



## Comparison of temulawak (*Curcuma xanthorrhiza* Roxb.) and turmeric (*Curcuma longa*) powder drinks against adolescent diet and body weight

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### ABSTRAK

**Latar Belakang:** Salah satu permasalahan gizi yang sering terjadi pada remaja adalah kurang energi kronis. Temulawak dan kunyit secara turun-temurun telah digunakan untuk terapi menaikkan berat badan dengan cara meningkatkan nafsu makan. Melalui kandungan karminativum dari minyak atsiri yang ada dalam rimpang temulawak dan kunyit.

**Tujuan:** Penelitian ini bertujuan untuk menganalisis pengaruh konsumsi minuman serbuk temulawak dan kunyit terhadap pola makan dan berat badan pada usia remaja.

**Metode:** Penelitian ini menggunakan desain quasi eksperimental. Sampel penelitian adalah santriwati Pondok Pesantren Miftahul Jannah Malang, sebanyak 45 responden yang terbagi menjadi 3 kelompok yaitu P0 (kontrol/tidak diberikan apapun), P1 (20 gr bubuk temulawak), dan P2 (5 gr bubuk kunyit). Teknik sampling yang digunakan adalah purposive sampling. Bubuk temulawak dan kunyit dilarutkan dalam 125cc air dan diberikan selama 14 hari. Pola makan dan berat badan responden setelah perlakuan diukur menggunakan metode Semi Quantitative - Food Frequency Questionnaire dan pengukuran langsung dengan timbangan digital. Data hasil pengukuran dilanjutkan dengan analisis statistika menggunakan uji wilcoxon signed ranks test Untuk melihat perbedaan pola makan sebelum dan sesudah perlakuan. Serta uji paired t test untuk melihat perbedaan berat badan antara sebelum dan sesudah perlakuan.

**Hasil:** Dari hasil Uji Wilcoxon didapatkan bahwa pada kelompok kontrol dan kunyit tidak ada perbedaan nyata skor pola makan sebelum dan sesudah diberikan perlakuan ( $p>0,05$ ), sedangkan pada kelompok temulawak terdapat perbedaan nyata ( $p<0,05$ ). Hasil Uji t test paired pada kelompok temulawak menunjukkan perbedaan berat badan yang bermakna antara sebelum dan sesudah perlakuan sedangkan pada kelompok kunyit dan kontrol tidak ada perbedaan ( $p>0,05$ ).

**Kesimpulan:** Pemberian minuman serbuk temulawak efektif dalam memperbaiki pola makan dan meningkatkan berat badan pada usia remaja..

**KATA KUNCI:** berat badan; kunyit; nafsu makan; temulawak



## ABSTRACT

**Background:** One of the nutritional problems that often occurs in teenagers is a chronic lack of energy. Temulawak and turmeric have been used for generations as a therapy to gain weight by increasing appetite, through the karminativum content of essential oils in the rhizomes.

**Objectives:** This study aims to analyze the effect of temulawak and turmeric powder drink consumption on adolescents' dietary patterns and weight.

**Methods:** This research design uses quasi-experimental. The population and sample of this study were female students of Miftahul Jannah Islamic Boarding School Malang, as many as 45 respondents were divided into 3 groups P0 (control), P1 (20 grams of ginger), and P2 (5 grams of turmeric). The sampling technique used is non-purposive sampling. The research instrument used the semi Quantitative – Food Frequency Questionnaire method and measured body weight using digital scales. The measurement data was followed by statistical analysis using the Wilcoxon Signed Ranks Test to see differences in eating patterns before and after treatment. As well as the Paired T-Test to see the difference in body weight between before and after treatment.

**Results:** From the results of the Wilcoxon test, it was found that in the control and turmeric groups, there was no significant difference in dietary pattern score (frequency and variation) before and after being given treatment ( $p > 0.05$ ), while in the temulawak group, there was a difference ( $p < 0.05$ ). Results of the paired t-test the temulawak group had a significant difference in body weight between before and after treatment, while the turmeric and control groups had no difference ( $p > 0.05$ ).

**Conclusions:** Giving temulawak powder drinks is effective in increasing dietary patterns and body weight in adolescents.

**KEYWORD:** appetite; temulawak; turmeric; weight

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## INTRODUCTION

The adolescent period is a transition phase between childhood and adulthood, starting from the age of 10-13 and concluding at 18-22 (1). Chronic energy deficiency (malnutrition) during this phase is caused by insufficient food intake, due to a lack of appetite or self-consciousness about body shape, leading to dieting. This is reflected in the 2018 Riskesdas (Riset Kesehatan Dasar) data, indicating that the prevalence of adolescent girls suffering from Chronic Energy Deficiency (CED) reached 13.88% in East Java and 31.8% nationally. In the age group of 15-19, the prevalence is 37.73%, while early (12-15) and late (15-21) adolescent subgroups show rates of 22.53% (2).

Traditional medicine offers a potential avenue for addressing underweight conditions. This treatment consists of remedies made from natural ingredients or combinations of substances derived from plants, animals, or minerals in an unrefined

state (3). In Indonesia, traditional medicine is classified into 3 categories, namely "jamu," Standardized Herbal Medicine (OHT), and phytopharmaceuticals. Furthermore, certain herbs such as turmeric and temulawak (*Curcuma xanthorrhiza* Roxb.) have been traditionally used to promote body weight gain by enhancing appetite. Turmeric, in both preclinical and clinical studies, has been shown to improve appetite due to the carminative properties of essential oil in the rhizome (4). This plant contains curcumin, proven to address various digestive issues, including enhancing food absorption in the intestines, managing stomach ulcers, acting as a hepatoprotector, increasing appetite, and antioxidant activity (5-8).

Turmeric is a substitute for synthetic antibiotics, as it contains active compounds or bioactive substances, particularly 3–5% curcumin and 2.5–6% (9). Curcumin in turmeric serves as

both an antibacterial and antioxidant agent. It has properties capable of increasing appetite and facilitating bile secretion, thereby enhancing digestive system activity (10).

Temulawak (*Curcuma xanthorrhiza* Roxb.) has been known since ancient times and exists in shaded places in the majority of rural areas, specifically those in the middle and highlands. This plant is native to Indonesia and belongs to the *Zingiberaceae* family (11). Temulawak is utilized to increase appetite due to its ability to enhance stomach emptying, leading to a feeling of hunger and an increase in appetite (12). Temulawak is one of the traditional medicines capable of enhancing and improving appetite in children, as it contains essential oil with carminative properties. The carminative action stimulates the digestive system, thereby eliciting appetite (4). The effect of the essential oil of temulawak is possible due to its choleric properties, enhancing bile secretion. Bile, containing bile acids and conjugates, plays a crucial role in the absorption of dietary fats and the catabolism of cholesterol (13). This study aims to develop a powdered drink from temulawak and turmeric for improving the dietary patterns and weight of adolescents.

## **MATERIALS AND METHODS**

### **Study Design, Place, and Time**

This study adopted a quasi-experimental design and was conducted at Miftahul Jannah Islamic Boarding School, Malang, between February to May 2023.

### **Study Sample**

The sample comprised adolescent female students (santriwati) from Miftahul Jannah Islamic Boarding School. Furthermore, the total number of respondents was 45, divided into 3 groups based on certain criteria, namely P0 (control/not given anything), P1 (20 grams of temulawak), and P2 (5 grams of turmeric). The weight of each treatment material is different based on each effective dose in our preliminary study and also the previous study (14). The inclusion criteria were willingness to participate, age 15-24 years, residency at the boarding school, each group staying in a different block of rooms, non-pregnant or breastfeeding, and non-smoker status. Meanwhile, the exclusion criteria were students who were ill, had false

consciousness about body shape, and did not participate until the observation was concluded.

### **Temulawak and Turmeric Drinks**

Adolescents typically have a preference for snacks or refreshing beverages consumed between daily activities. Therefore, temulawak and turmeric drinks were developed as suitable options. These drinks were prepared based on the procedures outlined by the previous study (14). The materials and equipment used were a scale, stove, and measuring glass. The required ingredients are temulawak, turmeric, boiled water, and sugar. Subsequently, the preparation process comprised the addition of one tablespoon of sugar to 20 grams of temulawak and 5 grams of turmeric each, grating and extracting the juice, and mixing with half a glass of water or 125 cc. The resultant mixture, blended with sugar, yielded a distinctively flavored beverage when steeped in hot water (14). The doses of ginger and turmeric used in this study were based on the effective doses of the two ingredients in our preliminary study and also the previous study (14). Each of the drinks was given to respondents once daily for 2 weeks (14 days), either in the morning or evening before eating (14).

### **Measuring Dietary Patterns and Body Weight**

Dietary patterns were evaluated using the Food Frequency Questionnaire (FFQ) method, a tool designed to capture data on the frequency of consuming various food items or finished meals during a specific period, such as days, weeks, months, or years. The questionnaire contains a list of foods and the frequency of consumption over a designated period. The items listed in the questionnaire are those consumed frequently by respondents (15). Each food item consumed was assigned a score based on frequency, namely never (score 0), 2 times/month (score 5), 1-2 times/week (score 10), 3-6 times/week (score 15), 1 time/day (score 25), and >3 times/day (score 50). The diversity of food consumption is directly proportional to the frequency and the score (16). Additionally, body weight was measured using an Omron brand digital scale.

### **Data Analysis**

Bivariate data analysis was conducted to assess the differences in pre-post test data using

Wilcoxon and Paired t-tests. The analysis was performed using the SPSS 22 application with a significance level of 95%. A p-value < 0.05 indicated a relationship between the independent and dependent variables. However, a value  $\geq 0.05$  implies no significant relationship. All respondents willingly provided voluntary consent to participate in this study by completing the informed consent form. The entire procedure received ethical approval from the Research Ethics Commission of the Health Polytechnic of the Ministry of Health in Malang, with Registration Number: 211/KEPK-POLKESMA/2022..

## RESULTS AND DISCUSSIONS

### The effect of temulawak and turmeric powder drinks on diet

#### Control Group

Dietary patterns of female students (santriwati) at Miftahul Jannah Islamic Boarding School were categorized into two groups, namely poor and good. If the dietary pattern score is the same or above the median of the population, it is classified as good. Meanwhile, if the diet score is below the population median, it is classified as poor.

**Table 1. Frequency distribution of respondents' dietary patterns in the control group**

Dietary Pattern	Before	After	p-value
Poor	47%	53%	1.00
Good	53%	47%	
Median	650	730	

According to **Table 1**, 15 respondents (47%) fell into poor dietary category, while 17 (53%) were classified under good dietary. Statistical analysis using the Wilcoxon test through SPSS yielded a significant degree of  $p = 1.00$ . Therefore, it can be concluded that there is no significant difference between dietary patterns before and after treatment.

In the control group, there was no change in dietary patterns before and after because no intervention was provided. This result was

supported by the Wilcoxon statistical test, where no significant difference was observed in the average dietary patterns before and after the treatment.

Based on **Table 2**, 15 respondents had poor temulawak dietary patterns (47%), while 17 fell into the good category (53%). Statistical analysis using the Wilcoxon test through SPSS showed a significant p-value of 0.025. Therefore, it was inferred that there were differences in dietary patterns before and after treatment.

**Table 2. Frequency distribution of respondents' dietary patterns before and after being given temulawak**

Dietary Pattern	Before	After	p-value
Poor	47%	13%	0.025
Good	53%	87%	
Median	750	900	

Following the administration of temulawak, changes in dietary patterns were observed before and after treatment. The active ingredients in the rhizome of the plant include xanthorrhizol, curcuminoids containing yellow substances (curcumin), demethoxycurcumin, essential oil, protein, fats, cellulose, and minerals. Among these ingredients, curcumin and xanthorrhizol have medicinal properties and are widely recognized and used.

According to the data, the observed improvement in dietary patterns of 15 respondents can be attributed to the essential oil of temulawak, particularly xanthorrhizol, which acts as a potent appetite stimulant. A previous study by Utami et al, 2019, found that a dose of ginger 10 g/day did not affect weight loss and food intake (17), while a study by Linawati et al 2021, a dose of ginger 20 g/day affected food intake and body weight (14).

The essential oil can enhance appetite due to its choleric properties, enhancing stomach emptying, digestion, and fat absorption in the intestines. It also stimulates the secretion of various hormones that regulate increased appetite. In addition to administering temulawak, providing supplements for children and introducing varied and preferred dishes are contributing factors. This is in line with the study of Marni et al. (2015), that temulawak can enhance dietary patterns in adolescents (18).

**Turmeric Group**

Based on **Table 3**, 15 respondents had poor turmeric dietary patterns (47%), while 17 had good dietary patterns (53%). Statistical analysis using the Wilcoxon test through SPSS showed a non-significant p-value of 0.564. Therefore, it was concluded that there was no difference in dietary patterns before and after treatment. The results showed that turmeric had

no difference in dietary patterns. According to a theoretical study conducted by Afrina et al. (2022), curcumin shows suboptimal bioavailability when administered orally due to rapid degradation and poor absorption in the digestive tract. This leads to low plasma concentration and distribution in tissues (19). This is because the smaller dose of turmeric so that causing less absorption which does not happen with temulawak with higher doses. Curcumin in the body is transformed into dihydrocurcumin (DHC), tetrahydrocurcumin (THC), hexahydrocurcumin (HHC), and octahydrocurcumin through reductase activity, followed by further breakdown into glucuronide derivatives. The different formulations need to be tested to maximize the effects. While oral administration is the conventional route, the impact of subcutaneous administration of curcumin also needs to be investigated.

**Table 3. Frequency distribution of respondents' dietary patterns before and after being given turmeric.**

Dietary Pattern	Before	After	p-value
Poor	47%	53%	0.564
Good	53%	47%	
Median	710	705	

**Effect of temulawak and turmeric powder drinks on body weight**

**Table 4** shows the before and after body weight of female students at Miftahul Jannah Islamic Boarding School. In the control group, no change in body weight was observed before and after treatment, as no intervention was provided. This result is supported by the statistical analysis of the Paired t-test, indicating no significant difference in the average body

weight. Following the administration of temulawak, changes in body weight were observed before and after treatment. Furthermore, weight gain is influenced by food consumption, which may be enhanced through the use of traditional remedies such as temulawak honey. Temulawak contains chemical compounds such as curcuminoids and essential oils (xanthorrhizol, germacrone, and others) capable of increasing appetite.

**Table 4. Effect of body weight on the control group, temulawak, and turmeric**

Intervention	Body weight		
	Before	After	p-value
Control Group	48	47.67	0.143
Temulawak Group	45.93	46.6	0.00
Turmeric Group	48.27	48.87	0.24

These compounds play a role in enhancing the digestive organs, stimulating the gallbladder,

releasing bile, and stimulating the release of pancreatic juice containing amylase, lipase, and

protease enzymes, thereby improving the digestion of carbohydrates, fats, and proteins (20). The effects lead to an increase in food consumption due to the increased absorption of nutrients. After the absorption, the requirements for proteins, carbohydrates, and other substances for the development of body cells and the formation of enzymes and hormones are met (21). Following the administration of turmeric, there was no change in body weight before and after the treatment. This is due to a lack of change in dietary patterns which is a factor influencing body weight. Dietary patterns refer to how an individual or a group of people select and consume food in response to physiological, psychological, cultural, and social influences, and these include dietary habits, food habits, or dietary patterns (22).

### CONCLUSIONS AND RECOMMENDATIONS

In conclusion, no difference in dietary patterns and body weight was observed in the control and turmeric groups before and after treatment. However, a better dietary pattern and body weight following the administration of temulawak. It is recommended to investigate the effects of turmeric on dietary patterns and body weight using higher doses.

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