

## NUTRITIONAL STATUS AND ANXIETY LEVEL OF PRE PUBERTAL AND POST PUBERTAL GIRLS

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### Introduction

Health is one of the major issues revolving around the different stages of adolescence. Despite the efforts from different governmental and non-governmental agencies focusing on different health aspects, these young populations, especially the girls, are deprived of the basic health care and awareness. The girls are often very ignorant of how their bodies function in terms of sex and reproduction and frequently express a strong desire for the opportunity to discuss such issues. Nutritional status during school age is a major determinant of nutritional and health status in adult life. Globally, including in India, health hazards associated with under nutrition and micronutrient deficiencies remain the major public health problems.

Puberty (say: PYOO-ber-tee) is the name for the time when your body begins to develop and change as you move from kid to adult. During puberty, body will grow faster than at any other time in your life, It is also important to remember that everybody goes through these changes. Usually, puberty starts between ages 8 and 13 in girls and ages 9 and 15 in boys. This wide range in

ages may help explain why some of your friends still look like young kids whereas others look more like adults. The onset of puberty varies among individuals. Puberty usually occurs in girls between the ages of 10 and 14, while in boys it generally occurs later, between the ages of 12 and 16. Adolescent girls reach puberty today at earlier ages than were ever recorded previously. Nutritional and other environmental influences may be responsible for this change. There is a wide variation in the normal onset and the rate with which a child progresses through puberty and there are many conditions that may affect this normal process. This variability involves the genetic factors, as indicated by the studies on heritability of menarchial age. Other factors such as ethnicity, nutritional conditions, and secular trends have been identified to influence the physiological range at the onset of puberty.

Adolescence, the critical period between 10 and 19 years is characterized by rapid growth and development physiologically, psychologically and socially. They are the future mothers and the nutritional problem of any adolescent girls may have an adverse effect on nutritional status of future generations.

### **Phases of adolescent growth**

The adolescent period represents an important physiological phase of life characterized by rapid growth and development.

#### **Pre-Puberty or Pubescence (Early Adolescence- Age 8-12 years):**

This is a period of about two years before the onset of puberty. The exact age, however, depends on factors such as heredity, nutrition and the sex of the child. In most of the industrialized societies, these two processes normally start between 8-10 years of age. However, in the developing countries, where more than one-third of the total children are malnourished or undernourished, the onset of these two processes may get delayed beyond the normal limit.

#### **Puberty (Mid Adolescence, Age 10-16 years):**

It is the period in which biological changes reach their climax. In more developed societies, this phase begins by the tenth year of life among the majority of females. In the tropical countries, the beginning of this phase (10-12 years) has dropped surprisingly by 2-3 years the last five decades. Available research shows that a hormonal (endocrinological) factor rather than nutritional correlates is responsible for this change. Several physiological changes take place during this period, the most prominent in girls being the onset of menstruation (menarche) and nocturnal emissions or wet dreams (spermarche) in boys. Among girls, the bodily change continues to include the enlargement of breast, widening of hips and the appearance of pubic hair. In the case of boys, the shoulders broaden, the length of bones in arms and legs increase, and there is an increase in the amount of body and facial hair.

## **Puberty**

Puberty usually occurs among girls between 10 and 15 years of age. The onset of menstrual periods (menarche) is one of the most visible signs that a girl is entering puberty. Before having the first menstrual period, the pubescent girl will normally experience a phase of rapid growth, especially an increase in height, breast enlargement, pubic, armpit, and leg hair growth, clear or whitish vaginal secretions, and increased hip width.

The rate at which breasts grow and develop varies greatly and depends of the deposition of fat-pads beneath the skin. The development of fat-pads is different for each young woman and depends on many factors like heredity and nutrition.

## **Body changes at puberty**

During the puberty growth spurt, four important physical changes occur which transform the child's body in to that of an adult are the changes in body size, changes in body proportions, the development of the primary sex characteristics and the development of the secondary sex characteristics.

## **Sexual maturation**

Female puberty is the state or condition of having become functionally capable of procreating offspring. Puberty in the female begins with the first sign of secondary sexual development and continues until ovulation occurs. The average duration of adolescent growth spurt is between 2.5 and three years. Most of the girls will menstruate after they have attained their peak height velocity. During pubertal development, the pelvis becomes broader, while the cavity deepens and becomes spacious to accommodate the genital organs completely.

## **Psychosocial changes (Emotional Aspects)**

As this period is a transition to adulthood, they try to develop self-identity. The desire to be accepted in their peer group changes their food habits, dressing and group conducts this in turn brings psychological, emotional and social stress. Adolescence usually does not know fully what is happening to their bodies. They become moody at times and parents need to understand this to help their adolescent cope with the changes. In mid puberty, the adolescents begin to experiment with independence from their parents and this is the stage in which they are most vulnerable to experimentation. Towards the end of puberty most of the conflicts begin to diminish and the adult is now thinking about the future. At this point there is lot of anxiety development.

## **Menarche and body build Post**

Post Menarcheal girls were significantly taller and heavier than their pre menarcheal counterparts. This was true of all girls ageing between 11 and 14 years. At the age of 15 years post menarcheal girls were also taller and heavier than pre menarcheal ones; however, these differences were not of statistical significance. Regarding body mass index significantly higher values were found for all age groups with the exception to 11 year old girls. Post menarcheal girls

surpassed their premenarcheal counterparts in lean body mass, absolute fat mass and fat percentage. The comparison of body composition parameters yielded also significant differences between pre menarcheal and post menarcheal girls(Kirchengast and Bauer, 2007).

### **Nutritional status of adolescents**

Growth and development of the children is largely dependent on its nutritional status. The nutritional status of children is assessed by various methods viz., Anthropometry, Biochemical, Clinical, and Dietary Intake. Nutritional status is the condition of health of the individual as influenced by the utilization of the nutrients. It can be determined by correlation of information obtained through medical and dietary history, physical examination and laboratory investigation. Measurements of height and weight are still the simplest and one of the reliable means by which the progress of a nonnal child is evaluated even when no other sign of illness is manifested. Anthropometry reflects both health and nutritional status and predicts performance, health and survival (Rajeswari et al., 2006).

### **Energy and protein**

The requirements for calories and proteins increase during school age. The calorie requirements remain almost the same for girls throughout. Boys 10-12 years of age require more calories as adequate reserves are being laid for growth spurt during adolescence. The protein requirements are slightly higher for girls than boys between 10-12 years for the approaching menarche. The metabolic demands of growth and energy expenditure increases the calorie needs. The ICMR committee has suggested that energy should be provided on the basis of ideal weight for age. The energy requirements for the boys are more than that of girls which is 2010 kcal and 2330 kcal for girls 11-12 years and 13-14 years respectively. The need for additional protein and nitrogen during this age is high. If they do not take the required amount of proteins at this time, it could lead to lower growth spurt and lower resistance to infection

## **Fat**

In terms of visible fat the ICMR has recommended an intake of 5-6 percentage of total energy from linoleic acid. Considering this the minimum visible fat required has been estimated to be 12g / day but ICMR has suggested the desirable visible intake for school going children as 35g/day.

## **Minerals**

The 10-12 year old children require more calcium than adults to meet the demand for skeletal growth. The iron requirements are increased as blood volume increases. The iron requirement is further increased by the gradual rise in the hemoglobin concentration and losses. Iron and calcium are the two most important minerals required during puberty, more so for girls, as the two will influence the health and wellbeing throughout life. Deficiency of iron in the diet leads to nutritional anemia. During puberty, the need for iron increases in girls, as there is loss of iron during menstruation. The normal level of hemoglobin for, females is above 12mg/dl .The daily recommended iron allowance is 27 mg (11 -12 years) and 27 mg (13-14 years) for girls. Calcium is another very important mineral required during the teen years. Low intake of calcium can lead to retarded calcification of bones and teeth. 800 mg recommended for the age group 10 to 14 years.

## **Vitamins**

Vitamin A requirements of 11-14 year old girls is 600µg. The RDA of vitamins A and C are same as adult RDA. The requirements for B vitamins are in proportion with the calorie requirement. The requirement for B vitamins namely thiamine, riboflavin and niacin increase in direct proportion with increase in calorie intake. Folic acid and vitamin B12 requirements also increase when there is rapid tissue synthesis as they participate in synthesis of DNA and RNA. Transamination to synthesize nonessential amino acids requires more vitamin B6. The structural and functional integrity of newly formed cells

depends on the availability of vitamins A, C and E. Increased nutritional needs at this juncture relate to the fact that adolescents gain up to 50 per cent of their adult weight, more than 20 per cent of their adult height and 50 per cent of their adult skeletal mass during this period. French et al., (2001) observed in their study eating away from home is more common and fast food restaurant use in particular is growing even more rapidly.

### **Nutrition related problems of adolescents**

The adolescence is considered especially vulnerable nutritionally for several reasons. First there is an increased demand for nutrients related to the dramatic increase in physical growth and development. Second the change of life style and food habits of adolescents affect both nutrient needs associated with a participation in sports, development of an eating disorder, excessive dieting, or other situation common to adolescents (Savitha and Narayanan 2007). Many adolescents make poor nutritional and life style choices that put them at risk of health problems. Eating disorders and unhealthy eating behaviors such as restrictive dieting, over eating and the use of harmful weight control behaviors represent major health concerns affecting adolescents (Striegel, 2017).

### **Anemia**

Anemia continues to be a major public health problem, particularly among the females of reproductive age in developing countries (Kumar et al., 2006). Anemia produces retarded neuromuscular development impairment in motor skills, attention span, learning capacity and educational attainment in adolescent girls. Mahajan and Gupta, 2003 and Kumiawan et al., 2006 stated that among adolescent girls anemia will bring negative consequences on growth, school performance morbidity and reproductive performance.

## **Obesity**

Obesity during childhood tracks in adulthood and this may be a serious threat to health as obesity is associated with dyslipidemia and other metabolic and vascular abnormalities. In adolescent girls excess weight is significantly related to body dissatisfaction, drive for thinness and bulimia. The most common consequences of obesity in adolescence are those related to Psycho social dysfunction and social isolation.

## **Anxiety level**

Anxiety greatly influences cognition, the ability to concentrate, learn, and solve problems. Mild and moderate levels of anxiety are still conducive to concentration, learning, and problem solving. A person of average intelligence who is mildly to moderately anxious discerns relationships between and among concepts with relative ease and can concentrate and solve problems without much difficulty. In contrast, severe anxiety hinders cognitive function.

## **Conclusion**

The chapter summarizes about the knowledge on nutrition and nutrition related problems among the adolescents when compared with prepubertal girls. Both pre and post pubertal girls have poor eating habits. They have poor knowledge on functions of nutrients, sources of nutrients, health related problems and general health problems. So it is necessary to educate them about the importance of nutrition. Various aspects such as physiology, pathology and psychology of menstruation have been found to associate with health and wellbeing of women; hence it is an important issue concerning morbidity and mortality of female population. On the other hand, hygiene-related practices during menstruation are of considerable importance for reproductive health, poor practices increase vulnerability to reproductive tract Infections.



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