



Review Article

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MANAGEMENT OF MALNUTRITION IN CHILDREN WITH AYURVEDA INTERVENTIONS: A REVIEW

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ABSTRACT

In India, malnutrition remains a significant and challenging public health issue despite dietary rehabilitation and the effort of the government to tackle malnutrition. Childhood malnutrition is an underlying cause of an estimated 35% of all deaths among children under five and 21% of global disability-adjusted life years lost among less than five children. In Ayurveda, malnutrition in children is described as balashosha, karshya, phakka and parigarbhika. A large number of clinical studies on the management of malnutrition with Ayurveda drugs have been conducted and published. The purpose of this study is to evaluate the effect of Ayurveda interventions in the management of malnutrition in children. This review is accomplished using a complete and organized search of the available literature in Ayurveda texts and published articles. The searches were performed using various databases, including PubMed, Scopus, MedLine, and Google Scholar. Ayurveda drugs described for managing karshya and balashosha are formulated to meet all the deficiencies and cure the same. The findings of this review suggest that Ayurveda drugs, along with nutritional rehabilitation, proves to be more effective than nutritional rehabilitation alone, which may be due to the presence of deepana, pachana, brimhana and rasayana property of the Ayurveda drug. These findings will provide a substratum for future research studies for generating good-quality evidence that can help design new health policies to combat malnutrition effectively.

Keywords: Malnutrition, Karshya, Balashosha, Ayurveda drugs.

INTRODUCTION

Malnutrition refers to deficiencies (Undernutrition), excesses (Overnutrition), or imbalances in a person's energy intake and/or nutrients¹. However, sometimes the terms Malnutrition and Protein Energy Malnutrition [MD-10 (ICD-10), NAMASTE-PORTAL] are used interchangeably with undernutrition. Undernutrition is a condition characterised by insufficient nutrient intake, poor absorption, or excessive loss².

Even though the primary causes are a lack of food and a bad diet because of poverty and unemployment, it's also may be due to illiteracy and a lack of knowledge about food, cleanliness, and health; environmental, economic, and geographical disasters; and diseases caused by a lack of potable water and improper sanitation. It is the underlying contributing factor in about 45% of all child deaths, making children more vulnerable to severe diseases leading to emaciation³. Apart from food availability, several challenges must be addressed. This includes clean drinking water, adequate sanitation and waste disposal, and regular deworming and nutrition for children. In addition, assuming food is made available, other aspects such as good digestion, absorption, and assimilation are equally vital. Undernutrition is caused by a lack of both quality and quantity of meals. When nutritional rehabilitation is necessary at the same time, appropriate digestion and assimilation are also required equally. The emaciated clinical condition of malnutrition resembles karshya⁴⁻⁵, balashosha, kuposhanajanya vyadhi, phakkaroga, shosha⁶, and yakshma, as mentioned in the classical texts of Ayurveda along with their management. Hence the same line of treatment can also be followed for managing malnutrition⁷.

In all the above-specified conditions, common pathophysiology is mainly vitiation of vatadosha⁸, agnimandya, accumulation of ama and rasavaha srotorodha resulting in uttarottara dhatukshaya. To manage it, the drugs which have vatashamaka, amapachaka, deepana, brimhana, srotoshodhana, dhatu poshaka and rasayana properties should be used, which will provide nourishment to the dhatu, and ultimately beneficial in the treatment of PEM⁹.

The Government of India has been putting in incredible efforts under various nutritional programs like ICDS¹⁰, VCDC, etc., for malnourished children. Also, it has taken steps to prevent childhood malnutrition by providing one nutritious meal every day at school called "Mid-Day-Meal"¹¹. Also, many more successful programmes include the National Health Mission¹² (NHM), the Rajiv Gandhi Schemes for Adolescent Girl Empowerment¹³ (RGSEAG), also known as SABLA, Swachhha Bharat Abhiyan¹⁴, RBSK¹⁵, Poshana Abhiyana¹⁶ and others. Due to these efforts, a decrease in the cases of malnourished children has been seen over the years, but still, India has the highest proportion of malnourished children in the world, along with Bangladesh, Ethiopia, and Nepal. India's rates are almost double those of Sub-Saharan Africa and five times higher than those of China¹⁷.

NEED OF THE STUDY

NFHS-4 and NFHS-5

According to the National Family Health Survey-4 (NFHS-4) in India 2015-2016, 38 % of children under the age of five were stunted, 36% were underweight, and 21% of children were wasted¹⁸ and NFHS-5, in India 2019-2021 recorded 36% children under the age of five were stunted (low height for age), which is the mildest improvement of 2 % in the cases of Stunting as

compared to 38 % in 2015-2016 and 4 % decrease in the case of underweight children with 32 % children under the age of five. Also, the cases of wasting (low weight for height) decreased by 2%, with 19% wasting children under the age of five in 2019-2021. In all phase-II States/UTs, the situation has improved regarding child nutrition, but the change is not significant (a slight improvement at all India levels) as drastic changes in respect of these indicators are unlikely in a short span period¹⁹. Despite various national programs launched by the Government of India. Still, there has not been much improvement in the nutritional status of children under three years of age in recent years.

METHODS

A Review of published studies reporting the ‘Management of malnutrition in children with Ayurveda interventions’ was undertaken following the PRISMA (Preferred Reporting Items for Systematic reviews and Meta-Analysis) statement guidelines²⁰. An all-inclusive literature search was conducted in the following databases: PubMed, Research Gate, Scopus, Google Scholar, and others for studies published until 2021.

The key terms were searched relating to or describing the interventions, condition of the diseases, etc.: ‘Malnutrition’, ‘PEM’, ‘Undernutrition’, ‘Karshya’, ‘Balashosha’

‘Kuposhanajanyavyadhi’, ‘Brimhana’, ‘Deepana-pachana’, ‘Agni’, ‘Rasayana’, ‘Ayurvedic drugs’, ‘Ayurvedic medicine’, ‘Ayurved’, ‘Ayurveda’, ‘Ayurvedic’, ‘Ayurveda therapy’, ‘Ayurvedic drugs’, ‘Ayurvedic Formulation’, ‘Ayurvedic Interventions’, ‘Ayurvedic management’, ‘Ayurveda Panchakarma’ and ‘Basti’. Results were confined to studies in English, while conference proceedings and commentaries were excluded.

The total hits from searching the databases with the search criteria were pooled together in the final stage, and duplicate articles were removed. The remaining publications were checked by reading the titles and abstracts. At this step, studies that were not satisfying the inclusion criteria were excluded. In the final stage, the remaining articles were reviewed by reading the complete text, and those that did not meet the inclusion requirements were removed. A manual search was performed to get additional data using the reference lists of included articles. This search process was conducted independently by two reviewers (ES and NKO), and the final group of articles to be included in the review was determined after an iterative consensus process. The selection process details for the study were shown in the Preferred Reporting Items for Systematic Reviews and Meta-analysis (PRISMA) flow diagram.

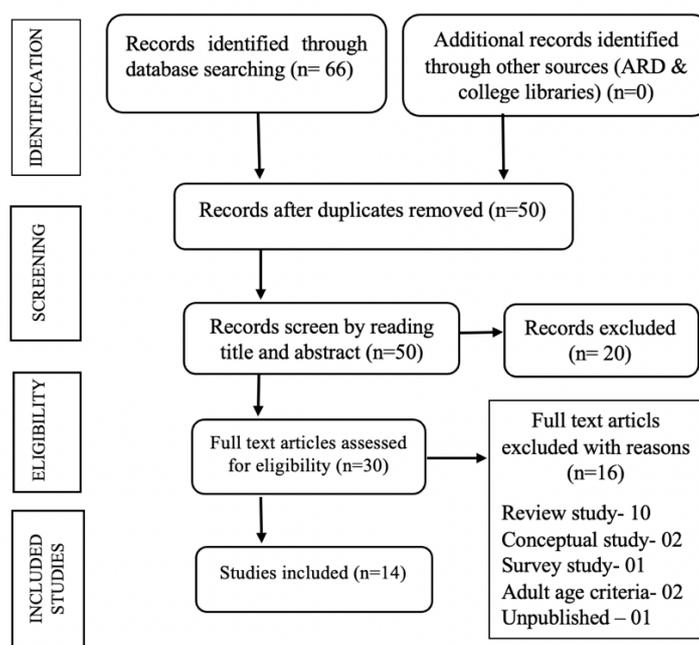


Figure 1: Clinical Study Process Adapted from the PRISMA Statement

Table 1: Studies containing the management of malnutrition

Researchers/ Authors	Participants	Intervention	Result	Study Design
Sudhanshu et al. ²¹ (2017)	N=30 15-50 years (18 months)	Ashwagandha Rasayana ²²	Ashwagandha Rasayana was found to affect increasing body weight, BMI and Haemoglobin significantly.	A randomized clinical trial
Bhagyashree et al. ²³ (2019)	N=2054 (1035-case, 1019-control) 0-6 year For 90 days	4 groups A. 6 months-1 year child- 2.5 gm - ayurvedic kalp -twice a day. B. 1-3 year child- 2.5 gm - ayurvedic kalp - twice a day, 1 biscuit -5 gm - once a day. C. 3-6 years children- 2.5 gm ayurvedic kalp and 1 biscuit - 5 gm twice daily. D. In women	Weight- significant increase (case-97.1%, control-82.2 %) Nutritional- Increased (case-40%, control- 8.4%) Hb%- significantly increased (case-91%, control- 36.51 %)	A randomized control trial

Kalpana Patni²⁴ (2017)	N=40 1-10 years For 3 months	2 groups a. Ashwagandha ksheerapaka b. Ashwagandha K.P. along with Ksheerabala taila abhyanga	Group B showed highly significant results in the management of Balashosha in children compared to only oral medication with Group A; remarkable results were obtained in Anthropometric indices and blood parameters in both the groups	A clinical study
Sagar et al.²⁵ (2019)	2 year 8 months- FCh	1. Deepana pachana- Panchakola phanta (20ml TDS before food- [Only for first 2 days] 2. Sarvanga Abhyanga-Mahamasha thaila 3. Shashtika Shali Pinda Sweda (S.S.P.S) 4. Matra Basthi-Aswagandha Ghrita (20ml) 5. Ksheerapaka with a powder combination of Aswagandha, Bala and Shathavari (20ml-20ml-20ml) 6. Aswagandha Leha 1 tsp BD with Warm milk before food. 7. Draksharishta 1tsp BD with an equal amount of water after food, For 1 -10 days.	There were significant changes in various parameters, including body weight, bowel status, generalized weakness etc., after 10 days of treatment.	A case study
Arti et al.²⁶ (2019)	N=100 2-5 years For 3 months	2 groups a. Kushmand kalpa with regular diet, 10gm b. Regular diet only	The therapy used in the trial group, i.e. Kushmanda kalpa, is more effective in increasing weight than the regular standard diet group.	An open end, randomized, controlled clinical study
Antim et al.²⁷ (2021)	N=30 1-5 years For 30 days	1 group a. Nutricharge powder 2.5 gm BD b. Poshaka laddu 16 gm OD c. Abhyanga with Chandana bala lakshadi taila (yogratnakar)	This study proves that combined therapy of NR powder, Poshaka Laddu and Adhyanga significantly increases malnourished children's weight and mid-under-arm circumference.	A clinical study
Jaidev et al.²⁸ (2018)	-	a. Paushtika biscuit Ingredients: Godhuma, Makhana, Amalaki, Madhuyashti, Atibala, Guduchi, Mandukparni, Dry khajoor, shunthi, Pravala bhasma, Mandoora bhasma, sharkara.	This concept is highly recommended for those children who are suffering from malnutrition. It will also recover faster in malnutritional, and it is easy to take and also used in Diets.	Pharmacognostic study
Dhanawade²⁹ (2019)	N=30 2-14 years	2 groups a. Shatavaryadi churna b. Vidaryadi churna	Shatavaryadi churna shows more significant relief than Vidaryadi churna in symptoms such as weight, kshudhamandhya, and MUAC of Balkarshya. In dhamanijala pradarshan – equally effective in both groups.	an open randomized controlled trial design
Jagruti et al.³⁰ (2018)	N=60 1-5 years For 60 days	2 groups a. Yashtyadyam ghrita (T) b. Goghrita (C)	There is a significant improvement in weight, height, mid-upper arm circumference, and Daurbalya and Kshudha alpata in both groups. But the trial group showed better results overall than the control group.	A clinical study
Arun Raj GR et al.³¹ (2019)	N=27 3-5 years For 42 days	2 groups a. Study group 1. Deworming 2. Chitrakadi vati ½ BD for 3 days 3. Amritprasha ghrita 6ml BD b. Home-based food along with 1. milk-150 ml 2. Seasonal fruit-1or2 3. egg - 1	The study group showed a statistically significant result in improving children's weight with Karshya than the control group. Amritpraasha Ghrita is effective in improving weight and in reducing the associated complaints of Karshya like Dourbalya (general weakness) and improving Kshudha (appetite), Cheshta (interest in activities) and Aakruti (appearance).	A clinical study
Sheetal bansode^{32,33} (2017)	N=28	Vidarikand churna	It shows better results in Subjective Parameters and also increases Weight, BMI, Height, Mid Upper Arm Circumference. 16 patients were markedly Improved, and 12 showed improvement	A clinical study
Dinesh ram et al.³⁴ (2020)	N=30 16-70 years	Ashwagandha Modaka ³⁵ orally	Ashwagandha Modaka possesses the Madura Vipaka, Laghu and Snigdha Guna, due to which Kapha Guna increases in the body. Therefore, Ashwagandha Modaka is effective in Karshya.	A clinical study
Rana AP³⁶	N=40 0-5 years	2 groups	Clinical survey reveals that the control group of patients have got no	A comparative study

		a. Shatavari kalpa 5-10 gm with milk, food, and health supplement from ICDS. b. Along with food and health supplement from ICDS.	significant results were as satisfactory, and significant results were observed in the treated group. Shatavari Kalp proves its efficacy as it is described in Kashyapa Samhita.	
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RESULTS

Searches for literature guided towards the following number of articles in the different databases; PubMed = 08, Research Gate = 21, Google Scholar = 27, Science Citation Index = 01, and Others = 09; after removing duplicate articles, the final list of articles included in the present reviewer are = 14 (total = 66). It is essential to have deepana, pachana, brimhana, balya and rasayana properties in Ayurvedic drugs for better improvement in malnourished children.

DISCUSSION

This study aimed to compile evidence on Ayurvedic interventions of malnutrition in children, which was obtained in 14 studies that showed positive outcomes of Ayurvedic interventions combined with nutritional rehabilitation on general health factors, weight gain, growth and development and Immunity.

The present review of the available studies suggests that malnutrition can be classified as apatarpanjanya vyadhis in Ayurved, and karshya is the most similar Ayurvedic diagnostic to malnutrition. According to Ayurveda, it is caused by starvation, ingesting dry food (ruksha ahara), and other factors. People who are malnourished, undernourished, or obese are always at risk for one or more diseases. As a result, "Brimhana chikitsa"³⁷ (i.e., administering medication and nutrition) is prescribed to cure these illnesses, malnutrition in this case. Ayurvedic medication and procedures are very efficacious to overcome this malnutrition, a tremendous burden on society. Assimilation also has a massive role in the absorption of brimhana yoga, so regulation of agni is crucial.

Agni (digestive fire), according to Ayurveda, is an essential factor in maintaining health and treating all ailments. Most diseases are usually caused by hypo implementation of agni (digestive fire) that leads to the formation of ama (metabolic waste material). By correction of agni (digestive fire), deepana-pachana (appetizer-digestives) is the most important therapy for the digestion of ama (undigested). Agni is responsible for the ayu (life span), varna (complexion), bala (strength), swasthya (good health), utsaha (enthusiasm), plumpness, prabha (glow), ojas (energy), tej (lustre), and prana (life breaths)³⁸.

Also, the basti procedure is more efficacious. In Ayurveda, malnutrition is significantly closer to nutritional disorders like -karshya, balashosha, balkshaya, ksheeraja phakka, parigarbhika, shushka revti etc. Samhitas provide mounting references to drugs which are indicated to manage malnutrition. According to the findings of this study, Ayurvedic medications combined with nutritional rehabilitation are more successful than nutritional rehabilitation alone, which may be due to deepana-pachana, brimhaniya, balya and rasayana properties can be more beneficial to reduce the severity of malnutrition.

Almost all studies have shown a significant improvement in a child's weight, immunity and a lowering in diseases and are more effective after Ayurvedic treatments combined with nutritional rehabilitation. This study will conclude the evidence-based effectiveness of Ayurvedic treatment and will aid in creating a database for future research.

CONCLUSION

The present study has properly compiled the most relevant studies on Ayurveda intervention on malnutrition and legitimately revealed a dearth of research on malnutrition. The results obtained from this review will help identify the evidence-based efficacy of Ayurveda interventions on weight gain in managing malnutrition. It will also provide a substratum for future research studies for generating good-quality evidence that can help design new health policies to combat PEM effectively.

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