was conducted in Wanamekar Village in the Wanaraja Health Center Work Area, Garut Regency. The population of stunted toddlers in the Wanaraja Health Center work area (Susilawati et al., 2023)(Yusuf, 2018). The sample used was quota sampling. The sample size is as follows:

$$n = [(Z\alpha + Z\beta) \cdot 2 \cdot SD^2 / (X1 - X2)^2]$$

$$= [(1,96 + 0,846) \cdot 2 \cdot 0,72 / (1 - 0,5)^2]$$

$$= 15,43$$

So the number of samples taken was 16 samples, in this study the researcher added 10% of the total samples calculated to anticipate drops so that it became 19 samples (Machin et al., 2018)(Khoeroh & Indriyanti, 2017). Systematic random sampling method in toddlers aged 24 months - 59 months to the intervention group (n = 19). The sample criteria in this study are as follows: a) Inclusion criteria Toddlers who are willing to be given innovative cilor products for 30 days Toddlers aged 24 months - 59 months with stunting and no comorbidities Parents of the sample are willing to cooperate and willing to be interviewed (Pediatrics, 2017). b) Exclusion criteria Toddlers who are sick during the research period (Antonova et al., 2012).

The types of data in the study are primary data and secondary data from the posyandu infant cohort and anthropometric measurements (Arumsari et al., 2023). The instruments used to obtain primary data in this study were height measurements, monitoring and observation sheets (Gorber et al., 2007). The monitoring sheets were in the form of a Food Frequency questionnaire Form and a food record. Observations when the researcher conducted anthropometric measurements were 4 times (Ulijaszek & Kerr, 1999).

Table 1. Data on increase in height of stunted toddlers before and after providing additional food in the form of cilor jelly pudding (cocos nucifera and moringa leaves)

Toddler Sample	Height Increase		Different d2-d1
	Before	After	
1	96	97,6	1,6
2	81,3	81,5	0,2
3	100,1	100,2	0,1
4	101,6	102	0,4
5	97,6	97,7	0,1
6	84	84,8	0,8
7	97	98,1	1,1
8	82,9	83,2	0,3
9	95,6	95,7	0,1
10	96,6	97	0,4
11	100,4	101,4	1
12	92,8	93,5	0,7
13	90,5	91,6	1,1
14	89	90	1
15	90,8	91,8	1
16	98,5	99,3	0,8
17	81,5	81,5	0
18	94,6	95,5	0,9
19	94,8	95	0,2

Based on table 1 above, it can be concluded that there is an increase in the height of stunted toddlers by 0.2 to 1.6 cm after being given cilor jelly pudding (cocos nucifera and moringa leaves).

Table 2. Results of descriptive calculations of the effect of increasing the height of stunted toddlers before and after giving cilor jelly pudding (cocos nucifera and moringa leaves)

	N	Minimum	Maximum	Mean	Std. Deviation
Before PMT	19	81.3	101.6	92.926	6.4989
After PMT	19	81.5	102.0	93.547	6.5855

Based on table 2 above, it can be concluded that from 19 data on the variable of increasing height before and after being given PMT in the form of jelly pudding cilor (cocos nucifera and moringa leaves) showed a minimum value before being given PMT of 81.3, a maximum value of 101.6, an average of 92.926 and a standard deviation of 6.4989, while after being given PMT the minimum value after being given PMT was 81.5, a maximum value of 102.0, an average of 93.547 and a standard deviation of 6.5855.

Table 3. Normality test of PMT data in the form of jelly pudding Cilor Innovation (Cocos Nucifera and Moringa Leaves) as an Effort to Prevent Stunting

Data Normality Test		Height Before	Height After
N		19	19
Normal Parameters ^{a,b}	Mean	92.926	93.547
	Std. Deviation	6.4989	6.5855
Most Extreme Differences	Absolute	.181	.166
	Positive	.126	.118
	Negative	-.181	-.166
Test Statistic		.181	.166
Asymp. Sig. (2-tailed)		.104 ^c	.177 ^c

a. Test distribution is Normal.

b. Calculated from data.

c. Lilliefors Significance Correction.

Based on the above, it can be seen that the significance results before PMT was given were $0.104 > 0.05$ and after PMT was given were $0.177 > 0.05$. It can be concluded that the data distribution in this study was normally distributed so that it could be used for t-test analysis.

RESULTS AND DISCUSSIONS

Based on the results of a study conducted on 19 toddlers aged 24-59 months for 30 days with CILOR Additional Food Provision after being given cilor jelly pudding for 30 days with 4 (four) measurements in Table 1 shows that there is an increase in the height of stunted toddlers by 0.2 to 1.6 cm after being given cilor jelly pudding (cocos nucifera and moringa leaves). Based on the results of the study, the provision of additional food has a positive impact on the growth of toddlers who experience stunting. Coconut contains a number of important nutrients, such as protein, healthy fats, vitamins, and minerals (calcium, magnesium, and potassium), which can support bone growth and toddler body development. Healthy fats in coconut also play a role in the absorption of fat-soluble vitamins, such as vitamin D, which is important for bone health. Moringa leaves are known to be rich in important nutrients such as protein, iron, calcium, vitamins A, and C, which can help overcome nutritional deficiencies in stunted children. Calcium and protein in moringa leaves are essential for bone growth and increased height. This is in line with the research of Purwanto et al in 2023 entitled the effect of supplementary feeding on increasing the height of stunted toddlers in the work area of Puskesmas Wanaraja Garut showing that there is an effect of Providing Additional Food (MP-ASI) on increasing the height of stunted toddlers in the Work Area of Puskesmas Wanaraja, Garut Regency. The materials used in the study used moringa leaves, which proves that the content of moringa is very influential in helping to increase height in toddlers.

Stunting in toddlers is the best indicator to measure welfare and accurately reflects the existing social inequality situation. (De Onis & Branca, 2016) Long-term impacts on individuals and society are hampered cognitive and physical development in later life stages, less productivity, poor health status and the risk of metabolic diseases. (Teja, 2019) The results of this study indicate that a very important factor is energy and nutrient consumption that contributes to the problem of stunting. Food intake is related to the balance of fat, carbohydrate, vitamin, and mineral content. This is due to the parenting pattern of parents regarding the provision of healthy food so that children do not get enough nutritional intake. One of them is with daily food and companions lacking nutrition which can affect children's health and growth.

Based on the research results of (Wiyono et al., 2023), that providing supplementary food can help increase body length in stunted toddlers. Providing Additional Food (PMT) made from local food is one of the strategies for dealing with nutritional problems in toddlers and efforts to prevent stunting. Local PMT activities are accompanied by education, counseling, nutrition and health counseling in order to accelerate the process of changing the behavior of mothers and families in providing appropriate food according to age, food preparation, and selecting food safety ingredients.

Based on table 2 of 19 data on the variable of increasing height before and after being given PMT in the form of jelly pudding cilor (cocos nucifera and moringa leaves) shows a minimum value before being given PMT of 81.3, a maximum value of 101.6, an average of 92.926 and a standard deviation of 6.4989 while after being given PMT the minimum value after being given PMT was 81.5, a maximum value of 102.0, an average of 93.547 and a standard deviation of 6.5855. Based on this, the provision of additional food in the form of jelly pudding cilor (cocos nucifera and moringa leaves) has a positive impact, especially in efforts to prevent stunting in toddlers. This is based on the increase in the minimum and maximum values and standard deviation before and after being given additional food in the form of CILOR. One strategy in dealing with toddler nutritional problems is through the Provision of Additional Food (PMT) made from local food ingredients. PMT made from local food can introduce and provide a variety of foods for toddlers from carbohydrates, animal protein, vegetable protein, vegetables and fruit.

Effectiveness of Cilor Jelly Pudding. Cilor jelly pudding as PMT has several advantages that contribute to increasing the height of toddlers, a complete source of nutrition such as protein, vitamin, and mineral content from natural ingredients in cilor jelly pudding supports children's growth, especially in improving bone structure and body tissue. Giving cilor jelly pudding has a texture and taste that children like, so that consuming this PMT becomes easier and well accepted by toddlers. This increases the success of the intervention because children are more likely to consume food.

Based on the research results of (Susianto et al., 2023), his research entitled the effect of providing additional tempeh nuggets as local food on the weight and height of stunted toddlers. The p value = 0.000 was obtained, which showed that there was a significant difference in toddler TB between before and after being given treatment in the form of providing additional tempeh nuggets. Providing modified additional food (PMT) based on local wisdom in this case tempeh nuggets can be an alternative program for overcoming stunting.

Based on Table 3, the significance results before PMT were given were $0.104 > 0.05$ and after PMT was given were $0.177 > 0.05$. It can be concluded that the data distribution in this study was normally distributed so that it can be used for t-test analysis. The provision of CILOR jelly pudding for 30 days routinely is carried out periodically with clear doses so that its effectiveness can be seen after the intervention is given for 1 month. According to the researcher, this is related to the mother's discipline in providing jelly pudding for 30 consecutive days, showing a significant increase. This is in accordance with research conducted by (Dewi et al., 2023) that there is an effect of giving jagaq porridge on the height (p-value = 0.000) of stunted toddlers, one of which is due to the mother's discipline factor in providing food intake so that the results obtained are very

influential. The process of providing additional food, the role of ASI cadres, nutrition education for parents of toddlers, starting from monitoring toddler growth, has a positive impact as a prevention against stunting and increasing cooperation with the village and providing a positive contribution (Handayani et al., 2019).

CONCLUSION

The results of the study concluded that after giving Cilor jelly pudding to toddlers aged 24-59 months for 30 days, it can increase growth in stunted children with changes in height, namely an increase in height after giving PMT. The nutrients contained in the pudding have the potential to support bone and body tissue growth. Based on this, the CILOR innovation can be used as an effort to prevent stunting given to toddlers aged 24-59 months.

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