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Postural Management in Children Attending Online Classes in Covid-19 Lockdown: A Case Study

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Abstract

Aim: To show the effectiveness of Postural management in children attending online classes.

Method: A total of 10 students were selected. Each student underwent postural assessment by Spinal flexibility test.

Souchard/ Global postural Re-education was given for 7 sessions for a week. Pre and Post test scores were taken using Spinal flexibility test. Each student showed remarkable difference in the Postural management.

Result: Physiotherapy treatment using Souchard/Global postural Re-education (GPR) in postural management showed remarkable difference in children attending online classes with improved Spinal Flexibility, Balance and Functional activities.

Conclusion: Effectiveness of PT in postural management in children attending online classes.

Keywords: Posture, Online classes, Souchard/Global postural re-education, Spinal flexibility test.

Introduction

Posture is defined as the attitude that is assumed by the body with support during the course of the muscular activity or as a result of the co-ordinated movements performed by a group of muscles functioning to maintain the stability¹. Posture is a reflexive and unconscious position and it represents the body's reaction to the force of gravity². Several factors contribute to the posture including neurophysiological, biomechanical and psych motive factors linked to the evolution of the species³.

Posture is controlled through the contraction of skeletal muscles, co-ordinated by multiple number of stimuli of various nature and through continuous adjustment of neuromuscular type⁴. It is of two types.

Dynamic posture is how you hold yourself when you are moving, walking, running or bending over to pick up something. It is useful for the efficient basis of movement. Muscles and non-contractile structures work together for adapting to changing circumstances⁵.

Static posture is how you hold yourself when you aren't moving, like sitting, standing or sleeping. Body segments are well aligned and maintain a fixed position. This is achieved by co-ordination and functioning of various muscle groups which work rhythmically to counteract gravity and other forces⁵.

A **good posture** is the combination of muscular and skeletal balance which protects the body against injury or any deformity. It is considered to be advantageous while standing, mechanically effective while moving and supports the normal functioning of the internal organs⁷. Under such conditions, the muscles perform most efficiently⁸.

Poor posture is an indistinct term that describes various body parts which is considered to be faulty and hence stretch the spectrum from the nonperfect posture to pathological posture. It is postulated that poor posture leads to increased strain and reduces the overall balance of the body⁶.

The physiological sagittal spinal curvature represents a typical feature of good body⁷. From a clinical point of view, the **disturbances of the human posture** can be classified as Non-structural and Structural⁸. Most common types of Non-structural misalignments of the body posture in the sagittal plane are Lordotic posture, Kyphotic posture, Kyphotic-lordotic posture, Flat back posture, Sway back posture^{6,7}.

The **structural malalignments** encompass special clinical entities such as idiopathic scoliosis, Scheuermann's juvenile kyphosis, Spondylolisthesis Thoracic hyper-kyphosis, Pelvis malposition, Mechanical back pain.^{6,7}

Etiology includes Past/Present injuries, low nutritional state, heredity, extra weight, bad postural habits, lifestyle and fashion.

Global Postural Re-Education is an ingenious postural correction method developed by the French Physiotherapist Phillippe-Emmanuel Souchard. RPG session comprises of muscle chain stretching positions, starting position encompasses mild tension and stretching is applied progressively and end position is termed as the final tension position. This final position differs with each individual and co-ordination chain is affected. The RPG method has been widely used in clinical practice⁹.

As the educational institutions have been closed down across the state following Covid-19 outbreak, some of the educational institutions have initiated **Online classes** for their students. (Deccan Herald on March 14th). While online connectivity has allowed many students to continue studies from their homes, it is beginning to throw up new challenges for their health-a direct result of having to sit in front of the gadgets fit classes. Dr. Priya Ghosh, a physiotherapist points out on how adversely it affects the posture.

Flexibility is a component of fitness First gained prominence in the early 1900's as the field of physical therapy emerged. In 1980 the physical fitness test that consists of flexibility test (sit and reach). Johnson and colleagues (1966) defined flexibility as "the functional capacity of the joints to move through a full range of motion". There are several other tests such as Schober test and Modified Schober test¹⁰.

Paediatric balance scale (PBS), developed to measure the balance in school-age children. This scale has demonstrated reliability and ease of application¹¹.

Barthel index/scale is a scale to measure the Activities of daily living. The performance of the individual is recorded and points are assigned to each level of ranking. The Barthel Index measures the degree of assistance required by an individual on 10 items of mobility and selfcare ADL.

Need For the Study

To enhance the flexibility in children attending online classes. Emerging research demonstrates that poor postural habits can be corrected and healthier posture can thereby be encouraged. As such, the Global Postural Re-Education method has been practiced for over 30 years and its main focus is on flexibility and stretching. Hence this study was done to find out whether GPR method can improve the posture in children attending online classes.

Methodology

Study Design

A Case Study

Study setting

The study was conducted in the locality.

Sampling technique

Convenience sampling

Sample size

A total of 10 students were selected. Each student underwent Postural assessment by Spinal Flexibility Test, Pediatric Balance Scale, Barthel Index Scale.

Treatment duration

The treatment was given for 7 sessions for a week.

Study duration

The study was conducted for a period of 2 months.

Selection Criteria

Inclusion criteria

1. Age: 11-14 years
2. Both the gender (male and female)
3. Healthy individuals

Exclusion criteria

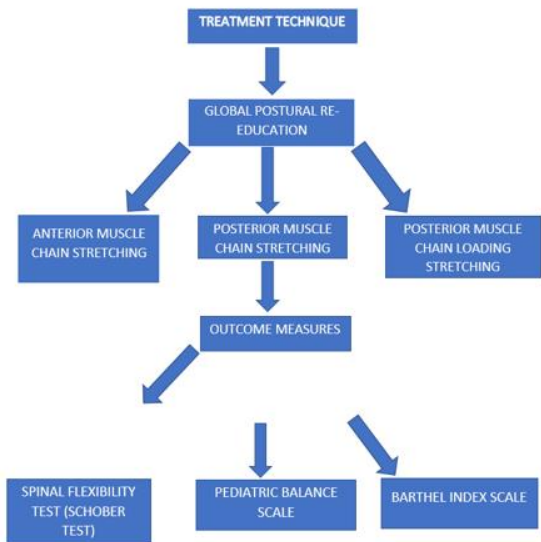
1. Age group below 11 years and above 14 years
2. Any cases diagnosed with Pediatric impairment
3. Any recent trauma or head injury
4. Not willing participants

Method of collection of data:

A total of 10 students who fulfilled the selection criteria were selected for the study. The children were explained about the study and consent was signed and obtained from their parents. A routine history collection and detailed assessment were carried out for all participants. Souchard /Global postural re-education was given for 7 sessions for a week. The treatment sessions were carried out under the participants cooperation. At baseline of the study, all children were assessed using Spinal flexibility test, Pediatric balance scale, Barthel index were used to know the pre-interventional score. After 7 sessions of GPR (Global Postural Re-Education), all were assessed using the same scales to know the post-interventional score.

Materials

- Adjustable height bench
- Chair with back support and arm rest
- Stopwatch
- Masking tape
- A stepstool
- A brightly colored object
- Blindfold



Assessment Tools

- Schober test, Pediatric balance scale and Barthel index were used.

Data Analysis

➤ **Age Distribution**

Among the 10 students, who were between 11-14 years of age, 1 student was 11 years old, 3 students were 12 years old, 1 student was 13 years old and 5 students were 14 years old.

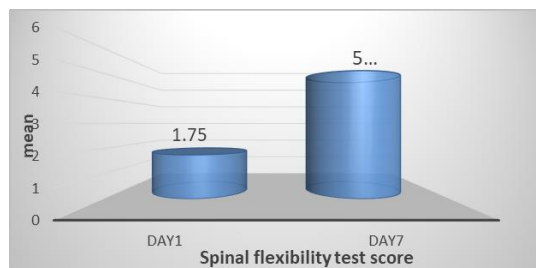
Table 1: Frequency Distribution for Age.

Age In Years	Frequency	Percentage
11	1	10%
12	3	30%

Table 3: Mean and Standard Deviation for Spinal Flexibility Test.

	No	Minimum	Maximum	Mean	STD Deviation	Z Value	P Value
Day1	10	1.00	3.00	1.7500	.67700		
Day7	10	5.00	5.50	5.1000	.21082	2.850	0.004

The above table shows Mean and Standard deviation value for Spinal flexibility score on Day 1 which was 1.75 ± 0.677 and on Day 7 it was 5.1 ± 0.210 . Pre and Post score comparison shows there was a significant difference in Spinal Flexibility Test Score between Day 1 and Day 7 (because $p \text{ value} < 0.05$).



Graph 3: Mean and Standard Deviation for Spinal Flexibility Test.

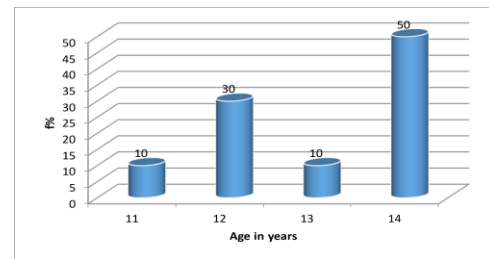
Table 4: Pattern of Disability by Using Spinal Flexibility Test.

Pattern of Disability	Day 1		Day 7	
	Frequency	Percentage	Frequency	Percentage
Moderate	2	20	10	100
Severe	8	80	0	0
Total	10	100	10	100

The above table shows that On Day 1 the spinal flexibility test score showed that majority (80%) were severely affected and (20%) were moderately affected. On Day 7 no severity was reported.

13	1	10%
14	5	50%
Total	10	100%

So, average age in the study group is 13 ± 1.154 years.



Graph 1: Age Distribution.

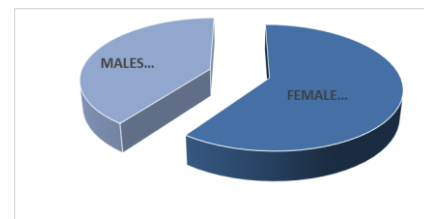
➤ **Gender Distribution**

Among the 10 students, 6 students were females and 4 students were males.

Table 2: Frequency Distribution of Gender.

Gender	Frequency	Percentage
Female	6	60.0
Male	4	40.0
Total	10	100.0

The study includes 6 (60%) females and 4 (40%) males.

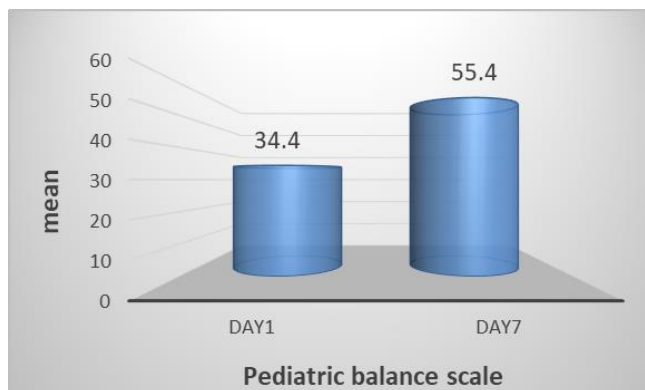


Graph 2: Gender Distribution.

Table 5: Mean and Standard Deviation for Pediatric Balance Scale

	No	Minimum	Maximum	Mean	STD Deviation	Z Value	P Value
Day1	10	30.00	42.00	34.4000	4.37671	2.807	0.005
Day7	10	53.00	56.00	55.4000	.96609		

The above table shows Mean and Standard deviation value for Pediatric balance score on Day 1 which was 34.4 ± 4.376 and on Day 7 it was 55.4 ± 0.966 . Pre and Post score comparison shows there is significant difference in Paediatric balance scale between Day 1 and Day 7 (because $p \text{ value} < 0.05$)

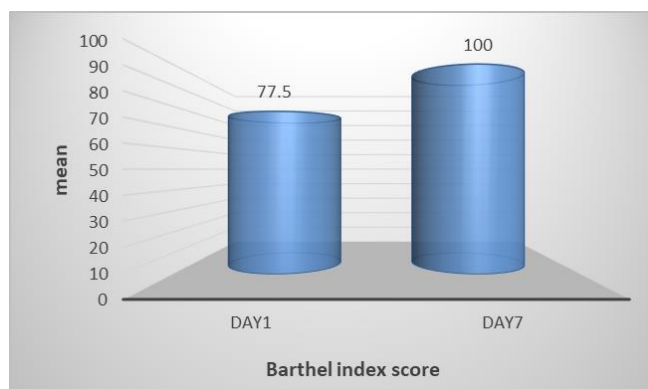


Graph 4: Mean and Standard Deviation for Paediatric Balance Scale.

Table 6: Mean and Standard Deviation for Barthes Index Scale.

	No	Minimum	Maximum	Mean	STD. Deviation	Z Value	P Value
Day1	10	70.00	85.00	77.5000	5.40062	2.821	0.005
Day7	10	100.00	100.00	100.0000	.00000		

The above table shows mean and Standard deviation value for Barthel index scale on Day 1 which was 77.5 ± 5.40 and on Day 7 it was 100 ± 0 . Pre and Post test score comparison shows there was a significant difference in Barthel Index Scale between Day 1 and Day 7 (because $p \text{ value} < 0.05$)



Graph 5: Mean and Standard Deviation for Barthes Index Scale.

Discussion

The study aimed at improving the posture in children attending online classes during Covid-19 lockdown. GPR comprises of a series of active gentle movements and postures and it aimed to realign the joints, stretching the shortened muscles and antagonistic muscles contraction. GPR method includes eight postures in lying, sitting or standing to be held for 15-20 minutes each. For the purpose of this study, **Francesca Bonetti et al.**, stated that in order to obtain uniformity among the sessions, 2-3 postures were used out of 8 proposed postures¹². Among the 100 participants enrolled, 50 participants were given GPR treatment and 50 were given SE group (Stabilization Exercise). The outcome measure and follow-up were documented. The study concluded that, it showed a significant result in reducing the pain and disability. **David Merinero et al.**, conducted a study and the results

showed pain reduction in 24 hours post GPR session and increasing in flexibility pre-post randomized study of 8 participants¹³. **C.Vanti et al.**, This study explored that the GPR method has been shown to be an improvement in treating musculoskeletal diseases¹². The global input of this study was to see the effectiveness of GPR in children attending online classes. For this purpose, 10 healthy students were selected on the basis of selection criteria by convenient sampling. There were 6 females and 4 males among the samples. During the training there was no discontinuation of training from the participants. The outcome was measured by Spinal Flexibility Test (Schober's Test), Pediatric Balance Scale and Barthel Index Scale were used to assess the Pre and Post interventional scores. The obtained data was statistically analyzed by a statistician. The age group selected for this study was 11-14 years. The average age

group in this study was 13 ± 1.154 years (Table 1).

Mean and Standard deviation of Spinal flexibility score on Day 1 which was 1.75 ± 0.677 and on Day 7 it was 5.1 ± 0.210 . Pre and Post score comparison shows there was a significant difference in Spinal Flexibility Test score between Day 1 and Day 7 (Table 3). Spinal flexibility test score showed that On Day 1 majority (80%) were severely affected and (20%) were moderately affected. On Day 7 no severity was reported (Table 4). Mean and Standard deviation value for Pediatric Balance Scale on Day 1 which was 34.4 ± 4.376 and on Day 7 it was 55.4 ± 0.966 . Pre and Post test score comparison shows there was a significant difference in Paediatric Balance Scale between Day 1 and Day 7 (Table 5).

Mean and Standard deviation value for Barthel Index Scale on Day 1 which was 77.5 ± 5.40 and on Day 7 it was 100 ± 0 . Pre and post test score comparison shows there was a significant difference in Barthel Index scale between Day 1 and Day 7 (Table 6).

Conclusion

The study result indicates that the Global Postural Re-education was more effective in Children attending online classes. There was a significant difference in reducing the pain, tenderness and improving the flexibility and overall posture among the students.

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