

EFFECT OF POSHAK YOG ON THE NUTRITIONAL STATUS OF AN UNDERWEIGHT SCHOOL-AGED CHILD: A CASE STUDY

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ABSTRACT

A healthy childhood leads to healthy adulthood. Childhood malnutrition remains a major public health concern in India and continues to affect physical growth, immunity and academic performance in children. According to NFHS-5, Poshan Tracker, and UN reports, Stunting (low height-for-age) \approx 34–36%, Underweight (low weight-for-age) \approx 25–30%, Wasting (low weight-for-height) \approx 14–18%². On average in India, one in every three children is shorter than expected for their age. Around one out of four children weigh less than normal for their age. Nearly one out of six children is too thin for their height, which shows the status of undernutrition in India. Despite various nutritional programs, a significant proportion of school-aged children remain undernourished. Ayurveda emphasizes nourishment-promoting therapies for improving growth and strength in children. The present case study evaluates the effect of Poshak Yog, an Ayurvedic nutritional supplement, on the nutritional and functional status of an underweight school-aged male child. A 9-year-old boy with poor appetite, generalized weakness, disturbed sleep and reduced physical activity was assessed. Baseline evaluation revealed severe undernutrition with a BMI of 12.0 kg/m^2 ($< -2 \text{ SD}$ as per WHO standards). The child received Poshak Yog along with an age-appropriate balanced diet for a period of 12 weeks. Subjective parameters were assessed using a graded scoring system, and objective parameters such as weight, height, BMI and haemoglobin levels were recorded before and after intervention. Following treatment, the child showed noticeable improvement in appetite, strength, sleep quality, activity level and academic performance. Objective measurements also demonstrated an increase in body weight, BMI and haemoglobin levels. No adverse effects were observed during the intervention period. The findings suggest that Poshak Yog may be useful as a supportive nutritional intervention in underweight children.

INTRODUCTION

Nutritional problems in the developing world is a complex affair, as it includes three types of phenomena known as the “triple burden” of malnutrition:- undernourishment, micronutrient deficiencies, and obesity (Park, 2021). It is posing a serious challenge, particularly in developing countries like India.

Undernutrition during childhood not only affects physical growth but also has long-term consequences on cognitive development, immunity and overall well-being (World Health Organization., 2009). Even among school-aged children, inadequate nutrition often goes unnoticed until growth failure becomes evident (World Health Organization., 2009).

According to Ayurveda, proper growth and development in children depend on adequate *Ahara*, balanced *Agni* and proper nourishment of body tissues. Conditions resembling undernutrition can be correlated with *Karshya* and *Daurbalya*, which arise due to inadequate intake, poor digestion and improper assimilation of nutrients. Classical Ayurvedic formulations described under *Balya* and *Brimhana* therapies aim to improve appetite, digestion and tissue nourishment (Sharma, 2011).

Poshak Yog is one such formulation traditionally used to enhance nutritional status and strength in children. The present study was undertaken to observe the effect of *Poshak Yog* on physical, functional and hematological parameters in an underweight school-aged child.

MATERIALS AND METHODS

Study Design

A single-case observational study.

Subject Profile

A 9-year-old male child studying in primary school presented with complaints of poor appetite, easy fatigability, reduced activity and suboptimal academic performance came to the outpatient department of *Kaumarabhritya* of Sree Narayana Institute of Ayurvedic Studies and Research Kollam. The subject was a preterm baby with a birth weight of 1.80 kg. He had difficulty in gaining weight from

the prime and had suffered from various infections frequently. Clinical assessment consisted of subjective parameters of *karshya*, a few laboratory investigations and anthropometric assessment. Laboratory investigation found him to be anaemic with total leucocyte count decreased than normal.

Anthropometric assessment revealed a BMI of 12.0 kg/m², which was below -2 standard deviations for age as per WHO growth standards, indicating severe undernutrition.

Intervention

The child was advised an age-appropriate balanced diet and was administered 5 days *astachoorna* followed by *Poshak Yog* in a suitable paediatric dose along with one glass of milk for a duration of 12 weeks.

Assessment Parameters

Subjective parameters including *Daurbalyam*, *Kshut*, *Nidra*, *Akriti*, *Vitgraham*, *Kapola gata vasa*, *Cheshta* and academic performance were graded on a 0–3 scale. Objective parameters such as weight, height, BMI, hemoglobin and total leukocyte count were recorded at baseline and after completion of treatment.

Ethical Consideration

Informed consent was obtained from the child's parent. The study was conducted in accordance with ethical guidelines for research involving human subjects.

RESULTS

Table 1. Subjective Clinical Parameters

Parameter	Baseline	After Treatment
Daurbalyam	2	1
Kshut	3	1
Nidra	2	0
Akriti	3	2
Vitgraham	2	0
Kapola gata vasa	3	1
Cheshta	2	1
Academic performance	2	1

Table 2. Objective Parameters

Parameter	Baseline	After Treatment
Weight (kg)	18.3	21.2
Height (cm)	123.5	126
BMI (kg/m ²)	12	12.4
Hemoglobin (g/dL)	10.8	11.9
TLC (cells/mm ³)	6200	6800

Table 3. Ingredients of poshak yog

Name	Latin Name	Part to be used	Proportion / 100 g Poshak Yog	Calories / 100 g (kcal)
Shashtika Sali	<i>Oryza sativa</i>	Shushka beeja	1 part / 12.5 g	43
Peanut	<i>Arachis hypogaea</i>	Shushka beeja	1 part / 12.5 g	68
Green gram	<i>Vigna radiata</i>	Shushka beeja	1 part / 12.5 g	41.2
Raw banana	<i>Musa paradisiaca</i>	Shushka phala	1 part / 12.5 g	18.37
Sunthi	<i>Zingiber officinale</i>	Shushka kanda	¼ part / 3.12 g	0.44
Raw sugar	<i>Saccharum officinarum</i>	—	8 parts / 100 g	387
Cocoa solids	<i>Theobroma cacao</i>	—	1 part / 12.5 g	28.62
Ragi	<i>Eleusine coracana</i>	Shushka beeja	4 parts / 25 g	42

Content	Energy per100g	Protein Per 100g	Carbohydrate Per 100g	Fibre Per 100g	Fat Per 100g	Moisture Per 100g
Shastika Sali	345kcal	6.8g	78.2g	1.2g	0.5g	1-2%
Mudra	334 kcal	24g	57.3g	16g	57.3g	6 %
Peanut	544kcal	27g	17g	9g	49g	20
Ragi (Madhulika)	336 kcal	7.7g	72.6g	3.6g	1.3g	4%
Sugar	387kcal	-	99.98g	-	-	-
Raw Banana	147kcal	1.1g	1.5 g	2.6g	9.5g	3.33%
Sunti	6cal	0.2g	1.3g	4.9g	1.5 g	3.5%
Coco solids (un)	229 cal	54.3g	19.6g	33g	8g	7%

Sweetened)						
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Figure1

Weight

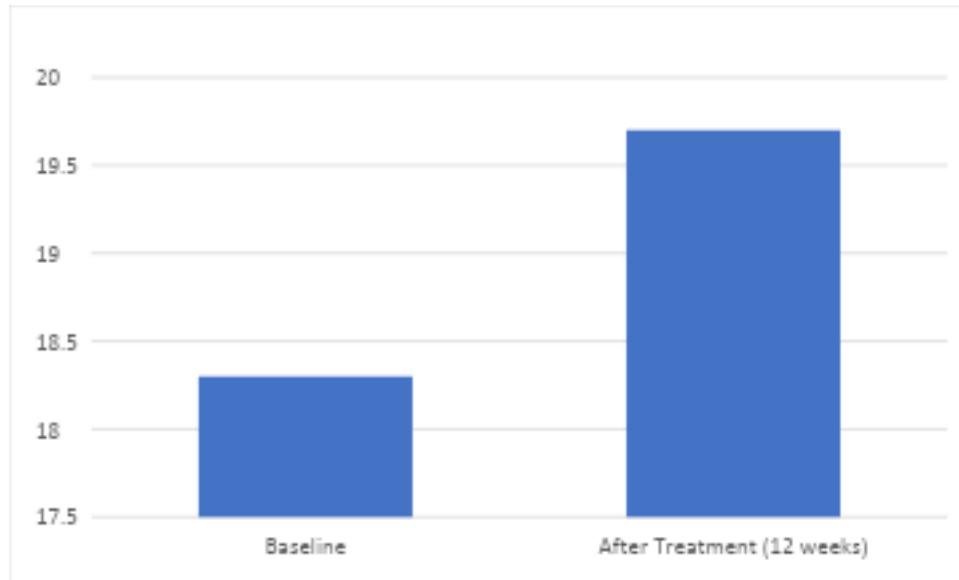


Figure2

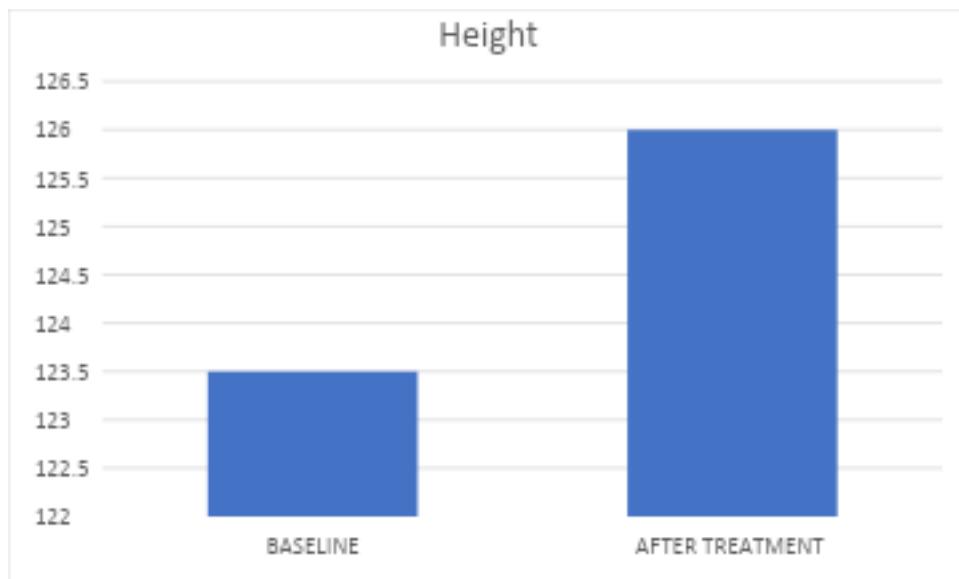


Figure 3

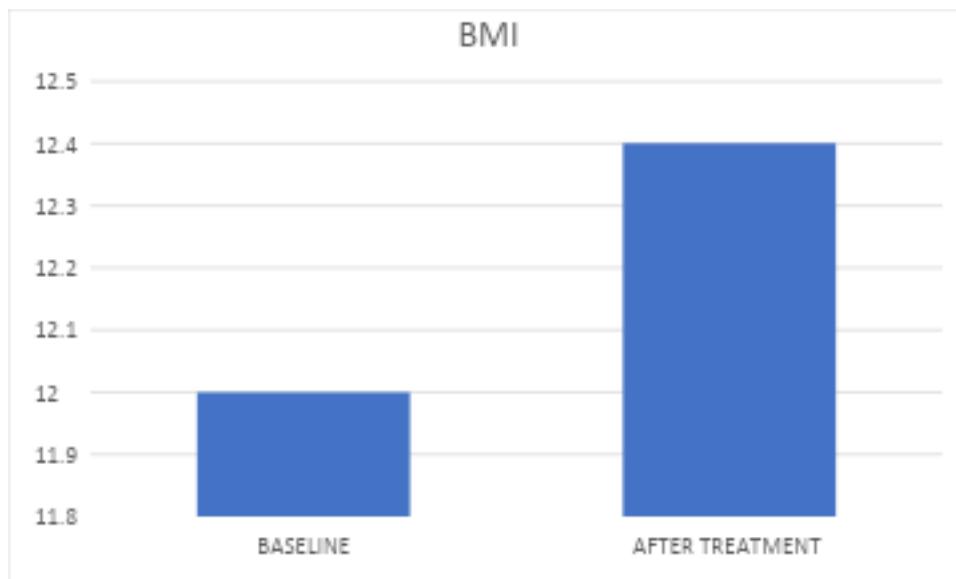
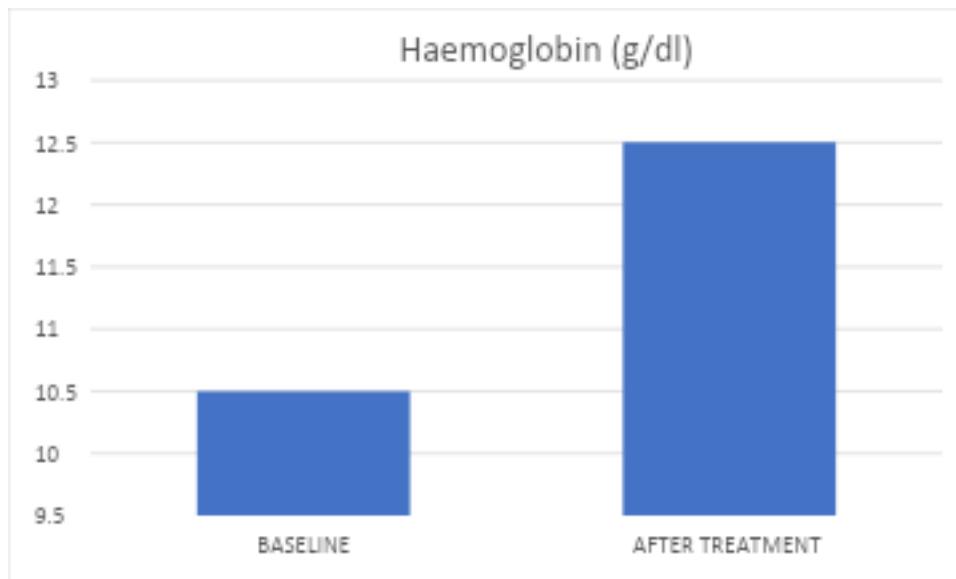


Figure 4



Weight, Height, BMI and Haemoglobin levels are presented as Fig. 1 – 4.

DISCUSSION

The improvement observed in appetite, strength and physical activity following administration of *Poshak Yog* suggests better digestive function and improved nutrient assimilation. The administration of *Ashtachoornam* has a carminative, digestant, astringent, antacid and is used to

improve appetite (Simon and Soumya, 2019). An Ayurvedic perspective, the formulation may have enhanced *Agni* (digestive power) and promoted proper nourishment of *Rasam* and subsequent *Dhatus*. This is reflected in the steady weight gain and improvement in BMI. The ingredients of *poshak yog* like *Shashthika shali* (*Oryza sativum L.*) has been described

as best among *shukadhwanya* i.e. cereals. It has *kashaya*, *madhura rasa*, *madhura vipaka* and *sheeta veerya*. It is a very good source of carbohydrate, vitamin B complex and minerals like Iron. According to modern researches it possesses antioxidant, cytoprotective, immunomodulatory, hepatoprotective properties (Saylee, 2016).

Mudga (*Vigna radiata* L.) one of the drugs of poshak yog has been described best in *shamidhwanya* i.e. pulses possess *madhura*, *kashaya rasa*, *katu vipaka* and *sheeta virya* with *laghu* and *vishada* guna have high nutritional value. 100g of it produces 334 Kcal of energy. It is rich in carbohydrate (56.7g/100g) and proteins 23.86g. It is very good source for minerals like Potassium (843 mg/100g), Magnesium (127 mg/100g), calcium (124 mg/100g), phosphorous (326 mg/100g) and iron (4.4 mg/100g). Vitamins like carotene, thiamine, niacin, riboflavin, ascorbic acid and folic acid are also present in mudga (Saylee, 2016). According to researches antioxidant, antihyperglycemic, antianaemic, antihyperlipidemic, and antimicrobial activities have been found in *mudga*. (Saylee, 2016). Regular consumption of *mudga* can regulate enterobacterial flora of intestine, decrease absorption of toxic substances, reduce risk of hypercholesterolemia and coronary heart disease and prevent cancer⁶ *Mudga* extracts were also found to have a potent scavenging activity against pro-oxidant species, including reactive oxygen species and reactive nitrogen species as well as an inhibitory effect on low-density lipoprotein oxidation (Saylee, 2016). *Godugdha* (cow's milk) was used as anupana for the *poshak yog*, it possesses *madhura rasa*, *madhura vipaka* and *sheeta virya* with *guru* and

snigdha guna. It has been described as *aajanmasatmya* (compatible from the birth), *ojovardhaka* (increases vital power of the body). It is a source of good quality protein, calcium and vitamins particularly, vitamin A, riboflavin, niacin and folic acid. In addition, milk contains several bio-protective molecules that ensure health security to humans. *Godugdha* has been reported to possess anti-oxidant, immunomodulatory gut protective activity (Saylee, 2016)

In Ashtanga Hridaya five Ikshu vikaras (sugar and sugar compounds) are explained viz. *Phanita*, *Guda*, *Matsyandika*, *Khanda* and *sarkara* these are *Madhura* (sweet), *Balya* (strengthening), *Vrushya* (aphrodisiac), *Mutrala* (diuretic) and *Rakta pitta Prashamana* (mitigates vascular disease) in nature (Ashok Kumar, Sujatha and Renjal, 2016). This also prevents dehydration used along with milk. In the formulation *sarkara* in raw form is used to enhance the palatability of the formulation.

Of all the cereals and millets, Ragi has the highest amount of calcium (344 mg%) and potassium (408 mg%). It has higher dietary fibre, minerals, and sulphur containing amino acids compared to white rice, the current major staple in India (Jagati, Mahapatra and Dash, 2021). Popped finger millet is treated as a nutrient enriched food component in nutrition intervention programme (Jagati, Mahapatra and Dash, 2021). Here in *poshak yog* the ingredients are dry roasted and made to powder. Peanuts are protein and energy-rich and have been utilized worldwide to address the nutritional needs in developing countries (Toomer, 2018).

Peanuts are calorie and supplement thick, and protein-rich, ideal for small stomachs in malnourished kids who can just take in modest quantities. They are mainly used in many RUTF(ready to use treatment foods) to treat malnutrition in underdeveloped countries . African countries like Malawi, Sudan and Haiti, treatment with RUTF (ready to use treatment foods) in youngsters has over and again demonstrated better recovery rates and shorter length than arrive at weight-to-development objectives contrasted with standard World Health Organization (WHO) treatments for malnutrition restoration in 2003, this indicated that modestly malnourished ready to use therapeutic food users had higher admission of vitality, fat, iron and zinc contrasted with a gathering of corn/soy treatment on the grounds that the utilization of staple nourishments fell in the corn/soy gathering (Moharana *et al.*, 2020)

Banana powder is a rich source of carbohydrates and calories. Although it is a low source of protein, the presence of other beneficial components of powder makes it a better source of protein as compared to other fruits. The powder is also found to be useful as a general treatment for dyspepsia (indigestion). Bananas are a very good source of vitamin B6 and contain moderate amounts of vitamin C, manganese and dietary fiber(Bana, 2015). These properties of banana in *poshakyog* eased the symptoms of constipation and other digestive discomfort.

Flavor is important in the admissibility of cacao beans and cocoa products, including chocolate, consequently contributing to defining the quality of the products(Mohamadi *et al.*, 2019). The cocoa solids added in the *poshak yog*

enhanced the flavour and palatability of the formulation thus making it easy to consume.

The increase in haemoglobin levels further indicates improved nutritional status and better utilization of nutrients. The combined effect of *Mudga* (*Vigna radiata* L.) *ragi*, raw banana and peanut contributed to this. The child also showed improvement in academic performance and activity levels, reflecting overall enhancement in physical and functional well-being. Importantly, no adverse effects were reported during the study period, indicating good tolerability of the intervention.

CONCLUSION

The findings of this case study suggest that *Poshak Yog*, when administered along with a balanced diet, may help improve nutritional status, hematological parameters and overall functional health in underweight school-aged children. Although the results are encouraging, larger clinical studies are required to establish its efficacy on a wider population.

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