

# Assessment of muscular and postural stress among handicapped college going girls

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■ **ABSTRACT** : The study was conducted with an objective to assess the muscular and postural stress among handicapped college going girls. The sample of 60 students from undergraduate level were selected randomly from Ambedkar Institute of Handicapped in Kanpur district. Results revealed that muscular stress was found greater in right hand than in left hand. Thus, the grip strength increased at writing than in reading. The change in the postural frequency while sitting and working with wooden study table and chair was found more. Thus, it is difficult to maintain any particular posture for a long period of time due to fatigue resulting from static muscular effort. Angle of deviation in posture measured by flexi curve showed that while reading the angle of deviation of lower back was 40° and upper back 36°, whereas while writing the angle of deviation of lower back was 50° and upper back 46°. Thus angle of deviation while writing was found more than reading.

■ **KEY WORDS** : Fatigue, Posture, Handicapped girls

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Disability as a handicap is suffering from continuing incapacitation of the body, intellect or personality, which is likely to interfere with an individual's normal growth, development or capacity to learning (Hugh, 1981). It was observed that disease such as polio, meningitis, leprosy and muscle among other can cause limb deformities or paralysis. In the present study emphasis has been given to partial disabled children their seating posture and the special type of school furniture which they need to read, writer or listen to the lectures delivered at school institute. In spite of various efforts carried out by many Government and non-government organizations on problems of handicapped girls, they face in their daily life are ignored, like adjustment with the working environment in which they work for 5 hrs with strain.

## ■ RESEARCH METHODS

The descriptive data were gathered personally by using interview method. Sample of 60 handicapped girls were selected for the present study. Purposive sampling design was used to

select the study area and respondents. The collected data were tabulated and analysed with the help of subjective (frequency, percentage, mean and S.D.) and rational statistics (coefficient correlation, score and rank).

## ■ RESEARCH FINDINGS AND DISCUSSION

It is portrayed in the Table 1 that 17.7±13.3 mean of strength of the muscles was trend more in rest in right hand than at work that was 12.4±12.2 followed by the mean 17.0±12.9 of the strength of the muscles was found more in rest in left hand while than at work that was 12.3±11.8. So, the percentage grip strength of right hand was found more (24.7%) than the left hand (23.8%) while reading .

It is evident from Table 2 that maximum postural changes during work of reading and writing was found for sitting back on chair with average value of 6.5 ± 2.5 followed mean value 6.1±2.5 for legs stretched forward and mean value 6.0±2.4 was found in legs flexed at 90° at knee, whereas mean value 5.8±2.6 was found in sitting forward on chair and mean values of

**Table 1: Mean value of muscular stress with study table and chair (n=60)**

Sr. No.	Classroom activity	Strength of the muscular in rest (Sr)		Strength of the muscles in work (Sw)		Percentage grip strength	
		Right hand	Left hand	Right hand	Left hand	Right hand	Left hand
1.	Reading	17.7±13.3	17.0±12.9	12.4±12.2	12.3±11.8	24.7%	23.8%
2.	Writing	18.4±12.2	15.2±17.2	18.8±14.5	16.2±12.2	26.8%	24.6%

**Table 2: Distribution of respondents as per changes in postural frequency (n=60)**

Sr.No.	Postural changes	Mean ± S.D.
1.	Sitting forward on chair	5.8±2.6
2.	Sitting upright on chair	5.8±2.3
3.	Sitting back on chair	6.5±2.5
4.	Leaning back on chair	5.2±2.6
5.	Arm supported on table	5.7±2.4
6.	Legs stretched forward	6.1±2.5
7.	Legs flexed at 90° at knee	6.0±2.4
8.	Legs flexed backward	5.4±2.3
9.	Legs held asymmetrically	5.4±2.3
10.	Legs crossed	5.5±2.6
11.	Feet on table rail	5.2±2.2

**Table 3 : Angle of back while performing different classroom activities**

Sr.No.	Classroom activities	Normal angle of back	Angle of lower back at work	Angle of deviation	Angle of upper back at work	Angle of deviation
1.	Reading	90°	50°	40°	54°	36°
2.	Writing	90°	40°	50°	44°	46°

5.8±2.3 was found in sitting upright on chair.

Thus, it can be concluded that it is difficult to maintain any particular posture for a long period of time due to fatigue resulting from static muscular effort. During such activity, the physiological cost is also increased without any profitable work. This leads to lower productivity. The only solution for this is the improvement of working posture by adopting suitable furniture or work space design (Table 2).

It is portrayed from Table 3 that the normal angle of the back for reading was found 90°. The angle of selected activities that is reading and writing was measured and then deducted from the normal angle of both the lower and upper back. While reading the angle of lower back was found 50° and upper back 54°. So, the angle of deviation for lower back was found 40° and upper back 36°. While writing the angle of lower back identified to 40° and upper back 44°. So, the angle of deviation for lower back was found 50° and upper back 46°. Thus, it is clear that the angle of deviation while writing was found more than the reading activity (Table 3).

**Conclusion :**

It was concluded that there were no facility of foot rest in the chair provided to children in institute. The table provided to the children had flat top and the angle of tilt was 0°. Majority

of respondents sit for long hours (5-6 hours) continuously on chairs which make them feel pain in buttocks, neck and shoulders. So, suitable cushioned foot rest with adjustable length and height should be provided. The chair should be provided with the arrangement of changing the angle between seat and back as well as seat height adjustment. So, they need training for using newly designed furniture/equipments with most comfort and important training classes.

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