Effect of Selected Remedial Exercises on Flat Foot for School Children

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Abstract

The purpose of the study was to find out the effect of selected remedial exercise of flat foot. To facilitate the study visited five schools in the city of Chennai and obtained from the Heads of the Institutions to undertake the research which was beneficial to the children. With the permission of the heads of the institutions, selected 87 children with flat foot by observation. The subjects selected for this study has divided into three equal groups consisting of twenty subjects in each group. The first group was treated as experimental group I who practiced remedial bare foot walking exercise for a period of 12 weeks. The second group was treated as experimental group II who practiced remedial foot gymnastic exercises for a period of 12 weeks. The third group was treated as a control group, who were not involved in any specialized foot exercises. The study was formulated as a true random group design consisting of a pre test and post test. Pre tests were conducted for all the subjects on selected variables, foot arch and foot promotion for both legs. The experimental groups participated in these respective remedial exercises for 12 weeks. The post tests were conducted on the above said dependent variables after a period of 12 weeks remedial exercise. The differences between the initial and final scores in selected variables were subjected to statistical treatment using Analysis of Covariance (ANCOVA) to find out whether the mean differences were significant or not.

Key words: Remedial exercise, Flat foot

Introduction

Modern world is the outcome of many scientific inventions through centuries scientific instruments and machinery halve helped to lead the daily life with case comfort. The modern man depends mostly upon the scientific equipment for his daily routine involving mainly his mental powers to have a comfortable life.

Flat feet is an informal references to a medical condition in which the arch of the foot collapse with the entire sole of the foot coming into incomplete. In some individuals the arch simply never develops in one foot. The human arch develops in infancy and early childhood as part of normal muscle, tender, ligament and bone growth. Flat arches in children usually become proper arches and high arches while the child progress through adolescence and into adulthood.

The purpose of this study was to investigate the effect of 12 weeks selected remedial exercise on flat foot among school children.

Methodology

For the purpose of this study, the investigator selected 87 children with flat foot by observation. The selected children were clinically observed by physicians to determine whether the children were having flexible flat foot care was taken to exclude students with any relevant clinical condition. such as palsy sequels, myclomenigocele meningitis sequels orthopaedic surgeries. Foot prints of the children with flexible flat feet were obtained and

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stahelip' Plantar Arch Index, advocated by Hernan dez et. al (2007) was calculated children with planter arch index greater than 1.15 in right and 1.14 in left leg were selected for this study as flat footed children. Finally the investigator selection 60 children with flexible flat tooted for this study and this age group was between 7 to 9 years.

Based on the obtained data, the group was equated into three experimental groups. Experimental group II and control group consisting of 20 subjects each. Experimental group one who practiced remedial bare foot walking exercise for period of 12 weeks. The second experimental group was practiced remedial foot gymnastic exercise for period of 12 weeks. The third group was treated as con group who were not involved in any specific foot exercise. The training for 12 weeks was assigned to group I and group II (5 days per week) and the control group was not permitted to do the daily routine work. From selected subjects (N = 60) exercise were conducted on the criterion measures programme. Prior to the administration of the exercise the subjects were made aware of the importance of the study. They were given a clear picture of each exercise the investigator demonstrated the exercises for the benefit of the subjects.

Statistical Technique

The data were collected from the central group and experimental group I and II criterion measures that is remedial bare foot walking exercises and remedial foot gymnastic exercises were statistically analysed by the analysis of covarians was used to find out the adjusted mean difference among the treatment of groups. The obtained 'F' ratio is tested at 0.05 level of confidence. The Schaeffer's post HOC test was used to find out the paired mean difference.

Result of the Study

The mean differences of the criterion measures for the groups are presented in the following tables.

Table-I

Analysis of Covariance for Data on Right Leg Foot Arches Assessed Through Stahels' Plantar Arch Index of Bare Foot Walking Exercises, Foot Gymnastic Exercises and Control Group (Scores in Index Numbers)

	Experi- mental group I	Experi- mental group II	Control group	Source of variance	Source of squares	Df	Mean squares	F value
Pre test	1.26	1.26	1.25	Between	0.00	2	0.000	0.01
STD	0.06	0.06	0.06	Within	0.22	57	0.004	
Post test mean	1.20	1.19	1.25	Between	0.04	2	0.018	5.34"
STD	0.06	0.05	0.06	Within	0.20	57	0.003	
Adju				Between	0.04	2	0.019	
sted post test mean	1.19	1.20	1.25	Within	0.07	56	0.001	15.73'

The calculated F valve for pretest (0.01) is lesser than the table value of at 0.05 level and hence it is not significant. The right plaster arch index of bare foot walking exercise group. (Exp. Crl.1) was 1.20 with standard duration of \pm 0.06 foot gymnastic exercises group (Exp. Gr. II) was 1.19 with standard deviation \pm 0.05 and control group was 1.25 with standard duration of 0.06 resulted in an 'F' ration of 5.34 which shows statistically significant difference among the post test means at 0.05 level of confidence.

Table-II Mean Differences between the Groups and Required Scheffe's Confidence Interval Value (Scores in Index Numbers)

	Means of	Mean	Required		
Experimental group II	Experimental group I	Control group	difference	CI	
1.19	1.20		0.01	0.03	
1.19		1.25	0.06"	0.03	
	1.20	1.25	0.05"	0.03	

* Significant at 0.05 level.

The results presented in Table II proved that there was a significant mean difference between experimental group II and control group 0.06 and experimental group I and control group 0.05 as these mean differences were greater than the required value of 0.03 to be significant. It was also proved that there was the significant difference between experimental group II and Exp. Gr. I, as the obtained mean difference of 0.01 was less than the required value of 0.03 to be significant.

Table-III

Analysis of Covariance for Data on Right Leg Foot Arches Assessed Through Stahels' Plantar Arch Index of Bare Foot Walking Exercises, Foot Gymnastic Exercises and Control Group (Scores in Index Numbers)

	Experi- mental Group I	Experi- mental Group II	Control Group	Source of Variance	Source of Squares	Df	Mean squares	F value
Pre Test Mean	1.25	1.24	1.24	Between	0.00	2	0.000	0.09
STD	0.06	0.05	0.06	Within	0.19	57	0.003	
Post Test Mean	1.19	1.19	1.24	Between	0.03	2	0.016	5.85'
STD	0.06	0.04	0.06	Within	0.16	57	0.003	
Adjusted				Between	0.03	2	0.015	
Post Test Mean	1.19	1.19	1.24	Within	0.04	56	0.001	20.69"

* F.05 (2.57) = 3.15, F.05 (2.56) - 3.16.

Table - III shows that the pre-test means of left leg planter arch index of barefoot walking exercise group (Exp. Gr. I) was 1.25 with standard deviation of ± 0.06 , foot gymnastics exercise group (Exp. Gr. II) was 1.24 with standard deviation ± 0.05 and control group was 1.24 with standard deviation of ± 0.06 , resulted in an 'F' ratio of 0.09, which shows statistically no significant difference among the pre test means at 0.05 level of confidence.

Table-IV Mean Differences between the Groups and Required Scheffe's Confidence Interval Value (Scores in Index Numbers)

	Means of	Mean	Required		
Experimental group II	Experimental group I	Control group	difference	CI	
1.19	1.19		0.00	0.02	
1.19		1.24	0.05'	0.02	
	1.19	1.24	0.05'	0.02	

* Significant at 0.05 level.

The results presented in Table IV proved that there was significant mean differences between experimental group II and control group 0.05 and experimental group 1 and control group 0.05, as these mean differences were greater than the required value of 0.02 to be significant. It as also proved that there was no significant difference between experimental group II and experimental group 1 as the obtained mean difference of 0.01 was less than the required value of 0.02 to be significant.

Table-V

Analysis of Covariance for Data on Right Foot Pronation Assessed through Navicular Drop Test of Bare Foot Walking Exercises, Foot Gymnastic Exercises and Control Groups (Scores in Index Numbers)

	Experi- mental Group I	Experi- mental Group II	Control Group	Source of Variance	Source of Squares	Df	Mean squares	F value
Pre Test Mean	1.25	1.30	1.28	Between	0.03	2	0.016	1.05
STD	0.08	0.14	0.13	Within	0.84	57	0.015	
Post Test Mean	110	1.12	1.27	Between	0.35	2	0.173	9.16"
STD	0.11	0.15	0.14	Within	1.07	57	0.019	
Adjusted				Between	0.32	2	0.161	
Post Test Mean	1.10	1.12	1.27	Within	0.61	56	0.011	14.91'

* F.05 (2.57) = 3.15, F.05 (2.56) - 3.16.

Table V shows that the pre-test means of right leg pronation measured through Navicular Drop Test of barefoot walking exercise group (Exp. Gr. I) was 1.25 with standard deviation of 10.08, foot gymnastics exercise group (Exp. Gr. 11)was 1.30 with standard deviation \pm 0.14 and control group was 1.28 with standard deviation of \pm 0.13, resulted in an 'F' ratio of 1.05, which shows statistically no significant difference among the pre test means at 0.05 level of confidence.

Table-VI					
Mean Differences between the Groups and Required					
Scheffe's Confidence Interval Value					
(Scores in Index Numbers)					

	Means of	Mean	Required		
Experimental group II	Experimental group I	Control group	difference	CI	
1.10	1.12		0.02	0.08	
1.10		1.27	0.16'	0.08	
	1.12	1.27	0.14'	0.08	

* Significant at 0.05 level.

The results presented in Table VI proved that there was a significant mean difference between experimental group II and control group 0.16 and experimental group I and control group 0.14 as these mean differences were greater than the required value of 0.08 to be significant. it was also proved that there was no significant difference between experimental group II and experimental group 1, as he obtained mean differences of 0.02 was less than the required value of 0.08 to be significant.

Padma Samson Discussion on Findings

The results of the study showed that there was a significant difference between the effect of remedial exercise on flat foot selected criterion variables among flat foot children. The selected criterion variables were foot arches right by end left leg and foot prenation for right leg and left leg. The analysis of covariance was used to find out the significant difference if any between the groups on selected criterion veriables. In all the cases 05 level of confidence was fixed to test the significance which was considered as appropriate.

Conclusion

Based on the results of the study, it was concluded that twelve weeks barefoot exercise significantly altered the right and left foot arches measured through Stahchi's Arch Index

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