

# UNIT I - HUMAN DEVELOPMENT AND FAMILY STUDIES

## DEVELOPMENT IN ADOLESCENCE I :

### PHYSICAL, MOTOR AND SEXUAL DEVELOPMENT

#### Introduction :

The word 'adolescent' is derived from the Latin word 'adolescere' meaning 'to grow' or 'to go to maturity'. In other words, the child as a whole undergoes a complex series of changes in the growth and development, namely physical, social, emotional, psychological and moral. Adolescence is usually associated with the teenage years, but its physical, psychological or cultural expressions may begin earlier and end later. Many psychologists use the term synonymously with "pubescence" or "reproductive maturation". Some of them define it as the transitional period of life during which the child experiences a number of changes - physiological, emotional and intellectual. This period runs between childhood and adulthood, sometimes-called "the period of storm and stress". Piaget has defined adolescence from a psychological viewpoint. According to him "psychologically, Adolescence is the age when the individual becomes integrated into the society of adults, the age when the child no longer feels that he is below the level of his elders but equal, at least in rights". Some psychologists consider it as a period between 13 to 18 years, whereas according to others it lasts upto 24 years.

According to L.Carmichael (1968) "Adolescence is a period of life when immature person's physical and mental development reaches to its peak. Adolescence can be defined biologically, as the physical transition marked with the onset of puberty and the termination of physical growth; behaviour changes occur when the individual becomes sexually mature and is capable of producing offsprings.

Major pubertal and biological changes include changes to the sex organs, height, weight, and muscle mass, as well as major changes in brain structure and organization.

According to A.T. Jersild, "Adolescence is a span of years during which boys and girls move from childhood to adulthood mentally, emotionally, socially and physically".

Adolescent period is divided into 2 stages :

(i) Early adolescent (ii) Late adolescent

It is customary to regard adolescence as the beginning when children become sexually mature and ending when they reach the age of legal maturity. However, studies regarding changes in the behaviour, attitudes and values throughout adolescence have revealed that these changes are more rapid in the early than in the later part of adolescence. Besides the behaviour attitudes and values in the early part of the period have marked difference from those in the later part. As a result, it has been widely accepted to divide adolescence into two subdivisions, early and late adolescence.

- (1) **Early adolescence :** This is the period from 13-14 years to 16 or 17 years. In girls, this period is from age 13 to 16 years and starts after one year in boys.
- (2) **Late adolescence :** This stage in girls is from 16 or 17 years to 20-21 years and in boys between 18-21 years. Transition period between early and late adolescence is the 17th year. Normally girls and boys of this age study in 11th or 12th standard. Parents acknowledge

them as adults and they are ready to enter in work area of adults, college or vocational training.

### **Characteristics of adolescence :**

- 1. Adolescence is an important period :** It is important for both psychological and physical effects because of its immediate effects on attitude and behavior. Along with the rapid physical development, adolescents undergo rapid mental development as well. These give rise to the need for mental adjustments and necessity for establishing new attitudes, values and interests.
- 2. Adolescence is a transitional period :** The individual's status is vague during transitional period and there is confusion about the roles that the individual is expected to play. The adolescent, at this time, is neither a child nor an adult. If they behave like children, they are told to "act their age". If they try to act like adults, they are often accused of being "too big for their age".
- 3. Adolescence is a period of change :** When physical changes are rapid during early adolescence, changes in attitude and behavior are also rapid. They have feelings of instability due to sexual maturity which is often intensified by the ambiguous treatment they receive from parents and teachers. The changes in their bodies, interests, social group expectations give birth to new problems. Their values change as interest and behaviour pattern change. They try to act independently.
- 4. Adolescence is a problem age :** Their problem and needs are taken care of by parents and teachers throughout childhood. Suddenly, adolescent starts feeling that they are independent and try to do everything on their own and end up in frustration.
- 5. Adolescence is a time to search for identity:** Adolescents want to look like as their gang-mates in dress, speech and behavior as possible. They use status symbols in the form of clothes, vehicles and other observable material possessions.

**6. Adolescence is a time of unrealism :** They have a lot of unrealistic aspirations, desires and goals not only for themselves but also for their families and friends. They get angry and disappointed when they feel that others have let them down or that they have not lived up to their set goals.

**7. Adolescence is a threshold of adulthood :** They want to create an impression that they are close to adults which they show in their dressing and behaviour, associated with the adult status like smoking, drinking, using drugs, engaging in sex etc.

### **I Physical development :**

"A healthy mind resides in a healthy body." Physical development is considered to be the most important development in the entire process of development. Other developments tend to be good when physical development is good. This rate of growth and development varies in different stages of life. The rate of growth and development is fastest in adolescence after pregnancy and infancy. It is also called the growth spurt; the growth spurt typically lasts about two years; soon after it ends, the young person reaches sexual maturity. Since girl's growth spurt usually occurs earlier than that of boys, girls between ages 11 and 13 are taller, heavier and stronger than the boys of same age. Muscular growth peaks at age 12.5 for girls and 14.5 for boys. After their growth spurt, boys are again larger than girls, as before. Both boys and girls reach virtually their full height by the age of 18. The physical changes of adolescence are as follows:

- 1. Height :** The height of boys and girls remains same between the age of nine to ten years. After that, rapid growth is found between 10-14 years and steady at 16-18 years. . The fastest growth rate of boys is between 12th and 15th year on an average, which slows down in the 16th year and stop between the age 20-22 years. Thus, girls reach their maturity in the 18th year and boys between 20-22 years. The early mature teenager's height increases after the maturity.
- 2. Weight :** The increase in weight in adolescence is not only with the increase of fat but also by the

growth of bone and muscle tissue during puberty. Bones not only increase in size but also change in shape, ratio and internal structure. The bones of the girls mature in terms of size and development by the age of seventeen. The development of bones in boys is completed almost two years later. The increase in weight among girls occurs just before and immediately after the first menstrual cycle. This time interval is 11-15 years. Similarly, maximum weight gain among boys is seen between 13th to 16th year. For this reason, girls have more weight between 10-15 years than boys of their own age, but there is reversal pattern after fifteen.

**3. Changes in body proportions :** The body grows when the puberty begins, however all the organs of the body do not grow at the same pace. Consequently remains the childish status of childhood. This is especially visible in the nose, legs and hands. After sexual maturity, only five percent growth in the periphery of the parts remain. Due to proportional growth of the face, the forehead starts to be high and chaotic and the nose elongate and broad, but gradually. The face of the boy becomes slightly high and sharp and the girl's face becomes round like egg when the maturation occurs. The legs are much longer than the torso just before the puberty and remains the same until 15 years of age. The sequence of arms growth is very much the same. The length of the arms increases before growth of the torso which makes them look very long. The long and thin upper body of the older teenager starts to crack on the hips and shoulders and the waistline becomes clear. Thus, boys' shoulders proportionately become broader than hips and hips of girls become broader than shoulders. The proportion of the body is similar to the youth by the second half of adolescence.

**4. Other physical changes :** The growth started during the puberty and in early adolescence, observed decreasing rate and stops gradually in late adolescence. Therefore, any increase in weight during adolescence usually happens due

to the increase of fat in those parts which did not have the first fat or had less fat. Consequently, the late adolescent body looks like full rather than the leanness of early adolescent. The growth of the skeleton stops at an average age of 18 years. Even after attaining the mature size of bone, other types of tissues continue to grow. For example the eruption of the teeth of the wisdom starts after twenty years. Extra activation of oil-producing glands during puberty increases excess lubrication of the skin's, causing the problem of acne. This problem is normal in adolescence.

**5. Development of internal organs :** There is proportional growth and development of the internal organs of adolescents, which occurs in early teens. The stomach develops in the digestive tract of the child increases its capacitance. Intestinal length and thickness increases. The muscles of the nerves become powerful and thick. The weight of the liver increases. The size and thickness of heart and blood veins increases in the circulatory system. Along with the increase in the width of the chest, there is an increase in the weight and volume of the lungs, but this increase is more among the girls than the boys. There is a temporary imbalance in the whole endocrine system due to increase in the activity of gonadal glands. The glands which were predominant in childhood, is now reduced and the primacy of the other glands (adrenal gland, thyroid gland, gonad gland etc) increases, which also increases the rate of minimum metabolism.

## **II Motor development :**

Muscle growth is also at a rapid pace along with physical development in adolescence. The maximum increase in the strength of boy's muscles starts at the age of 14 and it lasts upto 20-21 years. However, this growth reaches its peak for girls up to the age of 14 and slows down till 17 years of age. Muscle strength in boys at any stage is more than girls. This is because of the soft muscles of the girls. The muscle strength is not attained with the increase in the size of the muscles. A person should be trained to learn the skills

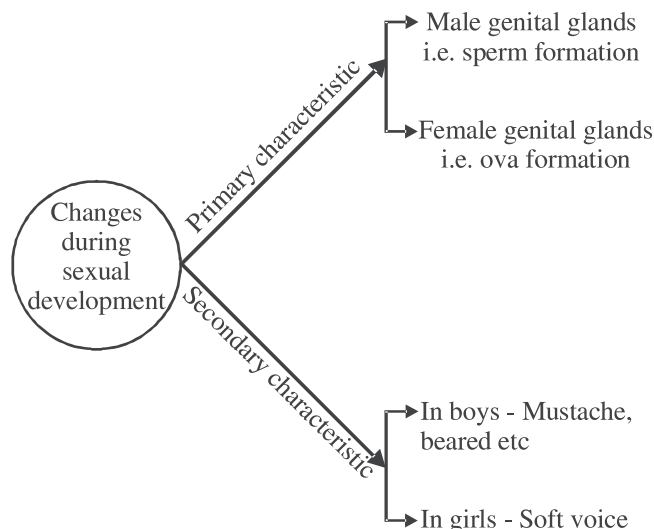
and opportunities be provided for the practice. Least of environmental constraints and strong motivation are needed for learning skills. Motivation to practice various skills in adolescence and to practice as long as they do not become trained is very strong. Apart from this, the adolescent also has the convenience that he/she always has one to teach skills, whether it be a teacher, a parent, or other teenager who has attained proficiency in those skills, whom he/she wants to learn. In this way, they get the path and the strong motivation of learning. Teenager by this way not only learns the skills but learns so well that they become expert of youth skills.

Increase in the ability to perform motion activities increase in girls at the age of 14 and in boys at the age of 17. The tests that are performed for measuring the ability, control strength and static equilibrium show the highest increase in the ability of the boys in the age of thirty. Upgradation takes place among girls up to the age of 14 years, and after that there is lack of ability/capacity due to change of interest. Most teenagers are extremely interested in active participation in sports, competitions and exercise skills, while others are interested in watching others participation in these skills. Adolescent girls dance in an complicated way, dive and enjoy in other sports, in which muscle coordination is more important. If they have to take part in sports competitions, then they compete with other girls because they are equal to the qualifications of other girls than boys.

### III Sexual development :

Sexual development in childhood begins with physical development as well. Changes in sexual organs begin in puberty stage and are completed during adolescence. Changes in adolescence can be divided into two parts :

1. **Primary sex characteristics :** The genitals are small and immature in childhood in terms of work, so they do not have the ability to reproduce. The genitals grow larger in size during adolescence and mature in terms of work.



**Fig. 1.1 : Changes during sexual development**

Male genitalia that reside inside the scrotum, achieves only 10 percent of its maturity at the age of fourteen, gets mature size in 20-21 years. These glands produce sperm, as well as produce hormones which control the physical and mental adjustments require for child reproduction. The intensity of the penis increases shortly after the rapid growth of testes. Penis grows in length first and then in thickness. On an average it often starts nocturnal emissions, at the age of 14-15 years when the genitalia matures for its action. This is the natural way to extract extra amount of semen. Nocturnal emissions often occur when dreams of sexual arousal occur, bladder is full, due to convulsion in the intestines, tightness of pajamas or tilting is quite common. It is normal upto 4 times in a week. Many boys have no idea until they see spots on beds or pajamas.

Female genitalia mostly reside in the body, so their growth is not known by anything other than the growth of the abdomen. At the age of 12, the weight of the ovary is 40 percent of mature weight which gets mature size and weight between 20 to 21 years, although they mature for their work around the mid of the puberty period. The main function of the ovary is to produce ovum, for childbirth. Apart from this, it also produces regulatory hormone-progesterone, estrogen hormone, corpus luteum etc. The composition and function of female genital organs develops due to female hormones, menstrual cycle starts and the secondary sex characteristics develop. The first true



indicator of maturing of female genitalia is the first menstrual cycle. In this, there is a fixed amount of blood, mucus and broken-cellular tissues discharges from the uterus in every 28-30 days with regularity till menopause. Menopause can occur between 45 and 55 years at any time. On the start of the menstrual cycle from the first 6 months to 1 year, the discharge is rare and sometimes in excessive amounts on an estimated period. In this condition, ovum growth (i.e., the maturation of the ovum) and ovary follicles do not lead to the release of ovum; in fact the girl cannot be pregnant and is called sterile. In the early menstrual, stage, girls often have headache, back pain, convulsions and abdominal pain accompanied by dizziness, nausea, dermatitis and even leg and ankle inflammation. These symptoms gradually decrease.

**2. Secondary sex characteristics :** In addition to progressing the early stage of adolescence, boys and girls become uneven in shape due to the development of the primary sex characteristics along with the secondary sex characteristics. The gradual development of secondary sexual symptoms in boys and girls are as follows :

#### **In boys :**

1. The hair grows over the genitals about 1 year after the increase in the size of the testicular glands and penis.
2. Beard and mustache on the side and face.
3. Hair growth on arms, legs, shoulders and chest.
4. All types of hair are light in color and slightly soft in the beginning and then become dense, stiff, dark and curved.

5. Skin becomes rigid, thick and yellowish rough.
6. Excessive acne from activation of oil glands.
7. Activation of armpit sweat glands causes sweating in the vicinity and a special odour emerges.
8. First tone of sound is soft then become heavy.
9. Cyst around the milk glands develop during the age of 12-14 years and automatically disappears after few weeks. Similarly, milk glands increase for a short period of time and then flatten like childhood.

#### **In girls :**

1. Increase in the width of the buttocks due to the growth of pelvic bone and the development of adrenal glands.
2. Enlargement of breast and chest along with the deposition of fat, due to which the breast lifts from the thoracic surface to cone shape.
3. The breasts are big and round due to the growth of the milk glands.
4. Growth of black and thick hair on the genitals after the development of hip and breasts.
5. Hair growth and swelling of sweat glands of armpit.
6. Growth of the upper lip, cheeks, face edges and the lower edge of the chin.
7. Activation of skin oil glands causes face acne.
8. Voice becomes soft and harmonious.

Thus, with the completion of the development of primary and secondary sex characteristics, a teenager becomes a young man or woman.

Girls		Boys	
Characteristics	Age	Characteristics	Age
Breast development	8-13 years	Egg and Testicles	10-13 years
Hair growth on genitals	8-14 years	Hair growth on genitals	10-15 years
Physical growth	9.5-14.5 years	Physical growth	10.5-16 years
Menarche	10-16 years	Genital growth	11-14 years
Hair growth in under arms	Within 2 years of genital hairs	Voice change	Same at the time of genital growth
Oil (Sweat glands)	Almost at the time of hair of under arms	Hairs on face and under arms	2 years after the growth of genital hairs
		Sweat glands	Almost at the time of underarms hair.

### Important points :

1. Adolescence derived from the Latin word generally means “to grow”.
2. Adolescent period is generally divided into two sub stages-early adolescent period and late adolescent period.
3. Adolescence is a period of stress and strain.
4. The fastest rate of growth and development in adolescence after pregnancy and infancy.
5. The time of growth spurt varies in girls and boys. The fluctuation increase in the girls starts around 11.5 years and reaches their peak in 12.5 years, while in the boys starts from 10.5 to 14.5 years and reaches the peak in 15.5 years.
6. The height of boys and girls is almost equal during the nine to ten years of age. Thereafter, there is a rapid rise in the height of girls between 10-14 years, whereas the boys’ average growth rate ranges from 12 to 15 year on average.
7. Weight increase in adolescence is not only with the increase of fat, but also by the growth of bones and muscular tissues.
8. The bone is mature in terms of size and development at the age of 17 years and the development of the ossicles in boys is completed after about two years.
9. The body grows when the puberty starts, but all the organ of the body does not grow at the same speed. As a result, childish attributes of childhood remains same.
10. The growth spurt that started at the time of puberty starts to decrease in the early adolescence and gradually stops in late adolescence.
11. There is proportional increase and growth of the internal organs of adolescents, which occurs in early teens.
12. Motivation to practice various skills in adolescence and to practice till it is not learned is very strong.
13. Older teenagers are highly interested in same lane, active participation in physiological sports, participate in exercise and more skills, whereas

early teenagers are involved in dizzying, gossiping and enjoying other sports that are far more powerful than others. Importance is of muscular coordination.

14. Sexual development as well as physical development begins in adolescence. The genitals mature in size and in terms of work during adolescence.
15. Gonadriens mature for their work around the middle of the puberty in both boys and girls, but get mature size until 20-21 years.

### Questions :

1. Choose the right answer to the following questions :
  - (i) Rate of Growth and development is fastest in adolescence known as :
    - (a) Rapid increase
    - (b) Increase flutter
    - (c) High growth
    - (d) None of the above
  - (ii) Shoulders are broad from the hips :
    - (a) In the child
    - (b) In the teens
    - (c) In the teenager
    - (d) In the girls
  - (iii) Thyroid is :
    - (a) Part of the skin
    - (b) Part of the digestive tract
    - (c) Part of circulatory system
    - (d) Gland
  - (iv) Male gonads receive mature size in :
    - (a) 10-12 years
    - (b) 14-15 years
    - (c) 20-21 year
    - (d) 30-31 years
  - (v) The first true indicator of maturing of female genitalia occurs in girls :
    - (a) Growth of hair in the genitals
    - (b) Oil glands are highly active
    - (c) First discharge of blood
    - (d) Hard and thick skin
2. Fill in the blanks:
  - (i) Development of the ability of motional work develops in girls and boys at the age of ..... and ..... respectively.

- (ii) When the genitals mature for their actions on average, at 14-15 years of age, they often begin to be .....
  - (iii) Female genitals are mostly in the body, so their growth does not recognized from anything except the growth of .....
  - (iv) Period of menarche is ..... with regularity till menopause.
  - (v) The breasts lift from the thorax and become cone shaped due to the deposition of .....
  - (vi) The main function of the ovary is to produce ..... which is necessary for childbirth.
3. “The physical development of the child is the basis of his personality.” Explain.
4. Comment on the following physical development in adolescents -  
(A) Length (B) Weight (C) Physical Ratio
5. “Adolescence is a period of Stress and Strom.” Explain.
6. What is the contribution of a teacher and parents in the successful motor development of adolescents ? Explain.
7. Write in detail about the changes that take place during sexual development in adolescents.
- Answer :**
1. (i) b (ii) b (iii) d (iv) c (v) c
  2. (i) 14, 17 (ii) nocturnal emission  
(iii) abdomen (iv) 28-30  
(v) fat (vi) ovum