INTRODUCTION
Chapter-I

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The term adolescence meaning “to emerge”, or “achieve identity” is a relatively new concept, especially in development thinking. The origins of the term from the Latin word, ‘adolescere’ meaning “to grow, to mature” indicate the defining features of adolescence. However, a universally accepted definition of the concept has not been established.

Adolescents aged between 10-19 years account for more than one-fifth of the world’s population. In India, this age group forms 21.4 per cent of the total population. Characterised by distinct physical and social changes, the separate health, education, economic and employment needs of adolescents cannot be ignored. Adolescents are also entitled to enjoy all basic human rights – economic, social, political and cultural but their inability to exercise these rights places the ones on policy makers and adults to implement separate measures to ensure their rights. Moreover, it is necessary to invest in adolescents as the future leaders and guardians of the nation’s development.

A pre-requisite for policy planning and focus is a comprehensive situational analysis of adolescents. Yet, there is a marked absence of reliable data and information on adolescents. There has been an encouraging trend to reverse this in recent years, with a growing awareness of adolescent needs, particularly in the voluntary sector, and an increase in the number of innovative programmes on adolescents.

Adolescence is one of the most fascinating and complex transitions in the life span. Its breathtaking pace of growth and change is second only to that of infancy. Biological processes drive many aspects of this growth and development, with the
onset of puberty making the passage from childhood to adolescence. Puberty is a transitional period between childhood and adulthood, during which a growth spurt occurs, secondary sexual characteristics appear, fertility is achieved, and profound psychological changes take place. Although the sequence of pubertal changes is relatively predictable, their timing is extremely variable. The normal range of onset is ages 8 to 14 in females and ages 9 to 15 in males, with girls generally experiencing physiological growth characteristic of the onset of puberty two years before boys. Pubertal maturation is controlled largely by complex interactions among the brain, the pituitary gland, and the gonads, which in turn interact with environment (i.e., the social, cultural, and ambient environment). A relatively new area of research related to puberty is that of brain development. Evidence now suggests that brain growth continues into adolescence, including the proliferation of the support cells, which nourish the neurons, and myelination, which permits faster neural processing. These changes in the brain are likely to stimulate cognitive growth and development, including the capacity for abstract reasoning.

**Defining the group ‘adolescents’**

Adolescents as an age group usually tend to be subsumed under the categories of either youth or children. The formulation of definitions clearly demarcating the age and characteristics of adolescents is only a recent phenomenon, and yet to be widely recognized across the world.

The actual interpretation of adolescence as a phase of life remains a social construct that differs between cultures. In India, there is a resistance to the concept of ‘adolescence’, if it is understood, as in the west, as an extended period of education and training for adult roles. The experience of such a phase is limited in the Indian context. This may be explained by factors such as a delay in the onset of puberty (due to poor nutritional status) and prevalence of early marriage (signifying
adulthood). It may further be argued that in India the generation gap cited in the west does not exist. However, with the changing economic and social profile, generation difference in India is becoming increasingly important. The association of adolescence with sexuality is another factor which increases resistance to the concept, particularly in regard to female adolescence (Greene, 1997). However, if adolescence is viewed in terms of shift in "dependency to autonomy, social responses to physical maturity, the management of sexuality, the acquisition of skills and changes in peer groupings" (Greene, 1997), then the notion that adolescence is a social stage that occurs only in developed nations must be discarded.

Adolescents are generally perceived as a homogenous group, yet they can be stratified on the basis of gender, caste, class, geographical location (urban/rural) and religion. Adolescents also include a whole gamut of categories: school and non-school going, drop-outs, sexually exploited children, working adolescents — both paid and unpaid, unmarried adolescents as also married males and females with experience of motherhood and fatherhood.

It may be persistent to ask are there, any common characteristics defining adolescents? The only universal definition of adolescence is to mark it as a period in which a person is no longer a child, and not yet an adult. This is a period of rapid growth and is apparent from the prevalence of new factors — of new capacities, of being faced with new situations, new types of behaviour — which signify opportunities for growth and development, but also risks to health and well-being. The period is characterised by a combination of physical changes (puberty), behaviour changes and shifts in social grouping.

Adolescents are tomorrow’s adults, and 85 per cent of them live in developing countries. They are relatively healthy compared to other lifecycle
groups, and they show roughly similar morbidity and mortality trends in developed and developing countries. As adolescents have a low prevalence of infection compared with under-five children, and of chronic disease compared with ageing people, they have generally been given little health and nutrition attention, except for reproductive health concerns. Traditionally, pre-school-age children and women of reproductive age have been targeted as nutritionally vulnerable groups in developing countries, whereas in industrialized countries, the focus tends to be on nutrition-related chronic diseases of the ageing population. Adolescents are an in-between group, with some nutrition problem commonalities with children, and with adults. However, there may be adolescent-specific priority issues, calling for specific strategies and approaches.

The main focus is developing countries, although this dichotomy of developed versus developing countries is becoming irrelevant with urbanization and globalisation, particularly among adolescents. Those living in cities anywhere tend to have a common liking for fast food, and they increasingly have access to the same commercial outlets world-wide. Obesity among young people is a growing problem in most countries owing to eating patterns and sedentary lifestyles. Teen pregnancy is a problem anywhere. Furthermore, micronutrient intake inadequacies are not only to be found in developing country adolescent girls. Deficiencies or poor diets may be associated with poverty; they may also result from unhealthy eating behaviours, which are observed in well of and not so well-off groups. Broadly, adolescent’s problems are malnutrition, micronutrient deficiencies, and nutrition-related chronic diseases. Wide disparities in the relative magnitude of these problems are likely even within a given region or country, with a direct bearing on priorities.
Focus of the health sector can, and should do for adolescents’ nutrition. Health programmes may as such have a substantive nutritional impact, for instance, control of infections and reproductive health care. However, while nutritional problems are health problems, their prevention and control lies to a large extent outside the health sector. There is widespread recognition of the critical role that economic constraints and food system bottlenecks play in contributing to poor nutritional health, in addition to socio-cultural pressures and lack of education. Nutrition cuts across many sectors, and nutrition action calls for strong inter-sectoral links, particularly among health, education and agriculture.

Adolescence may represent a window of opportunity to prepare nutritionally for a healthy adult life. Some nutritional problems originating earlier in life can potentially be corrected, in addition to addressing current ones. It may also be a time period to shape and consolidate healthy eating and lifestyle behaviours, thereby preventing or postponing the onset of nutrition-related chronic diseases in adulthood. Although adolescents, younger siblings, families, and other community members may be reached.

Prominent nutrition issues in adolescence

Adolescence is a period of intense physiological, psychological and social change. The transition from childhood to adulthood may extend over variable periods of time, depending upon socio-cultural and economic factors. Even in a given culture, adolescents are not a homogeneous group, with wide variations in development, maturity, and lifestyle. It is interesting, however, that a study conducted in 1996 on 25,000 middle-class high school students aged 15-18 years on five continents found them to be more similar than different in their values and concerns. Boys express more self-confidence, more happiness and well being, and less vulnerability than girls, who tend to be less satisfied with their body, their
personality and their health. A majority of adolescents think that they are in good
health, and they show little concern for protecting their health “capital” for the
future. Nonetheless, caution is needed before generalizing problems and
approaches.

The main nutritional problems of adolescents are micronutrient deficiencies,
iron deficiency anaemia in particular, and depending on the context, under nutrition
or obesity and co-morbidity. Like in any other age group, poor nutrition is usually
the result of dietary inadequacies, often combined with unhealthy lifestyles or
infections, which further compromise nutritional status. Dietary inadequacies are
likely more of a threat among adolescents because of erratic eating patterns and
specific psycho-social factors underlying these, combined with the particularly high
nutritional requirements for rapid growth. However, there is a dearth of data on
adolescents’ nutrition in developing countries, other than the eleven studies of the
International Centre for Research on Women (ICRW) in the 1990s. Adolescent
pregnancy is a well-documented nutritional risk factor, in addition to potential
health and socio-economic consequences.

Iron deficiency (anaemia) and other micronutrient deficiencies

Anaemia is generally recognised as the greatest nutritional problem among
adolescents, and diet is likely a major factor. The overall prevalence was of the
order of 27 per cent and prevalence was higher in boys. In the ICRW studies, rates
ranged from 16 per cent (Ecuador) to 55 per cent in India. A higher prevalence in
boys was only observed in one study. The physiological significance of anaemia in
adolescent boys is not fully understood, but it is only transient and subsides as
growth slows down. Iron deficiency as a result of chronic urinary and
gastrointestinal blood loss, and intravascular hemolysis, is associated with strenuous
exercise and endurance events in athletes. It is not known whether very heavy
physical work could have similar effects and therefore contribute to iron deficiency anaemia in adolescent boys (and girls). What is quite well established is that iron deficiency affects physical work capacity, in men and in women, although studies have not specifically focused on adolescents. Even mild anaemia may also interfere with leisure physical activity. Iron deficiency was also shown to be associated with impaired cognitive processes in adolescents as suggested by improved performance following supplementation in South-east Asia. Similarly, anaemia was independently associated with lower school achievement in adolescent girls.

Iron deficiency associated with poor intakes, or secondary to infections, is likely the major cause of anaemia among adolescents, but other factors may be involved and need to be better documented, including multiple micronutrient deficiencies involving folate and vitamin A. Vitamin A deficiency may be implicated in this heavy menstrual blood loss observed in 12 per cent of nulliparous under the age of 20. Vitamin A and iron deficiency are indeed interrelated. In Bangladesh school adolescents, it was found that low serum retinol was associated with low hemoglobin (Hb) and poor iron status. Controlled studies on the range of blood loss in malnourished adolescents are still awaited. In addition to well established obstetric risks, anaemia in pregnancy may be associated with a higher risk of hypertension and heart disease in the offspring.

Vitamin A deficiency is not only a problem in young children. It has been reported in pregnant women, and it is associated with excess maternal mortality. Sub-clinical vitamin A deficiency may also be widespread among adolescents.

Where iodine deficiency is endemic, women are most affected, but it seems that the whole community suffers. In a study in India, 9-15 year-old school boys from severely deficient villages showed not only neural impairment, but also a lack
of motivation to learn owing to limited socio-psychological stimulation in an environment, compared to matched groups from only mildly deficient sites.

Calcium requirements are greater during adolescence, since it is the period of peak bone mass increase, up to 37 per cent may be accumulated during the growth spurt of adolescence. There is some evidence of continuing bone acquisition after the adolescent growth spurt, and calcium intake could make a difference, at least in Caucasians. Bone demineralization in lactating adolescents has been ascribed to calcium deficiency, as it was reversed with increased calcium intake. Consumption of dairy products was reported to be associated with higher bone mass and density in Caucasian adolescent girls. High postmenopausal bone loss has also been associated with low calcium intake in earlier years, and milk conferred some protection, according to a retrospective study in American women. However, many factors other than diet determine bone status and osteoporosis, including body mass and physical activity level. Furthermore, calcium nutriture in developing countries and in population groups other than Caucasians is still poorly understood and this should be a priority area for research. Although osteoporosis was considered as a relatively unimportant problem in developing countries.

Malnutrition and stunting, and assessment issues

Stunting is commonly observed among adolescents in populations with a high rate of malnutrition; it was highly prevalent in 9 of the 11 ICRW studies, ranging from 27 per cent to 65 per cent. Chronic under nutrition that results in stunting is responsible at adolescence for delayed growth and maturation, magnified obstetric risk, and reduced work capacity. In 9 of the 11 ICRW studies, stunting was highly prevalent in adolescent boys and girls, ranging from 32 per cent in India to 65 per cent in the Philippines. In contrast, the rate of low body mass index (BMI) indicative of current under nutrition was relatively low, and exceeded 20 per cent in
only 3 sites. Delayed growth and maturation as a result of chronic malnutrition in children allows for some spontaneous catch-up growth in adolescence, since the growing period is thereby extended. However, this catch-up is not complete, particularly for those remaining in the same (adverse) environment. Furthermore, nutritional improvement may increase the velocity of adolescence growth spurt, but at the same time, accelerate maturation and as a result reduce the period of fast growth, with little change in the final achieved height. Potential benefits of gaining a few centimeters more in adolescence, if at all feasible, are reduced obstetric risk in girls and improved physical work capacity, as suggested by observations in Guatemalan adolescent boys. However, certain direct negative effects of chronic malnutrition may not be reversed, notably altered cognitive development. Furthermore, nutritional improvement through food supplementation may bring about some catch-up growth, but it may also increase the risk of obesity, as seen in adolescents who have an accelerated maturation, land as suggested by the observed association of overweight with. At growth spurt of adolescence, it is further reported that children who were growth retarded at birth tended to gain more weight than those with normal birth weight. Wasting, based on low body mass index (BMI) is not widespread among adolescents, according to available data. However, the situation may be very different in emergency settings. Particularly when the crisis situation extends over long periods of time, adolescents may be seriously affected by malnutrition and yet, have little access to supplementary or therapeutic feeding programmes.

There is at this time no truly appropriate anthropometric reference data set available at the international level to assess nutritional status of adolescents, whether under nutrition or obesity is the prevailing concern. Anthropometric assessment is more complex in adolescence that in childhood because of changes in
body composition, and of the variable timing of the growth spurt. Height and BMI cut-off points based on reference percentiles from USA adolescents’ data collected in the NHANES II survey in 1976-80 has been suggested by WHO for comparison purposes until more appropriate reference data become available. These values and cut-offs may not be appropriate for individual assessment of adolescents’ under nutrition irrespective of ethnicity, for wide variations of leg length are observed and make a difference. The overweight cut-off points may not either apply without confirmatory evidence of excess fat to all populations, in particular those with a high rate of stunting, although stunting may itself increase susceptibility to obesity. Furthermore, anthropometric data have to be age-adjusted for maturity status in adolescents. Practical indicators are age at menarche in girls, and of adult voice in boys. BMI for age was validated against other measures of body fat in adolescents, for instance in Italy, but this need to be done in different adolescent populations. Another limitation is that in adolescents in particular, levels of morbidity and mortality risk associated with various degrees of “overweight” and “obesity” based on BMI are unknown.

**Nutrition and health**

Nutrition is usually taken as another significant indicator of the health and overall status of adolescents. Adequate nutrition is particularly critical for adolescents as it is a primary determinant of the spurt of growth that characterises adolescence. Poor nutrition is often cited as the major reason for the delay in the onset of puberty in Indian adolescents. Also, gender discrimination in India is mentioned as one of the main causes of female under nutrition.

A measure of nutritional or health status is the average intake of energy and protein and also iron against the recommended dietary allowance (RDA). The protein intake of all groups is adequate but the age groups below 15 years fall short
in energy intake. Average intake of iron is deficient in almost all age groups. It is plausible that the short falls create more vulnerabilities among adolescent girls due to greater demands for better nutrition (for example in relation to early pregnancies, a high vulnerability of adolescent mothers to anaemia) and other reproductive health problems.

Low socio-economic status compounds the problem of undernutrition, with consequent effects on height and weight. In addition, undernutrition reduces the reproductive, physical, and mental capacities of girls and continues to result in low birth weights and foetal loss. If India wishes to achieve the goals of "Health for All" and "Adequate Nutrition for All", it must attend to the problem of undernutrition among adolescent girls.

Adolescents' eating patterns and lifestyles

Eating patterns are frequently erratic in adolescents, and this may be a common factor of nutritional risk irrespective of the area. When there are not major economic or food security constraints, food choices are primarily determined by psycho-social factors. Personal preferences take precedence over eating habits learned at home as adolescents progressively take control of what they eat, where and how. The following features are quite typical of adolescents, and have a bearing on diets; search for identity; struggle for independence and acceptance; concern about appearance; vulnerability to commercial and peer pressure; and limited concern for health. Girls may be more exposed than boys to inadequate intakes because of dieting, lower energy intake, social discrimination, and pregnancy. Some dietary patterns appear quite common among adolescents, at least in industrialized countries, and to mention a few; snacking, usually on energy-dense foods; meal skipping, particularly breakfast, or irregular meals; wide use of fast food, even in Europe; low consumption of fruits and vegetables, and of dairy products in some
instance; faulty dieting practices in girls; and unconventional dietary practices. Even in developing countries, particularly in cities, some of these patterns are also likely common among adolescents, but very little information is available. In Nepal, a study among school children revealed that fast food (ready to eat snacks, chips...) were preferred by more than two-thirds, and that advertising influenced preferences in 80 per cent of them. Adolescents may be seen as ‘early adopters’ of new products or ideas, if we consider the overwhelming influence that the media have upon them. All this makes adolescents an ideal target for nutrition education.

In many industrialized countries, eating disturbances and disorders have become a leading chronic illness among adolescent girls. Anorexia and bulimia are only the extreme of a broad spectrum of disordered eating, which also includes frequent dieting; partial syndromes. However, eating disorders are still rate in societies where obesity is not widespread or stigmatized by society. The problem is not described in developing countries, but in USA, it is increasingly observed at a younger age, in males, in not so affluent groups, and in non-Caucasians. Many theories have been proposed to explain the relationship between body image disturbances and eating disorders, but the socio-cultural factor is the theory which is best supported by available data. As part of nutrition promotion and obesity prevention, it is therefore important to develop a positive body image and self-esteem among adolescents.

It is interesting to note that healthy eating and other healthy behaviours are oftentimes strongly related, and that conversely drinking, smoking, lack of physical activity, overeating, and poor dietary choices tend to cluster. In high income societies, it is observed that physical activity tends to fall during adolescence, and girls are less active than boys. Self-efficiency, social support, and enjoyment have been found to be important determinants of leisure time physical activity. In
contrast, in poorer societies of developing countries, adolescent boys and girls may be expected to engage in heavy physical work many hours in day. This impinges on energy requirements and likely also on weight status. Poor access to food as a result of poverty may further exacerbate the gap between food energy requirements and intake of adolescents, as suggested by the frequency of reported household food insecurity in the ICRW studies among adolescents, notably 86 per cent of households. However, no gender difference in dietary adequacy was observed overall in the ICRW studies in adolescents. Thus, livelihoods may impose high physical work and energy demands among adolescents of poorer societies, while sedentary lifestyles are increasingly observed with urbanization in others. In one case, household food security needs to be improved for adolescents to have more adequate diets, and in the other case, a higher level of physical energy expenditure is required, in combination with healthier eating.

**Diet/Nutrition/Exercise**

Eating a healthy, balanced diet is very important during puberty. Food choices always vary to include all five basic food groups, particularly those rich in calcium (milk, yogurt and cheese) and iron (meat, beans and eggs). One of the results of puberty in girls is weight gain and a naturally higher percentage of body fat. There are three basic body types. Endomorphs are rounder with more curve and body fat, ectomorphs are slimmer with fewer curves and more angles, and mesomorphs are muscular with wider shoulders and slimmer hips. Some are heavier, some are bonier, but no matter an adolescent is, as long as she keeps herself fit.

The best way to keep the body in top shape is to exercise. Regular exercise is also important to strengthen heart, lungs and bones. One can choose to participate in team sports or exercise with friends or exercise on own. Dieting is usually unhealthy. It is not accidental that girls gain more body fat as they hit puberty: girls must have a certain amount of body fat in order to menstruate. Repeated dieting and over-exercising can lead
to serious health problem ever anorexia or bulimia. Following a common sense, balanced diet is the only way to be healthy. High-fat junk food and desserts may be avoided. Try to drink eight glasses of water a day and exercise at least three times a week is required at this stage.

(A) PHYSICAL CHANGES DURING ADOLESCENCE

(i) Breast development

The first physical sign of puberty in girls is usually a firm, tender lump under the center of the areolae of one or both breasts, occurring on average at about 10 years of age. This is referred to as thelarche. By the widely used Tanner staging of puberty, this is stage 2 of breast development (stage 1 is a flat, prepubertal breast). Within 6-12 months, the swelling has clearly begun in both sides, softened, and can be felt and seen extending beyond the edges of the areolae. This is stage 3 of breast development. By another 12 months (stage 4), the breasts are approaching mature size and shape, with areolae and papillae forming a secondary mound. In most young women, this mound disappears into the contour of the mature breast (stage 5), although there is so much variation in sizes and shapes of adult breasts that distinguishing advanced stages is of little clinical value.

(ii) Pubic hair in girls

Pubic hair is often the second unequivocal change of puberty. It is referred to as pubarche and the pubic hairs are usually visible first along the labia. The first few hairs are described as Tanner stage 2. Stage 3 is usually reached within another 6-12 months, when the hairs are too numerous to count and appear on the pubic mound as well. By stage 4, the pubic hairs densely fill the “pubic triangle” Stage 5 refers to spread of pubic hair to the thighs and sometimes as abdominal hair upward towards the navel. In about 15 per cent of girls, the earliest pubic hair appears before breast development begins.
(iii) **Vagina, uterus, ovaries**

The mucosal surface of the vagina also changes in response to increasing levels of estrogen, becoming thicker and a duller pink in color (in contrast to the brighter red of the prepubertal vaginal mucosa). Whitish secretions (physiologic leukorrhea) are a normal effect of estrogen as well. In the next 2 years following thelarche, the uterus and ovaries increase in size. The ovaries usually contain small cysts visible by ultrasound.

(iv) **Menstruation and fertility**

The first menstrual bleeding is referred to as menarche. The average age of menarche girls is about 12.7 years, usually about 2 years after thelarche. Menses (menstrual periods) are not always regular and monthly in the first 2 years after menarche. (Ovulation is necessary for fertility, and may or may not accompany the earliest menses. By 2 years after menarche, most girls are ovulating at least several times a year. Over 90 per cent of girls who experience menarche before age 13 years are experiencing very regular, predictable menses accompanied by ovulation within 2 years, and a higher proportion of those with later menarche may not establish regular ovulation for 4 years or more. However, initiation of ovulation after menarche is not inevitable, and a high proportion of girls with continued irregularity several years from menarche will continue to have prolonged irregularity and anovulation, and are at higher risk for reduced fertility. The word nobility has been proposed academically to designate achievement of fertility.

(v) **Pelvic shape, fat distribution, and body composition**

During this period, also in response to rising levels of estrogen, the lower half of the pelvis widens (providing a larger birth canal). Fat tissue increases to a greater percentage of the body composition than in males, especially in the typical
female distribution of breasts, hips, buttocks, thighs, upper arms, and pubis. This produces the typical female body shape.

(vi) Body odour, skin changes and acne

Rising levels of androgens can change the fatty acid composition of perspiration, resulting in a more "adult" body odour. This often precedes thelarche and pubarche by 1 or more years. Another androgen effect is increased secretion of oil (sebum) from the skin. This change increased the susceptibility to acne, a characteristic affliction of puberty.

(B) PSYCHOLOGICAL CHANGES DURING ADOLESCENT

The period of gestation of women is apparently the same all over and the new-born child is also in every way comparable. It begins to suckle as soon as it is given the breast, generally shows excellent nutrition, and has from the beginning a good voice. In 6 to 8 months the first teeth appear, during the 7th or 8th month the child begins to sit up; at 1 year it stands alone, and soon after begins to walk; at the age of about 18 months it commences to talk, and when 4 years of age it has a good command of language. During its first year the child spends as much time in sleeping and after the first year is very playful. Up to the 7th year incontinence of urine is quite frequent, apparently without pathological cause, but this disappears spontaneously thereafter.

The period of puberty in the adolescents is earlier in the low and hot regions than in those that are elevated or cold. In such very hot regions many of the girls begin to menstruate between the ages of 11 and 13; while among tribes that live at a considerable altitude this function begins usually during the 13th or 14th year, and delays are more numerous, precise data from many localities are as yet lacking. The development of the breast in the girl commences usually at about the 12th year, and
except among individuals there appears to be no great variation among the tribes of
which there is most knowledge. Full development of the breast is seldom attained in
the unmarried young woman before the 18th year.

(i) Personal Hygiene

The onset of puberty makes cleanliness even more important. As experience
puberty, she may begin to sweat more under her arms, on her feet and the palms of
her hands, and in your genital area. It is very important to shower or bath daily. The
oil glands in skin become more active during puberty, especially on shoulders,
neck, face, back and upper chest. This excess oil can clog pores and cause problems
like whiteheads, blackheads and pimples. One can help keep pores form clogging
by washing her face two or three times a day, eating healthy foods, exercising and
getting enough sleep. If one still has severe acne, a doctor can prescribe medicines
to help; severe acne can leave scarring.

(ii) Emotional

An adolescent undergoes not only physical changes, but also emotional
changes. She might find herself more easily upset and alternately anxious for
independence and still needing the close support of her parents. Many teens
experience mood swings and are more emotional. This is natural, one should not try
to control how she feels, but she does need to learn to control her behaviour.
Practice alternatives to yelling and screaming. She has to learn to make her case
rationally and thoughtfully remember that parents and peers are likely to reflect the
way she behave; if she become overwrought and upset, they probably will too.
However, if one is calm and rational, it opens the door for them to be open and
understanding as well.
(iii) Menstruation

Having one’s period, known as menstruation, or “that time of the month” or whatever it is called, is a natural process. But it can be frightening if one is not ready for it. First the ovaries will release an ovum/egg cell about as big as the period at the end of the month. This release of an egg cell is called ovulation. All human beings begin as the union of a female egg/ovum cell and a male sperm cell. Menstruation follows soon after ovulation. Menstruation usually begins about two years after her breasts begin to develop and soon after one begin to have some hair under her arms and in your pubic area. Although menstruation is a monthly cycle. Many times her period may be irregular for the first couple of years. Most menstruation cycles are 28 days but, again, everyone is different and cycles can range from 22 to 40 days. One can use a calendar to note the day when her periods begin and how long they last. After about a year she would probably begin to notice a pattern periods can last anywhere from three to seven days. Menstruation is made up of a soft lining of blood and tissue that is made every month inside her uterus. This lining is rich in oxygen and nutrients for a fertilized ovum/egg. If a male sperm does not fertilize /or join with an egg, it dissolves, and the lining comes out of the uterus through the vagina to the outside. The blood flow is usually heavier at the beginning and, even though it can seem like more, she usually only menstruates about a half cup of fluid, only two ounces of which is blood. Conversation with mother or another adult about using sanitary protection or pads during the period helps in overcoming the problem. Pads are worn on the inside of underpants and temporary are
inserted in the vagina. Both absorb menstrual fluid and she can choose whichever is the most comfortable for her. Either way is sure to change them often and read the packages and insert carefully. She wants to be sure that she is using them correctly to avoid toxic sock syndrome (T.S.S. is a disease caused by a bacteria and sometimes can occur with using tampons incorrectly). Some girls have cramps during their periods, usually in the lower abdomen. This is caused by the uterus contracting to shed the endometrial (uterus) lining. To relieve cramps, she can exercise, take a warm bath, or use a heating pad. If cramps are severe, one should ask an adult for medication and can consult doctor. Some people believe that one can’t shower or exercise during period but this is not true. She can continue all her normal activities.

Reproductive health

The complexity of the period of adolescence and the accompanying changes in physical and social characteristics is usually emphasized, but it is not very well understood by adolescents or adults. A poor understanding of reproductive health and sexual issues is the main cause for the absence of focus on services, information and research on unique features of adolescent reproductive health (ARH). In recent years, the trends of globalization and liberalization the rapid spread of communication and information technology, and shifting social and more norms may be said to have eroded the traditional bases and defining points for adolescent reproductive and sexual behaviour, leading to a host of changes in reproductive health concern. These require immediate attention and appropriate interventions.

Adolescent pregnancy

It is world-wide problem, with 25 per cent of girls having their first child before the age of 20. Risks are for both mother and child. Young age by itself may
not have much of an independent effect, but those factors that are associated with poor pregnancy outcomes are more often observed in pregnant adolescents, including primiparity, poor nutritional status, low SES. Delayed maturation due to chronic malnutrition further increases the risk of early pregnancy, because biological age lags behind chronological age.

Two years post menarche, nutritional requirements of pregnant adolescents are theoretically similar to adult pregnant women's. However, adolescents may enter pregnancy with poor nutritional status and low nutrient stores. Furthermore, until maternal growth is completed, competition for nutrients between mother and child may have adverse consequences, as suggested by many observations. Improving nutritional status of adolescent pregnant girls who are still growing through food may affect birth weight, as it seems that the extra nutrients are diverted for maternal growth, at the expense of foetal growth. Offspring of adolescent mothers may be at higher nutritional risk because of size and nutrient stores at birth, but also of breastfeeding and child-care practices (and perhaps less than optimal breast-milk production). However, nutritional risk was only increased among children of poor adolescent mothers in the ICRW studies. In the Latin American region, 70 per cent of early pregnancies occur in low income groups, according to PAHO (1997). Small baby girls tend to become small mothers, with higher obstetric risk. Adolescent mothers tend to beget adolescent mothers. Socio-economic consequences of adolescent pregnancy are not to be overlooked. Early pregnancy may have more economic than social drawbacks; it disrupts schooling, and this may be one way whereby it perpetuates poverty. It also tends to be associated with larger family size, and to perpetuate poverty of low income women.

So postponing the first pregnancy (keeping girls in schools is a good way), and improving nutritional status of adolescent girls (school again is a good entry
point) is important. This may contribute to breaking the intergenerational vicious cycle of malnutrition and poverty and chronic disease as well. There is accumulating evidence supporting the hypothesis of early programming of chronic diseases. Intra-uterine growth retardation as a result of foetal malnutrition has been found to be associated with coronary heart disease, hypertension, and metabolic disease in various adult populations. Maternal anaemia was also found to be a risk factor for hypertension. Maternal malnutrition is a primary factor of foetal growth retardation in poorer population groups, and pregnant adolescents are at even higher risk. This provides additional justification for improving nutritional status of girls before (and during) their first pregnancy, in parallel with attempts to delay this first pregnancy.

**Sexuality**

In a nutshell, puberty is body’s way of getting ready to have babies, preparing for the physical part of reproduction. But make no mistake: mentally, socially, financially and emotionally, She is not yet ready to become a parent. There is still a lot of growing up to do before she is completely ready.

The bottom line about sex is that it is a risky business. No matter what precautions one takes, she can get pregnant. Over one million teens become pregnant each year and this is a tragedy not only for the teens involved, but also for the baby who is born into a less than ideal situation. In addition one third of sexuality active teens contact a new sexually transmitted disease (STD) within six months of having sex for the first time. Some STDs are incurable. Some can affect her ability to have children later when she is ready, some are fatal. Abstinence (choosing not to have sex at all) is always the healthiest choice.
Obesity and other nutrition-related chronic disease

Obesity has become a pandemic, and it is today's principal neglected public health problem. There is still very little data on obesity world-wide, particularly in developing countries. Only patchy data are available on obesity in adolescence, and in the absence of consistent cut-off points and reference values, comparisons are uneasy. While existing information is sufficient to show that obesity is increasing everywhere, and in all age group, obesity should be monitored world-wide. In countries undergoing rapid urbanization and economic growth, nutrition transition is observed, with a rise in obesity and other nutrition-related chronic diseases. In China, for instance, overweight is only emerging, but it is a problem associated with urban living, high income, and adolescence. There are many reports on spreading obesity among young people in the Middle-East, but using different criteria. Changes in the structure of diets and level of physical activity obviously have to be incriminated, even if a genetic predisposition may be present. Furthermore, foetal malnutrition as evidenced by low birth weight may be an additional risk factor for obesity.

Obesity at adolescence is an issue because it tends to persist in adulthood, and the longer its duration, the higher the associated mortality and morbidity. Abdominal obesity in particular (high waist-hip ratio) is already associated with adverse blood lipid profiles in adolescents. Obesity imposes a heavy health and social burden, and it is widely recognised that treatment is not only costly, but remarkably ineffective. Prevention is now crucial, and adolescents should be a priority target, even in developing countries, particularly in urban settings because of conducive eating patterns and lifestyles. An additional reason is that obesity programmes appear more successful in adolescents than adults
Factors responsible for affecting puberty in adolescent girls

According to tradition, changes in personality are due to physical changes. At puberty, for example, there is the change from a children to an adult body. Because this physical changes is regarded as an improvement, the traditional belief maintains that there will be an improvement in personality also. By contrast, the physical changes occurring at the time of the climacteric and with advancing age are regarded as forms of deterioration. The personality changes that are believed to accompany these physical changes are assumed to be changes for the worse.

When these traditional beliefs are accepted, parents and other adults who are responsible for the training of children believe that changes for the better will automatically occur as children grow older. Children who are selfish, or aggressive, or shy, for example, will it is assumed, outgrow these undesirable traits at puberty. Consequently, they do little or nothing to change these traits which are proving to be stumbling block to social adjustments.

It is now recognised that changes in personality do not occur spontaneously. Instead, they are the result of advancing maturity, experience, pressure form the social and cultural environment, and factors within the individual, such as emotional pressures or identification with another person. If the desire for social acceptance is strong enough, the child will try to replace undesirable traits with those that are more likely to lead to social approval and acceptance. This is done by learning not by maturation.

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.
Keeping in view the above facts, the present study has therefore, been designed to investigate the effect of nutrition intake on sexuality of adolescent girls with the following specific 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.

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