

Nutraceutical Value of *Kushmanda Avaleha* and its Importance for Children's Health and Growth: A Review Article

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ABSTRACT

Nutrition is important factor which is necessary for every age group, According to *Ayurveda* three pillars of life *Ahara* (diet), *Nidra* (sleep), *Brahmcharya* (celibacy) is called *Trayopstambh* in life. Body is supported by these three pillars.^[1] *Ahara* is the best of all medicine considered one among these sub pillars, *Ahara* provide nourishment of the mind, body and soul, *Acharya Kashyapa* called *Ahara* as *Mahabhaishajya* (greatest and best medicine).^[2] *Karshya* in children is a clinical condition the body gets emaciate gradually due to indulgence in rough food and make a person over lean.^[3] *Kushmanda Avaleha* is the best *Ayurvedic* formulation which provides nourishment, improves appetite and increase the body strength, it is mild formulation that can be used in children. as well as old person.^[4] According to *Sharangdhara Kushmanda Avaleha* is *Balya*, *Vrishya* and *Brimahana* can be used as generalised tonics for the healthy body. *Kushmanda Avaleha* has been prepared as per the reference given by *Acharya Sharangdhara* in *Sharangdhara Samhita*.

Keywords: *Ahara*, *Avaleha*, *Kushmanda*, Nutrition, Undernutrition.

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INTRODUCTION

In human body food is a major concern beginning from the conception and extending through the entire life. Nutrients are necessary for physical activity and for maintaining growth of the children. Nutrients are classified as macronutrients and micronutrients, macronutrients are required in large quantity and referred as a chief energy yielding component of food, like carbohydrates, protein, fat. Micronutrients are required in very small amount. They play important role in metabolic process and very essential to keep healthy. These micronutrients have not produce energy but play protective role and important to enhance immunity, to keep overall health.^[5] All nutrients work together and deficiency in any of the essential nutrients can cause health problems. Nutrition is a part of growth and development, in children during first 5 year of life when rapid growth occurs nutrition are essential, Nutrition is related to better infant, child and maternal health. Undernourished children have risk of infections, morbidity and mortality. 35% of under 5 children associated with under nutrition cause death. Under nutrition

is strongly associated with poor, lean weight shorter height, less schooling, low cognition.^[6] Undernourished children have suffer from cognitive development such as calculation, long term learning, attention executive function, loss of memory and instinctual.^[7] As per the NFHS-4 (2015-16) the rate of malnutrition in Chhattisgarh was 37.7%and the national average rate at that time was 35.8%, Meanwhile, the rate of malnutrition in the state has come down by 6.4% according to the NHFS-5survey report.^[8] Mukhyamantri Suposhan Abhiyan and other nutritional schemes in Chhattisgarh was started in some Gram Panchayats, Nutrition Campaign has proved to be grand success as past three year^[9] 1.70 lakh children have become free from malnutrition. Among the tribal population, women and children are mostly affected by high level of malnutrition, tribal women give birth to a low birth weight infant due to poor intake of protein and energy. Low birth weight baby faces poor health care.^[10] As per the data of NFHS- 4, Chhattisgarh has wasting level has higher than 15% in every district, but (rated as very high) Bastar has the highest.^[11]

According to *Ayurvedic* text *Ahara* is the most important substance of life, only the use of wholesome food taken at right time and right quantity is essential for healthy and happy life and unwholesome one is the cause of disorder.^[12] *Ahara Rasa* (end product of good food) nourished *Rasa*, *Rakta*, *Mamsa*, *Meda*, *Asthi*, *Majja*, *Sukra* etc *Uttrottara dhatu*.^[13] Due to vitiation of *Vata* circulatory *Rasa Dhatu* formation decrease in quantity, due



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to insufficiency, *Rasa Dhatu* fails to nourish the tissue, hence extra emaciation or over lean body occur. Over lean person who has *Shushka Sphik* (dried up buttocks), *Shushkaudara* (Dried up abdomen) *Shushkageeva* (neck) prominent vascular network, *Tawagasthishesha* (only remnant of skin and bone) are present.^[14] *Acharya yogratnaker* said a child with proper *Agni* can become weak even after eating the right way.^[15] *Kushmanda Avaleha* is an herbal preparation which help in improving overall physical and mental Debility, Improving general weakness, increasing body mass in lean person. According to *Ayurvedic* text *Kushmanda Avaleha* has *Medhya*, *Balya*, *Brimhan* and *Rasayana* property.^[16] Its contains Carbohydrates, Protein, Fat, Sodium, and Zinc, so *Kushmanda Avaleha* promoting weight gain and strength, Provide nourishment to the undernourished body. *Kushmanda Avaleha* reduce *Vata* and *Pittadosha* and useful in summer season. *Kushmanda Avaleha* is a *Rasayana* concept given by *Acharya Charaka* which is an rejuvenation therapy, which help in maintenance and promotion of health and beneficial for children, young and old age people. *Kushmanda Avaleha* is a food supplement also.

In five basic *Kalpana Kushmanda Avaleha* or *Kushmanda Rasyana* is mentioned in *Panchvidh Kashaya Kalpana*. It has been prepared as per reference of *Sarangdhar Samhita*. *Avaleha Kalpana* or *leha Kalpana* is a semi solid preparation of drugs prepared with edition of jaggery, sugar or *Khand* (sugar candy) and boiled with prescribed juice or decoction (Ministry of health).^[17] An indication of contribution of a food to the nutrient content of the diet. This value depends on the quantity of a food which is digested and absorbed and the amount of the essential nutrients (Protein, Fat, Carbohydrates, Mineral, Vitamins) which it contains.^[18] *Avaleha Kalpana* has more shelf life due to jaggery, it is improving mental and physical health provide strength, nourishment of the body. It can be easily taken by children because of sweetness agent. So this study has been based on assessment of nutritional value of *Kushmanda Avaleha* in children associated with *Karshya* (under weight).



Figure 1: Main ingredient of *Kushmanda Avaleha* is *Kushmanda Phala* (Ash guard).

MATERIALS AND METHODS^[19]

Main ingredient of *Kushmanda Avaleha* is *Kushmanda* (Ash guard) (*Kushmanda phala* is shown in Figure 1).

Sanskrit name-Kushmanda

Botanical name-Banincasahispida

Family-Cucurbitaceae

Rasa panchaka

Guna-Laghu, Snigdha

Vipaka-Madhura

Rasa -Madhura

Virya -Sheeta

Karma- *Pitta, Vatahara, Hridya, Vrishya, Brimhana.*

Quantity in preparation -100 palas (4.800 kg)

Prakshepya dravya^[17] ingredient given in Tables 1 and 2.

Preparation of Kushmanda Avaleha^[20] (Figure 2)

Kushmanda is cut in small pieces and devoid of outer layer of skin and seeds, there after and cut into smaller pieces of 2.5 cm and cooked till pieces become soft. The fluid is strained and kept separately the pulp is made into a paste and bundled in a cloth, then squeezed by hand to remove the remaining fluid. The paste is then fried in a copper vessel with 8 palas of *ghrita* over a low fire till the colour becomes honey brown, at which stage there will be no moisture. To the strained fluid of *Kushmanda* sugar is added and boiled to *lehya paka*. To this the fried past of *Kushmanda* is added and stirred well. The vessel is then removed from the fire *Prakshepya dravya* are added and mixed and the remaining *ghrita* is added. Honey is added when cool.

RESULTS

Nutraceutical value of *Kushmanda Avaleha*

Food product testing can be done to provide accurate information about the nutritional value and safety of the food. Nutrition analysis is the process through which food nutrient contain is determined, it can be determine nutrient content is done using laboratory analysis. Nutraceutical value of *Kushmanda Avaleha* test result obtained through laboratory investigation.^[21]

Nutraceutical value of *Kushmanda Avaleha* mentioned in Tables 3 and 4 as per laboratory results.^[33]

DISCUSSION

Infant and children have higher requirements for nutrients than adults. While adults need nutrients for maintaining constant body weight and functions and children require nutrients for maintenance, promoting, and supporting their rapid rate of



Figure 2: Preparation of *Kushmanda Avaleha*.

growth and development nutritional requirement per kg body weight of children is higher than that of adults.

Carbohydrates

Carbohydrates provide energy and essential for digestion and assimilation of other foods 55-60% of total energy intake should come from carbohydrates.^[22] *Kushmanda Avaleha* has 80.44% of carbohydrates which provides 321.76 kcal energy. Carbohydrates provide instant energy due to sugar or jaggery.

Protein

Protein is the second most abundant substance in the body, next to water. Proteins helps the child to grow and are necessary for the synthesis of tissue in the body, formation of digestive juice, hormone, plasma protein, enzyme, vitamin, haemoglobin,^[23] therefore protein are vital for growth and development of every child, In *Kushmanda Avaleha* contains 5.01% of protein, which provide 20.04 kcal energy to the body.

Energy

Energy needs of children are for increasing in body size. Energy high metabolic rate that regulates body temperature and physical activity.^[24] *Kushmanda Avaleha* provide total energy 363.13 kcal/100 gm out of this maximum energy comes from Carbohydrates. Which is essential for their physical activities and growth.

Fat

Fat helps the body absorb Vitamins A, E, D and K, these are fat soluble the can only be absorbed with the help of fats and give energy to the body fats are major source of energy in diet in growing children.^[25] 25-30% of energy intake should be derived from fat. *Kushmand Avaleha* contain 2.37 gm/100gm, fat provides 9 calories per gram energy *Kushmanda Avaleha* provides only 21.33 kcal of energy. Saturated fat in this formulation contain is 0.82 gm/100. Too much saturated fat in diet can lead to heart disease and other health problems. It is unhealthy fat along with trans fat, trans fat in *Kushmanda Avaleha* is 0.00 gm.

Table 1: Prakshapya Dravya ingredients.^[20]

Drugs name	Latin name	Used part	Quantity (kg/gm)
Pippali	<i>Piper longum</i>	Fruits	96 kg
Shunthi	<i>Zingiber officinale</i>	Rhizome	96 kg
Jeerak	<i>Cuminum sativum</i>	Fruit	96 kg
Dhanyak	<i>Coriandrum sativum</i>	Fruit	24 g
Tejpatra	<i>Cinnamomum tamala</i>	Leaf	24 g
Ela	<i>Elattaria cardamomum</i>	Seeds	24 g
Maricha	<i>Piper nigrum</i>	Fruit	24 g
Dalchini	<i>Cinnamomum zeylanicum</i>	Bark	24 g

Table 2: Other ingredient of Avaleha.

Drug	Quantity in kg/ gm
<i>Ghita</i> (clarified butter)	8 palas (768 g)
<i>Ksaudra</i> (honey)	4 palas (384 g)
<i>Khanda</i> (sugar candy)	100 palas (4.8 kg)
Water	200 palas (9.600 lit)

Table 3: Nutraceutical value of Kushmanda Avaleha.

Sl. No	Quality Characteristics	Result	Test Method
1	Energy, kcal/100gm	363.13	AL/SOP/6.4/C-035
2	Total Fat gm/100gm	2.37	AL/SOP/6.4/C-111
3	Saturated Fat gm/100 gm	0.82	FSSAI Manual for Oil and Fat
4	Carbohydrates gm/100 gm	80.44	AL/SOP/6.4/C-036
5	Sugar gm/100gm	69.72	AL/SOP/6.4/C-109
6	Sodium mg/100gm	498.51	AL/SOP/6.4/C-088
7	Protein gm/100gm	5.01	AL/SOP/6.4/C-156
8	Dietary Fibre gm/100gm	1.02	IS 11062:2019
9	Trans Fat gm/100gm	0.0	FSSAI Manual for Oil and Fat
10	Iron mg/100gm	1.32	FSSAI Manual for metals
11	Calcium mg/100 gm	158.72	IS 5949: 1990
12	Potassium gm/100gm	464.73	AL/SOP/6.4/C-088

Table 4: Nutraceutical Value.

Sl. No.	Quality characteristic	Result	Test Method
1	Cholesterol mg/100 gm	0.0	AOAC 19 th EDITION
2	Vitamin D mcg/100 gm	0.0	AL/SOP/6.4/C-172
3	Added sugar gm/100 gm	0.0	AL/SOP/6.4/C-109

Iron

Iron is also found in *Kushmanda Avaleha* which supports muscle, metabolism and healthy connective tissue and also necessary for physical growth neurological development iron deficiency anaemia is associated with impaired performance in mental and physical function, and health consequences in young children are serious.^[26] Iron is an essential for blood production. *Kushmanda Avaleha* provides only 1.32 mg/100gm of iron.

Calcium

Calcium is a mineral which body needs to build strong bone, teeth and play Important role in blood clotting nerve conduction and muscle stimulation.^[27] *Kushmanda Avaleha* contain 158.72 mg/100 gm of calcium.

Sodium

Sodium 498.51gm /100gm present in *Kushmanda Avaleha*. Human body requires a small amount of sodium to conduct nerve impulses and balance of water and mineral in our body.^[28]

Potassium

Potassium and sodium are electrolytes that help maintain fluid and blood volume. And both are involved in transport of fluids and nutrients across the cellular membrane.^[29] The content of potassium in *Kushmanda Avaleha* is 464.73 mg/100 gm. Potassium is found naturally in food Potassium maintain fluid level inside cell and helps muscle to contract.

In other hand *Kushmanda Avaleha Prakshepya* ingredient has major role in *Avaleha Kalpana*, work as *deepana*, *pachan*, *ruchikara* and *Rasayan*. *Shunthi*, *maricha*, *pippali* improve digestion and work as carminative and *twak,ela*, *tejpatra* increase test of *Avaleha*. *Prakshepya dravya* increase therapeutic efficacy of *Avaleha* and increase its bioavailability in body.^[30] *Kushmanda Avaleha* is effective in the *Raktipitta* (bleeding disorder), Chronic respiratory condition (*swasa*, *kasa*), person who recovered from fever to improve strength, thirst, patient of tuberculosis to improve general health and for respiratory strength, nourishing or strengthening of emaciated person and work as a *Rasayana*.^[31] According to *Acharyas*, *Kushmanda Phala* act as *Brimhana*, *Raktapittahara*, *Balya* and *Pittahara*, *Vrishya*, *Vastivishodha*.^[32]

Kushmanda fruits have nutritional as well as medicinal values. It is widely used as a vegetable in the region of Chhattisgarh, it is easily grown at home garden and it does not require any extra effort for its cultivation. It is also cultivated commercially. *Kushmanda Avaleha* preparation is an easy process, so it can also be made at home.

CONCLUSION

Kushmanda Avaleha is a mild herbal formulation that can be used in children, young as well as old people for overcoming weakness and debility after disease. It is *Balya*, *Vrishya* and can be used as generalised tonic. *Kushmanda Avaleha* reduce elevated *Pitta* so it can be used for the treatment of *Amlapitta* According to *Bhavamishra* *Kushmanda* fruit is *Medhya* (nootropic drug) drug and acts on the nervous system due to the presence of sodium and used for the treatment of mental disorder specifically to improve memory and intellect by *Prabhava Kushmanda Avaleha* contains Carbohydrates, Protein, Energy and Vitamins. It can be used in malnourished and underweight children for gaining weight and body nourishment, Vitamins provides immunity also. *Acharyas* described *Kushmanda Avaleha* as a *Medhya*, *Brimhana*, *Balya* and *Rasyana* property which provide nourishment, strength, and improving weight property.

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CONFLICT OF INTEREST

The authors declare no conflict of interest.

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