



## **A comparative study: Modisco and acupressure for weight gaining toddler**

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### **ABSTRAK**

**Latar Belakang:** Praktik pemberian makan dan makanan pendamping yang belum sesuai merupakan salah satu penyebab terjadinya gizi kurang pada anak di Indonesia. Pemberian makanan tambahan berupa Modisco (Modified Dietetic Skimmed Milk and Coconut Oil) dapat menjadi salah satu upaya untuk memperbaiki status gizi balita, selain itu terapi akupresur dapat meningkatkan nafsu makan sehingga dapat menambah berat badan anak.

**Tujuan :** penelitian ini bertujuan untuk mengetahui perbedaan efektivitas pemberian kombinasi modisco dan akupresur dengan pemberian modisco saja terhadap peningkatan berat badan balita.

**Metode :** Penelitian ini menggunakan desain Quasy Eksperimet group design dengan pendekatan Pre and Post Test Control Group Design. Kriteria inklusinya adalah anak usia 1-5 tahun, termasuk dalam kategori kurus dan tidak memiliki penyakit jantung, hati, dan ginjal. Sampel dipilih dengan purposive sampling sebanyak 30 balita yang dibagi menjadi 2 kelompok dengan ketentuan kelompok I berjumlah 15 balita dilakukan pemberian makanan pendamping berbahan dasar modisco II selama 14 hari dan akupresur sebanyak 6 kali (2 kali seminggu selama 3 minggu), sedangkan kelompok II berjumlah 15 balita hanya diberikan makanan pendamping berbahan dasar modisco II selama 14 hari. Uji statistic menggunakan Paired sample T Test.

**Hasil :** Pada kelompok I, terdapat perbedaan rata-rata berat badan balita sebelum dan sesudah diberikan intervensi dengan nilai  $p = 0,001$  ( $p < 0.005$ ), artinya kombinasi modisco dengan akupressure dapat meningkatkan berat badan pada balita. Pada kelompok II, ada perbedaan rata-rata berat badan balita sebelum dan sesudah diberikan intervensi dengan nilai  $p = 0,003$  ( $p < 0.005$ ) yang berarti modisco dapat meningkatkan berat badan pada balita.

**Kesimpulan :** Dari hasil rata-rata selisih berat badan kelompok I dan kelompok II dengan nilai  $p = 0,013$  artinya tidak ada perbedaan yang signifikan antara kelompok kombinasi modisco dengan akupressure dan kelompok modisco terhadap peningkatan berat badan balita.

**KATA KUNCI :** modisco; akupresur; berat badan balita

### **ABSTRACT**

**Background:** Inappropriate practice of feeding and complementary foods is one of the causes of malnutrition in children in Indonesia. Providing additional food such as Modisco (Modified Dietetic Skimmed Milk and Coconut Oil) can be an effort to improve the nutritional status of toddlers, besides acupressure therapy can increase appetite so that it can increase the child's weight.

**Objectives:** This study aims to determine the difference in the effectiveness of the combination of Modisco and acupressure with only Modisco on increasing toddler's weight.

**Methods:** This study used a Quasy Experiment group design with a Pre and Post Test Control Group Design approach. The inclusion criteria were children aged 1-5 years, included in the thin category and did not have heart, liver, and kidney disease. The sample was selected by purposive sampling as many as 30 toddlers who were divided into 2 groups with the provision that group I amounted to 15 toddlers were given complementary foods made from modisco II for 14 days and acupressure 6 times (2 times a week for 3 weeks), while group II amounted to 15 toddlers are only given complementary foods made from modisco II for 14 days. Statistical test using Paired sample T Test.

**Results:** In group I, there was a difference in the average weight of children under five before and after the intervention with  $p$  value = 0.001 ( $p < 0.005$ ), meaning that the combination of modisco and acupressure can increase body weight in toddlers. In group II, there was a difference in the average weight of children under five before and after the intervention with a  $p$  value = 0.003 ( $p < 0.005$ ), which means that modisco can increase body weight in toddlers.

**Conclusions:** From the results of the difference in the average weight of group I and group II with a value of  $p = 0.013$ , it means that there is no significant difference between the groups given the combination of modisco plus acupressure and the modisco group on the weight gain of toddlers.

**KEYWORD :** modisco; acupressure; toddler's weight

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## INTRODUCTION

Toddlers are an age group that is vulnerable to nutritional disorders. A balanced nutritional intake will make children grow up healthy and smart, if these nutritional needs are not met, it will have an impact on children's growth and development (1). Child nutrition is a key priority in Indonesia and part of the government's SDGs commitment to tackle nutritional problems such as low birth weight and stunting. Malnutrition in children is a significant problem in Indonesia, such as stunting, low body weight, and very thin children. Indonesia is ranked fifth and fourth highest in the world for wasting and stunting rates(2).

One of the health indicators that is assessed for its success in achieving the SDGs is the nutritional status of toddlers. The nutritional status of toddlers is a reflection of

the size of the fulfillment of the nutritional needs of toddlers obtained from the intake and use of nutrients by the body. In 2018, children who were malnourished based on body weight / age ( $<-3SD$  to  $<-2SD$ ) in Indonesia were still 17.7% which were divided into two categories, namely poor nutrition (3.9%) and undernourished (13,8%) (3). Based on data from the East Java Health Service in 2020, underweight toddlers (weight/age) were 9.8%, the percentage of stunting (height/age) was 12.4% and the percentage of wasting toddlers was 8.0%(4). The nutritional status of toddlers in Sidoarjo Regency in 2020 was reported to be 7.7% undernourished toddlers (Weight/age), 7.8% short toddler (height/age), and 7.8% underweight toddler (weight/height). In the Wonoayu sub-district, there were 11.3% of malnourished toddlers,

6.2% of short toddlers, and 6.7% underweight toddler(5).

The practice of feeding and complementary foods that are not appropriate is one of the causes of malnutrition in children in Indonesia, so that children do not get quality food intake and essential nutrients. Various efforts can be made to improve the nutritional status of toddlers, one of which is by providing additional food —(2). Modisco (Modified Dietetic Skimmed Milk and Coconut Oil) is a diet therapy for toddlers with low protein energy which is highly nutritious, rich in calories and protein. Modisco is a therapeutic liquid food recommended by WHO. It has been tested and meets the dietary requirements of the Decree of the Minister of Health on the Nutritional Standards of supplement products '(6). Modisco was first known in Indonesia under various formula names, namely Modisco containing 80 kcal of energy, 3.5 g of protein and 2.5 g of fat; Modisco I contains 100 kcal of energy and 3.5 g of protein, and 3.5 g of fat; Modisco II contains 120 kcal of energy and 3.5 g of protein, and 4 g of fat, and Modisco III contains 120 kcal of energy and 3 g of protein, and 7.5 g of fat. Modisco consists of three basic formulas with the main ingredients, such as sugar, oil or margarine, and skim milk or full cream milk. All these materials can be obtained easily both in urban and rural areas (7).

In addition, efforts to overcome eating problems in children can be done by non-pharmacological methods, including through herbal or herbal drinks, massage, acupressure, and acupuncture. Acupressure is a form of massage using the hands or a blunt object at certain points with the aim of

restoring the body's positive energy(8).

Acupressure can overcome eating difficulties in toddlers by facilitating blood circulation in the spleen and digestion, through pressing using fingers or a blunt object on body meridians or energy flow lines so that it is relatively easier to do than acupuncture. Impaired spleen and digestive functions are the most common causes of eating difficulties in toddlers, as a result, food is not digested immediately, resulting in food stagnation in the gastrointestinal tract which causes frequent vomiting and stomach feels full and ultimately decreased appetite. Acupressure at the body's meridian points will be able to facilitate blood circulation in the spleen and digestive system so that it can increase the absorption of nutrients or nutrients more optimally as a result of increased appetite and ultimately can increase body weight (9). In Wijayanti's research (2019), it was stated that after acupressure was carried out, most of the toddlers experienced weight gain, meaning that acupressure was effective in increasing the toddler's weight —(10).

## **MATERIALS AND METHODS**

This study used a Quasy Experiment group design with a Pre and Post Test Control Group Design approach. This study used purposive sampling, the number of samples was 30 toddlers. The inclusion criteria in this study were children aged 1-5 years, including undernourished categories based on weight/height (<-3SD to <-2SD) and did not have heart, liver and kidney disease. The sample was then divided into 2 groups with the provision that group I amounted to 15 toddlers who were given additional food made from modisco II for 14 days and acupressure 6

times (2 times a week for 3 weeks). emphasis on points LR3, SP6, ST36, LI4, LI9, PC6, CV12 and CV14. While group II amounted to 15 toddlers, only given additional food made from modisco II for 14 days. Modisco is presented in several variations of the food and drink menu which the researchers made themselves. Before conducting the intervention, the researcher explained the aims and objectives of the study to obtain the consent of the mother's toddler, then measured the weight and height of the toddler. Weighing was done again 1 day after the last acupressure therapy. This study uses the

Paired Sample T Test as a statistical test with a significance level of  $\alpha = 0.05$ .

## RESULTS AND DISCUSSION

### RESULTS

The characteristics of toddlers who became respondents in this study can be seen in the frequency distribution table as follows.

Based on the **Table 1** above, it is known that most of the children under five (60%) are male, 73% aged 12 to 36 months. At the age of 1 year, children usually experience eating problems such as being picky about food or refusing certain foods. This usually occurs in children aged 1-3 years.

**Table 1. Frequency distribution of toddler characteristics**

	n	%
Sex		
Male	18	60
Female	12	40
Age		
12 – 36 month	22	73
37 – 60 month	8	27
Total	30	100

*The effectiveness of modisco and acupressure on toddler weight gain*

Based on the **Table 2** above, it shows that the average body weight (BB) before being given modisco and acupressure was  $10.20 \pm 1.10$  and the average body weight (BB)

after being given modisco and Acupressure was  $10.74 \pm 1.25$ . The results of the Paired Sample T test showed p value =  $0.000 < 0.05$ , which means that the combination of modisco and acupressure is effective in increasing the toddler's weight.

**Table 2. Test results paired sample t test differences in weight before and after being given additional food modisco and acupressure**

	n	Mean $\pm$ s.d	p
Weight before being given modisco + acupressure	15	$10.20 \pm 1.10$	0,000
Weight after being given modisco + acupressure	15	$10.74 \pm 1.25$	

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**Table 3. Results of the paired sample t test. the difference in body weight before and after being given the modisco supplementary food**

	n	Mean±s.d	p
Weight before being given modisco	15	9.79±1.70	0,003
Weight after being given modisco	15	10.06±1.68	

*Differences in the effectiveness of the combination of modisco and acupressure with only modisco on toddler weight gain*

Based on **Table 4** above, it can be seen that the average weight gain in group 1 (Modisco+Acupressure) was 0.546±0.294 and the average weight gain in group 2 (Modisco) was 0.266±0.284. The results of the

Independent Sample Test (Levene's Test) showed p value = 0.013, which means that there is a difference in weight gain in toddlers who are given a combination of Modisco and Acupressure with toddlers who are only given Modisco. However, this difference was less significant, this could be due to the time the intervention was limited to only 14 days.

**Table 4. Results of the independent sample test the difference in the average weight gain in groups 1 and 2**

	n	Mean±s.d	p
Group 1 (Modisco+acupressure)	15	0.546±0.294	0.013
Group 2 (Modisco)	15	0.266±0.284	

## DISCUSSION

Modisco is one of the efforts to overcome malnutrition and malnutrition and can be used as an alternative nutrition that can be given at home(11). Modisco which consists of skim milk, sugar and oil or margarine has a high nutritional content of calories and protein. Modisco has been tested and meets the special dietary requirements for children in Indonesia so that it can be used to improve nutritional status or increase children's weight quickly. The child's body weight can increase by 30-100 grams in a day after giving Modisco. Modisco does not have bad side effects on children's health but for children who are overweight (obese), suffer from kidney, liver and heart disease, Modisco cannot be given freely without consulting a doctor(8).

The provision of additional food made from Modisco is useful to meet the nutritional needs of children, especially children with less nutrition. Modisco has proven to be an

alternative formula to aid weight gain for malnourished children. It can also be a food supplement to complement daily nutrition to improve children's nutritional status '(6). In Nurina's (2020) study, giving soybean Modisco to KEP white rats for 14 days was able to increase body weight by an average of 55.33 grams (54.9%)(12).

Muflihatin's research (2021) stated that children who were given Modisco with Moringa leaves for 7 days, had 56.6 times greater potential to increase their weight than those who were not given. So it can be concluded that the consumption of f Modisco with Moringa leaves has a beneficial effect on improving the nutritional status of children (6). in Arolyumma's research (2016) concluded that there was a significant difference in body weight change before and after giving Modisco ice cream (13). Modisco has a liquid form so the child's reception is not so good. In this study, toddlers were given a Modisco food

supplement in several processed variants such as fashionable avocado juice, Modisco pudding and Modisco cake to increase the child's acceptance and avoid boredom because it was given every day for 14 days. In addition, researchers also provide acupressure therapy for toddlers to optimize toddlers' weight gain.

Acupressure is a form of massage using hands or a blunt object at certain points with the aim of restoring the body's positive energy (14). Impaired spleen and digestive functions are the most common causes of feeding difficulties in toddlers, as a result, food is not digested immediately, resulting in food stagnation in the gastrointestinal tract which causes complaints of frequent vomiting, nausea when fed, and a full stomach and finally decreased appetite or even no appetite at all (15). By emphasizing on the body's meridians or energy flow lines, it will be able to facilitate blood circulation in the spleen and digestive system so that acupressure is able to increase the absorption of nutrients or nutrients more optimally resulting in increased appetite and ultimately weight gain (8).

Several acupressure therapy points that are scientifically proven to increase toddlers' appetite are ST36 (Zusanli), CV12 (Zhongwan), SP3 (Taibai), SP6 (San Yinjiao) and additional ST25 (Tianshu) points (14). This happens because these meridian points can facilitate blood circulation in the spleen and digestive system through the brain wave mechanism (hypothalamus) which plays a major role in the response to hunger and appetite. The hypothalamus produces the hormone ghrelin which can affect appetite (15). The concentration of this hormone ghrelin increases progressively in the first two

years of life and decreases in late childhood (16).

Based on the results of the assessment of the average weight gain of toddlers, it can be seen that the average weight gain in group 1, which is given a combination of Modisco and Acupressure, is greater than the average weight gain in group 2 which is only given Modisco. This shows that the supplemental feeding of Modisco together with acupressure therapy is more effective in increasing body weight than only given only Modisco. The provision of supplementary food made from Modisco contains nutrients high in calories and protein that can fulfill and increase the nutritional intake of toddlers, especially undernourished toddlers, while acupressure can optimize the work of the digestive system and stimulate the release of hormones that can increase appetite so that it can increase toddler body weight.

## **CONCLUSION AND RECOMMENDATION**

Giving a combination of modisco and acupressure is effective in increasing the toddler's weight. Likewise, only with the provision of modisco can increase the toddler's weight. The increase in body weight was greater in toddlers who were given additional food with modisco with added acupressure therapy compared to those who were only given modisco.

Based on the results in this study, it is hoped that mothers who have under-fives who are malnourished can provide additional food made from modisco and do acupressure regularly to improve the nutritional status of their toddlers as well as cadres and midwives can support them to continue their efforts to improve the nutrition of children under five.

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