CHAPTER-II

REVIEW OF LITERATUE

2.1 Adolescent Period

Adolescence is a unique period in one’s life and is of great importance because of the growth spurt that occurs in this period. The term ‘adolescence’ is derived from the Latin word meaning ‘to grow into maturity’. Adolescence is a state of growing and it is defined as the period advancing from childhood to maturity (Oxford Dictionary, 2000).

Adolescence is a cultural and social phenomenon and its endpoints are not easily tied to physical milestones. This period is identified with dramatic changes in the body, along with developments in person’s psychology and academic career. In the onset of adolescence, children usually complete elementary schools and enter secondary education, such as middle school or high school.

Government of India (2000) defines adolescence as the age encompassing of 10-19 years. While India’s draft youth policy defines adolescent as the age between 13-19 years.

Integrated Child Development Services Scheme recognizes 11 to 18 years old as adolescents. World Health Organisation (2004) has defined adolescent both in terms of age spanning between 10-19 years and in terms of phase marked by special attributes like rapid physical growth and development, social, psychological maturity and sexual maturity. The onset of sexual activity, experimentation, development of adult mental processes, adult identity and finally transition from total socio-economic dependence to relative independence.
2.2 Adolescence - Growth and Development

Adolescence is often described as a phase of life that begins in biology and ends in society. The beginning of biological growth and development during adolescence is signified by the onset of puberty, which is often defined as the physical transformation of a child into an adult (Nair, 2004).

Several factors contribute to the growth and development of adolescents. Havighurst (1970) defined the developmental task of the adolescent period that centres on the definition of personal identity. This definition involves resolving value systems, issues of independence, and attaining sexual and social maturity. Cognitive changes from concrete to abstract reasoning occur.

A myriad of biological changes occur during puberty including sexual maturation, increases in height and weight, completion of skeletal growth accompanied by a marked increase in skeletal mass, and changes in body composition. The succession of these events during puberty is consistent among adolescents; however, there may be a great deal of deviation in the age of onset, duration, and tempo of these events between and within individuals. For this reason, adolescents of the same chronological age can vary greatly in physical appearance. This has direct relevance for the nutrition requirements of adolescents (Shils, et al, 1994, Story, 2005).

Udipi (2004) quoted that this is the only time in the extra-uterine life where velocity of growth increases. ‘Growth velocity in a girl is maximum between ages 10 to 13 years of age. In a boy, it is between 12 to 15 years. This period of maximum growth for both height and weight is greatest in girls in the year preceding menarche. Weight gain is 25 to 30 kg in both sexes.
The skeletal growth is completed in adolescence - 50 per cent of adult bone mass and 20 percent of the body stature is acquired during this period. Each one centimeter gain in height needs 20g of calcium. The bone growth is mainly cortical growth. At the cessation of growth boys are taller than girls, however, in early adolescent girls are taller (Tanner, 1972).

Height achieved during adolescence is 25 per cent, which typically marks the end of height growth. The onset of menarche for girls and increases in fat and muscle mass place extra nutritional requirements. As a result of pubertal changes, males have a larger lean body mass (muscle mass), a larger skeleton and less adipose tissue (fat tissue) as total body mass than females. Increased nutritional needs at this juncture relate to the fact that adolescents gain up to 50% of their adult weight, more than 20% of their adult height and 50% of their adult skeletal mass during this period (Nair, et al., 2004) and (Bodhankar, 2002).

Unlike boys, girls have a continuous increase in body fat during puberty. The onset of pubertal changes occur at 11 years of age on average with 95% of normal girls begin their breast development between 9 to 13 years. The pubic hairs appear approximately at 11.5 years. All girls begin to menstruate at 11 - 15 years. The physical changes in vulva, vagina, uterus, fallopian tubes and ovaries are accelerated (Anitha, et al., 2003). Stature can be completed as early as age 16 or as late as age 23 (Kurz, 1994).

2.2.1 Cognitive Development

The early stage of adolescence is a time of great cognitive development. Teens start to comprehend the relationship between existing health behaviors and future health status, but their desire to fit in with peers may make it difficult for adolescents to make health-related choices based upon knowledge rather than peer pressure. Cognitive development is the process by
which the brain develops the abilities to think, learn, reason and remember. These advances are divided into several areas. They develop advanced reasoning skill, which includes a more logical thought process and the ability to think about things hypothetically. The second area is developing abstract thinking skills like which cannot be seen, heard or touched, and finally developing the ability to think about thinking in a process known as “meta-cognition”. Meta-cognition allows individuals to think about how they feel and what they are thinking. It can also be used to develop strategies, also known as mnemonic devices, for improving learning (Huebner, 2000).

2.2.2 Sensory and Motor Development

Young adolescents may be somewhat awkward or clumsy as the brain adjusts its connections with the rapidly growing body; boys and girls have about equal strength before the adolescent growth spurt, after which males have the advantage. Both sexes can improve their strength by participating in sports and exercise programme (Fackler, 2006).

2.2.3 Language Development and Communication

Due to increased cognition, they are better able to express themselves. Some are better at verbal others prefer written. Use of slang / profanity / acronym is very common. They maintain open communication with teenagers. Communications are mainly of open-ended questions (www.kckcc.edu, 2004).

2.2.4 Social Development

In early adolescence, the peer group has much influence in their behaviour and attitude. It usually consists of non-romantic friendships, often including ‘cliques’, gangs or clubs. Acceptance in clique is based on achievement, recognition, and demonstration of conformity to rules of conduct. As it moves in to mid-adolescence (14 o 16 years), the peer group expands to include romantic friendships. Mid to late adolescence
is characterized by a need to establish sexual identity through becoming comfortable with one’s own body and sexual feelings. Heterosexual interests begin prior to adolescence and emerge more strongly during adolescence (Greene, 2005).

Peer influence is very strong during adolescence. Because the influence of peer group is more than that of adults, the adolescent is torn between his loyalty to his parents and peers. They develop values different from the ones held by adults. Family tensions are common during this period. They try to have autonomy or independence in three areas namely emotion, behaviour and values. They do not like parental control and resist being treated as children. There is a gap between adults and adolescents in understanding and interests. They spend less time with family members and more with peers (Suriyakanthi, 1997).

The psychosocial development can be utilized to promote behavior change through the use of peer education and counselling sessions. In peer education, teens who have mastered the skill of making dietary change and are willing to share their experiences and knowledge provide nutrition education to other teens under the supervision of a health professional (Croll, et al, 2001).

Young adolescents should be educated on normal variations in initiation and progression of biological growth and development in an effort to facilitate the development of a positive self-image and body-image and to reduce the likelihood of early initiation of health-compromising behaviours (Barr, 1994).

2.3 Health and Nutritional Problems of the Adolescent Girls

In the milieu of social structure of India where equality, justice and health issues are mere slogans, the problem of adolescent girls has not been paid enough attention and they are living in pathetic conditions
Adolescents are tomorrow’s adult population and their health is relatively recent and a focus on nutrition is even more recent (WHO, 2003).

Adolescent girl’s health and nutrition are important issues, which have not received the attention. The period of adolescence is generally regarded as a period virtually free of any health problems. On the contrary, they encounter various nutritional problems like malnutrition, under nutrition, obesity, anaemia, goitre and so on. Certain behaviours that are establishing during youth lay the foundations for adult diseases such as heart disease, cancer, diabetes mellitus and osteoporosis (Bansal and Mehra, 1998, Deo and Ghattargi, 2004).

2.3.1 Malnutrition

Report on Food and Nutrition Board, (2001-02) states that malnutrition is a complex phenomenon. It is both the cause and effect of poverty, ill health, and follows a cyclical, inter-generational pattern. It is inextricably linked with illiteracy, especially, female illiteracy, gender discrimination against the girl-child, lack of safe-drinking water, and proper sanitation. It is directly linked with poverty, lack of purchasing power, food and nutrition insecurity, ignorance, lack of awareness on proper nutrition, and ill health. It creates its own cycle within the larger cycle of poverty (Mehra and Deepti Agarwal, 2004).

Novak (2005) stated that what mothers eat when they are pregnant could alter the function of key genes in their offspring and according to a new USC study (2004), malnutrition in the first few years of life leads to antisocial and aggressive behaviour throughout childhood and late adolescence.
It is stated that in Tamil nadu, adolescent girls were the most affected by malnutrition due to inadequate parental nurturing, changing food styles, and the status accorded to women in society, according to Sundararajan (2004), Indian girls are four times more likely to suffer from acute malnutrition than boys. (Gender and Development of Action, 2003)

2.3.2 Under nutrition

Rapid growth during adolescence may increase the severity of under nutrition. The cluster of under nutrition and micro nutrient deficiencies caused about 6 million deaths in 2000 (Lopez,2004).

Under nutrition at this period can jeopardize girl’s health and physical development with life-long consequences. The stunted growth affects the proper development of the pelvis. Over half the girls get married before the age of 18 years. Early pregnancy further aggravates both under-nutrition and anaemia and leads to difficulties in detection and management of obstetric/nutritional problems and result in adverse outcome of pregnancy (Baskaran, 2002).

Young girls who grow poorly become stunted women and are more likely to give birth to low-birth-weight babies who are then likely to continue the cycle by being stunted in adulthood, and so on. A smaller pelvis can prolong labor, obstruct delivery, and also poses serious risks leading to injury or death for mothers and their new born (Konje and Ladipo, 2000).

Rao (2000) pointed that stunting appeared to be a persistent phenomenon beyond the third year of life among rural children, and it had significant impact at 10+ years of age, and thus majority of rural children enter adolescence with poor nutritional status.
Research has shown that better-nourished girls have higher pre-menarcheal growth velocities and reach menarche earlier than undernourished girls, who grow more slowly but for longer, as menarche is delayed. Ultimately, these two factors tend to balance out, and total height achieved during adolescence may be similar for well-nourished and undernourished adolescents (United Nations Children’s Fund, 1998).

2.3.3 Obesity

Kaur, et.al. (2005) pointed out that in the present time, the most important medical and public health hazard is obesity. The problem of obesity is confined not only to adults but also to children and adolescents.

Many studies (Dietz, 2001, Parsons, et al, 2001) found that children obese at 13 years of age had an increased risk of obesity as adults, and that there was no excess adult health risk from childhood or adolescent overweight. Interestingly, they found that in the thinnest children, the more obese they became as adults, the greater was their subsequent risk of developing chronic diseases.

More than 60 per cent of overweight children have at least one additional risk factor for cardiovascular disease, such as raised blood pressure, hyperlipidaemia, or hyperinsulinaemia, and more than 20 per cent have two or more risk factors over weight and obese children and adolescents are at higher risk for long-term mortality and morbidity as well as psychological problems (Wang, et al, 2003, Mokdad, et al, 1999).

Martin (2005) listed the various factors that play a role in person’s weight such as gender, genes, health, education, life style, exercise and diet to name a few. When one of these factors is not balanced with the other causes it. Of all the main causes, bad eating habits and lack of exercise are the two main ones.
Eating highly concentrated calorie food, high in fat or sugar, drinking too many soft drinks and too little water, or taking few natural foods and uncontrolled desire for junk food consumption.

On account of prosperity and changing life styles in urban areas, obesity is emerging as substantial problem among several groups of women in India. On the basis of BMI, NFHS-2 (1998-99) data indicate that overall 10.6% of women between 15-49 years were obese and obesity was more pronounced in Delhi (33.8%), Punjab (30.2%), Kerala (20.6%), Haryana (16.66%), Tamil Nadu (14.7%), Jammu and Kashmir (13.8%), Karnataka (13.6%) and Himachal Pradesh (13.1%). Around 6-7% of women have BMI of 30 or more.

A school-based study in Chennai done in adolescents girls 10-15years old of affluent families found a prevalence of 9.6% overweight and 6% obese. The rural/urban difference in the prevalence was based on the area of residence of the adolescent, and area of the school. It was found that those living in urban areas showed a higher prevalence than those in rural areas (Ramachandran, 2004).

As the population goes up the socio-economic scale, cereal intake is likely to decline and the intake of sugar and fats generally increases. Fast foods find increasing acceptance. Coupled with lifestyle factors, it leads to the problem of adolescent obesity (Subramanyam, et. al., 2003).

A study by Garaulet, et.al, (2002) showed that overweight and obesity appeared to be related to a lower level of physical activity in over-weight boys, whereas in girls, it appeared to be related to a lower consumption of fiber-diet.

It is now widely prevalent in several developing countries. However, in India the problem of obesity has been scantily explored even in the affluent population groups (Sidhu, et al., 2002).
Rao (2004) in his study showed the prevalence of obesity in India at seven to nine per cent. This may seem small but the numbers are significant due to the size of India's population, and hence needs to be tackled early. Zlelovics (2004) suggested low calorie diet but rich in calcium and magnesium to prevent cardio vascular imbalance.

2.3.4 Anaemia

Anaemia is a critical health concern for adolescents. The prevalence of anaemia is disproportionately high in developing countries affecting 700 million persons in the world today due to poverty, inadequate diet, certain diseases, pregnancy, lactation, and poor access to health service. (Senderowitz, 1998).

Adolescents are particularly susceptible because of their rapid growth. It is the primary contributor to maternal mortality, significantly associated with a compromised pubertal growth spurt and cognitive development among girls aged 10-19 years (Anuradha and Sangeetha, 2001, Kasthuriba and Akkamah Devi, 2001).

Deepa, et al, (2004) quoted that anaemia as a worldwide problem, especially, among adolescents, and the prevalence in India is reported to be 65-75 % in under-privileged community. This glaring deficiency in young girls may probably be due to low intake of haemopoietic nutrients and increased demand for nutrients coupled with menstrual losses of iron.

A study conducted by Rajaratnam, et al., (2000) showed that anaemia among rural girls of Tamilnadu is high as in other parts of the country. This indicates the importance of including adolescents in the risk-group to improve their own status, and the need for planning intervention programmes that would increase the Haemoglobin levels among adolescent girls through prophylaxis
treatment, dietary modification and helminthes control. Primary health care system can be a powerful resource to address this problem in a more effective manner (Kapur, et al, 2002).

2.3.5 Osteoporosis

Osteoporosis, a disease where bones become fragile and can break easily, is associated with inadequate intake of calcium.

Peak bone mass is attained by females during adolescence and the extent of the increase in bone density during this time can be directly related to the occurrence of osteoporosis in later life. In girls, peak bone mass is reached two years after first menstruation (menarche) and bone mineralization shows dramatically after that (Golub and King, 1996).

A study by Harinarayanan, et al., (2004) in South India showed that dietary calcium intake was inadequate in both rural and urban subjects compared to the recommended daily allowances (RDA) for our country. About 31% of the population had normal vitamin D levels, 54% had vitamin D insufficiency and 15% had vitamin D deficiency. About two-thirds of the population had low levels of vitamin D.

Due to faulty-eating habits, they are often deficient in calcium for instance, they dramatically cut back on the amount of milk they drink, once they hit their teenage years. Yet, almost half a woman’s bone mass is formed during adolescence, and low intakes of calcium today may lead to osteoporosis tomorrow (Peeke, 2002).

A study by Siega-Riz (2000) stated that increased soft drink consumption along with overall low consumption of green vegetables and orange fruits may possibly lead to an increase in phosphorus excretion which may compromise bone building and maintenance.
23.6 Heart Disease

Enas and Senthil Kumar (2003) in their study reported that Indians appear to be genetically predisposed to early heart attack, by virtue of nurture and nature. The nurture is provided by factors associated with affluence and urbanization (lack of exercise and excessive calorie intake). The nature of genetic predisposition is mediated by elevated level of lipoprotein (a), a genetic risk for early heart attack in young Indians. The most common cause of heart disease is related to high blood cholesterol levels, which are associated with poor dietary habits.

Adolescents who ate foods containing the minerals like potassium, calcium, magnesium and vitamins such as folate had significantly lower blood pressure than teens whose diet contained lesser of these foods, regardless of bodyweight and salt consumption. These results suggest that diets deficient in multiple nutrients may contribute to the development of hypertension in adolescents having risk factors for cardio-vascular disease (Falkner, 2000).

A family history of heart attack, short stature (less than 59 inches), waist circumferences of more than 30 inches, a weight gain of 20 pounds after the age eighteen, doubles the risk for diabetes and heart attack in females (Enas and Senthil Kumar, 2003).

Garry (2002) also opined that it is quite possible that cardio-vascular disease risk status is set early in adolescence, thereby leading to cardiovascular morbidity in the future.

Blood pressure has been found to track from childhood to predict hypertension in adulthood, but with stronger tracking seen in older ages of childhood and in adolescence. The presence and tracking of high blood pressure in children and adolescents occurs against a background of unhealthy lifestyles, including excessive intakes of total and saturated fats, cholesterol
and salt, inadequate intakes of potassium, and reduced physical activity, often accompanied by high levels of television-viewing in adolescents, habitual alcohol and tobacco use contribute to raised blood pressure (Whincup and Cook, 1997, Roberts, 2001, Ebbeling, et al., 2002).

Geleinjnse and Grobbee (2002) stated that high salt consumption (over six grams per day for children aged seven to fourteen) may also pose a health risk to adolescents. Eating too much salt, especially during childhood has been associated with the development of hypertension.

Another study by Galal (2002) showed that obesity, prevalence of Diabetes mellitus, and hypertension are very high among the adolescents. These conditions are the result of poor nutrition, high levels of anaemia, parasitic infections and accumulated health problems from childhood.

2.3.7 Eating Disorders

Madhok (2003) classified the main eating disorders as anorexia nervosa, bulimia nervosa, food avoidance, emotional disorder and selective eating. Selective eating involves a limitation of the range of foods rather than the quantity as in anorexia nervosa. The teen-age years are a time when awareness is increased regarding figure, weight, image, and good looks. This is also the period when a lot of teenagers with peer pressure try out all sorts of fad diets to lose weight or totally go off food. This leads to a condition called anorexia nervosa where the teenager throws up anything eaten, and losing appetite and ruining his/her health totally. Eating habits in adolescence can have a major impact on adult eating habits, if psychological factors are involved.

Eating disorders are characterized by abnormal eating patterns and cognitive distortions related to food and weight which in turn result in adverse effects on nutritional status, medical complications, and impaired health status and function (Rock, 1999).
It is a life and health threatening eating problem (Doe, 2006). Potential irreversible effects such as growth retardation, pubertal delay or arrest, and impaired acquisition of peak bone mass increase the risk of osteoporosis in adulthood (Fisher et al., 1995).

Parikh (2004) reported that 5 percent adolescent girls / young women show symptoms of eating disorder, though it is seen in young men and boys too. It is 10-20 times more in females, upper class, educated, professionals, and urban women. Now this disorder is on the rise in India.

The parents should help children recognize the right diet, right nutrition and the right body image because what they seen on the T.V. are not necessarily healthy. Girls may be prone to an eating disorder like anorexia nervosa and they stop eating because they are afraid of putting on weight (Swati Bhave, 2004, Kant, 2003).

2.3.8 Constipation

Twenty percent of school-going adolescents is faced with the problem of constipation. The reasons for having constipation are poor water intake, inactivity, low fibre content foods, habitual tension, and consumption of too much of fine-powdered cereals (Virudhagiri, 2002).

Faulty food habits include irregular hours of meals, getting up late in the morning, and rushing through the morning rituals with very little time to visit to the toilet before going to the school (Bakhru, 2002).

2.3.9 Iodine Deficiency Disorders

Iodine deficiency disorders are common throughout the developing world, yet they are considered one of the most preventable causes of mental retardation. Iodine deficiency has tremendous consequences on women and girls and not only impairs a women’s reproductive health, but it also has a
serious consequences for a growing fetus, Adolescent girls are still growing and preparing to have children, this deficiency can lead to congenital hypothyroidism in newborn infants (Pawloski, et al, 2003).

Poor nutritional status and illiteracy have significant effect on the individuals. Underweight women had a fourfold higher risk and those who were illiterate had a eight fold higher risk, or a failed pregnancy, compared with nutritionally healthy literate women. Those results emphasized the need to implement an effective iodine supplementation programme. They also stressed the importance of improving the nutritional status of young girls and the crucial role that was played by education in the prevention of reproductive failure (Dillion and Milliez, 2000).

The study was carried out by National Nutrition Monitoring Bureau (NNMB) (2003) in eight states including Tamilnadu for Iodine Deficiency Disorder. The spot test revealed that 42% house holds were consuming uniodized salt, 31% consumed iodized salt as per recommended level of >15 ppm, and 27% consumed salt having unsatisfactory level of iodine content (about 7ppm).

A disturbing finding in recent years is the emergence of new goitre-endemic areas in the irrigated plains of Asian countries such as India, Myanmar and Indonesia. The precise factors underlying this have not been identified, but it is being suspected that the modern practice of intensive agricultural technology could have resulted in the diminished bio-availability of soil iodine and the consequent diminished content of iodine in food and water. The possible role of an excessive use of fertilisers, pesticides, and food additives has also been suspected (Gopalan,1994).
2.3.10 Vitamin A Deficiency

A study by Kanani and Consul (1990), which showed that adolescent girls had ocular signs of Vitamin A Deficiency: Conjunctival xerosis and bitot spots. Another study by Jondhale, et al, (2000) showed that anaemia and vitamin A Deficiency were the two nutritional deficiency disorders found in more number of adolescent girls of 13 years of age.

2.4 STATUS OF ADOLESCENT GIRLS IN INDIA /

Several factors point to the neglect of women in India and other South Asian countries except perhaps Srilanka. These include (i) High maternal mortality (ii) Low sex ratio (iii) Early marriage and pregnancy (iv) Malnutrition and low-weight gain during pregnancy and (v) poor literacy (Bamji, 2003).

2.4.1 Illiteracy

Adolescent girls in the rural areas, especially among the peasant families, are either illiterate or have attended primary schools for very short period before they are removed from the schools to be in homes to help their mothers as “mother-substitutes”. The dropout rates of girls in the age group of 10 to 12 years is extremely high in the most developing countries, especially in the rural areas. Studies in India in different regions have revealed the same practice, which to a large extent explains the glaringly low female literacy level.

It has been repeatedly demonstrated in several developing countries that female illiteracy is the major factor for infant and child malnutrition, adolescent malnutrition and various types of morbidities during the reproductive period of women. Improvement in literacy level in adolescent girls, starting even earlier, could be an effective means to improve not only
health and nutrition status of adolescent girls but would ensure good nutrition health start of her off-spring and later on her family members. A literate wife is the greatest insurance against unhygienic practices leading to infective morbidities of the entire family members (Bagchi, 1999).

Gender disparities in nutrition are evident from infancy to adulthood. In fact gender has been the most statistically significant determinant of malnutrition among young children, and malnutrition is a frequently, direct or underlying cause of death among girls below the age of five. Women consume approximately 1000 fewer calories per day than men, comparison of household dietary intake studies in different parts of the country shows that nutrition equity between males and females is lower in northern states of India (Ramalingaswami, et al, 1996).

2.4.2 Health care and other expenditure

Most low-income families are subject to these economic realities and are therefore keener to protect the health of male children rather than female children. There is widespread “son preference” in most of these countries (SikhSpectrum.com, 2003). Females receive less health care than males. Many women die in easily prevented complications. Working conditions and environmental pollution further impairs women’s health (Coonrod, 1998).

A study by Thangamuthu and Rasi (2000) revealed that the girl children account for lower shares of family expenditure on food, clothing, education and medicine when compared with the boys in the lower income groups of households. In the higher income groups, the boys and girls are getting almost similar treatment. In the items such as clothing, education and medicine, the girls are receiving marginally better treatment in the better-off households. Thus, not only in health care, but also in various other items of childcare expenditure, the girls suffer the most in the lower income households.
The sons get the priority of attention. It is also striking to note that girls, not with-standing greater incidence of sickness, have received relatively lesser attention in terms of medical expenditure.

Despite the constitutional safeguards, even after independence, the position of girls continues to be much lower than that of a boy. She is generally known as a temporary guest in her parental home or a bird of passage. A girl is neglected from her birth and systematically deprived of physical and psychological inputs. This deprivation leads to an unequal share in terms of food, clothing, health care, education, family income and property, which subsequently have a tremendous impact on her physical and mental health and personality development (Pandya and Anuradha Mathu, 2004).

Gender and Development Plan of Action (2003) says that women and girls eat only the food that is left after the males in the family have eaten. This often results in chronic under-nutrition. Indian girls consume less food when compared to the boy’s intake, even though girls do much of the heavy work. This often results in chronic under-nutrition.

2.4.3 Early Marriage

The National Family and Health Survey report revealed that 50% of the population, marry below the age of 18, ignore the Child Marriage Restraint Act of 1976, resulting in the reproductive pattern too early, too frequently and too many (Anjaneyulu, 2002).

Soon after attaining puberty, in a girl's life, during school-going age was marriage, not education and this perhaps reveals the lesser importance given to a girl's education by the community (Ananthakrishnan and Nalini, 2002).

A very large percentage of our girls are pushed in to marriage very early, the marriage being consummated almost immediately after menarche. Thus, their arduous reproductive journey begins almost from their 14 year
and teenage pregnancies are by no means uncommon. Even with the existing levels of poverty, a significant impact of maternal nutritional status and birth weights off-spring can be achieved through just bringing about a rise in the age at marriage of our rural girls. The 1991 census figures show marriage of currently married women in the country as a whole has increased to 17.7 years while in 1981, it was 16.7 years. In most part of India 15% of girls are married before 20 years but they are not fully mature sexually, emotionally and physiologically and without much knowledge of family planning. Early marriage leads to long fertility period with its adverse effects (Nair, 2000) and (Venkaiah, et. al, 2002).

Thus raising of age at marriage could possibly be considered to have a considerable impact on maternal, foetal and infant nutrition even in the current context of poverty in our rural communities (Saxena, 2002).

Another economic disadvantage of daughters in India is their relatively low earning potential. As in many other countries, although women work as hard or harder than their male counterparts, they make very little money. The long hours spent in cooking, cleaning, and caring for their children are viewed as “sitting at home all day”. Even the time spent in the fields is not considered significant since men do much of the heavy lifting. Frequently women are illiterate and lack schooling. Women in India are generally unable to obtain high paying work and are, therefore, financially dependent on the men in the family. As a result, it is felt to be to a family’s economic advantage to minimize the number of daughters (Mallick, 2004).

Healthy development of adolescent girls also depends upon a number of factors like environment at home, the community, school and work place. These can provide opportunities for healthy social, emotional, intellectual, physical, and moral development. A loving and stable environment that encourages increasing independence and sets appropriate limits will build up self-esteem in adolescents, and lead to achievements in their life.
The above inequalities severely constrain the ability of women and adolescent girls to acquire good health and women-centered health services. At the household level, these disparities translate into a lack of autonomy and control over the household resources both material and knowledge (Jejeebhoy, 1997).

2.5 Factors Affecting the Nutritional Status of the Adolescent Girls

Various factors affecting nutritional status of the adolescent girls are discussed below:

2.5.1 Demographic Factors

Demographic factors play an important role on the pattern of consumption of food and nutrients. The milk and milk products, fats and edible oils were higher in the dietary pattern of Hindus, whereas intake of flesh foods was higher among the Muslims (Rahman and Visweswara Rao, 2002).

2.5.2 Family Environment

Another factor that impinges upon the nutritional quality of a child’s diet is the breakdown of the family meal. Research shows that when children eat meals with their parents and siblings, they eat a more nutritious diet. A pleasant family atmosphere at mealtime having a good parental role model positively influences the nutritional quality of the diet. Unfortunately, the reality that the families do not eat together (Herald of Health, 2002).

Young children interact with their environment and learn culturally determined behaviours from constituents of their microenvironment which includes family’s belief system, attitudes, traditions, and food likes and dislikes. It is well-known that food behaviour, nutritional status, growth and development are influenced by each other. These factors are synergistically
modulated by the socio-economic factors that include the literacy status, income and occupation of the parents / caregivers, demographic features of the home, access to quality foods and health care (Vazir, 2003).

2.5.3 Parental Education

Educational status and socio-cultural level of parents strongly influence the nutritional status of adolescent girls (Singh and Mishra, 2001). This was proved by Kronsberg, et al, (2003) that higher levels of parental education was associated with lower percentage of kilo calories from total fat and dietary cholesterol and also higher percentage of kilo calories from carbohydrate.

Mothers’ level of education is the single most important determinant of child’s survival. Children of educated women have an increased chance of receiving better nutrition, health care, and education (Singh and Sharmila Singh, 2004).

Teenagers want and need to make their own food choices and purchases. Hence, the parent can set a good example, but parental influence is much weaker now. Hence, promoting female education and literacy can improve nutrition and regular health care (Ruth Oniang’o and Edith Mukudi, 2002).

2.5.4 Poverty

Adolescent girls face more problems than boys. This unfortunate state of nutrition in India is attributed to the socio-economic factors. Large segment of population is affected due to socio-economic factors. Adolescent girls are deprived of adequate health care, good nutrition, and opportunity for schooling. Poverty underlies the poor health status since, poor dietary intake was caused by poverty (Krishnaswami and Vijayaraghavan, 2000).
Due to poverty, healthful foods such as fresh fruits and vegetables often are seen as luxuries rather than necessities. Hence, they may be unwilling to purchase and prepare unfamiliar foods because if the family does not like the food, money will have been wasted and little will be left to purchase foods that family will eat (Graham, 2001). Hence, the nutritional status of the poor depends disproportionately on cereals, while pulses are completely out of reach. However, large poverty groups in India do not have access even to the minimum required cereals (Health for the Millions, 2001). Malnutrition is a common feature in low-income groups (Islam, et.al, 2004).

The poor are more vulnerable to diseases due to lack of financial resources, limited knowledge of education and on health matters, limited use of health services, and inadequate nutrition. Higher income and assets are especially important in regard to health (Dara Carr, 2004).

Better nutrition can be a by-product of socio-economic development, but improved nutrition can certainly be a valuable instrument in promoting socio-economic development. Better nutrition can be the cause and result of socio-economic development (Rao, 2004).

2.5.5 Taboos

Household’s resources, customs and traditions affect the nutritional status of an individual. Even within the same level of resources, the traditional beliefs towards food items influence their intake and hence the nutritional intake. For example, if certain foods though rich in some relatively scarce nutrients, are believed to be bad for children, their intake result will be less satisfactory (Behrman, 1995). Unfortunately most of the harmful beliefs and prejudices are associated with diets of women and children who constitute the most vulnerable segments of our population (Vijayalakshmi and Krishnaswamy, 2000).

In some area, especially in South Asia, pregnant women’s diet may be subject to cultural norms that discourage women from eating nutrient rich foods thought to be harmful. Women may be encouraged to consume less food during pregnancy so that this will help to avoid the difficult labour which can occur, if a baby is too big to fit through the mother’s pelvis (Rush, 2000).

The practice of excluding lactating women from certain green leafy vegetables was seen prominently in southern India. These green leafy vegetables were avoided for fear of diarrhoea or cold in infants. In the eastern India, colocasia leaves had a negative connotation, since they are offered at funerals by the Tea Tribe communities, while the other rural and tribal populations believed that colocasia leaves could cause a wide variety of health disorders (Seshadri 1996).

Hence, food fads and beliefs, coupled with lack of knowledge limit the food intake, and they are the important contributory causes for the wide prevalence of malnutrition (Swaminathan, 1999, Purusothaman, *et al.*, 2002).

2.5.6 Food Intake

Food is a pre-requisite for nutrition. Some knowledge of the basic factors of nutrition is helpful to anyone who has to make food choices. By nutrition cognition it is meant both nutrition knowledge as well as nutrition attitude. Nutrition cognition is the outcome of nutrition awareness and it is basically the knowledge of the nutrients in food, and their role in physiological and biochemical reactions that determines the attitudes towards food consumption pattern (Hoorweg and Neimeijer (1989).
The most important factor in determining the health status of a population is food-intake. Although affected by cultural patterns, seasonal variations, and dietary knowledge of the household food procurer, the food intake is chiefly determined by food availability at the household (Bhasin and Veena Bhasin, 2002).

Mittal, *et al.*, (2003) stated that adequate nutrition is one of the key factors which helps each person to attain his / her full potential as an adult, and it depends to a great extent on the quality and quantity of foods. Chevassus and Agnes (1999) cited that at the individual level, the degree of efficiency with which the body utilizes the food consumed is a key determinant of nutritional status. That efficiency is generally affected by poor health conditions and reduced significantly by specific diseases such as infections, intestinal parasites, diarrhoea, etc. The most important factors influencing food choices includes hunger/food cravings, the appeal of food (i.e., taste, familiarity, appearance and smell), the time available to them and their parents, and convenience. Secondary factors were availability of food in the home and situational factors such as where they were and whom they were with (Neumark - Sztainer, 2003).

**2.5.7 Life Style Factors**

Today’s youngsters are enamoured of western fast foods. However, these foods have been proved to be a major cause of diseases such as obesity, coronary heart disease, and hypertension etc.. Fast foods are a sign of the times and it is almost like a status symbol. Fast foods are like our fast-paced modern society - instantly produced and instantly consumed. Most of these foods have very low fibre content, usually highly processed and refined. It produces acidity, indigestion, and constipation (Kango, 2002).
2.8 Programmes for Adolescent Girls

CINI (The Child in Need Institute) is situated in the eastern part of India bordering Bangladesh. CINI’s programme for adolescent girls addresses the needs of rural girls and boys both in school and out of school. The programme targets health sensitization sessions, peer education for students, and health awareness camps. It conducts reproductive health services to both married and unmarried girls.

CHETNA (Center for Health Education Training and Nutrition Awareness) organized health education camps as a strategic tool for engaging hard-to-reach groups like adolescents and young women. They focused on creating awareness about anatomy, physiology, male and female reproductive systems, and addressing myths and misconceptions relating to menstruation, pregnancy, and lactation with special relation to nutrition. It also provides health education information and support to the community.

CEDPA (Centre for Development and Population Activities) partnered with four non-governmental organizations to provide family life education and implement adolescent-friendly reproductive health services as part of the better life-options programs in three states of India. The four partners are Prayatn, YMCA in Delhi slums, Bharatiya Grameen Mahila Sangh in Madhya Pradesh and Society for the Promotion of Youth and Masses in Haryana. It is a comprehensive package for both adolescent girls and boys. Adolescent girls received iron supplementation, deworming, tetanus toxoid immunization, and nutrition counselling. Both boys and girls received health check-ups, haemoglobin testing, treatment for reproductive tract infection, health counselling, and general health care.
CARE - This project is located in Madhya Pradesh, Jabalpur city. It is funded by UNFPA. The project is identified as adolescent girls health project. This project is designed to address the reproductive health needs of nearly 32,000 adolescent girls living in the slums.

RACHNA (Reproductive and Child Health, Nutrition and HIV/AIDS). This programme aims at improving the health of women and children, provide reproductive health and hygiene, education, improve the quality and availability of health services, and advocate policies that prioritize the needs of poor and vulnerable families.

SUTRA (Society for Social Uplift through Rural Action) is based in the hilly region of Jagjit Nagar, Himachal Pradesh and regularly undertakes training programs, seminars/workshops, and courses for capacity building among various groups. These groups include mahila mandals (women’s groups), panchayats (local governing councils), and yuvati sangathans (adolescent girls’ groups). The organization operates in five districts and 10 development blocks of Himachal Pradesh. The activities are geared toward wide understanding of reproductive health. The encompassing issues are body care, menstruation, RTIs, abortion, family planning, sexual relations, violence, liquor, and adolescent health.

ADITHI a non-governmental development organization, established in Bihar in 1988, has been working on adolescent issues since 1995, focusing specifically on adolescent girls between ages 11-18. ADITHI started Balika Kishori Chetna Kendras (awareness centers for young unmarried girls) with support from UNICEF. The aim of the kendras is to build a community where women and men have equal status and importance. There are more than 18 kendras in 18 villages, with a total of 465 participants, of whom 351 participated regularly.
PRERANA initiated adolescent programs in 1987 and in 1990. Its initiatives are: launching the Better Life Demonstration Project for Girls and Young Women, and a parallel program of Better Life Development Program for Boys and Young Men. The objective of each program is to create an environment of dignity and opportunity for adolescents, enabling them to achieve their full potential in terms of personal growth and ability to contribute to family, community, and societal development. The programs were implemented as a development project in six villages along the periphery of Delhi. Over 5,000 adolescent girls and 1,800 adolescent boys have been reached through direct field programme.

2.9 ICDS PROGRAMME AND SERVICES FOR ADOLESCENT GIRLS

ICDS program was launched on October 2, 1975, the 106th birth anniversary of Mahatma Gandhi, the father of the nation. As Gandhiji saw India’s development in the empowerment of its people, so does ICDS seeks to empower communities for the care and development of their children and women - shaping the country’s present and future human resources. It signifies a renewed commitment to the Gandhian vision of reaching out to the most deprived in society. ICDS is the only programme in the world which holistically addresses health, nutrition, and development needs of young children, adolescent girls and pregnant / nursing mothers across the life cycle (Mahajan, 2000).

The rich experience of ICDS has brought about a deserving transition from a welfare orientation to a new challenging perspective. It has fostered a new vision for the most vulnerable younger children less than 3 years of age. The vision of the new millennium signifies its renewed commitment to ensure children’s rights for their survival, development, protection, and active participation in given environments where they live, grow, and develop.
ICDS equally provides deserving support to girls and women for their active involvement in educational pursuits, releasing the girl from the conventional burden of sibling care at a tender age (Joshi, 2000).

The programme emerged as the most effective programme for breaking an intergenerational cycle, covers about more than 75% of India’s community development blocks and it is the focal point for converging various Government programmes for young children, girls, and women from disadvantaged communities (Chaturvedi, 2000).

Integrated Child Development Services Scheme (ICDS) provides an integrated approach for converging all the basic services for improved child care, early stimulation and learning, health and nutrition, water and environmental sanitation aimed at the young children, expectant and lactating mothers, other women and adolescent girls in a community (Kapil and Pradhan, 2000).

The ICDS programme has crossed many milestones since its inception in 1975. Today, ICDS is globally acknowledged and recognized as one of the community based out reach system for women and child development. There are almost 600,000 Anganwadi workers and an equal number of helpers providing services to beneficiaries throughout the country. It currently reaches 33.2 million children and 6.2 million pregnant and lactating mothers (Ghosh, 2005).

ICDS program is the reflection of the Government of India to effectively improve the nutrition and health status of underprivileged section of the population through direct intervention mechanism. The program covers 27.6 million beneficiaries with supplementary nutrition. The program services and beneficiaries have essentially remained the same since 1975. Recently a review of the scheme was held, sponsored by Government of India, which suggested modifications in the health and nutrition component of ICDS scheme to improve the program implementation and efficiency (Kapil, 2002).
Status report of the ICDS (2003) states that, universalization of ICDS was originally contemplated to be achieved by the end of 1995-96. Out of 5614 sanctioned projects till 1996, become operational by the end of eighth plan and by the end of ninth plan it was spread about 5652 blocks / wards all over the country. However, only 4608 blocks could be operationalized by the end of ninth plan period due to paucity of funds and by September 2003, 5068 projects became operational.

Tenth five-year plan envisages to universalize ICDS in the country and expects to cover 54.3 million children and 10.9 million mothers.


Several World Bank supported ICDS projects have been established in various states with additional spectrum of services and inputs.

2.9.1 WBA ICDS - III IN TAMILNADU

World Bank Assisted ICDS III project is the successor of the Tamil Nadu Integrated Nutrition Project II. The project provides services through 19500 Anganwadi centres in the 318 rural blocks of the state. Under general ICDS, the services provided have been merged with World Bank Assisted ICDS III projects under the control of the project coordinator.

Likewise, 718 Municipal Child Welfare Centres under the control of Director of Social Welfare have also been brought under the control of project coordinator, World Bank Assisted ICDS III project. Of these, 204 Municipal
Child Welfare Centres functioning in the districts of Thiruvannamalai, Namakkal, and Tirunelveli have been converted as ICDS centres from the year 2002-2003.

The following are the specific objectives of the World Bank Assisted ICDS III Project and general ICDS:

a) To improve the nutrition, health, and psychosocial status of children in 0-6 years of age with particular emphasis on preventing malnutrition in children under 3 years of age and improve childcare practices at the household level.

b) To improve the nutrition and health status of women, particularly pregnant and lactating mothers and adolescent girls.

c) To empower women and adolescent girls through increased awareness to take better care of their personal and household health, and nutrition issues, and

d) To make “Tamil Nadu Malnutrition Free” and to provide a whole life-cycle nutrition security programme for those below poverty line with special focus on nutrition for expectant mothers, infants, adolescents, and the aged.

2.9.2 Beneficiaries of the project

> Children upto 3 years
> Children 3 to 6 years
> Expectant mothers
> Nursing mothers
> Adolescent girls
2.9.3 Package of services delivered at Anganwadi centres

- Growth promotion.
- Selective supplementary nutrition.
- Early childhood care and pre-school education.
- Health services by health personnel by Voluntary Health Nurses/Medical Officers
- Nutrition and health education
- Referral services.

2.9.4 Integrated Child Development Services in Tamil Nadu

The following materials are collected from the compendium of ICDS guidelines (2000):

ICDS was started in Tamil Nadu in 1975 with 3 projects, and now it has expanded to 113 (69 rural and 44 urban) projects in which 10421 Anganwadi centers are functioning with Central assistance.

Tamilnadu Integrated Nutrition Project started with World Bank assistance in 1980, in one rural block in Madurai district. It has now expanded to 318 rural blocks in which 19500 anganwadi centers are functioning. Consequent on the closure of Tamil Nadu Integrated Nutrition Project - II, the World Bank Assisted ICDS project- III came into being in April 1999. Under this project, 14 lakh children of 0-36 months, 3.5 lakh children of 37-72 months, and 5.5 lakh pregnant and lactating mothers are benefiting at any point of time, of which 2.36 lakhs of 6-36 month children, and 2.30 lakhs of pregnant and lactating mothers are given supplementary feeding.

These services have contributed to improved health among children in ICDS areas. The Infant Mortality Rate (IMR) of 71.3/1000 live births in 1992 in ICDS areas was found to be lower than the national estimates in 1989.
In ICDS projects for more than 3-years old, IMR was found to be 84.5; further decline in IMR in 1990 were found in projects older than 5 years (Sharma and Gupta, 1993)

The World Bank assisted ICDS Project- III has been designed in such a way that the benefits of the earlier TINP II Programme are consolidated, and new thrust areas given due focus. The major objectives are:

1. Improve nutrition, health, and psychosocial status of children of 0-6 years of age with particular emphasis on preventing malnutrition in children under 3 years and improve childcare practices at the household level.

2. Improve nutrition and health status of women particularly pregnant and breast feeding mothers, and adolescent girls and

3. Empower women and adolescent girls through increased awareness to take better care of their personal and household health / nutrition issues.

During 2002-03, activities such as construction of 29 block offices and 29 Anganwadi centers purchase of medicine kits, play materials, 323 vehicles and deworming, IF A tablets, and training have been undertaken. New issues like health and nutrition services for adolescent girls, convergence of services, need-based training for stakeholders, women empowerment and total quality management have been addressed. Another new step is introduction of village level-monitoring system by Monitoring Committee consisting of members of the public; special emphasis is given to early childhood development, education and women empowerment.

During 2002-03, against the outlay of Rs.11251.56 lakhs for ICDS III comprising Rs.10319.10 lakhs for ICDS III, and Rs.932.46 lakhs for World Bank assisted ICDS III; the anticipated expenditure is Rs. 10464.94 lakhs.
The proposed outlay for 2003-04 is Rs. 11431.76 lakhs. Besides, an amount of Rs.4753.00 lakhs was allocated for 2002-03, and Rs.5765.16 lakhs was proposed for 2003-04 under Government of India funds. For the functioning of regular ICDS Projects including training, the allocation for 2002-03 was Rs.1166.19 lakhs under State schemes and Rs.4521.31 lakhs under Centrally Sponsored Schemes. For 2003-04, an amount of Rs.1375.17 lakhs under State schemes and Rs.4602.85 lakhs under Centrally Sponsored Schemes was proposed. During this period, 12.16 lakh children in the age group of 0-6 years and 3.52 lakh pregnant and lactating mothers were benefiting under both the projects.

2.9.5 Adolescent Girls Scheme

Adolescent Girls Scheme introduced under ICDS scheme to address the life cycle approach of Human Development is being implemented presently in 507 blocks in the country (Krishna, 2000).

The adolescent girls scheme has been designed to include two sub-schemes viz. scheme - I (Girl to Girl Approach) and scheme - II (Balika Mandal).

The scheme - I: It has been designed for adolescent girls in the age group of 11-15 years belonging to families whose income level is below Rs.6400/- per annum. The girls in the age group 11-15 years were identified and attached to one anganwadi centre for a period of six months. In each six-monthly round, the girls received instructions and learnt through participation simple and practical messages on preventive health, hygiene, nutrition, working of anganwadi centre, and family-life education were given through an initial three-days training programme followed by six continuing education sessions of one day each every month. These girls participated in the activities of anganwadi centre for two days a week and got supplementary nutrition six days a week (Lal,2001), (Joshi,1998).
The scheme - II: It is intended to reach all the adolescent girls in the age group of 11 - 18 years irrespective of income levels of the family. Under the Balika Mandal Scheme, 20 girls in the age group 11-18 years were identified and were enrolled. Anganwadi was the focal point for development of these girls. These girls were provided with supplementary nutrition, besides learning about personal hygiene, environmental sanitation, nutrition, home nursing, first aid, communicable diseases, family life, child care and development and constitutional rights and their impacts on the quality of life. Training on vocational skills was also arranged apart from creative activities as also learning through sharing of experiences. It was envisaged that intersectoral coordination will be generated to fulfill the objectives of the scheme (Lai, 2001).

The Adolescent Girl Scheme in its present form is being implemented through anganwadi centres in both rural and urban settings.

The objectives of the scheme are as follows

1. To improve the nutrition and health status of girls in the age group of 11-18 years.

2. To provide the required literacy and numeracy skills through the non-formal stream of education, to stimulate a desire for more social exposure and knowledge, and to help them improve their decision-making capabilities.

3. To train and equip the adolescent girls to improve / upgrade home-based and vocational skills.

4. To promote awareness of health, hygiene, nutrition and family welfare, home management and child care, and to take all measures as to facilitate their marrying only after attaining the age of 18 years, and if possible, even later.
5. To gain a better understanding of their environment-related social issues and the impact on their lives, and

6. To encourage adolescent girls to initiate various activities to be productive and useful members of the society.

Coverage

It is expected that, in a village with one thousand population, there will be 70 adolescent girls in the age group 11-18 years. This gives us a figure of 7% of the total population. The total adolescent girl population in our country would be around 5.6 crores. In the presumptive population of 1 lakh in a block, or an ICDS project, the number of adolescent girls will be 7,000, of them 4,500 will be in the age group of 11-15 years, and 2,500 in the age group of 15-18 years.

Achievements

There has been significant progress in the implementation of ICDS during the last three years in terms of operational projects and coverage of beneficiaries. About 244.64 lakh pre-school education beneficiaries, and 562.18 lakh beneficiaries are benefited out of this programme as on 31.03.2006 (www.wcd.nic.in).

2.9.6 Anganwadi Worker (AWW)

Anganwadi worker is a key person, enacting a primary resource person to deliver the services envisaged by ICDS. The job responsibilities of Anganwadi workers were defined way back in 1975. To keep pace with the time and newer development, the job functions of Anganwadi worker and other functionaries have been redefined to enrich the job and make these more relevant to the needs and aspirations of women and children (ICDS, 2000).
Her understanding about ICDS and her own socio-demographic profile is important in the success of implementing the services at community level (Kapil, et al, 1997).

The Anganwadi worker should be from the community that she serves. So that it enables her to devote her time to service package. From the studies, it was observed that the Anganwadi workers residing more than 5 kms away from the centres have to spend extra time and energy to reach the work spot which affects the work performance (Philips and Kurian, 1986).

Assessment regarding the health and nutrition knowledge of Anganwadi workers suggests a satisfactory level of knowledge in topics like vaccines-prevented diseases, dosage of vaccines, symptoms and treatment of several common diseases, growth monitoring, introduction of weaning food and cholostrum. However, a few studies have highlighted Anganwadi workers lack of knowledge about the importance of supplementary feeding, basic facts on nutrition aspects and importance of breastfeeding during diarrhoea (Jayanthi, 1984).

Many studies have highlighted that work expectation of anganwadi workers were higher as compared to honorarium offered to them. Honorarium of Anganwadi workers has been increased to Rs.1000/- per month; it is quite encouraging. In order to utilize her potentialities, they should be given incentives for better performance. Timely evaluation of training is reported to be necessary to strengthen the knowledge (Lai and Dinesh Paul, 2003).

2.10 Studies on ICDS

Lakshman, (2006) opined that, in States like Tamil Nadu, its functioning has yielded positive results. Its role as an instrument to secure children's right to food cannot be overstated. The ICDS functioning in Tamil Nadu, when compared to five other States, (Chhattisgarh, Uttar Pradesh, Maharashtra, Rajasthan and Himachal Pradesh) was far better in terms of indicators
such as longer opening hours, the number of infants in the under-three-age group who attend regularly, basic infrastructure facilities, and salaries paid regularly to the Anganwadi workers. The quality of services including preschool education, supplementary nutrition, health and immunisation services was found to be satisfactory by nearly 90 percent of the mothers who used these services.

The studies taken up on ICDS service packages are reviewed and given below.

2.10.1 Preschool education

ICDS also provides support to the national efforts for universalisation of primary education, through increased opportunities for promoting early development, associated with improved cognitive and social skills, enrolment and retention in the early primary stage (Anuradha and Komala, 2003).

Pre school education component of ICDS may be well considered the backbone of ICDS Programme, since all its services essentially converge on the Anganwadi. This is also the most joyful play-way-daily-activity, visibly sustained for three hours a day. It includes thorough intervention with mothers/caregivers. The programme for the 2-to-6 year old child in the Anganwadi Center is directed towards providing and ensuring a natural, joyful and stimulating environment. The target is to cover 40 per cent of children in the age group of 2- to -5 years in the area with focus on below poverty line families (Vijaya, et al, 2003).

Raizada, et al, (1993) assessed the impact of evaluation of non-formal preschool education on mental and cognitive development of children. The study showed that there was an increase in the cognitive development with the advancement of age.
2.10.2 Supplementary Nutrition

Nutritional status is an indicator of the overall well-being of the population. Nutritional status of preschool children reflects not only the nutritional status of the population as a whole but also acts as an indicator of the overall living conditions of the society. A study by the National Institute of Nutrition (NIN)(1990) had recorded better nutrition status of children attending ICDS anganwadis as compared to children of the same village and similar socio-economic status not utilising the services of ICDS. Several aspects related to the decline in under-nutrition have been examined. It has been noted that young children belonging to special groups, namely tribes, Scheduled Castes, Scheduled Tribes, and Backward Communities, had all shown beneficial impact of ICDS on their nutritional status. Similar conclusions were drawn by the previous studies of Renu and Rekha (1982), and Sharma and Gupta,(1993). Yegammai and Nivargi (1995) have observed that nutritional status of the children was improved as a result of the ICDS centres. Participation in the supplementary nutrition program (SNP) of the beneficiaries was increased two to three folds in all categories of the target population (Naswa, 1998, Patnaik, et al., 1999).

The factors responsible for better nutritional status of children in ICDS area were the availability of health care facilities, supplementary nutrition, and NHEd. The nutritional status of pre school children in ICDS area as reported by various studies has showed good improvement. The nutritional status of children in 1976 was grade I was 50.6%, 71.4% in 1982, 72.4% in 1987, and 74.7 % in 1990. The percentage of severely-malnourished children declined from 20.5 in 1976 to 9.9 in the year 1991 (Saraswathi, 1995, Sachdev, et al., 1995).
Bagyalakshmi and Vijayalakshmi (2002) studied the impact of ICDS on the health status of children. They opined that the ICDS, with its innovative approach has yielded the best results in improving the nutritional status, health status, and performance of children along with improved attendance in Balwadis.

The coverage of beneficiaries under supplementary-feeding programme was found to be satisfactory. Various studies reported the beneficiaries’ satisfaction with the quality of food (Masood and Sinha, 1984, NIN, 1990).

Recent study conducted by Vaid and Nidhi Vaid (2005) too reached the similar conclusion that ICDS children are having better nutritional status as compared to their non-ICDS counterparts.

A national study conducted in 1991 by the National Institute of Public Cooperation and Child Development confirmed the positive impact of ICDS. Where the program was operating, there were lower percentages of low-birth-weight babies, lower infant mortality rates, higher immunization coverage, higher utilization rates for health services, and better child-nutrition. Further, the percentage of severely-malnourished children declined, the positive effects of preschool were evident, and a larger percentage of mothers were getting their children medically examined. Over the last three decades, ICDS has demonstrated its effectiveness. Consequently, the Government of India has renewed its commitment to making the programme universally available in order to achieve equality of opportunity for all Indian children.

2.10.3 Immunization

The addition of immunization component in ICDS also contributed significant coverage. The incidence of vaccine-preventable diseases varies with the immunization coverage. The data on the immunisation of children in ICDS project areas, as assessed at periodic intervals, provide a generally encouraging picture (Tandon, 1993).
Tandon and Gandhi (1992) found that the coverage was higher in the ICDS area than the non-ICDS area. The incidence of such diseases are definitely on the decline in ICDS project area. The immunisation coverage (BCG, DPT and polio - three doses) in 1990 in ICDS project samples had increased to 69.0 per cent, 67.6 per cent, and 67.7 per cent respectively from the baseline of 21 per cent (1976), 4.9 per cent (1976) and 13.7 per cent (1981), respectively (Annual Survey - 1990-91, 1981-82, Central Technical Committee, New Delhi, 1992). The year 1991 report indicated cent percent coverage of immunization. The Anganwadi worker was found to be a very valuable functionary for the promotion of the immunisation drive of the health and Family Welfare Department, and the credit for the better success of the immunisation programme in the ICDS area must largely go to them (GOI, 1995, Raghavan, 1996, Bhargava, 2000).

Govt, of India reported overall coverage of fully-immunized children around 50%, coverage was highly uneven between various states, only 11% of children in Bihar, and 14-17% in Nagaland, Meghalaya, Assam and Rajasthan were fully vaccinated; by contrast, in Tamil Nadu, Himachal Pradesh, Goa and Kerala 80% or more were fully vaccinated (National Family Health Survey (NFHS-2) 1998-99).

Bhandhari, et al, (1993) conducted a study in the villages of Garhi tribal block of South Rajasthan to evaluate the ICDS. The findings suggested that Anganwadi workers were able to successfully motivate the parents to immunize the children, and also it indicated that it improved the immunizational status of children. Similar finding was also seen in the study conducted by Trivedi, et al, (1995) reported that the nutritional and immunization status has not improved. The reasons they stated were insufficient knowledge, lack of aptitude and limited devotion of health and ICDS workers.
Regard to poliomyelitis, the prevalence rate was comparatively lower in an ICDS area than non-ICDS area. It was found to be effective as it ensured immunity. The coverage was over 85 percent due to awareness created among parents and health workers (Kapil, et al, 1997).

Immunization coverage reflects two important problems. First is the weak convergence of services at the anganwadi centre level. Field observations and review of available data suggest that immunization coverage is highly variable, and that it depends on the level of cooperation between the Health and ICDS systems at the local level. A second problem is the provision of vaccines (and micronutrient supplements) related to central procurement, state level pharmaceutical management, and supervision. Convergence of health interventions with ICDS and timely detection of growth faltering (followed up by proper referral, treatment, and counselling of mothers) will effectively contribute to preventing the increase of malnutrition among vulnerable infants (WFP, 2001).

2.10.4 Nutrition and Health Education (NHEd)

Nutrition and Health Education activity has been generally unsatisfactory in ICDS. Indeed, most of our national health programmes are weak in this regard. The Anganwadi worker is able to do this job only to a limited extent due to her pre-occupation with other activities at the anganwadi centre. Attempts to involve Mukhya Sevikas and to evolve a regular health and nutrition education activity have not really been very successful. ICDS, despite its strong infrastructure of honorary workers, is still functioning as a ‘government scheme’ and has not become a ‘peoples’ programme’. Adequate information dissemination and interaction of officers of the programme with the local community is minimal in ICDS (Tandon, 1993).
In the context of ICDS, NHEd aims at effective communication of certain basic health and nutrition messages with a view to enhance the awareness of infant feeding practices, immunization, utilization of health services, family planning and environmental sanitation. It is a vital service under ICDS and has a potential to bring out a directional change in the attitude and practices in the community, and it is not being implemented effectively. It has not received attention that it deserves (National Conference on Research on ICDS, 1986).

Lai (1993) in his study observed that NHEd was considered to be the weakest part of ICDS. Though Information Education and Communication (IEC) has been expanding, the community participation has not kept pace. ICDS needs to improve technical and IEC training for field workers and should expand initiatives that will increase adolescent girls’ knowledge of health and nutrition before marriage (The World Bank, 1996).

Earlier studies conducted by Aizaz (1987) showed that in an urban ICDS block, use of ORS and management of diarrhoea was influenced by literacy rate, traditional beliefs and taboos prevalent in the society. It was found that the messages given by private practitioners were more effective than the ICDS workers. Another study conducted by the same author said that health and nutrition education was conspicuously absent in most of the centers, and the Anganwadi workers were unaware of the methods to be used to provide this component. Awareness about health and nutrition education was very low among the surveyed households.

A study by Tandon (1989) showed that ICDS achieved better coverage of the target population and led to a significant decline in malnutrition among preschoolers who received nutrition, health care, and education through separate programmes. Another study conducted by Tandon in 1993, showed
that NHEd had a significant impact on the mother-beneficiaries whose knowledge, attitude, and practices regarding infant feeding, deficiency disease, and hygiene and sanitation was better when compared to the mothers who had not received NHEd.

Report of ICDS (1990-91) stressed the fact that successful delivery of NHEd component to a large extent depends upon the attitudes and skills of ICDS functionaries. It was reported that Anganwadi workers rarely conducted NHEd while their attitude and performance was rated, it was at the average level.

Kapil (2002) in his study suggested the modifications to be undertaken in the health and nutrition component of ICDS scheme to improve the program implementation and efficiency.

UNICEF believes that Anganwadi workers lack knowledge on what information to communicate and may not have the necessary skills to provide effective counselling to mothers and care-givers. Some of them were themselves not convinced that breastfeeding alone for the first six months was crucial in the development of a well-nourished child (Rajalakshmi, 2006).

2.10.5 REFERRAL SERVICES

This component of the ICDS programme includes health care of children less than six years of age, pregnant, lactating mothers and adolescent girls. Severely malnourished Children (Grade III and IV), pregnant women and nursing mothers during the course of health check up if need be are referred for treatment to nearby government hospitals for specialised intervention. Referral slips are provided in each anganwadi centre. Beneficiaries with referral slips are attended to on priority, and follow up is done by Anganwadi workers (Kumar, 2006).
The number of children and mothers referred over the years have shown a steady rise from 2 lakh in 2000-01 to 6.4 lakh in 2004-05. During the year 2005, 3.3 lakh beneficiaries have been referred (Government of Orissa, 2005).

From the above literature, it is clear that a considerable amount of work has been carried out in the area of assessing nutrition and health status of adolescent girls and service packages to beneficiaries. What appears to be less emphasized in the literature are the education intervention for adolescent girls and also need for strengthening NHED. The present work addresses all these issues to have a birds-eye view of the study with a view to enhance the adolescent girls’ knowledge, attitude and practice, which in turn enhances their health and nutritional status.