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Original Research

Administration of Curcuma Xanthorrizha (Temulawak) Jelly Increases the Body Weight of Undernourished Toddlers

Marwinda Sri Mahasari[1*], Lusinta Agustina[2], KH. Endah Widhi Astuti[3]

[1,2,3]Ministry of Health Polytechnic Surakarta, Indonesia

ABSTRACT

Background: *Malnutrition in toddlers remains a public health challenge because it can hinder children's growth and development. One of the main causes is low appetite, which leads to inadequate nutritional intake. Temulawak (Curcuma xanthorrhiza) is known to have properties that improve digestive function and increase appetite through its curcuminoid content, which acts as an antioxidant. This study aims to determine the effect of Curcuma xanthorrhiza jelly on weight gain in malnourished toddlers in Krajan Village, Jatinom, Klaten.*

Methods: *This study used a quantitative design with a quasi-experimental design and a pretest-posttest approach with a control group. The sampling technique used was total sampling with 17 toddler respondents, consisting of 9 toddlers in the intervention group and 8 toddlers in the control group. The research instrument was a weight observation sheet, while data analysis was performed using the Mann–Whitney nonparametric test.*

Results: *The analysis results showed a higher increase in weight in the intervention group compared to the control group, with a statistically significant difference (p-value 0.013).*

Conclusion: *There is a significant effect of Curcuma xanthorrhiza jelly administration on weight gain in malnourished toddlers. It is recommended that innovations in the administration of natural herbal ingredients such as temulawak be developed in the form of safe and attractive functional food products to improve the nutritional status of toddlers.*

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CONTACT
Marwinda Sri Mahasari
✉
marwindasari@gmail.com
Ministry of Health Polytechnic Surakarta
JL. Letjend Sutoyo, Mojosongo, Surakarta 57127

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INTRODUCTION

Malnutrition and severe malnutrition remain a public health challenge in Indonesia. Data from the 2018 Riskesdas survey shows that 10.2% of toddlers suffer from malnutrition (wasting) and 3.5% of them suffer from severe malnutrition (severe wasting), which is still considered high according to WHO criteria. This condition indicates that nutrition problems still require comprehensive intervention, especially among the group of toddlers who are vulnerable to growth and development disorders (Indonesian Ministry of Health, 2020).

One of the main causes of malnutrition is low food intake in terms of both quantity and quality. Low appetite means that nutritional needs are not met, which affects children's growth. Parents often make various efforts to increase their children's appetite, ranging from varying the menu, giving appetite-boosting vitamins, to using traditional medicines such as herbal remedies (Candra, 2017; Puspitasari, 2020). The use of natural ingredients to increase appetite is an attractive alternative because it is considered safer than chemical drugs.

Temulawak (Curcuma xanthorrhiza) is an Indonesian herbal plant widely known for its health benefits. The curcuminoids it contains act as antioxidants and anti-inflammatories, as well as helping to improve digestive and liver function, which are related to increased appetite. Previous studies have shown that temulawak can help improve children's nutritional status by increasing body weight and improving metabolic function (Badan POM RI, 2020; Item, 2021). The great potential of this plant makes it a natural ingredient that can be developed into a form that is more appealing to children.

Traditional herbal medicine preparations such as "cekok" are often unpopular with children because of their bitter taste and uncomfortable administration. Therefore, innovations in presenting herbal medicine in attractive forms such as jelly are a potential alternative. Jelly is a snack that children love because of its soft texture and sweet taste, making it a pleasant medium for administering herbal ingredients. Several studies have shown that modifying the form of herbal ingredients can increase consumption compliance and effectiveness (Lali Midu et al., 2021; Mustika, 2019).

Based on these conditions, innovation in the utilization of Curcuma xanthorrhiza in a form that is more appealing to children is needed to increase the weight of malnourished toddlers. This study is novel in developing temulawak herbal medicine in the form of jelly that is attractive, practical, and safe for children to consume. The purpose of this study was to analyze the effect of Curcuma xanthorrhiza jelly on weight gain in malnourished toddlers in Krajan Village, Jatinom District, Klaten Regency.

MATERIALS AND METHODS

This study used a quasi-experimental design with a pretest-posttest with control group design. The researchers chose this design because it is suitable for assessing the effect of an intervention when group allocation cannot be done completely randomly. This design allows researchers to compare weight changes between the treatment group and the control group, so that the cause-and-effect relationship can be analyzed more strongly even without full randomization.

The study was conducted in Krajan Village, Jatinom District, Klaten Regency from September to December 2022. The location was selected purposively because the area had a high number of cases of malnourished toddlers based on data from the local health center. These conditions supported the implementation of a nutritional intervention study to assess the effectiveness of Curcuma xanthorrhiza (temulawak) jelly as a means of improving toddler nutrition.

The population in this study consisted of all malnourished toddlers in Krajan Village, totaling 24 children. Sampling was conducted using total sampling technique, considering all members of the population who met the inclusion criteria as research samples. After considering the exclusion criteria and dropouts, 17 respondents were obtained, consisting of 9 toddlers in the intervention group and 8 toddlers in the control group. The inclusion criteria included toddlers aged 12–59 months with malnutrition, healthy based on anamnesis and physical examination, and residing in Krajan Village.

The exclusion criteria included toddlers with low birth weight, acute or chronic infectious diseases, and congenital disorders.

The independent variable in this study was the administration of Curcuma xanthorrhiza jelly, while the dependent variable was the increase in weight of malnourished toddlers. The research instruments included a questionnaire on respondent characteristics and AND brand digital scales with an accuracy of 0.01 kg to measure weight. The validity of the instruments was ensured through testing and calibration of the equipment by the Klaten District Health Office, while reliability was obtained through the accuracy of measurements taken directly by the researchers to prevent bias in the results.

The data collection procedure was carried out in several stages. First, the researchers obtained permission and explained the purpose of the study to the parents of the toddlers and obtained written consent (informed consent). Second, initial weighing (pretest) was carried out for all respondents. The intervention group was given two cups of Curcuma xanthorrhiza jelly every week for one month, while the control group did not receive any intervention and continued to consume their daily meals as usual. After one month, all respondents were weighed again (posttest) to assess changes in body weight. During the research process, parents filled out monitoring sheets to record their toddlers' daily food intake.

The collected data were analyzed using SPSS version 26.0. Univariate analysis was used to describe the characteristics of the respondents, while bivariate analysis used the Mann-Whitney test to determine the difference in weight gain between the intervention and control groups because the data were not normally distributed based on the Shapiro–Wilk test. Throughout the study, the principles of informed consent, anonymity, and confidentiality were fully maintained to protect the rights and privacy of the respondents.

RESULTS

Table 1. Frequency Distribution of Characteristics of Mothers and Toddlers in Krajan Village, Jatinom District, Klaten Regency (n = 17)

Characteristics	Category	Intervention (n=9)	Control (n=8)	Total (n=17)	Percentage (%)
Age of Toddlers	12–24 months	5	2	7	41.2
	25–36 months	0	3	3	17.6
	37–48 months	3	1	4	23.5
	49–59 months	1	2	3	17.6
Gender of Toddler	Male	6	4	10	58.8
	Women	3	4	7	41.2
Mother's age	20–35	7	6	13	76.5
	>35 years old	2	2	4	23.5
Mother's education	Junior High School	4	4	8	47.1
	High School/Vocational School	5	4	9	52.9

Characteristics	Category	Intervention (n=9)	Control (n=8)	Total (n=17)	Percentage (%)
Mother's occupation	Housewife	9	8	17	100
Number of Siblings	< 2 children	7	6	13	76.5
	≥ 2 children	2	2	4	23.5

Based on Table 1, most of the toddlers were aged 12–24 months (41.2%) and male (58.8%). The majority of mothers were aged 20–35 years (76.5%) and had a high school/vocational school education (52.9%). All respondent mothers were housewives (100%), and most had fewer than two children (76.5%). These characteristics indicate that the respondents belonged to the productive age group with small families, thus having the potential for optimal nutritional care for toddlers.

Table 2. Statistical Description of Weight Gain in Undernourished Infants in the Intervention and Control Groups

Variable	n	Mean (grams)	Median (grams)	Mode (grams)	SD	Minimum	Maximum
Intervention Group	9	416.67	250.00	200	307.21	150	1000
Control Group	8	81.25	200	-50.00	164.62	-100	350

Table 2 shows that the average weight gain of toddlers in the intervention group was 416.67 grams, higher than the control group at 81.25 grams. The standard deviation in the intervention group was 307.21 grams, indicating greater variation in weight gain due to individual responses to *Curcuma xanthorrhiza* jelly administration. Meanwhile, in the control group, some toddlers experienced weight loss of up to –100 grams, indicating that without intervention, weight gain was not significant.

Table 3. Results of the Mann Whitney U Test on Weight Gain in Undernourished Toddlers

Variable	U	Z	Sig. (2-tailed)	Decision
Weight Gain	10,500	-2.478	0.013	There is a significant difference

Table 3 shows that the Mann Whitney test results indicate a p-value of 0.013 ($p < 0.05$), meaning that there is a significant difference between the intervention group and the control group. This indicates that the administration of *Curcuma xanthorrhiza* (temulawak) jelly has a significant effect on increasing the weight of malnourished toddlers in Krajan Village, Jatinom District, Klaten. Thus, the research hypothesis can be accepted.

DISCUSSION

The results of this study indicate that the administration of Curcuma xanthorrhiza (temulawak) jelly has an effect on increasing the weight of malnourished toddlers. This finding shows that curcumin in temulawak can increase appetite by stimulating the digestive system and bile secretion. The administration of temulawak jelly makes children

feel hungry more easily and increases their consumption of nutritious foods, which has a positive impact on weight gain (Handajani & Widhiastuti, 2018).

The findings of this study are in line with the results of Novikasari's (2021) study, which states that temulawak has active substances that can improve digestive function and increase nutrient absorption. Optimal digestion allows for efficient absorption of nutrients, resulting in gradual weight gain in children. Astawan (2020) also explains that the use of herbs such as temulawak has natural therapeutic properties that can support children's digestive health and metabolism. Thus, local herbal ingredients can be a safe and effective alternative in helping to overcome malnutrition in toddlers.

Weight gain is also influenced by the age and gender characteristics of toddlers. Preschool-aged toddlers show better weight gain because they begin to actively choose foods they like. Lopes et al. (2018) explained that children aged 3–5 years are active consumers who can determine foods according to their preferences, so interventions in the form of jelly with a natural sweet taste are more easily accepted. In addition, high physical activity at this age also plays a role in balancing energy intake and metabolism (Sanusi et al., 2020).

Maternal characteristics such as age and education level also influence the results of intervention. Most of the mothers in this study were of productive age and had a secondary education, which enabled them to better understand the importance of balanced nutrition for children. Nurmaliza (2018) found that maternal knowledge and education had a positive relationship with the nutritional status of toddlers. Mothers with good nutritional knowledge will be more consistent in implementing a nutritious diet and regularly monitoring their children's growth (Indonesian Ministry of Health, 2021).

The implications of this study's findings suggest that the use of local herbal ingredients such as temulawak can be part of community-based nutrition intervention strategies. Temulawak jelly is easily accepted by children because it is attractive, safe to consume, and has no side effects. The government, through the Ministry of Agriculture and BPOM, has also encouraged the use of traditional medicinal plants to support public health (Ministry of Agriculture, 2019; Indonesian Food and Drug Administration, 2020). Thus, this intervention can be integrated into toddler nutrition improvement programs at the family and health center levels.

The limitations of this study lie in the small sample size and short observation period, so the results cannot be generalized broadly. Additionally, this study only measured body weight without involving other nutritional indicators such as height, upper arm circumference, or hemoglobin levels. Therefore, it is recommended that future studies use an experimental design with a larger sample size, a longer intervention period, and involve more diverse physiological variables. In this way, the effectiveness of Curcuma xanthorrhiza jelly in improving the nutritional status of toddlers can be proven more comprehensively.

CONCLUSION

The results of the study indicate that the administration of Curcuma xanthorrhiza (temulawak) jelly has a positive effect on increasing the weight of malnourished toddlers in Krajan Village, Jatinom, Klaten. The curcumin content in temulawak plays a role in improving digestive function, increasing bile secretion, and stimulating appetite, thereby increasing toddler nutritional intake and improving nutritional status. This effectiveness is supported by the characteristics of the mothers, most of whom are of productive age and have a secondary education, which allows for the optimal implementation of

parenting and child nutrition. These results reinforce the evidence that the use of local herbal ingredients can be an alternative nutritional intervention that is easily accepted by children and safe to use. Therefore, it is recommended that temulawak jelly be developed as a traditional ingredient-based nutritional innovation product in the community and integrated into malnutrition prevention programs at the family level and basic health services such as posyandu and puskesmas.

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