

SBG STUDY

5

Children and Sports

Chapter at a Glance

- 1.1 Motor Development in Children & Factors affecting it
- 5.2 Exercise Guidelines at different stages of Growth & Development
- 5.3 Advantages and Disadvantages of Weight Training
- 5.4 Concept & Advantages of Correct Posture
- 5.5 Causes of Bad Posture
- 5.6 Common Postural Deformities – Knock Knee; Flat Foot; Round Shoulders; Bow Legs; Kyphosis; Lordosis and Scoliosis
- 5.6 Corrective measures for Postural Deformities

INTRODUCTION

New parents are eager to see their children move through typical stages of development. This includes lifting their heads, rolling over, sitting, crawling, walking, and grasping or manipulating objects. These are all activities that lead to walking, independent play, and self-care. These movement patterns are called motor skills.

Motor development is physical, emotional and mental skills the child obtains through many different stages of childhood. Motor development is the step to step ability of an infant to carry out various human skills. The skills include movement control, flexibility, exploration and understanding motor skills.

Development of these goal-oriented motor skills requires the complex interactions of the skeletal muscles, joints, and nervous system.



5.1 MOTOR DEVELOPMENT IN CHILDREN AND FACTORS AFFECTING IT

Motor development refers to the development of a child's bone, muscles and ability to move around and manipulate his/her environment. In simple words, motor development means the development of movement and various motor abilities from birth till death. In other words, motor development is the progressive change in movement throughout the lifecycle. It can be divided into two types:

1. **Gross Motor Development:** It involves the development of large muscles in the child's body such as sitting, walking, running, climbing etc.
2. **Fine Motor Development:** It involves the small muscles of the body especially in the small movement of the fingers and hands. For example, holding the javelin, discus, pole, catching a cricket ball, smashing volleyball and gymnastic exercises with or without apparatus, etc.

Motor Development in Children

Motor development in children can be studied effectively under the following three stages of childhood:

1. **Early Childhood (2 to 6 years):** The period of early childhood starts from 2nd year and continues till the 6th year. During this period, motor development takes place rapidly. It is also known as the pre-school years. In this period a child becomes perfect in various fundamental movements such as running, jumping, throwing and acquires the ability to unite or combine these movements. In this period children's stride length increases and they develop a more mature running pattern. They can hop and gallop skilfully. They can unite these movements efficiently under changing and difficult conditions. They become efficient in various combinations of movements such as running and jumping, catching and throwing or running and throwing, etc. They become efficient in such movements but it is advised that competitions should be avoided at this stage.
2. **Middle Childhood (7 to 10 years):** The period of middle childhood starts from 7th year and continues up to the 10th year. In this period children become active and agile. They have strong desire to engage in various physical activities. Children during this period have desire to compete with children of their own age. They also have an urge to improve upon their previous performance. During this period, most of the children achieve mature patterns of fundamental motor skills. Their posture and balance become better. They try to become efficient in the variation of movements which they had already learnt. The speed ability develops at a faster rate. coordinative abilities also show a higher level of development in this age group, whereas flexibility develops at very slow rate. During this period, rules should be flexible, instruction time should be short and there should be minimum competitions. Stress should be given on movement correction.
3. **Late Childhood (11 and 12 years):** The period of late childhood starts from 11th year and continues up to the 12th year or till the beginning of sexual maturation process. During this period, girls are temporarily taller and heavier than boys because of the earlier onset of puberty. Strength begins to differ but the differences are small. Boys and girls are able to compete evenly. Most of the children are master to most intricate or complex motor skills. They are ready to learn strategies and more complex play combinations. Running and jumping movements, qualitatively as well as quantitatively, develop at a faster rate than in the middle childhood period.

Factors Affecting Motor Development

The development and quality of a child's motor skills are influenced by many factors. These factors can be classified as follows:

1. **Tone:** It refers to the ongoing contraction and state of the muscle at rest. Tone can be normal, **hypotonic** or **hypertonic**. When tone is low or high, the child may have trouble moving her arms or legs because of stiffness or trouble staying balanced because of floppy muscles. These are challenges for children such as those diagnosed with **cerebral palsy**.
2. **Strength:** It refers to the force of a muscle contraction purposefully exerted against resistance to carry out an activity. For example, a child with weak leg muscles might have trouble standing or stepping up or down stairs.
3. **Endurance:** It is the ability to maintain the exertion required for an activity. A child with poor endurance might be able to step up a stair, but not climb a flight of stairs. Endurance involves many factors such as muscle tone and strength, heart and lung function, and motivation.
4. **Balance:** It is the delicate interaction of equilibrium (or vestibular) centers in the brain with sensory input. Sensory input includes vision, body-position awareness, and muscle strength and tone. These factors all work together to allow your child to maintain an upright posture and to move between positions needed for activities such as sitting, crawling, walking, and reaching.
5. **Motor planning:** It is the complex, and often intuitive, ability to know how to carry out the steps needed to complete a physical activity. Motor planning requires the coordination of the systems that regulate perception, sequencing, speed, and intensity of movements.

6. **Sensory integration:** It is the ability to accurately interpret sensory input from the environment and to produce an appropriate motor response. Some children may have a different threshold for responding to sensory input. They may exhibit a reduced (under stimulation) or heightened (over stimulation) response to sensory information.
7. **Genetics:** Children get 'genes' for their physical development from their parents. It has been observed motor development of a child follows the same pattern as of his parents.
8. **Nutrition:** Nutritious food promotes good motor development. Sensory motor development is dependent upon nutrition that the child gets to a great extent. Children get stronger and development is good if they get nutritious food.
9. **Immunisation:** If mother and child both are immunised at a proper time it leads to good sensory motor development.
10. **Environment:** Encouragement, love and security help the child to take risk to explore fearlessly and to know more about environment which leads to a better sensory development.
11. **Opportunities:** Children who get more opportunities to do more activities, motor development is better in them. Opportunities to play to gain knowledge give a better chance of developing sensory motor activities.

5.2 EXERCISE GUIDELINES AT DIFFERENT STAGES OF GROWTH AND DEVELOPMENT

"If exercise were a pill, it would be one of the most cost-effective drugs ever invented."

People who do regular activity have a lower risk of many chronic diseases, such as heart disease, type 2 diabetes, stroke, and some cancers. Research shows that physical activity can also boost self-esteem, mood, sleep quality and energy, as well as reducing risk of stress, depression, dementia and Alzheimer's disease. It is not limited to any age. It starts with first breath and ends with the last one.

In human beings, the complete life is divided in six levels:

- (i) Infancy (0–2 years)
- (ii) Toddlers (3–6 years)
- (iii) Preschoolers (7–12 years)
- (iv) School aged adolescence (13–19 years)
- (v) Adults (20–50 years)
- (vi) Older adults (above 50)

Exercise Guidelines for Infants, Toddlers and Preschoolers

Infants should be encouraged to be physically active from the beginning of life. That is among the recommendations of the first physical activity guidelines specifically designed to meet the developmental needs of infants, toddlers and preschoolers.

Guidelines for Infants

Part of the infant's day should be spent with a parent who provides systematic opportunities for planned physical activity. These experiences should incorporate a variety of baby games such as peek-a-boo and pat-a-cake and sessions in which the child is held, rocked and carried to new environments.

- (i) Infants should interact with parents in daily physical activities that are dedicated to promoting the exploration of their environment.
- (ii) Infants should be placed in safe settings that facilitate physical activity and do not restrict movement for prolonged periods of time.
- (iii) Infants' physical activity should promote the development of movement skills.



- (iv) Infants should have an environment that meets or exceeds recommended safety standards for performing large muscle activities.
- (v) Individuals responsible for the well-being of infants should be aware of the importance of physical activity and facilitate the child's movement skills.

Guidelines for Toddlers and Preschoolers

For the guidance for toddlers, basic movement skills such as running, jumping, throwing and kicking do not just appear but also clearly influenced by the environment. For instance, a child who does not have access to stairs may be delayed in stair climbing and a child who is discouraged from bouncing and chasing balls may lag in hand-eye coordination.

- (i) Toddlers should accumulate at least 30 minutes daily of structured physical activity; preschoolers at least 60 minutes.
- (ii) Toddlers and preschoolers should engage in at least 60 minutes or several hours per day, unstructured physical activity and should not be sedentary for more than 60 minutes. But sleep soundly and without any disturbance.
- (iii) Toddlers should develop movement skills that are building blocks for more complex movement tasks; preschoolers should develop competence in movement skills that are building blocks for more complex movement tasks.
- (iv) Toddlers and preschoolers should have indoor and outdoor areas that meet or exceed recommended safety standards for performing large muscle activities.
- (v) Individuals who are responsible for the well-being of toddlers and preschoolers should be aware of the importance of physical activity and facilitate the child's movement skills.



During the preschool years, children should be encouraged to practice movement skills in a variety of activities and settings. Instruction and positive reinforcement is critical during this time in order to ensure that children develop most of these skills before entering school.

Exercise Guidelines for School Aged, Adolescent, Adults and Older Adults

Ways to support the recommendations:

- (i) Play the games that incorporate music, imitation and simple directions where children are the leaders.
- (ii) Play games that incorporate strength, coordination and confidence; finding hidden objects, relay races, obstacle courses.
- (iii) Encourage children to adapt or invent their own games.
- (iv) Provide safe objects to throw, kick and catch.
- (v) Provide playground equipment for climbing.
- (vi) Share information about healthy habits with families through conversations, newsletters and events.
- (vii) Encourage children's individual abilities and interests.
- (viii) Provide free space, toys and equipment to encourage children to be physically active.

The above points should be kept in mind for all aged beings. But, the physical activity changes with the growth of human being. This is given below.

Physical Activity for school aged should include:

- (i) Daily planned physical activity that is engaging and involves all children with minimal or no waiting time.
- (ii) Muscle strengthening or resistance activities as part of the 60 or more minutes on at least 3 days of the week.

Activities should be fun and can include:

- (i) Movements that strengthen muscles without weights, for instance using playground structures (e.g. monkey bars, rock climbing walls), as well as movements that strengthen muscles with weights (e.g. working with resistance bands).
- (ii) For strengthening bones of the body, children should be trained in running, rope jumping or skipping and hopscotch, etc.
- (iii) Vigorous physical activity aiming for at least 10 minutes per day (e.g. running, martial arts, active games that involve running and chasing).

Physical Activity for Children

- (i) Play games, sports, transportation, chores, recreation, physical education, or planned exercise. These activities should be carried out in a close care of family, school, and community. In order to improve cardio-respiratory and muscular fitness, bone health, and cardiovascular and metabolic health biomarkers.
- (ii) Amounts of physical activity greater than 60 minutes provide additional health benefits.
- (iii) Most of the daily physical activity should be aerobic.
- (iv) Vigorous-intensity activities should be incorporated, including those that strengthen muscle and bone at least 3 times per week.
- (v) For this age group, bone-loading activities can be performed as part of playing games, running, turning or jumping.



Physical Activity for Adolescents

- (i) As part of their 60 or more minutes of daily physical activity, adolescents should include muscle-strengthening physical activity on at least 3 days of the week.
- (ii) As part of their 60 or more minutes of daily physical activity, adolescents should include bone-strengthening physical activity on at least 3 days of the week.

Physical Activity for Adults

- (i) Physical activity includes leisure time (for example: walking, dancing, gardening, hiking, swimming), transportation (e.g. walking or cycling), occupational (i.e. work), household chores, play, games, sports or planned exercise, in the context of daily, family, and community activities. In order to improve cardio-respiratory and muscular fitness, bone health, reduce the risk of depression.
- (ii) For additional health benefits, adults should increase their moderate-intensity aerobic physical activity to 300 minutes per week, or engage in 150 minutes of vigorous-intensity aerobic physical activity per week, or an equivalent combination of moderate-and-vigorous-intensity activity.
- (iii) Muscle-strengthening activities should be done involving major muscle groups on 2 or more days a week.



Physical Activity for Older Adults

- (i) Physical activity includes leisure time activity (for example: walking, dancing, gardening, hiking, swimming), transportation (e.g. walking or cycling), occupational (if the individual is still engaged in work), household chores, play, games, sports or planned exercise, in the context of daily, family, and community activities. In order to improve cardio-respiratory and muscular fitness, bone and functional health, reduce the risk of depression and cognitive decline.

- (ii) For additional health benefits, older adults should increase their moderate-intensity aerobic physical activity to 300 minutes per week, or engage in 150 minutes of vigorous-intensity aerobic physical activity per week, or an equivalent combination of moderate and vigorous-intensity activity.
- (iii) Older people, with poor mobility, should perform physical activity to enhance or improve their health at least for 3 days a week.
- (iv) Muscle-strengthening activities, involving major muscle groups, should be done on 2 or more days a week.
- (v) When older adults cannot do the recommended amounts of physical activity due to health conditions, they should be as physically active as their abilities and conditions allow.



5.3

ADVANTAGES AND DISADVANTAGES OF WEIGHT TRAINING

Weight Training

Weight training is defined as those exercises that are designed to strengthen specific muscles by causing them to overcome a fixed resistance, usually in the form of bar-bells or dumb-bells. During childhood, kids improve their body awareness, control and balance through active play. As early as age 7 or 8, however, weight training can become a valuable part of an overall fitness plan — as long as the child is mature enough to follow directions and practice proper technique and form. If a child expresses an interest in weight-training, remind him or her that weight training is meant to increase muscle strength and endurance. Bulking up is something else entirely — and most safely done after adolescence. Don't confuse weight-training with weight-lifting, bodybuilding or powerlifting. These activities are largely driven by competition, with participants vying to lift heavier weights or build bigger muscles than those of other athletes.



Advantages / Benefits of Weight Training for Children

If done properly, weight training can have the following advantages:

1. **It helps in Getting Good Shape:** Weight training is an extraordinary training. This is full of magic because it can shape up all people by using appropriate schedules (and sometimes appropriate diet). Fat children can become trim and slim, children can even put on weight if so desired. The weak can become strong and the strong can become stronger. The slower can become speedier and the ponderous can become more dynamic. In fact, weight training helps children in getting the entire body in good shape. It is beneficial not only for upper but lower body also.
2. **Best Means of Providing Fitness:** Weight training has a major advantage over other means of fitness. Optimum gains can be made by spending just one hour three times a week in weight training gymnasium. It enhances all the components of health fitness such as muscular strength, and body composition.
3. **Helpful in Enhancing Child's Athletic Performance:** A perfect weight training programme is helpful in enhancing child's athletic performance. The advantages of strength training to athletic performance are enormous. Weight training is one of the most significant components of conditioning programme for runners, throwers, jumpers and players of football, basketball and other games.

4. **Best Means to Develop Strength:** Today weight training is considered as the best means of securing strength but it requires proper guidance of coaches and expert physical trainers. The weight training exercises have value but have to be done carefully and systematically. In fact, there is no other better means to improve strength, speed and endurance for application to all sports and to all walks of life than by training with weights.
5. **Increase Bone Density:** Weight training helps in increasing bone density. Research studies which have been conducted in this field indicate that the risk of osteoporosis is lower for the individuals who perform weight training exercises at least three times a week.
6. **Reduces Stress and Tension:** Weight training is also advantageous for reducing stress and tension. In fact, it acts like an outlet for stress and tension.
7. **Protection Against the Injury:** Weight training improves physical activity, system of the body and reduces risk of injury.
8. **Promote Health (Blood Pressure and Cholesterol Level):** Physical exercise with the resistance training decreases bad cholesterol level and increases good cholesterol. It also improves blood circulation, which in turn maintains a healthy blood pressure.
9. **Improves Immune System Function:** With the proper digestion, release of enzymes, absorption of nutrients, release of toxic substance and healthy functioning of body organs, the immune system functioning is improved and the body become capable of fighting against diseases and infections.
10. **Improves Psycho-social Well-being:** A child with the well shaped healthy body with more potential to work is better accepted by society. A well-maintained healthy physique makes a child more confident or raise his/her self-esteem.

Disadvantages of Weight Training for Children

Some doctors recommend that children should avoid weight training because the growth plates on their bones might be at risk. Various disadvantages of weight training for children are given below:

1. **Growth Plate Fractures:** Weight training can put too much strain on young muscles, tendons and areas of cartilage that haven't yet turned to bone (growth plates). Growth plates fractures in children who train with weight occur — especially when proper technique is sacrificed in favour of lifting larger amounts of weight. Lack of adequate supervision and improper form can also result in injuries.
2. **Risk of Injury:** Younger children are at greater risk of injury than adults if they drop a weight on themselves or perform an exercise incorrectly; further, they may lack understanding of, or ignore the safety precautions around weight training equipment.
3. **Body Deformity:** Body deformity such as flat foot can occur in children who lift heavy weights.
4. **Less Flexibility:** Weight training reduces the level of flexibility because weight training mostly performs for the development of strength so children flexibility are negligible due to it.
5. **Maturity:** Children should not begin weight training or any other workouts until they are physically and emotionally mature enough to handle it because immaturity of children lead to serious bony injury or deformities in the children.
6. **Growth of Children:** Excessive Weight training may cause negative effects on the normal growth of children.

Extra adult supervision is an important part of youth strength training. Supervision of minors is considered vital to ensuring the safety of any youth engaging in strength training.

Precautions / Principles of Weight Training

One might also check with child's doctor to begin a weight training program, especially if a child has a known or suspected health problem — such as a heart condition, high blood pressure or a seizure disorder.

While doing weight training, keep these general principles in mind:

1. **Seek Instruction:** Start with a coach or personal trainer who has experience with children weight training. The coach or trainer can create a safe, effective weight training program based on child's age, size, skills and sports interests.
2. **Warm Up and Cool Down:** Encourage child to begin each weight training session with five to 10 minutes of light aerobic activity, such as walking, jogging or jumping rope. This warms the muscles and prepares them for more vigorous activity. Gentle stretching after each session is a good idea, too.
3. **Keep it Light:** Kids can safely lift adult-size weights, as long as the weight is light enough. In most cases, one set of 12 to 15 repetitions is all it takes. The resistance doesn't have to come from weights, either. Resistance tubing and body-weight exercises, such as push-ups, are other effective options.
4. **Stress on Proper Technique:** Rather than focusing on the amount of weight child lifts, stress on proper form and technique during each exercise. Child can gradually increase the resistance or number of repetitions as he or she gets older.
5. **Rest Between Workouts:** Make sure child rests at least one full day between exercising each specific muscle group. Two or three weight training sessions a week are plenty.

Results won't come overnight. Eventually, however, child will notice a difference in muscle strength and endurance — which might fuel a fitness habit that lasts a lifetime.

5.4

CONCEPT AND ADVANTAGES OF CORRECT POSTURE

Concept of Correct Posture

Posture means position or pose. It concerns the way an individual carries himself. Correct posture means the balancing of body in an accurate and proper manner while sitting, standing, reading, writing, etc. Good posture makes it possible for the ligaments and muscles to maintain positions of the body movements. The efficiency of body movements depends upon a balance of various forces acting on the body. In a correct posture, the whole body weight falls on both feet without any effort and entire body appears to be in a vertical line. It is very important that every person should check his movements and positions to maintain a good posture. A good posture keeps natural balance during activities.

Definition of Correct Postures

According to Avery, "Good posture is one in which the body is so balanced as to produce least fatigue."

Good posture handles the body easily, gracefully and efficiently under all circumstances, the body should be the key to a correct posture, both static and mechanical.

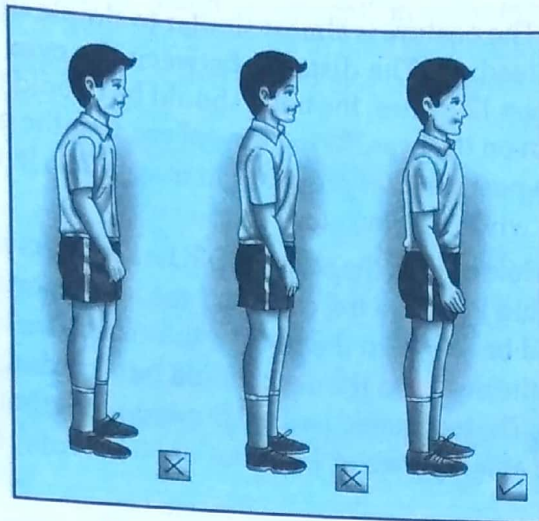
In good posture, body will be at ease involving less effort, weight equally distributed, the curves of the spine are not twisted, abdomen held inside, chest held high in such a way that the shoulders are in erect position.

Types of Good Postures

Postural positions can be broadly classified in two categories:

1. Standing Posture
2. Sitting Posture

1. Standing Posture: Each person adopts his own posture while standing. A 'Neutral posture' is a position, when the joints are not bent and spine is aligned and not twisted. Correct posture leads to self-confidence and strength.

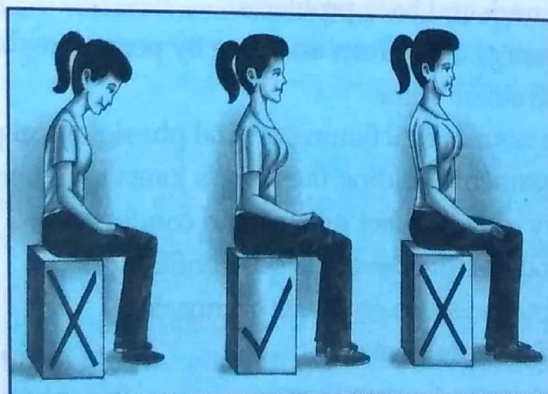


Correct/Incorrect Standing Postures

Some General Rules for Standing:

1. The head should be held straight and not tilted in any direction.
2. Chin should be up and the head centered over the shoulders.
3. Chest should be in forward position.
4. Knees should be straight and not bent in any direction.
5. The body weight should be evenly balanced over both legs and feet.
6. The hip should tuck in and pelvis should not be tilted backward or forward.
7. The stomach should be flat and not bulging out.
8. Body must be well balanced, alert and comfortable.

2. Sitting Posture: We should sit in such a posture that our backbone remains erect. The middle region of the body should be set straight against the seat of the chair, head, shoulders and hips should be in the same straight line. The head should remain straight so that the muscles in front and on the back may get rest. By adopting the correct posture of sitting the various organs of the body get rest and one remains healthy.



Correct/Incorrect Sitting Postures

There are three Main Sitting Postures

1. Simple sitting.
2. Reading while sitting.
3. Writing while sitting.

1. **Simple Sitting:** This position is one in which a person occupies a position where the muscles involved in the process experience minimum stress and strain.
2. **Reading while Sitting:** The posture is almost similar to simple sitting position at the time of reading. The distance between the eyes and the book should be at least 12 inches; the book should be in bold type so that it gives less strain on the eyes. At the time of reading the book should be kept in such a position that proper light may fall on it. One should not read a book while it is too close or too far.
3. **Writing while Sitting:** While writing the body should be kept erect and balanced. The thigh should be set on the chair and the lower portion of the spinal cord should be joined to the back of the chair. The seat should be drawn under the desk and the desk should be according to the height of the students. The feet should be fixed firmly on the ground. The notebook should be at a distance of 12 inches or 30 cm from the eye.

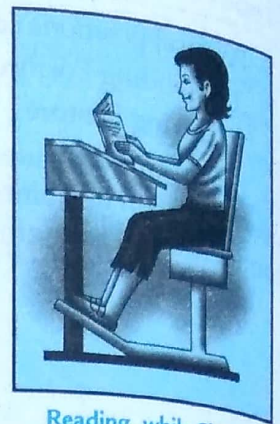
Some General Rules for Sitting

1. The hips should touch the back of the chair. Foot rest may be used for comfort.
 2. The body weight should be distributed equally on both hips.
 3. The feet should be kept flat on the floor, slightly apart and parallel while sitting.
 4. Leg should not be crossed. The knees should bent at right angles.
- The position should be shifted after some time to avoid strain on muscles.

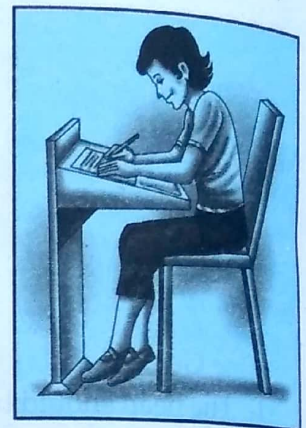
Advantages of Correct Posture

Nobody can deny the significance and importance of good posture in our daily life. It has the following advantages:

1. Provides good impression of his well-being.
2. Develops strength, physical fitness and athletic ability.
3. Minimum risk of many neck and back problems.
4. We have to spend less energy and efforts and time by possessing balanced posture.
5. Good posture reduces strain on spine.
6. Permits and encourages normal functioning of vital physiological processes.
7. Puts less stress on the ligaments holding the spine's joints together.
8. Movements become very easy and feel relaxed and comfortable.
9. A person possessing good posture develops self-confidence.
10. Good posture does not put pressure on bones or muscles.
10. Fewer upper and lower back problems.
11. An individual feels less fatigue due to less stress on muscle and joints.



Reading, while Sitting



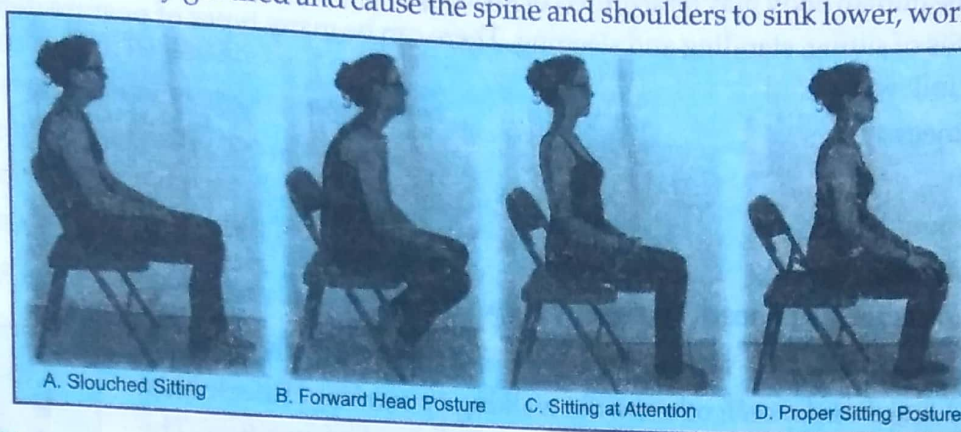
Writing while Sitting

5.5 CAUSES OF BAD POSTURES

Most people do not realise how important good posture is, and hence often neglect how they carry themselves. A person with bad posture is perceived as a person with low self-esteem and low confidence, besides harming overall health in the long-term. The physical harm directly affects back and neck pain, amongst several other ailments.

Some causes of bad posture are given below:

1. **Fatigue:** Most children are told to "stand up straight" in order to have good posture. It is difficult to keep the back straight for long and maintain to hold the position. The muscles that support the back will eventually get tired and cause the spine and shoulders to sink lower, worsening posture.



2. **Foot Placement:** Your feet naturally roll inward, causing your knees to bend and your back to slouch. This is the typical position for bad posture. Keeping your feet in this position will tire out your entire body, which will cause further bad posture.
3. **Age:** Age can weaken muscles, making it harder to maintain a good posture.
4. **Pain or past injuries:** When you experience pain in your back or neck muscles or any other part of the body, you tend to overcome the pain by holding your body in a different position. When this posture is continued for a long time, it can become a daily habit.
5. **Low nutritional state:** Your spine and back need adequate nutrients to grow strong and straight. Low nutrition and lack of vitamins and calcium can affect the bones and muscles by not providing adequate strength and flexibility to hold itself in a correct posture.
6. **Hereditary:** If you have a family history of bent back, then even you might have to deal with it. Sometimes no matter how hard you try to hold your posture in a correct way, the reason can be just genes that are preventing you from improving your posture.
7. **Extra weight:** Carrying extra weight can also be the reason for your poor posture. People with extra weight around their stomach can have a problem with lower back.
8. **Habit:** Sometimes, the way you walk or the way you hold things can be the reason of bad posture. For instance, if you always walk with your head down or slump your shoulders, this can cause poor posture. Sometimes, carrying weight on only one side of the body can contribute to imbalanced or poor posture.
9. **Your job:** People, who have desk jobs, often push their neck and head forward. All these factors contribute to our inability to keep our spines straight and results in poor posture.
10. **Lifestyle and fashion:** Clothing and shoes especially affect posture. Women, who walk on pencil heels, are more prone to cause problems to their posture. Besides high heels shoes, wearing boots, tight fitting clothes, low waist jeans and wide belts can cause bad posture. When you wear something uncomfortable like wide belts or high heeled shoes, this changes your centre of gravity, which ultimately causes your posture to suffer.

5.6

COMMON POSTURAL DEFORMITIES — KNOCK KNEE; FLAT FOOT; ROUND SHOULDERS; BOW LEGS; KYPHOSIS; LORDOSIS AND SCOLIOSIS

The incorrect posture causes many deformities. It is well known that if any organ of the body is placed in one posture over a long time, it acquired the shape accordingly. And the body also assumes the same shape if a person continues to work by bending over or walk by bending his shoulder or walk by leaning his neck forward, his bones develop the same type of bend. The use of high pillow under the head at the time of sleeping upsets the balances of the backbone and creates many deformities. Such deformities of the human body may be acquired or are congenital. The reason may be accident, inadequate diet, wrong habits of sitting, standing and sleeping. There can be many types of posture deformities some of which are as follows:

1. Knock-knees
2. Flat foot
3. Round shoulders
4. Bow legs
5. Spinal curvatures (Kyphosis, Lordosis, Scoliosis)

1. Knock-knee: Knock-knee is a postural deformity in which the legs are bent inward and knees strike each other while walking or running. Knock-knee is a condition where the legs are bowed inwards in the standing position. The bowing usually occurs at or around the knee; the knees join together while there is wide gap between the ankle. The children suffering from knock-knees cannot run easily.

Causes:

- (i) Obesity during childhood.
- (ii) Diseases like rickets and osteomyelitis (a disease of bone).
- (iii) Muscular or ligaments' weakness at early or adolescent age.
- (iv) Fractures and injuries involving the knee joint.
- (v) Lack of balanced diet.
- (vi) Irregular growth of lower leg bones.

Prevention:

- (i) Proper exercise
- (ii) Proper diet.
- (iii) Never force bodies to walk at very early age.

Remedies:

- (i) Use cod-liver oil.
- (ii) Use walking calipers.
- (iii) Horse-riding.
- (iv) Keep a pillow between knees and stand erect for some time.

2. Flat Foot: Flat foot is also called fallen arch. It is a postural deformity in which the inner curve of foot has bulge more than normal. In case of flat foot, there will be complete print of foot on the floor. If



Knock-Knee

one cannot slide his fingers under the arch of an individual's foot while he is standing or if the arch is resting on the supporting surface, the foot is classified as a flat foot.

Causes:

- (i) Weakening and stretching of muscles and ligaments.
- (ii) Hereditary or congenital structural deformity.
- (iii) Increase in body weight.
- (iv) Using improper shoes.
- (v) Carrying heavy weight for a longer period.

Prevention:

- (i) Avoid high heeled shoes.
- (ii) Never walk bare feet for long period.
- (iii) Don't force bodies to walk at early age.
- (iv) Don't carry heavy weight while walking for a long distance.
- (v) Maintain weight of body.

Remedies:

- (i) Walking on sand.
- (ii) Walking on wooden staircase.
- (iii) Walking with weight on heels and toes.
- (iv) Dancing and rope skipping.
- (v) Perform stretching exercises.
- (vi) Wear special shoes or jump on toes.

3. Round Shoulders: Round shoulders is a postural deformity in which the shoulders become round, sometime they seem to bent forward. The head is extended and chin poked forward. Round shoulders are usually the result of slouching. It can strain the muscles between the shoulder blades. This can also result neck and upper back pain.

Causes:

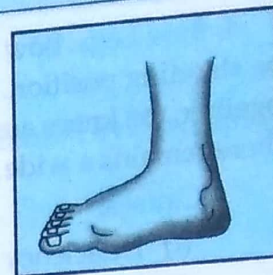
- (i) Tight chest muscles
- (ii) Weak upper back and shoulder muscles
- (iii) Due to heredity
- (iv) Wrong posture
- (v) By walking, sitting in bent position
- (vi) Wearing very tight clothes

Prevention:

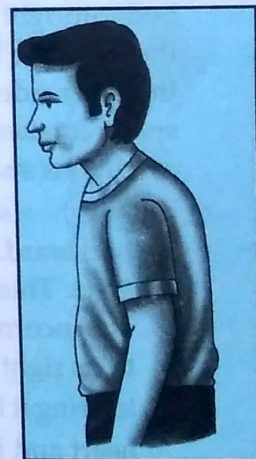
- (i) Never walk, sit or stand in bent position.
- (ii) Wear loose clothes at least shoulders can move clock or anti-clockwise.
- (iii) Keep an eye on posture.

Remedies:

- (i) Keep the tips of fingers on shoulders and encircle elbows in clockwise and anticlockwise dissection for the same number of times.
- (ii) Perform chakrasana and dhanurasana regularly.



Flat Foot



Round Shoulders

4. Bow Legs: Bow legs is a postural deformity. It is a condition where the legs are bowed outwards in the standing position. It occurs during childhood, at or around the knee, so that on standing with the feet together, the knees are apart. Bowing is a condition involving the shin and thigh (tibia and femur) bones. There remains a wide gap between knees when a bow legged person keeps his feet together.

Causes:

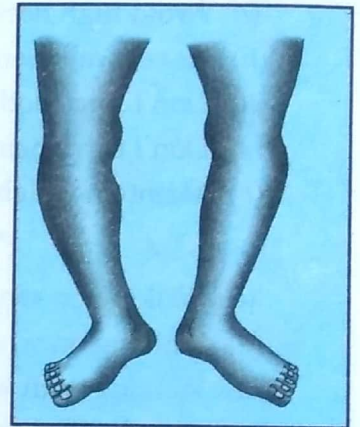
- (i) Deficiency of vitamin D and calcium.
- (ii) Improper way of walking.
- (iii) Obesity in children.
- (iv) Forcing babies to walk at early stage.
- (v) Disease like rickets and an abnormality of the growth plate at the top of the shin bone at the knee.
- (vi) Defaulted footwear.

Prevention:

- (i) Don't carry heavy weights in childhood.
- (ii) Never force bodies to walk at early age.
- (iii) Use proper shoes.
- (iv) Balanced diet.

Remedies:

- (i) Walk on inner edge of feet, by bending the toes inwards.
- (ii) Vitamin-D and calcium should be taken. They can be taken as supplements too.
- (iii) Perform garudasana regularly.



Bow Legs

5. Spinal Curvature: (Kyphosis, Lordosis and Scoliosis): The spine has natural curves that help balance body upright as we sit, stand, walk or otherwise move. The muscles of the vertebral column on the long side become loose and weak by keeping part of the body bent more, and the muscles of the other side become hard, and contract as well. This becomes the cause of the curvature of the spine. It takes the shape of the letter "C" in English alphabet or deformed curves, resulting in conditions such as Kyphosis, Lordosis and Scoliosis.

(i) Kyphosis: In this type of curvature the neck leans forward and the back backward. The spinal cord bends in the shape of a bow. The chest cannot remain erect. This condition in child develops due to continuous sitting for hours in one incorrect posture. If the fault is corrected in due time, the backbone comes to its right position. In case the back gets completely bent, it becomes difficult to bring it back to its right position. This also results in improper functioning of heart and lungs. The muscles of the chest contract and grow longer. The neck protrudes in this condition and head seems to be bent forward. The spine seems to protrude backward through the back and knees.



Kyphosis

Causes:

1. Reading in dim light, while leaning forward.
2. Short eye-sight.
3. Hard of hearing.
4. Use of worthless (improper) furniture for sitting.
5. Wearing tight and shapeless clothes.

6. Weakening of muscles by body.
7. Bending development of the body.
8. Bending downward of the girls in the age group of 14 due to shame caused by developing of their breast.
9. Sickness or accident.
10. Habit of working by landing unnecessary downward.

Preventions:

- (i) Good posture.
- (ii) Loose clothes.
- (iii) Suitable furniture.
- (iv) Maintain proper distance between eye and the work you perform.

Remedies:

- (i) Swimming.
- (ii) Perform Chakrasanas and Dharurasana regularly.
- (iii) Hanging with wall bell.
- (iv) Always keep pillow under your back while sleeping.
- (v) Bend your head backward in standing position.

(ii) **Lordosis:** In this type of curvature the spine leans forward from the stomach. Owing to its leaning forward, the person feels difficult to sit, stand or walk. The muscles get weak. Deformity of lordosis should be checked at early stage; it is not possible to rectify it at a later stage. The person suffering from this deformity feels ashamed of himself on seeing his deformed body. In case of lordosis the waist protruding forward, the muscles of hip's contract, the lower band in the spinal cord protrudes outward, resulting in the protruding of belly as well.

Causes:

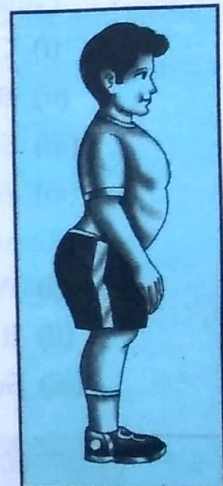
- (i) The habit of walking with belly protruding in younger age.
- (ii) Not taking balanced diet in childhood.
- (iii) Diseases of spinal muscles.
- (iv) A woman has given birth too many children.
- (v) Overweight or obesity.
- (vi) Taking excessive food than required.

Preventions:

- (i) Balanced diet.
- (ii) Never take excessive food.
- (iii) Maintain weight.

Remedies:

- (i) Performing halasana and paschimontanasana regularly.
- (ii) Standing attention and touching the toes with hands.
- (iii) Standing fully erect, bending the trunk forward and then straightening.
- (iv) Perform sit-ups.



Lordosis

(iii) **Scoliosis:** Scoliosis is an abnormal side-to-side curve of the spine. Scoliosis causes one shoulder down and other is raised up. Body weight is shifted to sideward. It normally occurs, while studying children keep their body bent towards left or right side for long time. By doing so, their back bone leans towards the side to which they bend long. When they go to school, they usually carry their bag on one particular shoulder, resulting in several deformities in the body. In the beginning such deformities can be rectified by doing some simple exercises. Later on, it is difficult to rectify them.

Causes:

- (i) Lifting weight towards one side in routine.
- (ii) Wrong standing posture.
- (iii) Postural defects by birth.
- (iv) By birth abnormal twisting of the vertebrae as from Spain.
- (v) By inhalation of dust containing silica or silicon dioxide.
- (vi) Difference in lengths of legs.

Preventions:

- (i) Correct posture.
- (ii) Balanced diet.
- (iii) Suitable furniture.
- (iv) Avoid carry heavy weight at one side. Try to divide the weight and hold in both hands.

Remedies:

- (i) Performing Trikonasana.
- (ii) It can be controlled by expert doctor.
- (iii) Swimming.



Scoliosis

5.7 CORRECTIVE MEASURES FOR POSTURAL DEFORMITIES

Physical activities play an important role as corrective measures for different deformities. Physical activities not only help correct the deformities, they also help the person prevent from the different deformities. Appropriate remedial actions should be started in case of any problem. Bad posture exerts unusual stress on muscles, tissues and ligaments of the body segments. Physical activities make the body muscles and bones strong and healthy. Physical activities also make other systems of the body healthy which help cure and prevent the various deformities. Some of the physical activities are explained below:

- I. **Strengthening Exercises:** These exercises are used to provide strength to the muscles. Depending on the postural defect, specific strengthening exercises can be planned.
- II. **Back Exercise:** Weakness of back muscles is the main reason of many postural deformities. To strengthen these muscles, some workout in the form of back exercises must be done.
- III. **Specific Exercises:** Some specific exercises are essential as corrective measure for common postural deformities. These are explained as below:

1. Exercises Related to Knock-knee:

- (i) Horse riding.
- (ii) Perform Padmasana and Gomukhasana regularly.
- (iii) Keep pillow between the knees and stand erect for sometime.
- (iv) Walking calipers may also be used.

2. Exercises Related to Flat Foot:

- (i) Walking on heels.
- (ii) Walking on inner and outside of feet.
- (iii) Walking on toes.
- (iv) Perform Vajrasana.
- (v) Jumping on toes for sometime.

3. Exercises Related to Round Shoulder:

- (i) Hold the horizontal bar for sometime.
- (ii) Perform Dhanurasana and Chakrasana regularly.
- (iii) Sit on a chair. Rest the back against it. Pull the shoulders backward and see upwards.
- (iv) Keep your chin upward, head straight and chest forward while standing, walking and sitting.
- (v) Keep your tips of fingers on your shoulders and rotate the elbows in clockwise and anticlockwise direction for equal numbers of time.

4. Exercises Related to Bow Legs:

- (i) Massage the legs.
- (ii) Perform Garudasana regularly.
- (iii) Try to walk on the inner edge of the feet for some distance regularly.
- (iv) Try to walk by bending the toes inward.

5. Exercise Related to Spinal Curvature:

The following exercises should be done to correct the spinal curvature:

- (i) Swimming.
- (ii) Exercise for moving the trunk forward and backward.
- (iii) Taking exercises while hanging from a neem or peepal tree.
- (iv) Doing breathing exercise.
- (v) Doing exercises which make muscles flexible.
- (vi) Carrying the bucket in the hand other than the one usually employed in doing so.

Conclusion: Corrective exercises are remedial in initial stages and in cases where the deformity is due to incorrect posture. If exercises are done regularly they can help and correct the deformity and discomfort. In some cases it depends on the degree. If the degree of the deformity is too much medical help should be taken.