Chapter-VI

SUMMARY AND CONCLUSION

The developments of a country are based on the development of adolescents of the country. The true development of the adolescents is possible only when they are healthy. Health of a person is decided by his/her nutritional status.

The protein intake of girls of both the groups was below than (ICMR) RDA. But in case of fats and carbohydrate the mean intake were more than (ICMR) RDA for both the group of girls.

At the time of independence maternal and childhood mortality was as peak. Country was compounded with illiteracy, poverty and resources were meagre. During first developmental plan priority was accorded to MCH services and in spite of all odds, success has been achieved in bringing down mortality indicators. Emphasis had been put on raiding nutritional status of under five children through a number of initiatives including integrated child development scheme. However, benefits of various nutrition programmes have not been so profound particularly in case of girls child.

It is now realized that nutritional intake at earlier ages leaves their mark during adolescence. Besides this, in adolescent girls, psychological and emotional problems are of considerable magnitude and they may exert significant influence on their nutritional status. Although, genetics codes set the upper limit of optimum growth, the environment in which they thrive can help or hinder realization of that goal. During adolescence, gender based discrimination prevails in various ways viz., selective nutritional neglect of girls, differential investment or expenditure on health care educational opportunities and work force participation. Unfortunately
assessment of nutrition status of adolescent girls has been the least explored area of research particular in rural India.

Nutritional anaemia has been considered as an important problem in adolescent girls. Clinically one out of four adolescent girls suffered from nutrition anthropometry predominates over the other methods of nutritional assessment. This situation is serious with respect to the findings of present study. However, comparatively low figure has been reported by other research. This phenomenon remains uninterrupted throughout their life. This is substantiated by the fact that in this study stunting which is considered as index of chronic or long duration of malnutrition was maximally present during middle and late adolescence. Besides clinical examination and nutritional anthropometry, hemoglobin (Hb) estimation is an prevalent in adolescent girls its proper assessment needs Hb estimation and study of biochemical parameters. Perceptive differences has not been observed in the extent of anaemia by clinical observation and haemoglobin estimation, thereby indicating applicability of clinical examination for detecting anaemia in adolescent girls.

The poor nutritional status of adolescents especially girls, has important implications in terms of physical work capacity and adverse reproductive outcomes. However, much more needs to be done to address the issue of adolescent malnutrition at the national level.

Anthropometrics can be sensitive indicators of health, growth and development in infants and children. Malnutrition (under nutrition or over nutrition) which refers to an impairment of health either from a deficiency or excess or imbalance of nutrients all over the world. It has now been well established that the body mass index (BMI) is the most appropriate variable for determining nutritional status among adolescents.
Adolescence is a period of increased nutritional requirements and adolescent anthropometry varies significantly. Therefore, there is a need to develop a data base of adolescent under nutrition from different parts of the country.

Objectives

1. To assess the socio-economic status of adolescent girls.
2. To study the anthropometrics and clinical measurements of adolescent girls.
3. To study the dietary habits of adolescent girls by 24 hrs recall method.
4. To study the effects of dietary pattern on puberty.
5. To study the factors responsible for affecting puberty in adolescent girls.

Research Methodology

The study was conducted in Faizabad district of Uttar Pradesh. 10 Hindi and 10 English medium colleges were selected randomly from the district with the help of BSA office.

11 adolescent girls (12-18) were selected randomly from each college. Total 220 adolescent girls were selected in the study area. Dependent and independent variables used such as age, education, caste, nutritional status, nutrition intake, dietary survey etc. The study was totally survey worked the statistical tools were used such as percentage, arithmetic mean, S.D. correlation and ‘t’ test, and $\chi^2$.

Major findings

Adolescence is the period of rapid growth when young ones acquire new capacities and physical changes with many new characteristics that create not only opportunity for their progress but also create problems to their health and well being. Maximum 44.5 per cent girls have 14 to 16 years age group whereas 31.8 per cent have 16 to 18 years age group in study area. 23.7 per cent adolescent girls were belonged
to 12 to 14 years age group. 14 to 18 years age group of adolescent girls have faced metabolic changes in body, menstrual and other problems in body. Emotional and psychological changes in behaviour were also faced in this age group.

Maximum 45.9 per cent girls respondent were studying in high school level, 32.3 per cent girls in Intermediate class and 21.8 per cent adolescent girls were in secondary education level. Education is an important factor in national development since women, especially adolescent girls are the nurtures of nature, play a very significant role in the upliftment of the society.

Majority of girls respondent (more than 62.7 %) belonged to nuclear family system whereas 37.3 per cent were in joint family system. Modern time joint family system disintegrate into nuclear family.

59.5 per cent adolescent girls belonged to 5 members family size whereas 40.5 per cent 6 and above members family size.

Caste is an important factor in rural and urban both areas, 42.3 per cent girls respondent belonged to general class caste system and 35.0 per cent belonged to OBC system. 22.7 per cent girls respondent belonged to SC/ST caste.

The majority of the respondents belonged to Hindu family whereas 22.0 per cent girls belonged to Muslim class. Religion plays an important role in females diet system of the respondents. Other than Hindu religion in which mostly have taken non-vegetarian foods.

35.5 per cent girls respondent belonged to family system whose income up to Rs. 10,000 monthly and 42.7 per cent respondent’s family has earned Rs. 10,000 to Rs. 20,000 monthly and remaining 21.8 per cent belonged to Rs. 20,000 and above. Income is a economic status of all families and the family were depend upon the income group their economic status and social status were count by its own income. Diet system, nutrients intake was depend upon the income of the family.
20.4 per cent mothers have passed intermediate class. 18.2 per cent mothers have passed high school education level. Mothers' education plays an important role in girls adolescent problem like menstrual and other metabolic changes. It is very important for the mother of an adolescent girl to be educated because this age is a growing age and the responsibility of the mother becomes doubled in taking all over care of her daughter.

In food habits, mother’s occupation plays an important role. If the mother is working she will be able to fulfill her daughter’s needs and desires according to the changing trends of the society and will always be aware of what her daughter needs. Result shows 59.1 per cent women's as a housewife and 24.1 per cent women were doing service (private and government). 16.8 per cent women were doing business.

57.3 per cent girls respondent belonged to service class family system and 30.4 per cent adolescent girls were from business class family system. Family occupation plays an important role in living system of adolescent girls. Income of the family was depending on the family occupation.

Average body mass index 18.8 kg/m² of the adolescents were belonged to 14 to 16 years age group. Since adolescence is a period of growth and development, the height, weight and BMI measurements of the adolescent girls are important to be taken into consideration. As menstruation commences, height of adolescent girls stops increasing and if weight after 16 years is not controlled, lot of problems such as obesity may become a matter of great concern. Thus, it is important to take nutrients according to the RDA on which height, weight and BMI are entirely dependent.

According to clinical assessment, 86.4 per cent adolescents appear normal and healthy, 9.1 % girls were ill and 4.5 % girls were unwell. Hair of the adolescent girls respondent were normal and black (81.8 %). 18.2 per cent adolescents appear normal and only 15 % girls were suffering from thin sparse. Eye of the adolescents
respondents were looking normal (90.9 %) whereas (2.3 %) suffering from bitot spot. Majority of adolescent respondents (86.4 %) have normal tongue and only 13.6 per cent feels pale red. 95 per cent adolescents have normal lips whereas 4.5 per cent cheilosis and angular stomatitis respectively. 75.0 per cent respondents have normal teeth whereas 25.0 per cent chalky. 81.8 per cent adolescents have normal gum whereas 18.2 per cent bleeding gums due to various reason like not properly washing the gum regularly. Cent per cent respondents have normal glands. 93.2 per cent respondents have normal skin whereas 6.8 per cent dermatitis ringworm infection. Nails of the adolescents have normal (65.9 %) whereas 13.6 per cent nails pale and 11.4 per cent nails have brittle in shape.

A vegetarian diet can be a very healthy option. However, adolescents who follow a vegetarian diet. Whether for religious or personal reasons, need to carefully plan their intake to get the protein and minerals they need. Strict vegetarians (those who do not eat eggs or dairy products) also know as Vegans, may need nutritional supplements to meet their needs for calcium, vitamin B₁₂ and iron.

Physiological and psychological pressures influence adolescents eating habits. The boy fares better than the girls in that this large appetite and sheer volume of food leads him to consume adequate nutrients. Muslim, Sikh and Christian religion girls have taking more non-vegetarian other than Hindu religion. Out of 17.7 per cent, 10.4 per cent non-vegetarian girls respondent belonged to high status family. Food habits of non-vegetarian adolescent girls have greater effect on their sexuality in comparison to those taking vegetable and food. This is due to the fact that animal foods are hot and have an effect on body changes such as greater quantity of bleeding during menstrual cycle, vaginal discharge, enlargement of breasts, which is commonly observed in adolescent girls taking such food. Proper development of breasts and proper bleeding during period is an indication of proper
sexual development. This can be seen in Muslim girls whose sexuality is better than Hindu girls.

Food habits of adolescent girls are irregular not like that of elder people. Mostly girls in this age group prefer eating snacks in between meals and taking small meals at small intervals rather than thrice specific meals a day. But if the food of adolescent girls includes milk, green leafy vegetables, eggs, fruits and juices that are rich in nutrients, their body development will be proper, leading to a positive effect on their sexuality. Parents should advice adolescents to take three good meals and some snacks each day. They must take breakfast which is important but especially so if the adolescent has to walk a long way to school or work and/or does not eat much at midday. A meal in the middle of the day. Parents should try to give adolescents a variety of different foods if they take food to school or work. If adolescent buy food from street vendors or Kiosks, they should know which foods give the best value of money. Eating too many fast foods can lead to weight gain and in some cases, diabetes and heart disease.

Nutrient’s intake of adolescents according to age group, significant difference between calories, fat, iron and calcium with age of the respondents. 2025 Kcal per day energy consumed by adolescents were 16 to 18 years age group, 600 mg per day calcium consumed by adolescents in 12 to 14 years age group, 24 g fat consumed by adolescents in 14 to 16, 16 to 18 years age group respectively. 592 µg per day vitamin A consumed by adolescents were belonging to 16 to 18 years age group. Although individual needs vary girls consume fewer kilo calories than boys. Sometimes the large appetite characteristics of this growth period leads adolescents to satisfy their hunger with snack foods that are high in sugar and fat and low in protein. Adolescent need between 45 and 60 g of protein each day. Most teens easily meet this requirement with their intake of beef, pork, chicken, egg and dairy products. Protein also
available from certain vegetable sources, including toffee and other soy foods, beans and nuts.

Adequate calcium intake is essential for development of strong and dense bones during the adolescent growth spurt. Inadequate calcium intake during adolescence and young adulthood puts individuals at risk for developing osteoporosis later in life. In order to get the required 1,200 milligrams of calcium, teens are encouraged to consume three to four servings of calcium-rich foods each day. Good sources include milk, yogurt, cheese, calcium-fortified juices, and calcium fortified cereals.

As adolescents gain muscle mass, more iron is needed to help their new muscle cells obtain oxygen for energy. A deficiency of iron causes anemia, which leads to fatigue, confusion, and weakness. Adolescent boys need 12 milligrams of iron each day, while girls need 15 milligrams. Good sources of iron include beef, chicken, pork, legumes (including beans and peanuts), enriched or whole grains, and leafy green vegetables such as spinach, collards, and kale.

Tissue growth involves amino acid metabolism particularly transamination to synthesis non essential amino acids. So the requirement for B₆ is increased. Premenstrual tension can be reduced if adolescent girls consume 100 mg/day vitamin B₆. Skeletal growth requires vitamin D while the structural and functional integrity of newly formed cells depends on the availability of vitamin A, C and E.

High economic status of the girls respondent were taking more junk food like pizza, burger, chowmien and others, 33.4 per cent, 29.6 per cent, 26.1 per cent and 30.0 per cent respectively. Medium class family girls respondent have taking various type of junk food. Junk food impacts the body directly and psychologically. Just like western culture in which junk foods are quite popular. Indian culture is also adopting the same trend and it has a direct effect on children and adolescents. Junk food items like Burger, Pizza, Chowmien, Chips, Waffers, Chocolates etc. satisfy hunger to an extent, but do not suffice the nutritional requirement of the
body. Due to which problems like obesity, thyroid, gastric intestinal disorder etc. are being increasingly observed in adolescent girls, out of which obesity is the most widespread one. Apart from these, lack of physical exercise and sedentary ways of living are also important problems which are becoming a matter of great concern in today’s world. To overcome these problems adolescent girls should take balanced diet according to the RDA and do proper physical exercises like cycling, swimming, skipping, aerobics etc. This will enhance proper secretion of body hormones which internally will have a positive effect on the sexuality of adolescent girls.

2210 Kcal/day consumed by girls respondent whole mother’s educated up to graduate level, 56 g per day protein intake of the girls respondent, whose mother educated up to intermediate level, 485 μg per day vitamin A consumed by girls respondent whose mother educated up to high school. 24 mg per day iron consumed by girls respondent whose mother educated up to high school and intermediate level respectively. If the mother of an adolescent girl is a home scientist she will be aware of the RDA requirements of this age. Accordingly, with the use of this knowledge she will make a meal plan to take proper care of nutritional requirements of her daughter, and in turn save her from various deficiency diseases arising due to lack of balanced diet. On the other hand if the mother is a non-home scientist she will be knowledgeable and aware about the nutritional intake of adolescent girls through TV, newspaper, magazines, etc. but she will not be aware of the quantity which is to be given. As a matter of fact, she will not be able to make a balance between the quantity of intake of different nutrients. Also she will be unaware that during menstruation adolescent girls should be given methi and ajwain water, apple juice etc. and precaution should be taken with cold food items like rice, radish etc.

Caste of girl’s respondent was significantly correlated with iron nutrients intake.
Mean Hb in 12 to 14 years age group of girls respondent 10.8 g/dl and in 16 to 18 years age group mean Hb 10.9 g/dl which is lower than 14 to 16 years age group girls because in 16 to 18 years lower Hb due to menstruation process. Hb estimation is an important component of nutritional assessment. Nutritional anaemia even if it is preventing in adolescent girls its proper assessment needs Hb estimation and study of biochemical parameters. Nearly girls were all age group anaemic (Hb < 12 g/dl). Anaemia is a major problem observed in adolescent girls and which starts from puberty and stretches till menopause. During periods (menstruation) haemoglobin level can reduced which has an effect on heart rate and some cases can report for problems like constipation etc. As a precautionary measure female should take apple juice, green leafy vegetables, menthe and ajwain water, jaggery, coffee and other food items which elevate the blood count very rapidly. Having a diet rich in iron needed at certain times such as during pregnancy but these should never replace good diet. Preventing hookworm infection, malaria and other causes of anaemia.

75.0 per cent adolescent girls were faced social factors like mostly pocket money, 85 per cent adolescents was faced economic factor like spend of pocket money in various area clothing, cosmetic, junk food, stationary and friends. 45 per cent adolescents were faced factors according to religion, 35 per cent is faced cultural factors like, drama/dance and other activities. 85 per cent respondents were suffered from psychological factor like education level, pocket money and freedom. 54.5 per cent adolescent girls have livelihood factors. Changes in personality do not occur spontaneously. Instead, they are the result of advancing maturity, experience, pressures from the social and cultural environment, and factors within the individual such as emotional pressures or identification with another person. When changes in the personality pattern do occur they are usually not due to one factor or one
condition. Instead, they are usually brought about by the interaction of two or more factors.

Determinants of dieting in teenagers are broad, therefore, identifying which teenagers are most at risk of dieting and health-compromising weight loss strategies is challenging. In general, dieting and disordered eating behaviours in teenagers increase in frequency with age and are more prevalent among girls. Although there are some variations in socio-economic status and ethnic groups, it is clear that no group is immune from body dissatisfaction and weight loss behaviours. Not surprisingly, girls who consider themselves overweight and are dissatisfied with their bodies are more likely to diet and are also more likely to engage in unhealthy weight loss behaviours. As the degree of overweight increases, so does the risk of dieting and disordered eating. However, despite this association, it is important to recognize the high prevalence of dieting among normal and even underweight teenagers.

More than 50.0 per cent individual factors like female (82.7 %), overweight (89.1 %), low self esteem (62.7 %), low sense of control (65.5 %) and early puberty (52.3 %) have taken girls respondents. Girls who consider themselves overweight and are dissatisfied with their bodies are more likely to diet and are also more likely to engage in unhealthy weight loss behaviours. It is important to recognize the high prevalence of dieting among normal and even under weight teenagers. Body dissatisfaction and unhealthy weight loss practices have been found to be more common in teenagers affected by a chronic illness (diabetes, asthma, attention deficit disorder and epilepsy).

Although adolescent dieters may make some positive choices, changes are often temporary and we must consider possible physiological and psychological adverse effects of dieting, particularly, in light of the evidence that dieting is
unlikely to be effective at achieving sustained weight loss. The majority of teenagers who diet do so without any apparent sequelae, but they may be putting themselves at risk of consequences with little chance of tangible benefit. Unfortunately, few studies have addressed possible negative consequences because most dieting in teenagers is done in an unstructured way and decisions on how to go dieting have been undertaken, but unfortunately, the conclusions pertain to dieting adults, in whom rapid physical and psychological change is not occurring.

Dieting is associated with potential negative physical health consequences. Nutritional deficiencies, particularly of iron and calcium. Disordered eating, even in the absence of substantial weight loss, has been found to be associated with menstrual irregularity (41.8%). The long term risk of osteopenia and osteoporosis in dieting girls (36.4%). It is recognized that teenagers with low self-esteem are more likely to diet, often is an attempt to feel better about themselves if weight loss is successful. The process of dieting may take the situation worse and have further negative impact on the young girls self esteem because during childhood and adolescence self-esteem is in part defined by success and failures.

Over the past few years, with the social emphasis on thinness and a media playing up the “slim” image, there’s been a rise in eating disorders all over the world. But what was essentially a western concept has now transcended to most cultures. 5 per cent adolescent girls show symptoms of eating disorder. It is 10-20 times more in females. Upper class, educated, professionals and urban women are more prone to these disorder. It is being seen in young men and adolescent boys too. The prevalence of anorexia nervosa and bulimia nervosa has significantly increased since the late 1960’s. Anorexia nervosa is characterised by self starvation and excessive weight loss. Bulimia nervosa is characterised by a secretive cycle of binge eating followed by purging bulimia includes eating large amounts of food.
Binge eating disorder is characterised by periods of uncontrolled impulsive or continuous eating beyond the point of feeling comfortably full. Mental health professionals that specialize in working with children and adolescents are trained to evaluate, diagnose, and treat these psychiatric disorders. Eating disorders frequently co-occur with depression, substance abuse, and anxiety disorders, and it is important to recognize and get appropriate treatment for these problems as well.

70.9 per cent girls respondents have suffered serious mental health like low BP, cardiac dysfunctions, fluid retention, severe depression

In this study, 102 girls 46.4 per cent were complaining pain in abdomen and giddiness as symptoms before the onset of menstruation. In this study, it was observed that the first menstruation occurs between 11-15 years with mean age of 13 years. It is more closely related to bone age than chronological age.

31.4 per cent deficit iron nutrient intake due to this deficit 75.0 per cent girls were suffering anaemic and 6.7 per cent deficit calcium, 57.3 per cent girls respondent were suffering osteoporosis and weaker bone and feeling pain in different part of the body.

Hormones causes changes. The brain knows when the body is nearing sexual maturity. It releases chemicals called hormones. Different hormones are responsible for different changes. As she get nearer to puberty, the brain and pituitary gland release hormones that regulate the reproductive organs of both males and females. These hormones stimulates the ovaries of girls to produce other hormones called estrogen and progesterone, and the tester of boys to produce testosterone.
Suggestions, recommendation and policy implications

1. Education and awareness about the illness is necessary, especially amongst the adolescent who are most vulnerable to these disease.

2. Workshops in school to create an awareness of the hazard of eating disorders are a must.

3. Programmes by experts on self image where adolescent girls can understand that self esteem is beyond looks and weight.

4. An adolescent who has actually been identified with an eating disorder needs to undergo an intensive programme involving the patient and family, under the guidance of a psychiatrist.

5. The programme must involves the use of medications and therapy.

6. Eat plenty of fresh fruits and vegetables, bean, instead of fatty meat and fish, whole meal cereals and pulses.

7. Fatty and sugary foods and alcoholic drinks should not be taken. Fat should supply only about a third of the energy needs, this can only be met if foods rich in fat are eaten only in smaller amounts. Remember that most of the fat in the diet is often ‘hidden’ in foods like meat, groundnuts, milk and fried foods. The fat in plant foods and fish is usually healthier than fat in meat and milk.

8. Adolescents should be ideal targets for food based approaches to improving micro-nutrient status, in particular vitamin A and iron. The effectiveness of pilot interventions must be focusing on achievable improvements of micronutrient status through food would urgently
STRATEGY FOR NUTRITION INTERVENTION IN ADOLESCENCE

NUTRITION PROMOTION
- Healthy eating
- Breast feeding
- Physical activity
- Self-esteem

PREVENTION - MANAGEMENT
- Micro nutrient Malnutrition
- Early Pregnancy
- Under nutrition/ Malnutrition
- Obesity (and associated chronic diseases)
- Eating disorders

CLINICAL CASE MANAGEMENT
- Diabetes
- HIV/ AIDS
- Other
need to be evaluated, with considerations of process, cost and sustainability in addition to micronutrient status impact.

9. Dietary enquiry tools must be specifically designed for adolescents or direly needed. The enquiry should encompass household food security, food diversity, eating practices and underlying influences and physical activity. These tools need to be developed and validated in different settings, in connection with school-based or health centre-based intervention programmes rather than as free-standing research for higher prevalence.

10. Promote weekly IFA supplement of 52 tablets in a year.

11. Promote iron rich food.

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