



From undernourished (Karshya) to thriving: How food nutrition supports preschool children's growth

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Abstract

Malnutrition is one of the most important public health problems. Acc. to NFHS, 2019-2021 the statistics of malnutrition are 7.7% of children are severely wasted, 19.3% are wasted and 35.5% are stunted and on the other hand, 3.4% of children are overweight. Undernutrition (Karshya) and overnutrition both are two manifestations of malnutrition. A balanced diet with the proper dietetic rules can help combat malnutrition in children. In many countries including India, people are suffering from health problems because of poor nutrition and/or faulty eating habits. Ayurveda classic explains nutritional issues. Each disease occurs due to faulty Ahara and Vihara. To get optimal benefits from consumed food Ahara vidhi is important in the same way. The purpose of the literature review is to highlight the Ayurvedic perspective of causing malnutrition and the role of food and nutrition in the management of malnutrition among children.

Background: Malnutrition is one of the most important public health problems. According to National Family Health Survey (NFHS) 2019-2021, the statistics of malnutrition are 7.7% of children are severely wasted, 19.3% are wasted and 35.5% are stunted and on the other hand, 3.4% of children are overweight. Malnutrition is a state of improper nutrition balance in the body inadequate intake of food or a specific nutrient leads to undernutrition, while overnutrition means that a person eats more food than they need. Undernutrition and overnutrition both are two manifestations of malnutrition. A balanced diet with the proper dietetic rules can help combat malnutrition in children. In many countries including India, people are suffering from health problems because of poor nutrition and/or faulty eating habits. Ayurveda classic haphazardly explains nutritional issues. Each disease occurs due to faulty Ahara and Vihara. To get optimal benefits from consumed food Ahara vidhi is important in the same way. To eradicate malnutrition, it is important to follow daily and seasonal regimens and a proper diet. In Ayurveda, Karshya is a disease as well as its cause, prodromal symptoms, features of different diseases, and bad prognostic signs. Karshya is also physiological in Vataja prakriti individuals. The purpose of the literature review is to highlight the ayurvedic perspective of causing malnutrition and the role of food and nutrition in the management of malnutrition among children.

Material and Method: This review of literature has been taken from the text book, Dietetics, B.Shrilaxmi and Ayurvedic text, and research journals. Ayurvedic texts were scrutinized for the study of the undernutrition, and its factors causes undernutrition, have been taken from recent research.

Result: Malnutrition is a major public-health problem for the developing country. Globally, there are about 60 million children suffering from moderate acute and 13 million suffering from severe acute malnutrition. Both overnutrition and undernutrition are the form of malnutrition. Overnutrition occurs due to excess intake of food. Inadequate diet, poor nutrition, malabsorption, prolonged disease, hygiene and sanitation are the major cause of undernutrition among children which leads to under-nutrition. Protein-energy Malnutrition is a condition which occurs due to lack of protein and energy.

According to Ayurveda, consuming Ruksh ahara (dry food) is one of the factors responsible for malnutrition. According to Charak samhita, Karshya means a person with having lean and thin body personality but doesn't have any more complaints. Acharya Charak has explained nutritional issues as well as clinical symptoms & causing factors, i.e., Ahara (dietary), Viharaja (behavioral), and Manshika (psychological). Ahara, vihara, and manshik factor aggregate Vayu, alter Agni, produces insufficient Rasa dhatu along with other Dhatus,

Conclusion: Multiple birth, socio-economic condition, illiteracy, inadequate food, gender injustice, hygiene and sanitation, prolonged illness, are the factor which is responsible for the malnutrition among children. In Ayurveda, due to decrease in rasa dhatu, medha dhatu and mamsa dhatu the etiology and consequences of undernutrition occurs. According to Ayurveda, Diet (Ahara), Lifestyle (Vihara), and Psychological (Manshika) factors have an important role in causing emaciation. Langhana (fasting for a long period of time), Vikara anushaya (prolonged or continued illness), Prakriti (heredity), Rooksha Anna pana (consumption of foods that are dry in nature) Pramitashana (taking very less quantity of food). Education and awareness, government nutritional program and Ayush dietary guideline are helpful in improving the nutritional status of malnourished children.

Keywords: Ayurveda, Ahara Vidhi, malnutrition, overnutrition, undernutrition, etc

Introduction

The growth, development and survival of children, society and economy of the state and developing countries threatened due to double or triple burden of malnutrition. [1] According to WHO, in 2020, globally 149 million children under 5 were estimated to be stunted, and 45 million were estimated to be wasted. Around 45% of deaths occur among children under 5 years in developing countries. There are multiple forces that shaped children's diet- globalization, urbanization, inequity, environmental crises, epidemics, humanitarian emergencies, lack of access to nutritious, safe, and affordable foods. Half of the Indian rural population is underweight with up to three-quarters being so classified in an underprivileged community. Malnutrition is a

condition that occurs due to inadequate nutrition, poor diet (excess or low intake of food), a digestive condition, hygiene and sanitation, prolonged disease, etc. Pregnant women show a proportional increase in the risk of an underweight baby born in comparison to postpartum BMIs and BMIs range from 25-16 or less. [2] The term malnutrition has two broad conditions undernutrition and overnutrition. Over-nutrition occurs due to excess intake of nutrients for a long time and under-nutrition is a condition that occurs due to deficiency of nutrients over a long period of time. Undernutrition (wasting, stunting, and underweight), and micronutrient deficiencies all are the form of undernutrition. [3] (As mentioned in Figure1).

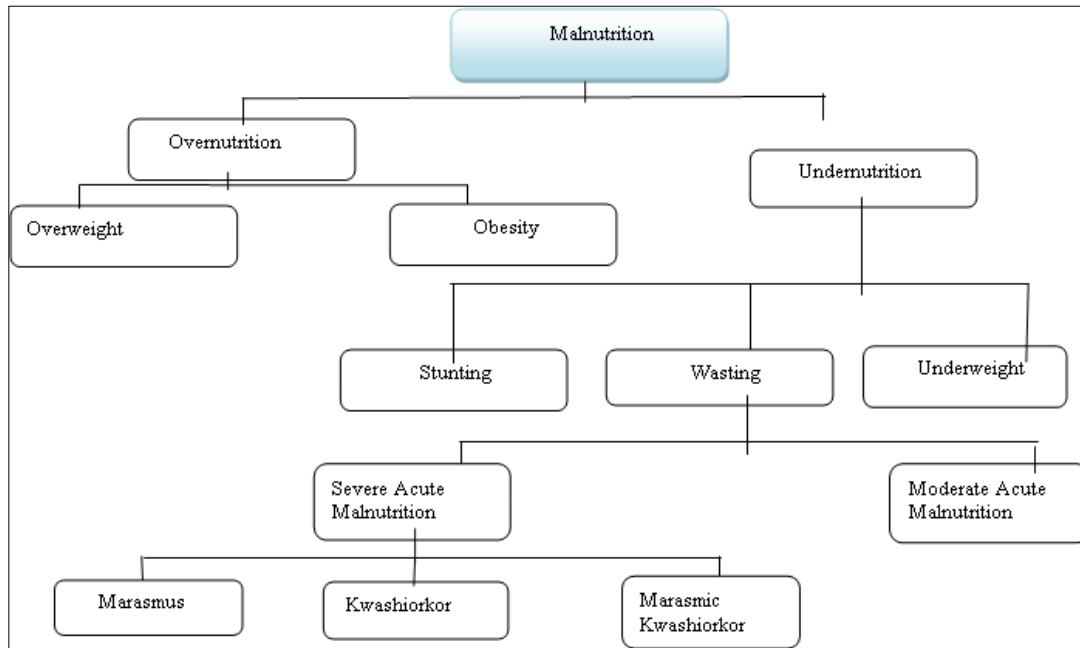


Fig 1

Protein-Energy Malnutrition

Protein-Energy Malnutrition (PEM), now termed as Protein-Energy Under-nutrition (PEU), occurs due to insufficient intake and absorption of protein and calories. Kwashiorkor and Marasmus are the forms of PEU. PEM is defined as a range of pathological conditions arising from co-incident lack of varying proportions of protein and calorie, occurring most frequently in infants and young children and often associated with infection (WHO 1973). Kwashiorkor occurs in 1-4 years old children due to a deficiency of Protein. 2-4-year-old children suffer from marasmus. It occurs due to a deficiency of protein as well as calories in the diet. [4]

Table 1: WHO SD classification categorizes children into different grades of nutritional status.

SD Classification	Weight for Age	Height for Age	Weight for Height
>Median – 2SD	Normal	Normal	Normal
<Median – 2SD to Median – 3SD	Moderate Underweight	Moderate Stunting	Wasting
<Median – 3SD	Severe Underweight	Severe Stunting	Severe Wasting

According to the 21st chapter of the Charak Samhita Sutrassthana, overlean (Atikrushya) people, as well as over fat (Atisthaulya) people, are classified as Ashta Ninditiya

Purusha means eight types of undesirable body constitutions (i.e. Ati Deergha (too tall), Ati hrasva (too short), Ati loma (too hairy), Aloma (hairless), Ati Krishna (too black), Ati gaura (too white), Ati sthoola (too corpulent), Ati krisha (too emaciated).

Undernutrition comes under cause, prodrom signs and symptoms, complication, and bad prognostic signs. Undernutrition results from chronic disease as well as acute. [5] To combat these forms of malnutrition it is important to improve children's access to nutritious, safe, affordable, and sustainable diets. They need to provide quality nutrition, hygiene, sanitation, and government and social support to keep them nourished. In Ayurveda, under-nutrition (emaciation) is Rasa-pradoshaja vyadhi [6] and an Apatarpanjanya Vyadhi (due to lack of nutrition) [7]. According to Charak samhita, Karshya means a person with having lean and thin body personality but doesn't have any more complaints. Acharya Charak has explained nutritional issues as well as clinical symptoms & causing factors, i.e., Ahara (dietary), Viharaja (behavioral), and Manshika (psychological). Ahara, vihara, and manshik factor aggregate Vayu, alter Agni, produces insufficient Rasa dhatu along with other Dhatus, which leads to under-nutrition. In charak Samhita it has been explained that in under-nutrition the body gets emaciated gradually, the digestive system gets reduced, strength gets reduced, semen

and muscle tissues start to destroy and fever, chest pain, anorexia, constipation, accumulation of urine, body pain and other diseases occurs due to vitiation of Vata are caused due to improper nutrition and starvation.^[8] An undernourished child gets suffered from spleen enlargement, cough, wasting, dyspnoea, Gulma, piles, abdominal disease, and the disease of the gastrointestinal tract if they did not treat properly in beginning. Charaka has explained that Karshya is better than sthaulya (obesity). According to modern science, the reason behind the undernourished child is repeated infection or prolonged diseases like diarrhea, pneumonia, poor appetite due to infectious diseases, digestive problems are affected and the immune system is also depressed causing a vicious cycle of infections and infestation. Malnutrition has a vast scale and a high mortality rate in preschool children^[9] that is why the whole world focuses on undernourished children suffering from PEM- kwashiorkor, marasmus, and other micronutrient deficiency diseases.^[10]

Lakshana (Features) of Karshya

Due to the loss of fat, the body of the undernourished from the neck (Greeva), abdomen (Udarara), buttocks (Shushka-sphic), and children get excessively lean. Veins are visible through the skin, joints are prominently seen, and only skin and bones can see.^[11]

Symptoms of Undernutrition^[12]

- Thinning and dryness of hairs
- Moon face
- Lowered sleep time totally
- Abnormalities in pituitary hormones
- Mildly altered thyroid function
- Lowered body temperature
- Loss of fat around the heart causes size reduction of heart
- Light headedness
- Slower heart rate
- Anemia (Mild)
- Fine raised white hair on the body surface
- Constipation
- Amenorrhea
- Brittle nails
- Loss of subcutaneous fat
- Diminished muscle mass
- Dry skin
- Slower reflexes
- edema

Etiology (Nidana) of emaciation^[13]

The etiology and consequences of undernutrition are an outcome of a decrease in rasa dhatu, medha dhatu and mamsa dhatu. Diet, Lifestyle, and psychological factors have an important role in causing emaciation. Some etiological factors of emaciation are-

1. Langhana (fasting for a long period of time)
2. Krodha (anger)
3. Jara (old age)
4. Vikara anushaya (prolonged or continued illness)
5. Prakruti (heredity)
6. Snana (repeated bath)
7. Rookshasya Udvartana (powder massage)
8. Shoka (grief)
9. Vega Nidra Vinigraha (suppression of the natural urges including sleep)

10. Kriya Atiyoga (excessive panchakarma therapy)
11. Rooksha Anna pana (consumption of foods that are dry in nature)
12. Pramitashana (taking very less quantity of food)

Disease susceptibility of undernourished preschool children

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Undernourished children are prone to following diseases like Kshaya (muscle wasting), Kasa/jwara (cold & cough), Shwasa (asthma, dyspnoea), Pleeha (splenic diseases), Arsha (piles and duodenum and small intestine diseases), Gulma (tumor with pain occurs in the abdomen), cannot withstand physical exercise, intake of a small quantity of food, hunger, thirst disease, and drugs. Undernourished children are unable to withstand excessive cold, heat.^[14]

Pathophysiology (Samprapti) of Karshya

Vata-promoting diet, excessive physical exercise, strenuous study, grief, anxiety, wakefulness at night, thirst, hunger, taking of astringents, partial starvation, etc., circulating Rasa being reduced in quantity fails to nourish the tissue due to insufficiency; thus, undernutrition occurs.^[15]

Features (Lakshana) of Karshya

The excessively lean person has dried-up that is fat loss, especially from the buttocks (Shushka-sphic), abdomen (Udarara), and neck (Greeva), veins can be seen easily through skin, and joints are prominently seen, but only skin and bones can be seen.

Dimensions of Nutritional Deficiency

Some multiple dimensions that are responsible for nutritional deficiencies are:

- Poverty
- Illiteracy or unawareness
- Multiple births
- Superstitions or food taboos
- Incompatible food selection
- Gender injustice
- Hygiene & Sanitation
- Unemployment/ low access to food
- Inadequate food
- Changes in food pattern
- Lacunae at the policy level
- Inadequate food supply
- The Traditional method of food production.
- Infectious & infestation
- Prolonged sickness etc.

Management of Undernutrition through Ayurveda

A light and nourishing diet should be recommended for undernourished children to make them fat. It helps to increase agni, santpraka food like newly harvested rice nourished body.^[16] Ayurveda strongly emphasizes primitive and preventive aspects of health-giving prime importance to "Ahara" (wholesome diet). Based on the Principles of Ayurveda, Ayush has recommended 5 'Rights' of AYURPOSHAN i.e. The Right Time, The Right Quantity, The Right Quality, The Right Methods, and The Right Place. Ayush has given basic dietary guidelines in terms of appropriate food, incompatible food combinations, and methods of cooking, storage, dining atmosphere, hygiene, and etiquette for the maintenance of health. They suggested following Ritucharya (seasonal), bhojana krama (sequence

of food), and sequence of eating food as per rasas (tastes) are good for healthy living. The quantity and quality of food, their processing methods, as well as processing method, proportion size, and combination of food, plays important role in the management of undernutrition. According to Ayush emotional aspects, the nature of the consumer, geographical and environmental conditions, etc., should be followed while planning a meal for undernourished preschool children.^[17]

Nutritional and Food Requirements

High calorie, high protein, high fat (simple fats), and some vitamins are the nutritional requirement of undernourished children. Before dietary plan, it is important to know the cause of the under-eating and then should plan the food requirements. The choice of the food item should be based on the children's acceptance. Easily digestible food should be given. The fat should be given in low quantities initially and gradually increases the amount of fat. Fatty food should not be given at the beginning of a meal as they reduce appetite.

Result and Discussion

Undernutrition is a double burden for developing countries. Malnutrition is one of the predominant risk factors for death in preschool children. Changing food patterns, poverty, lack of hygiene and sanitation, gender injustice, lacunae at the policy level, inadequate food supply and inadequate intake of food is the major reason for under-nutrition. According to Ayurveda, Ahar, Viharaja, and Mansik are the factors responsible for undernutrition. Vata dosha is the main factor to cause malnutrition in children (Renu rathi *et al.*, 2018). Undernutrition vitiates creates dryness and disturbs the nutrition of the body tissues thus emaciation of body fat and muscles occurs (Elizabeth KE *et al.*, 2007)^[7]. Bones and veins are visible due to dry food intake, inadequate or improper diet, grief, phobia, suppression of natural urges, hereditary effects, physical exertion, and repetition of diseases are common causes of malnutrition (Renu Rathi *et al.*, 2018). Ahara, Viahara and Mansika]. According Charak Samhita, to overcome the disease condition the treatment of very lean and thin person should be provided earliest, because they are undesirable.

Conclusion

Food (Aahara) is one of the three sub-pillars of life as per Ayurvedic classics and Ahara Dosha (faulty dietary habits) is the main predisposing factor for this disorder among which reduced intake of food (Alpashana) and false habit of intake (Vishamashana) are particularly responsible in the development of Karshya. PEM is used interchangeably with undernutrition. The condition of undernutrition occurs due to inadequate consumption, poor absorption, or extreme loss of nutrients, and according to Ayurveda karshya is a state of wasting (low weight for height) and stunting (low height for age) due to chronic malnutrition.

To combat undernutrition, it is important to imply the government policy at the root level and should follow the guidelines of WHO and AYUSH. Daily and seasonal regimens suggested by Ayurvedic classic text must be followed.

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