

Chapter – 3

Adolescence changes: Physical, Emotional, Social and Cognitive

Adolescence is generally considered to begin with onset of puberty, the process that leads to sexual maturity, or fertility or ability to reproduce. The term “Puberty” which is applied to period of physical changes for reproductive capability of boys as well as girls, derived from the Latin word, *Pubertas* meaning age of manhood. Puberty refers to first phase of adolescence during which reproduction apparatus matures. Adolescence starts from the age of about 11 or 12 years to late teens or early twenties. It goes through the interrelated development changes along with physical changes. Their emotions go up and down. The new social relationship builds up. The self-identity is searched. Adolescence is the social construction (Papalia, 2004). The physical, cognitive, social and emotional changes, which take place during adolescence age, are briefly described here.

3.1 Physical changes

Glandular or Hormonal changes are responsible for physiological changes. The increase output of *gonadotropic* hormones of the anterior pituitary gland located near brain, governs and control the hormone balance in the body. It stimulates the sex glands for increased production of sex hormone - sperms in males and ova in females. The sex hormones testosterone in male and estrogen in females in combination of other hormones stimulate the growth of bone and muscle. Growth spurt during puberty is strikingly visible as height and weight increase to noticeable level within short time span. But even for perfectly normal child

the increase varies widely with respect to intensity, duration and more importantly the age of onset from one child to another.

The popular belief prevails that girls attain their adolescent height and weight two years earlier than boys. The proportions of body organs undergo change. The baby face of childhood, slowly disappears and forehead, mouth, lips become fuller. Almost every part of the body undergoes some changes during adolescence. All the reproductive organs increase in size. Girls have thicker fatty tissue than boys at all ages, but the prepubescent spurt in boys is followed by a sharp drop in fat widths during and after adolescence, while fat width in girls continue to increase in size during the prepubescent years (Madaras, 1989).

3.1.1 Bone development

Bone skeleton change in proportion and shape. Bone-width difference is minimal during childhood between boys and girls, but the growth rate is greater in the male during adolescence. The childhood compositions of bones have relatively more cartilage and fibrous tissues, and less mineral water than is found in later adolescence. But, as the bones increase in size, the cartilage begins to calcify, making the bones harder, denser and more brittle. The ossification process speeds up at puberty and during late teenage it completes. The final shape of the vertebral body is formed by the ring apophysis, which fuses to the rest of the body at adolescence (amershamhealth.com)

3.1.2 Menarche in girls

The most important point is widespread variation in the age of menarche among normal girls, which result into unnecessary concern among adolescent girls. The awareness helps among adolescent girls and their parents, that variations on menarche age is normal and do not affect at all in the future physical growth or sexual development and functions. Endomorphic physiques, more rounded, found in early maturing girls, while ectomorphic physiques, more slender, found in late maturing girls. Menarche in girls reaches at around 12 years of age. But it can reach as early as 9 years and as late as 16 years also (Madaras, 1989). It is now assumed that age of menarche has reduced due to environmental factors. Further research with large sample may help to substantiate the trend. The menarche starts earlier in hot climatic region and starts late in cold climate. This belief again needs a substantive data research (Mussen, 1969) 'Menarche' is the major milestone of puberty, in the growth and development of a girl. Studies have shown that Indian girls attain menarche at above 12.5 years of age. Girls should be informed about the process of menstruation period to this age. Otherwise, she may be frightened at the onset of menstruation and many find it difficult to adjust with changes. In many cases their mother prior to menstruation do not adequately prepare girls. (Thomas et al., 2003)

Menstruation, as a symbol of sexual maturity and future role as wife and mother, should be a favorable experience to adolescent girl. Shame, embarrassment, upset, dirty, danger and proud feelings identified with menstruation. Menstruation is not a "curse" or being unwell' or 'dirty', but negative attitudes of others affect the reaction of adolescent girls. It is also a part of physical discomfort and painful symptoms in initial periods. The irregularity of

menstruation in the beginning also causes worry. The bleeding also is a loss of blood and a reason to get upset. It is also a frustration that a girl cannot control menstruation. Menstruation brings more responsibility on girls for personal hygiene. Discussion on menstruation still remains a taboo and put more regulations on girls' mobility.

3.1.3 Breast development in girls

The first external sign of reproductive changes in girls is the appearance of the breast bud. The dark area around nipple, which is called areola, increases in diameter as well as growth of breast tissue underneath take place, which forms a small mound on the chest. During next three years breast will slowly develop fully in stages. The projection of papilla (nipple) and more fatty tissue growth beneath take place. The areola, the circle of different darker colored skin around the nipple; increases in size at this time. (healthsystem.virginia.edu). The breast bud develops a year or two before the time of menarche, the first menstruation in the puberty life of girl. It develops at different age in different girls.

3.1.4 Nocturnal emission in boys

Puberty onset in boys is different and not so visible and regular as menarche in girls. Boys' pubic hair growth is remarkable between 13 to 14 years of age. Precise information is lacking in the case of boys. The increase in size of penis and testes take place during puberty. The production of sperm and ejaculation, as nocturnal emission is the sign of complete fertility in boys (Berk, 2003).

Nocturnal emission or wet dream surprise and worry the pubescent boys. The ejaculation of seminal fluid during sleep occurs in a year or two after onset of puberty in boys. These emissions are accompanied by erotic dreams and sexual fantasies. Nocturnal dreams of orgasms in girls are far less frequent and tend to reach peak until after adolescence. Many boys in their early and middle years of adolescence do not gain proper instruction from their peers or parents. They experience unnecessary fear and guilt.

A boy's first ejaculation is a remarkable experience in his puberty. It can be as startling as the first period for a girl and has the same biological significance, reproductively speaking, yet we tend to discuss it less. "Wet Dream" is the term used to describe ejaculation of semen that occurs during sleep. This release of semen is involuntary. All the boys may not have this experience; those who do may find it embarrassing. The important thing to remember is that it is normal. Men produce sperm cells constantly and this is one way the body releases stored semen. (Bennett & Rowe 2004)

3.1.5 Body image

Possession of desirable physique is associated with sexual attractiveness and peer group acceptance. The fear of social rejection and feelings of sexual inadequacy prevail on the mind of most adolescents. Individual assessment of self-image with respect to social environmental and cultural trends is continuously processed in the mind. The boy may be concerned with his height, the chest and shoulders, the muscular development and the facial and bodily hair. The girls are concerned with the height, breast and buttocks and facial features. The adolescents equate the ability to form friendship and hitherto sexual relationship with physique and appearance known as body image. Furthermore adolescents compare themselves

with ideal in their peer group, and are not satisfied with self body image. They desire a change in their physique. A late maturing boy who has no facial hair and linear physique is likely to feel inferior to his peers. He may avoid participation in events and friendship with girls. It appears that the boys who matures late are anxious about their deviant status, and this anxiety leads to a maladaptive behaviors designed to gain attention and recognition from others as well as affect his personality development. Early and late maturing boys and girls also appear to differ in their interest post menarche girls were more interested in social activities with the boys, in personal adornment display of person and in day dreaming.

3.1.6 Sexuality in human being

Among the number of distinctive features established during puberty, which set the human species apart from nearly all other animal, is the sexuality and reproductive behaviour. Almost all other animals mate for the sole purpose of producing young. Most of these animals confine mating to a brief breeding seasons and other may only be sexually receptive for one or two days in a year. Hence in these animals, sexual behavior simply does not take place outside these clearly defined period of time. In contrast, human being can mate at any time, the only limiting factor being individual physiological and physical preferences and the operation of social constraints (Geddes, 2002). Sexual capability achieved during puberty to be understood better for health sexual life and marriage.

Human males, like in other animals, may give off “odorous chemical” that attract mates. Frequently exposures to the pheromones of unrelated males may speed-up pubertal development. Adolescents of single parents experience such feelings. Early pubertal

development in girls has been identified as risk factor for sexual promiscuity and teenage pregnancy. Father's early presence and active involvement helps girl's healthy sexual development. Sexual intimacies may take place in casual encounters in a loving heterosexual relationship (Papalia, 2004).

Effects of early or late maturation are most likely to be negative when adolescents are much more or much less developed than their peers, when they do not see the changes as advantageous, and when several stressful events occur at about same time. (Peterson, 1993)

3.2 Emotional changes

Emotional changes during adolescence are observed and result into frequent mood swings. Adolescents move from relationship with family members to relationships with society members outside the family. Understanding and control of emotions is slowly beginning. Many times it result into confused behavior.

3.2.1 Peer relationship

Friendship holds a special position and performs special functions among adolescents. Friendship evolves emotional bonding with honesty. It shares doubts, anxieties, fears and strong resentments. Intimate friendship opens door for mutual trust and love. Adolescents support talents through friendship. Adolescent friendship has flexibility and readiness for change. Adolescents learn to modify behavior, tastes, ideas, and career goals through criticism between friends. Unacceptable adolescents by peer group get emotionally troubled and lack self-confidence, further move away from participation in-group activity.

Parents may have difficulty in understanding and sharing the problems of adolescents, even though they may make an effort to do so. Adolescents-peer relationship becomes more dependent than adolescent-parent relationship. The family relationship is charged with conflicting emotions during adolescence period, striving for independence with reality of financial dependency, hostility mixed with love and conflict over cultural values, customs, fashion and rules. Peer group also reinforces fundamental attitudes, values, beliefs and interests as it is from same socio-cultural background. The conflict between influence of parent and peer increase when parents are not certain on their expectation on behavior of adolescents. Peer bond usually are not as intense as attachment to parents, they are vital for social competence (Harlow, 1969).

3.2.2 Onset of sexual infatuations

Psychological and cultural forces influence sexual behavior of adolescents; sudden increase in sexual drive cannot be denied. The production of androgens in adolescent of both the sexes lead to an increase in sexual drive. Boys have to confront sexual drive, directly and consciously as well as find means of release without guilt or control without inhibitions. Girls' sexual drive is ambiguous. Temporary denied of sexual impulses provide comfortable adaptation and erotic gratification remain secondary. Girls' sex organs are less prominent and less spontaneous. Boys have more incidence of masturbation than adolescent girls. The environment and interactions build or reduce the sexual drives.

During a project, on 'Health awareness and need assessment study of school going adolescents of Vadodara city' by Govt. Medical College, Vadodara, some conflict of perceptions exist about what others think of adolescents. There were lacunae in adolescent's understanding of reproductive system and reproductive health. But most of them expressed a desire to know more about it as a part of school curriculum. Teachers have been candid in their admission of the fact that 'These Topics' are skipped from classroom teaching. Adolescents prefer to talk to their peers for the other problems. This coupled with their difficulty in saying 'no' to the peer-group's calls and peers typically replace the family as the center of a young adolescents social and leisure activities (Project, 2003).

3.2.3 Body image perspective

A sedentary lifestyle that continues during adolescence may result in obesity. Obesity creates lot of emotional stress among adolescents. Regular 30 minutes moderate physical activities have health benefits, if carried out daily. Exercise and physical activities improves strength and endurance. It helps to build bones and muscles, optimize weight and reduce anxiety and stress. Many boys and girls become less active during adolescence compared to their childhood.

Distorted body image, affect the diet of adolescents. Girls are afraid of obesity and even though they are normal, they think otherwise. Perception of one's own appearances play crucial role in body development among adolescents. During Puberty, normal growth of fatty tissues among girls causes anxiety and unhappiness. Tremendous emphases prevail on girl's physical attributes to play culturally suitable role. It leads to obsessive efforts to weight

control through dieting. Media image encourage weight concerns. Parental attitude also have effect on body image of adolescents. Adolescents in nuclear family, who frequently eat alone, are at risk of eating disorders.

3.2.3.1 Anorexia nervosa : an eating disorder

Anorexia nervosa is an eating disorder showing unusual food intake through self-starvation. It is life threatening with irregular or cessation of menstruation and growth of soft, fuzzy body hairs. Anorexics adolescents are on constant diet and think they are too fat. They may withdraw and go into depression. (Martinez et al, 2003). Bulimia Nervosa is eating disorder where huge eating within short time is observed and undo the high caloric intake by self induced vomiting, vigorous exercise, laxative to purge the body. Adolescents with bulimia are obsessed with their weight and shape. They are worried over their eating habits and feel ashamed and depressed. Excessive concern of body image, weight and dieting is early warning sign with adolescents.

3.2.4 Suicidal symptoms

Suicidal adolescents have very low self-esteem. They feel hopeless and have poor control on their impulse. They have low tolerance over frustration and stress. These adolescents are alienated from their parents emotionally and have no other relationship to turn to. The family life disturbed due to economic or social problem of elders. They are abused and neglected. School problem, academic or behavioral are common with, would be suicides (Barosky, 2001). The stress of academic excellence leads many adolescents to suicidal attempts during X and XII standard board examinations. Adolescents start getting depressed due to academic

failures. Their inability to find meaningful vocations and increasing societal pressures compound this trend. This kind of depression leads to aggression, deviancy and anti-social behaviour.

It is during the period of adolescence that potentialities are realised, abilities and skills developed and habits and attitudes formed. In today's fast moving world the psychological concerns of adolescents are accentuated by parental discord, rapidly changing social and cultural values, increasing exposure to global media, different life styles and exposure to different cultures. Understanding of emotional changes by parents can help adolescents as well as in their cognitive development.

3.3 Cognitive changes

Cognitive development induces capacity for abstract thinking around age 11 years and older at the formal operational stage. The adolescent reasons much like scientist, searching for solutions in the laboratory. Concrete things and events are no longer required as objects of thought. Intellectual growth takes place with moral reasoning and arguments with parents, teachers and friends.

3.3.1 Development of moral reasoning

Kohlberg, 1969, suggested three levels and six stages of "Moral Reasoning" which changes as the development takes place to become mature adult being. (Kohlberg, 1981).

Level – I : Pre-conventional Maturity (age 4 to 10 years) :

Stage 1 : Orientation towards punishment and obedience “ What will happen to me “

Stage 2 : Instrumental purpose and exchange “You scratch my back, I will scratch yours)

Level-II : Conventional Morality (age 10 to 13 beyond)

Stage 1 : Maintaining mutual relations, approval of others, the golden rule “ Am I a good boy or girl ? “

Stage 2 : Social concerns and conscience “What if everybody did it? “

Level III : Post-conventional (Early adolescence, or not until young adulthood, or never):

Stage 1: Morality of contract, of individual rights, and of democratically accepted law.

People think in rational terms, valuing the will of majority and welfare of society.

Stage 2: Morality of universal ethical principles. People do what they, as individuals think is right, regardless of legal restrictions and opinions of others.

Adolescents critical and abstract thinking plays on their relationship and emotions. They search for their identity in the society. Their thought process have specific characteristics.

3.3.2 Characteristics of thought process in adolescence

Elkind, 1998, described six characteristics of thoughts of the adolescents as under.

1. Idealism and criticalness
2. Argumentativeness
3. Indecisiveness
4. Apparent hypocrisy
5. Self consciousness
6. Specialness and Invulnerability

A special form of egocentrism underlies much risky and self-destructive behaviour. Elkind used the term “Personal Fable” denote the belief by adolescents that they are special and that

their experience is unique and that they are not subject to the rules that govern the rest of world. Adolescents assume “Imaginary Audience” that think about the same thing they are thinking about (Elkind, 1998). All the above thinking and behavior build their value system. The acceptable social norms and activities go into character grooming.

3.3.3 Moral values and reality

Adolescents would acknowledge that cheating is not good in principle, but the conviction is not held strongly for different reasons at different time. The current system of education with large classes, impersonality and marks scoring of standardized examinations, is not adequate to truly measure the individual’s knowledge or ability. The environment impressions and practical situations sometimes dilute the moral values. Parents, teachers and other role models behavior and value system also confuse the adolescents.

3.3.4 Effect of sleep on development.

Adolescents who have irregular sleep timings may not get 9 hours sleep at night and result in to laziness during the day. Sleep deprived adolescents tend to show symptoms of depression and affect their study and cognitive development. (Wolfson et al, 1998). Adolescents want to complete their homework or surf the Internet or talk to friends over phone before going for night sleep. Adolescents undergo shift in natural sleep schedule. After puberty, secretion of melatonin, a hormone is a gauge of when the brain is ready for sleep. The secretion takes place later at night in adolescents compare to child. School schedules and biologically changes get upset with early morning schools (Carskondon et al, 1997).

3.4 Social changes

The adolescents gradually adjust to sexual maturation, establish workable peer relationship, and decide for purposeful vocation and some independence from family. Adolescents search for their identity outside the family. Our society does not permit complete independence from family. Formal professional education takes long time and so adolescents are forced to remain financially dependent on parents in India. Parents provide food and shelter to adolescents. Dependence creates anxiety and conflict with adolescents. Independent behavior and decision-making give feeling of adult status to adolescents. Height, weight and few skills do not satisfy adolescents, they seek independence and autonomy. They want to decide on their classes, on eatables, on sleep, on movie etc. The adolescents experience inconsistencies with respect to independence. Either or both parents may have mixed expectation over adolescent's growing independence. Parent-child relationship is put to test as parent-adolescent relationship. Love- hate and trust-mistrust exists simultaneously. The severity of conflicts over independence and dependence can be resolved by better understanding of each other. It will revolve around parent's authority and control vis a vis freedom and autonomy.

3.4.1 Heterosexual friendship and relationship

The heterosexual friendship and relationship directly faced by every adolescents. It progress from antagonism to a positive interest in opposite sex will depend on early parent-child relationship. Attitude developed during childhood will prevail. The experience of gender bias may handicap the adolescent in heterosexual relationship. Resentment towards opposite sex is probably more prevalent among girls than boys, as boys seem to have a preferred status in our society.

Dating providing development of social and interpersonal skills with opposite gender. Dating provides an opportunity to meet opposite gender and explore mutual compatibility within a social framework that allows for terminating unwanted relationship and building new ones with minimum emotional loss. Adolescents seek more meaningful relationship with peers than superficial aspects of dating.

The peer group 'crowd' activities are based on mutual interest, likes and social ideas. The earlier relationship is centered among unisex groups. They meet for activities and not due to personal attraction. Soon they may have heterosexual members. Crowd meeting are arranged ones, while clique is continuously on all weekdays. Adolescents involve in complex relationship with numbers of overlapping peer groups that vary in size, degree of personal intimacy among members and functions. There is a transition from unisexual adolescents to unisexual cliques in early adolescence group to heterosexual cliques of older adolescence. Unisex peer group continue even up to adult life as career, business or community and social group. Socio-economic status prevails over other features in clique formation. It serves common interest, hobbies, residential proximity, same school environment, degree of social and personal maturity and degree of heterosexual interest.

Some adolescents experience a sense of alienation that comes with adolescence of childish ties to ones parents and ones childhood itself. Alienation may involve deep despair, apathy or defeat and result in to withdrawal from society. In Erickson's terms, the truly culturally alienated young man is suffering from "identity" diffusion. Sports can be used as means for socializing and developing friendship, relationship, teamwork and leadership.

3.4.2 Sex and sexuality in social relationship

Time and again, while attempting to articulate feelings of confusion, guilt, shame and fear in relation to sexual abuse, girls inevitably run into the need to address their sexuality during puberty. How can one talk about sexual abuse without also talking about what is sexual? Most of us have grown up with very hazy notion about sex and sexuality. Even though nobody tells us anything about our sexual nature. Adolescents receive lot of messages during puberty, which form their ideas about what sex. (Sakshi, 2003).

The culture prohibits sexual activity throughout childhood, adolescence and adulthood till marriage. Culture's attitude towards sex can be a source of pleasure also, or reserved only for reproduction. Sexual behavior is appropriate only between marriage partners in our society and so it is refused to adolescents. Adolescents are taught to inhibit sexual responses in order to prepare them for marriage. For years adolescents respond to sex with anxiety. Child marriage act restrained to marry if "child" means a person who, if a male, has not completed twenty-one years of age, and if a female, has not completed eighteen years of age (Appendix-3.4.2)

Even otherwise adolescence is a period of sexual maturation, and experimentation is not uncommon. However knowledge of sexuality, menstruation and reproduction is limited and often distorted. A disturbing factor is the lack of use of contraception and knowledge of sexually transmitted diseases, including HIV/AIDS. The education system does not adequately meet the needs of sex education. There is a vast unmet need for adolescent counseling, information and health services. Sex education to adolescents determines the

interest and views as a pleasant and needful affair, or as sinful and problematic or extremely exciting or as aggressive authority; or rape. Premarital sexual relationship is not approved by society.

3.4.3 Independence from parents

Parents, who encourage autonomy as well as retain interest and responsibilities, are likely to strike a balance. The two extremes put adolescents at risk. Autocratic or authoritarian parent tends to stifle the independence responses, while indifferent or total permissive parent fails to encourage responsibility. Dependent behavior of girls and boys as adolescents are looked at differently by society. Girl's dependent behavior is accepted norms and continues even after marriage, while society encourages adolescent boys to become independent.

3.4.4 Selection of vocation under social pressure

The selecting of vocational or professional course becomes critical with adolescent boys and girls. In our society, husband remains the prime-earning members in the family, while wife earning remain secondary. The social class status is linked with husband's occupation. Adolescent boy prime concern is future financial security and the status. Boy makes meaningful commitment to vocation he strives for. Choice of vocation and participation in efforts to achieve it sets the reciprocal feedback system to crystallize and reinforce the adolescents' self-concept.

Parents influence the decision at large in our society for selection of vocation for adolescents. Peer pressure and influence of school environment is secondary. Socio-economic factors also

influence to select the vocation. Gender based vocation also earmarked through social norms. The specific occupation of father also has significant influence on carrier choice of sons to keep continuity of occupation. The numbers of son follow their father's footsteps. Adolescents may not consciously recognize the entire motive that helps in selection of the carrier. Adolescents selecting a carrier consonant with his/her own needs consciously or unconsciously will help; stereotype image of vocation and changing job market influence the choice of adolescents.

3.5. An overview

Relatively small group are activist and participate in political issues, other majority of adolescents stay with mainstream. Adolescents pace of hectic modern life. They are leaning to live with uncertainty and ambiguity in many fields, but still they have neither activist nor dropouts. Adolescent strive for their independent identity in the society. The physical changes to make the human body capable of reproduction are the major ones affecting adolescence. The awareness on the physical development may help in their emotional and social behavior. The cumulative effect will be on their cognitive development result into career and personality development. The books on reproductive health are listed at (Appendix-3.5)

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