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## Prevention Of Nutritional Disorders In Adolescent Girls

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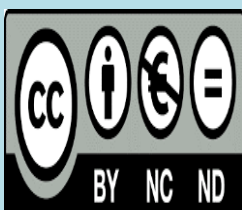
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### ABSTRACT: -

Adolescence is a transition period between childhood and adulthood characterized by puberty. It is a growth spurt in which an individual undergoes various physical, physiological, emotional and social changes. Therefore, nutritional needs are increased as compared to school years. An adolescent girl goes through a lot of changes which may lead to a number of disorders if unnoticed. For example, menstruation may lead to anaemia; hormonal changes may lead to obesity, infertility, PCOS, acne vulgaris and desire to be slim may lead to anorexia nervosa or bulimia & other problems like mood swings etc. In adolescent girls nutrition is of utmost importance because it will influence not only her own health but also health of the next generation (foetus) during reproduction period. Many other disorders like diabetes mellitus, dyslipidaemia, osteoporosis etc. may develop in later years. Such major health related problems can be prevented by few changes in lifestyle such as modifying dietary habits, intake of balanced diet, physical activities for digestion, absorption and assimilation of ingested food. These all are better described in *Ayurveda*. Details will be provided in paper.

**Key Words:** Adolescent girls, Nutritional disorders, Diet & related rules.



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## INTRODUCTION

Adolescence is one of the most rapidly growing phases of human development. W.H.O. defines adolescents as those people between 10 to 19 years of age.<sup>[1]</sup> Some 1.2 billion adolescents make up 18% of world's population<sup>[2]</sup> and out of them, more than half lives in Asia. In absolute numbers India is home to more adolescents i.e. around 253 million. Every fifth person is between 10 to 19 years of age.<sup>3</sup> Adolescent girls form an important vulnerable sector of population that constitutes about 1/10th of Indian population. Nearly 50% of adolescents (63 million girls and 81 million boys) aged between 10-19 years are malnourished in India<sup>[4]</sup>. 56% adolescent girls are anaemic in India (NFHS-3, 2006). A number of disorders develop in these adolescent girls due to their bad eating habits and poor life style.

*Ayurveda* not only described nutritional properties of food items but also discussed nutrition as per individual needs, described guidelines to be followed while preparing and eating the meal. Positive frame of mind while eating is equally important. Another principle of *Ayurveda* is the principle of *Agni* (digestive strength). If *Agni* (digestive strength) is normal, there will be proper digestion, absorption and assimilation of nutrients. Various *Yogasana* (body postures) and *Pranayama* (controlled breathing techniques) have been described to

keep *Agni* (digestive strength) in normal state and for relaxation of body and mind. Therefore nutritious diet, positive frame of mind and physical activities to improve *Agni* (digestive strength) together forms a complete package to prevent nutritional disorders in adolescent girls.

## MATERIALS AND METHODS

The *Ayurvedic* scriptures, modern available literature and Internet services were referred in regard to this paper. Causes of nutritional disorders in adolescent girls and their preventive measures were thoroughly reviewed and discussed ahead.

## RESULT

Adolescence is the beginning of productive life hence it is a critical stage of life. Adolescents gain approximately 15-20% of adult height and 50 % of adult weight Adolescent age is the age of second growth spurt. Typically, girls have their growth spurt 2 years earlier than boys. The maximum linear growth also known as peak height velocity occurs at an average age of 11.5 years in girls. Average gain in height is 5-6 cm and peak height velocity is as much as 8-10cm per year. At this time girls mainly gain body fat 1.14 kg/year<sup>[5]</sup>. There is variation between different children. Recommended dietary allowance for girls is as follows:

**Table 1: Recommended Dietary Allowance (RDA) in Indian girls (2010)**

Sr. No.	Age of Girl (in years)	Body weight (kg)	Net energy (kcal/day)	Protein (g/day)	Fat (g/day)
1.	10-12	35	2010	40.4	35
2.	13-15	46.6	2330	51.9	40
3.	16-17	52.1	2440	55.5	35

Nutritional disorders of adolescent girls generally develop due to abnormal food behaviour like e.g. irregular meals/ skipping meals, dependency on snacks, over eating or under nutrition and due to reasons for food choices e.g. vendor facility, easy access to ready to eat food, availability of cheaper fast food, advertisements and media, ignorance about role of food and nutrition in future health etc. The outcome of nutritional imbalance appears either in a short duration or effect is visible after long time.

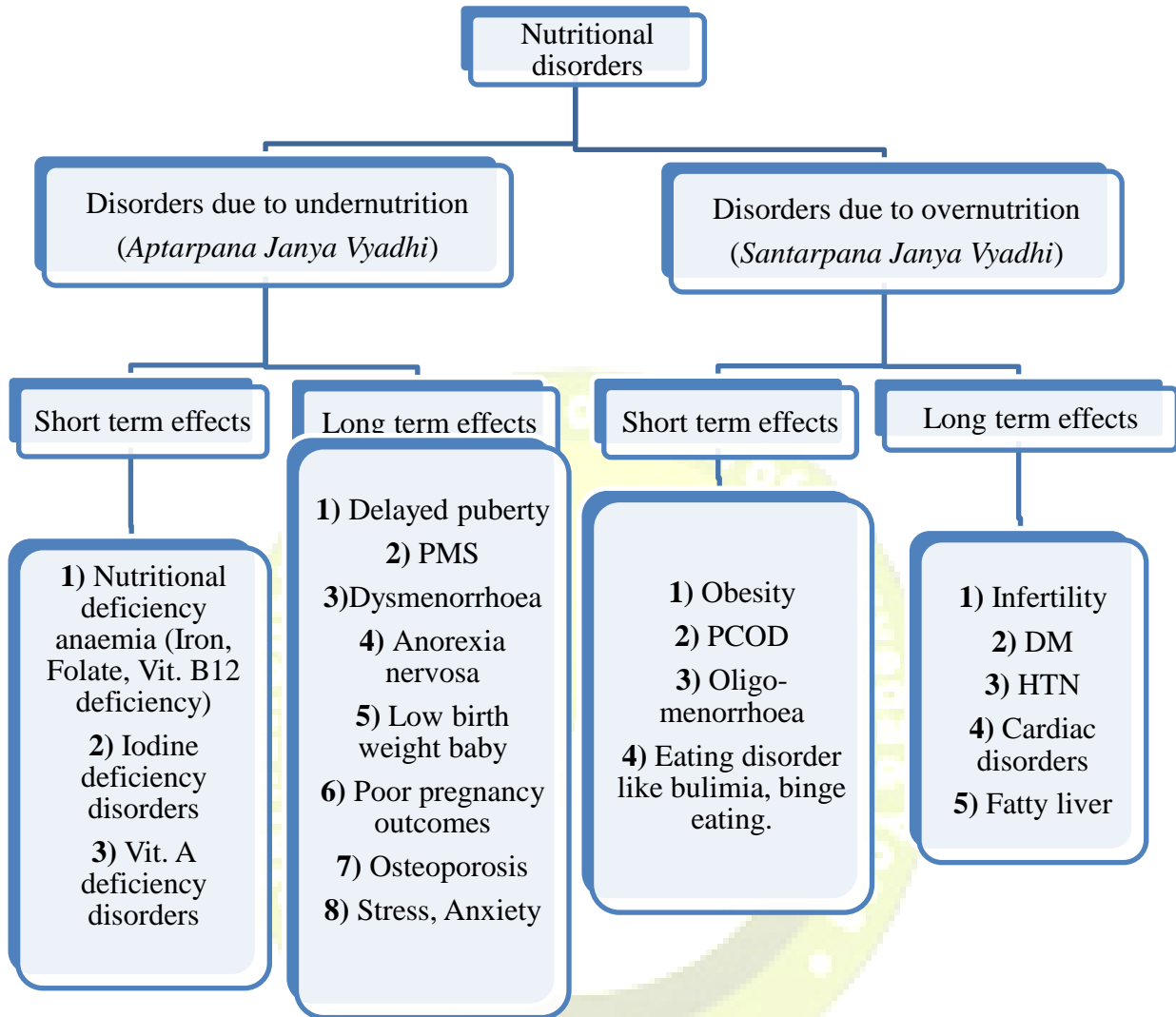
*Ayurvedic* scriptures have described nutritional disorders, their causes, prevention and management. *Acharya Charaka* has explained *Atisthula* (overweight) and *Atikrisha* (underweight) and a whole chapter “*Santarpaniyam Adhyaya*” about nutritional disorders. Their causes and management has also been discussed. *Ashta Ahara Vidhi Vishesha*

*Ayatana* (eight factors determining utility of food), *Ahara Vidhi Vidhana* (rules to be followed while eating), nutritious food items, *Rasayana*, *Yogasana* (body postures) & *Pranayama* (controlled breathing techniques) to improve *Agni* (digestive strength), *Nidra* (proper sleep) are important factors in prevention of nutritional disorders in adolescent girls.

## DISCUSSION

For better understanding and correlation between *Ayurvedic* and modern concept regarding this topic, nutritional disorders in adolescent girls is being discussed under two categories:

- 1) *Santarpana Janya Vyadhi* (The disorders due to over nutrition)
- 2) *Aptarpana Janya Vyadhi* (The disorders due to under nutrition).



**FIGURE 1. : Nutritional Disorders (*Santarpana & Aptarpana Janya Vyadhi*) in Adolescent Girls**

**Causes of nutritional disorders in adolescent girls:**

**a) The causes of *Santarpana Janya Vyadhi*<sup>61</sup> (The disorders due to over nutrition) in adolescent girls are:**

- i. *Snigdha Ahara* (Oily and fat rich food): Pizza, Burger, Deep fried food preparations.
- ii. *Madhura Ahara* (Sweets): All type of sweets, Candies, Chocolate, Soft drinks, Muffins, Pastries and cakes, cookies.

*Pichhila and Guru Ahara* (Slimy and Heavy food): Chowmin, Butter, Bread, deep fried food items.

*Anoopa and Jaangla Maansa Rasa* (Non Vegetarian diet): Examples of *Anoopa Maansa* are Pork meat, sea food and birds like duck, swan, living in or around water. Examples of *Jaangla Maansa* are poultry meat, mutton, beef meat, meat of *Sambher* animal, dog meat.

- v. *Atimatra* (Overeating): Excessive quantity of food, increased frequency of meals or snacks in between the major meals, heavy to digest food taken more often, one type of constituent in excess e.g. Sweets.
- vi. *Cheshta Dvesha* i.e. sluggish activities or reduced physical activity.
- vii. *Shaiyasana Sukha* i.e. enjoys sitting or lying down postures.
- viii. *Diva Swapana* i.e. day sleep.

**b) The causes of *Aptarpana Janya Vyadhi*<sup>[7]</sup> (The disorders due to undernutrition) in adolescent girls are:**

- i. *Langhana* (Habit of skipping meal): Usually girls try to skip meal due to fear of weight gain.
- ii. *Pramitashana* (Very low quantity of food intake as compared to body requirement): may be due to fear of weight gain or over consciousness about outlook.
- iii. *Ruksha Annapaana* (Affection towards dry food items) e.g. affection for *Chapati*, rice, dry vegetables, roasted grains, peanuts, dry fruits. No affection for fresh fruits, water intake and fluid rich food items like pulses, soups, milk etc.
- iv. *Kriyati Yoga*: Hyperactive: Body and mind remain in a state of restlessness.
- v. *Nidravega Vinigrah* (Awakefulness while sleeping)
- vi. *Shoka, Krodha*: To be in a state of mental stress, anger, anxiety most of the time.
- vii. *Vikaara Anushaya*: Diseased conditions from a longer duration.

**Prevention of Nutritional Disorders of Adolescent Girls:**

*Ashta Ahara Vidhi Vishesh Ayatana* (eight factors determining utility of food) and *Ahara Vidhi Vidhana* (rules to be followed while eating) are the general guidelines to be followed for prevention of *Santarpana Janya Vyadhi* (The

disorders due to over nutrition) and *Aptarpana Janya Vyadhi* (The disorders due to under nutrition).

***Ashta Ahara Vidhi Vishesh Ayatana*<sup>[8]</sup>**: These are the tools or principles which determine the utility of food.

- i. *Prakriti* (Nature of the substance): Diet should be planned based on its constituent's basic nature. e.g. *Mudga* (Green gram), *Adhaki* (Pigeon pea), *Masoor* (Pink lentil) are *Laghu* (light/ provide less calories). These will be beneficial in *Santarpana Janya Vyadhi*. *Masha* (Black gram), *Gritta* (clarified butter), *Mahisha Dugdha* (buffalo milk), *Maansa* (meat) are *Guru* (heavy/ provide high calories). So, these should be consumed in case of *Aptarpana Janya Vyadhi*.
- ii. *Karana* (Processing of substance) e.g. while preparing *Bhata* (cooked rice) if raw rice is washed many times, they become light to digest. Similarly if *Manda* (rice water) is drained out they become *Laghu* (light) and are beneficial in *Santarpana Janya Vyadhi*. If no *Manda* (rice water) is separated from cooked rice or raw rice are washed once only, they are beneficial for *Aptarpana Janya Vyadhi*.
- iii. *Sanyoga* (Combinations of the substances) e.g. If *Mahisha Ghritta* (clarified butter extracted from buffalo milk)/*Guda* (jaggery) is added in diet, it is good in *Aptarpana Janya Vyadhi*. If *Madhu* (honey) is added in diet it will be beneficial in *Santarpana Janya Vyadhi*.
- iv. *Rashi* (Quantum of substances) Quantity of meal can be taken as a whole i.e. meal with a number of major ingredients like *Chapati*, rice, *Daal* (pulses), vegetables, meat is *Sarvagraha Rashi* i.e. a balanced diet. If quantity of one ingredient is increased it is called *Parigraha Rashi*. e.g. if quantity of *Daal* (pulses) or *Maansa* (meat) is comparatively increased it would be beneficial for *Aptarpana Janya Vyadhi*. If quantity of meal

or snacks is reduced it will be beneficial for *Santarpana Janya Vyadhi*.

- v. *Desha* (Habitat of substance) e.g. *Daal* (pulses) like *Maasha* (black gram), *Rajmash* (Kidney beans), *Nuts* and fruits like apple, apricot, *Maansa* (Meat), profuse *Ghee* are usually consumed in upper hilly area of Himalayan ranges. The people residing in this region are able to digest such *Guru* (heavy to digest) food items due to harsh climatic and working conditions. Thus, these food items should be given or added in the diet of girls who live in such *Desh* (habitat).
- vi. *Kaala* (Time): In case of *Santarpana Janya Vyadhi*, adolescent girl should extend the time interval between two meals and in case of *Aptarpana Janya Vyadhi* time interval between two meals should be reduced.
- vii. *Upyogasanstha* (Dietetic rules): Dietetic rules mostly depend on *Agni* (digestive strength). In case of *Santarpana Janya Vyadhi* meal should be taken when one feels hungry not on the basis of cravings. In case of *Aptarpana Janya Vyadhi* meal should taken as soon as one feels hungry, doesn't matter how many times a day.
- viii. *Upyokta* (Habits of the individual) : Adolescent girls must know, evaluate and decide, what is beneficial and what is harmful for her. Parents should set example and inculcate healthy eating habits right from childhood.

**Ahara Vidhi Vidhana:** These are rules which should be followed while eating.

- i. *Ushana*: Food should be warm.
- ii. *Snigdha* Food should be unctuous. Quantity of *Snigdha* food items like *Ghritta*, milk, water should be increased in *Aptarpana Janya Vyadhi*.
- iii. *Matravata*: Food should be in proper quantity. More quantity in *Aptarpana Janya Vyadhi* but keeping in mind the state of *Agni* (digestive

strength) and quantity of food should be less for *Santarpana Janya Vyadhi*.

*Jeerna-ashniyata*: Eat only after digestion of previous meal. It is applicable to everyone.

*Avirudha Veeryama*: Eat food preparations without any contradictory potency. e.g. Mango shakes should be avoided.

*Ishta Desh, Ishata Sarva Upkarana*: Intake of food in proper place and with all required accessories.

*Na ati Druta* : No hurry should done while eating.

*Na ati Vilamba*: Meal should not be eaten very slow.

*Ajalpana Nahasana*: Intake of food without talking and laughing. One should concentrate on food while eating.

*Atamaanama Abhisamikshya*: Eat food after observing oneself.

### a) Prevention of *Santarpana Janya Vyadhi* (Over Nutritional Disorders)<sup>[9,10]</sup>:

#### i. Herbal preparations

- *Haritki* (*Terminalia chebula*) with *Madhu* (honey)
- *Trifla Kwatha* (decoction of three fruits: *Embellica officinalis*, *Terminalia chebula* and *Terminalia bellerica*)
- *Kwatha* (decoction) of the mixture of following drugs –*Nagarmotha* (*Cyperus scariosus*), *Gokshura* (*Tribulus terrestris*), *Aaragvadha* (*Cassia fistula*), *Patha* (*Cyclea peltata*), *Khadira* (*Acacia catechu*), *Nimba* (*Azadirachta indica*), *Trifla*, *Devdaaru* (*Cedrus deodara*), *Haridra* (*Curcuma longa*), *Daruharidra* (*Berberis aristata*), *Kutaja chhaala* (bark of *Holarrhena antidysentrica*).
- *Kwatha* (decoction) of *Trifla*, *Trikatu* (combination of *Zingiber officinale*, *Piper longum*, *Piper nigrum*), *Vidanga* (*Embelia ribes*), *Ajmoda* (*Trachyspermum roxburghianum*) and

- add *Sattu* (powder of roasted Bengal gram), *Taila* (oil) and *Madhu* (honey).
- *Takra* (buttermilk) and *Haritki* (*Terminalia chebula*)
  - *Tryushana* (combination of *Zingiber officinale*, *Piper longum*, *Piper nigrum*) *Hingu* (*Ferula asafoetida*), *Ajmoda*, *Chhoti Aela* (*Elettaria cardamomum*).
  - *Loha Raja* (Iron powder)
  - *Trifla Rasayana*
- ii. ***Ekala Dravya* (single food content) which should be specifically added in routine diet are:**
- *Takra*
  - Old butter
  - *Yava* (Oats)
  - Old wheat
  - Old *Madhu* (honey)
  - *Gou-Ghritta* (clarified butter of cow)
  - Pulses: *Mudga*, *Arahara* (Red gram), *Kulatha* (Horse gram)
  - *Ruksha Anna: Channaka* (Roasted Bengal gram), *Bhune Yava* (Roasted oats)
  - *Sattu* (Powder of Bengal gram)
  - *Amalaki* (*Embellica officinalis*) with meal
  - All Vegetables specially *Parwala* (*Trichosanthes dioca*)
- iii. **Dietary preparations:**
- *Sharbata* of *Madhu* (honey in water)
  - *Trifla Kwatha* (decoction of *Trifla*)
  - *Takrarishtha* (Fermented buttermilk formulation)
  - *Dadhi Manda* (water of curd)
  - *Yava Bhaat* (parboiled Barley)
  - *Moonga Amalaka Yusha* (Soup of Green gram added with *Embellica officinalis*)
- iv. **Physical and mental exercises (*Vyayama and Chintana*)**
- ***Yogasana* (Body postures) [11] :**
    - *Vajrasana*
    - *Shashankasana*
    - *Ardhamatsyendrasana*
    - *Katichakrasana*
    - *Pashchimottanasana*
    - *Uttanapadasana*
    - *Pawanmuktasana*
    - ***Agni Vardhaka* (digestive strength enhancing) *Pranayama*[12] :**
      - *Nadishudhhi* (*Anulom vilom*)
      - *Surya bhedi*
      - *Bhastrika*
      - *Bhramari*
      - *Kapalabhati*
      - *Agnisaara*
- b) **Prevention of *Aptarpana Janya Vyadhi* (Under Nutritional Disorders)**
- i. ***Brihaniya Dravya* (Body mass improving food items) which should be specifically added in routine diet [13-16]:**
- Milk of buffalo
  - *Ghritta* of buffalo
  - Fresh butter
  - Cream of milk
  - New grains e.g. rice and wheat
  - *Maasha* (Black gram)
  - Juice of sugarcane
  - Food items made up of *Jaggery*.
  - *Madhu* (Honey): Because it acts as *Yogvahi*. Honey accentuates the uptake and assimilation of food.
  - Non vegetarian food specially *Gramya*, *Aanoop*, *Audaka Maansa Rasa* e.g. meat of goat, sheep, pork, chicken, fish.
- ii. ***Brihaniya* (Body mass improving) food preparations [15, 16]:**
- *Ghol* i.e. when curd is churned without mixing water and without extracting butter.
  - Curd mixed with sugar.

- *Brihanartha Bhaat*: Rice can be cooked along with highly nutritious contents like *Ghritta*, dry fruits, Sugar, milk etc.
  - *Panaka* (drink) made from seasonal fruits
  - *Puplika* (Fried *Chapatti* made of wheat flour)
  - *Lapsika* (Semi liquid preparation of semolina added with *Ghritta*, sugar and milk)
  - *Mudga and Maasha Yusha*
  - *Brahma Rasayana, Chyawana Prasha*
- iii. ***Taila Abhyanga (Full body massage)*** with *Brihaniya* oils e.g. *Ksheer Bala Taila, Maha Maasha Taila, Til Taila*.
- iv. ***Nidra (Sound sleep and sleep during day hours)***: The beddings and cushions should be comfortable.
- v. ***Virama, Priyadarshana***: Take complete rest and live in a pleasant environment.
- vi. ***Yogasana (Body postures)***<sup>12</sup> improve *Agni* (digestive strength) and thus provide proper digestion and assimilation of food as well as it provide relaxation. The common *Asanas* which should be practised are :
- *Vajrasana*
  - *Shashankasana*
  - *Pawanmuktasana*
  - *Makrasana*
  - *Shavasana*
- vii ***Pranayama (Controlled breathing techniques)*** which should be practiced are:
- *Nadi shudhhi (Anulom Vilom)*
  - *Bhramari*
- i. ICDS (Integrated Child Development Services Scheme: Launched in 1975 for early childhood care and development.
- ii. *Kishori Shakti Yojana (KSY)*: Launched in the year 2000 Nutritional Programme for Adolescent Girls (NPAG): was initiated as pilot project in 2002-03.
- iii. Rajiv Gandhi Scheme for Empowerment of Adolescent Girls (RGSEAG)-SABLA: Launched in the year 2010, formulated by merging erstwhile two schemes.

## CONCLUSION

Therefore, it is concluded that to prevent nutritional disorders in adolescent girls, balanced diet should be encouraged. Nutritional adequacy should be ensured. Eating behavioural problems should be discouraged. Adolescent girls and their parents or care takers should be educated about balanced diet and nutritional requirement as per age. Family members should set good examples to their children regarding good eating habits. Nutritional deficiencies should be identified early and quick intervention should be done.

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