EFFECT OF MOTOR ACTIVITIES ON PERCEPTUAL MOTOR FUNCTIONING OF SPECIAL CHILDREN BETWEEN THE AGE GROUP OF SIX AND ELEVEN YEARS

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ABSTRACT

Background: The aim of this study was to collect data on the results of the active knee extension test in subjects with reducution in hamstring extensibility to establish the significance of holistic physiotherapeutic approach compared to structured stretching influence over hamstring flexibility relater motor fitness variables. Forty asymptomatic male subjects, age range (14-28) with hamstring tightness performed the active knee extension test followed by the v sit reach test. A goniometer and measuring tape were used to measure the knee flexion angle of the active knee extension test flexibility athletes were also subjected to shuttle run, 40 meters sprint test vertical jump test for lower limb motor fitness variables. The statistical analysis was performed to find out the effectiveness of structured stretching holistic physiotherapy approach in improving hamstring flexibility motor fitness variables the analysis of covariance was used to analyse the results. At the conclusion of the study, holistic physiotherapy group had the largest overall mean difference between protest and post-test knee extension degrees measurements, V sit reach test measurement, vertical jump performance on power, agility shuttle run 40 meters sprint speed. This study was designed to obtain a more thorough understanding of handling hamstring tightness motor performance for increasing hamstring flexibility related motor fitness variables, and how the use, holistic physiotherapeutic approach can affect these parameters in the clinical setting. Holistic approach has proven it can accelerate both hamstring flexibility and lower limb motor performance. Athletic education and tailor-made exercise in the holistic perspective are the keys to maintain flexibility and excel in motor fitness.

KEY WORDS: Hamstring tightness flexible stretching holistic approach in Hamstring tightness motor fitness.

Introduction

Research has long been a feature of modern Physiotherapy, dating from the first the USA research study published in 1921. Throughout development of the Physiotherapy profession, training and technique have continued to change and improve. Sports Physiotherapy is the specialized branch of physical therapy which deals with sports injuries, Fitness, Prevention of injuries and issue related to athletic.

There are various activities performed in the athletic training that place the athlete in injuries prone situations. These situations make it extremely important that each athlete is prepared for any type of Situation whether it is physical or mental.

Physical fitness training with sport specific movement screening program, which will elicit positive performed changes, can be designed in an effort to prevent many of the musculoskeletal injuries and sport specific injuries. Strength and conditioning program which spot light on improving the body's movement mechanics and inefficiencies should serve to progress the sports performance in athletes. The prevention of musculoskeletal injuries however is a much more intricate issue, which is why it has been such a frequently research and highly discussed topic. Considering the importance

to develop strategies in preventing musculoskeletal injuries, the initial focus should be to identify who is at risk for these injuries.

- A sports physiotherapist utilizes a wide range of technique, and the work of a sports physiotherapist ranges from application of the latest scientific techniques to the available holistic remedies.
- A sports physiotherapist utilizes a wide spectrum of technique ranging from first aid to manual therapy. The physiotherapist is usually skilled in manipulation and massage techniques, and these hands-on methods can help-on methods can help an athlete break through a fitness plateau to achieve a whole new level of fitness.

Hamstrings tightness, Flexibility, Stretching and sports injury

Hamstring tightness, the inability to stretch to stretch the muscle through its full range of amplitude, is associated with several conditions of the knee and spine. Flexibility is defined as "the absolute range of movement in a joint or series of joints is attainable in a momentary effort with the help of a partner to a particular joint. In other words, it is a myth that some people are innately flexible throughout their entire body.

There are several different factors that are implemented into hamstring fitness. These factors are core strengthening, Eccentric or concentric training, Flexibility, Balance, Proprioception, dynamic, soft tissue mobilizations, and active release techniques. There is currently not a single hamstring rehabilitation program in the literature that consistently address all the factors that have been listed above.

Though the ethology of hamstring pathologies has been explored it has not been fully developed. We must first understand the anatomy, ethology, and epidemiology of hamstring injuries before we can investigate the rehabilitation. Hamstring rehabilitation must address all aspects of the injury and furthermore lower the risk of re-occurrence. The athletic population has shown a growing needed for this research and development.

Taut hamstring -injury, treatment and performance

We can start by looking at how the hamstring function. One of their duties is to bend the knee and pull us through our stride as we walk or run, which is why runners typically have such tights hamstrings. The muscle is used in this way when the lower leg moves freely. But the hamstrings also have a postural function, holding us upright which works the other end of the muscle, at its origin.

Holistic approach A holistic health approach doesn't view the body. Mind and sprit as separate entities and promotes drugs and surgery only when absolutely essential and after other solutions have been sought. Means of or relating to holism, relating to or concerned with wholes or with complete system rather than with the analysis of, treatment of, or dissection into parts while stretching flexibility exercise will certainly help your body feel better, it is important to follow a holistic approach that also address your mind and spirit. In fact, with the help of therapeutic exercise you can alleviate stress and get in touch with your inner self at a much deeper level.

The study suggest that off-season and preseason conditioning programs include components of holistic physiotherapeutic components,

1. To identify the most significant faulty pattern (screening whole body & mind). If muscle flexibility /tone (identified by assessment) is the problem then

2. Reset tone/flexibility in the area of limited muscular length
3. Introduce normal ROM and length to the muscle group
4. Reset pattern (sports specific as movement training) with a corrective meneuver that utilizes the basic mobility and stability needed in the basic pattern.
5. As things improves reduce time and activity in flexibility and concentrate in corrective maneuver & basic pattern, eventually as successfully addressed the primary problem.
6. Deal with emotional aspects anger and frutrations and influence on hamstring by patient education.

By surveying the related literature and theoretical concepts, it was found that the use of holistic physiotherapeutic approach application (individualized athletic approach) had not been evaluated on the human hamstrings muscle as measure of managing hamstring tightness in athletes which incorporates manual medicine as a tool

STATEMENT OF THE STUDY

The study is comparative and experimental in nature. The study aims the need for the holistic physiotherapeutic approach in management of hamstring tightness among athletic population

AIM OF THE STUDY

The aim of the Is to evaluated the effectiveness of holistic approach over structure stretching in improving hamstring flexibility among male athlete and finds the influence on hamstrings flexibility ROM, lower limb (performance) agility, strength, speed & explosive power

HYPOTHESIS

Since the study aims to compare two different teachniques it will be carried out under frame work **of null hypothesis, there will be no significant effect of** holistic approach over structured stretching in improving **hamstring flexibility and performance among male athletes**

METHODOLOGY

1. Only male subjects were tested,
2. Only 40 subjects were tested,
3. Sit and reach 90/90 active knee extension and goniometry used in assessing hamstring flexibility.
4. Vertical jump test (Sargent jump) used asses power in lower limp
5. 40 meters sprint & shuttle run were used to assess speed and agility of lower limp
6. The purpose of this study is to identify if the use of holistic approach helps produce the greatest results in hamstrings flexibility & related motor fitness variables

LIMITAIONS

Certain habits, lifestyle, routine work which may affect the result of study is not taken into consideration

DATA ANALYSIS

The motor fitness variable and hamstring flexibility data collected were subjected for data analysis.

A descriptive statistical analiysis, paired t-test was performed to find out the efficacy of stretching within group I and holistic approach within group 2.

An inferential was done using (**ANACOVA**) analysis of co-variance between the groups.

The data collected were entered into SPSS version 9 & the results were sort simulataneously

Table 1

Group 1: Mean, Standard Deviation, Paired Difference,T-Value

Variables	Pre-test mean	Post-test mean	Mean paired diff.	Pre-test S.D	Post-test S.D	S.D paired diff	't'-value	Dt	T Table value	Sig	p
Active knee extension right (degrees)	150.45	157.30	6.850	7.16	5.17	2.6413	11.598	19	2.861	**	0.01
Active knee extension left (degrees)	150.95	157.95	7.000	6.66	4.59	3.0088	10.405	19	2.861	**	0.01
V sit reach (CMS)	15.10	8.80	6.300	6.66	3.96	3.2622	8.637	19	2.861	**	0.01
Vertical jump(CMS)	22.15	22.88	0.7350	6.15	6.11	.4936	6.659	19	2.861	**	0.01
Shuttle run (seconds)	13.35	12.55	.8035	.87	.63	.5355	6.710	19	2.861	**	0.01
40 meters sprint (seconds)	5.77	5.31	.4560	.77	.62	.3849	5.299	19	2.861	**	0.01

Table 2

Group 1i: Mean, Standard Deviation, Paired Difference,T-Value

Variables	Pre-test mean	Post-test mean	Mean paired diff.	Pre-test S.D	Post-test S.D	S.D paired diff	't'-value	Dt	T Table value	Sig	p
Active knee extension right (degrees)	154.65	164.80	10.150	5.72	3.68	4.0817	11.121	19	2.861	**	0.01
Active knee extension left (degrees)	155.20	163.30	8.1000	4.46	2.89	3.9855	9.089	19	2.861	**	0.01
V sit reach (CMS)	15.90	5.15	10.750	4.95	3.01	3.9984	12.024	19	2.861	**	0.01
Vertical jump(CMS)	20.54	22.18	1.6400	5.06	5.23	.6248	11.738	19	2.861	**	0.01
Shuttle run (seconds)	13.55	12.42	1.1305	.89	.46	.5995	8.433	19	2.861	**	0.01
40 meters sprint (seconds)	5.84	4.90	.9385	.65	.38	.4362	9.621	19	2.861	**	0.01

RESULTS:

The statistical analysis was performed on the baseline data to find out the effectiveness of structured stretching & holistic physiotherapy approach in improving range of motion-sit reach test for hamstring flexibility & vertical jump.40 meters sprint & shuttle run on motor fitness variables performance were indicating that there were significant differences within each group & between two groups.

The analysis of covariance was used to analyze the results of type of approach for hamstring flexibility & related motor fitness variables. The holistic physiotherapeutic approach is far superior compared to structure stretching as the values were highly significant leaving such inference.

Table 3

Anacova for Active knee extension (Degrees)-Post Test Right

ACTIVE KNEE EXTENSION (Degrees)-POST TEST RIGHT	Sum of Squares	df	Mean Square	F	Sig.	Table vale	p
Covariate-ACTIVE KNEE EXTENSION (degrees) PRE RIGHT	572.701	1	572.701	109.964	**	7.347	<0.01
Between groups	223.645	1	223.645	42.942	**		
Residual	192.699	37	5.208				
Total	1327.900	39	34.049				

Table 4

Anacova for Active knee extension (Degrees)-Post Test left

ACTIVE KNEE EXTENSION (Degrees)-POST TEST RIGHT	Sum of Squares	df	Mean Square	F	Sig.	Table vale	p
Covariate-ACTIVE KNEE EXTENSION (degrees) PRE left	349.205	1	349.205	61.543	**	7.347	<0.01
Between groups	82.436	1	82.436	14.528	**		
Residual	209.945	37	5.674				
Total	845.375	39	21.676				

Table 5

Anacova for Vertical Jump-Post Test

VERTICAL JUMP-POST TEST	Sum of Squares	df	Mean Square	F	Sig.	Table vale	p
Covariate-Vertical Jump-pre	1216.583	1	1216.583	3745.771	**	7.347	<0.01
Between groups	8.160	1	8.160	25.124	**		
Residual	12.017	37	.325				
Total	1233.634	39	31.632				

Table 6

Anacova for Shuttle Run-Post

SHUTTLE RUN-POST TEST	Sum of Squares	df	Mean Square	F	Sig.	Table vale	p
Covariate-Shuttle Run-pre	6.969	1	6.969	56.791	**	4.10	<0.05
Between groups	.499	1	.499	4.10	**		
Residual	4.540	37	.123				
Total	11.673	39	.299				

Table 7

Anacova for 40 Meters Sprint-Post

400METERS-POST TEST	Sum of Squares	df	Mean Square	F	Sig.	Table vale	p
Covariate-40 Meters Sprint-pre	6.832	1	6.832	78.509	**	7.347	<0.01
Between groups	2.062	1	2.062	23.696	**		
Residual	3.220	37	0.0870				
Total	11.765	39	.302				

Table 8

Anacova for Sit V Reach-Post

V Sit Reach-POST TEST	Sum of Squares	df	Mean Square	F	Sig.	Table vale	p
Covariate-V Sit Reach-pre	309.051	1	309.051	71.157	**	7.347	<0.01
Between groups	162.335	1	162.335	37.377	**		
Residual	160.699	37	4.343				
Total	602.975	39	15.461				

Hamstring flexibility.

Knee extension range of motion & V-sit reach test:

Significant differences were found between the groups measurements over time. An increase in active knee extension range of motion (right & left) was noted in both experimental groups between pre test scores & post test scores after intervention Group (holistic physiotherapy) had Increased active range of movement of knee extension degrees (right & left) between pre & post when compared with other group (structured stretching).An increase in V-sit reach score was noted in both groups between pre test. Scores & post test scores after intervention. Group II (holistic physiotherapy)

had increased flexibility of hamstrings (V-sit reach) between pre & post when compared with other group (structured stretching). At the conclusion of the study, holistic physiotherapy group had the largest overall mean difference between pretest and posttest knee extension degrees measurements (Right-10.15 & Left-8.19V sit reach test showed a mean holistic physiotherapy group superior in measurement,(10.75cms)

Motor fitness variables.

Vertical jump performance: Significant differences were found within & between group measurements over time. A significant increase vertical jump height was noted in both experimental groups between pre & post test values. Holistic physiotherapy group had significant increase in vertical jump score when compared between groups. At the conclusion of the study, holistic physiotherapy group had the largest overall mean difference between pretest and posttest measurements (1.64cms).

Shuttle run: Significant differences were found within & between group measurements over time. A significant decrease shuttle run time was noted in both experimental groups between pre & post test values. Holistic physiotherapy group had significant decrease in shuttle run time score when compared between groups. At the conclusion of the study, holistic physiotherapy group had the largest overall mean difference between pretest and posttest time measurements (1.13sec).

40 meters sprint: Significant differences were found within & between group measurements over time. A significant decrease in time for 40 meters sprint was noted in both experimental groups between pre & post test values, Holistic physiotherapy group had significant decrease in time 40 meters sprint score when compared between groups. At the conclusion of the study, holistic physiotherapy group had the largest overall mean difference between pretest and posttest measurements (938sec)

DISCUSSION ON FINDINGS

This study was designed to obtain a more thorough understanding of handling hamstringtightness & motor performance for increasing hamstring flexibility & related motor fitness variables, and how the use holistic physiotherapeutic approach can affect these parameters in the clinical setting & performed within the athletic context. This approach is involved screening for a "key link"which will be found Such a key link gives the physiotherapist a key to work on with the athlete. Athlete's fitness is contingent on performance of his motor system. According to Janda et al (1987) there are four stages of rehabilitation including task to Normalize Joint Function, Relax and/or Stretch Hypertonic Muscles, Facilitate and/or Strengthen Inhibited Muscles Reprogram Coordinated Movement Sub cortically, which supports the holistic physiotherapeutic approach. The study focuses on prehabilitation as flexibility plays a major cause for injuries in the athletic career. Waddell (2004) stated that the biomedical model does not appear to be equally well suited for managing the most common non-operative musculoskeletal disorders that physical therapists treat Wainner RS et al (2001) mentioned that With respect o musculoskeletal problems, regional interdependence refers to the concept that seemingly unrelated impairments in a remote anatomical region may contribute to, or be associated with, the patient's primary complaint supporting the holistic physiotherapeutic approach. The fundamental movement patterns require appropriate, symmetrical mobility and stability in order to perform the movement properly. With sport movement, the entire core is functioning as a unit so it was expected correlations would have been identified as seen by Nesser et al(2008) This approach incorporates concepts of functional movement screening which is a testing procedure that has shown clinical effectiveness in its ability to assess individual movement patterns by Cook, et al., (1998, 2001, and 2004). It has been hypothesized that the movement patterns assessed

by the Functional Movement Screen would have the potential to establish biomarkers which may act as predictors for injury and performance Cook et al., (1998, 1999).

The efficacy of the post intervention strategy seems to be supported in both groups of treatment. The observed increase in the extensibility of the muscle measured in degrees of knee extension range of movement was due to the application of active release combined myofacial release or viscero myofacial release over the hyper reflexic zones or corrective alignment should reflect plastic changes in the muscle, because it was intervened before the measurements were taken. The change that the researcher obtained was huge and statistically significant.

The difference in flexibility of hamstring muscle among the individuals in holistic physiotherapeutic group may be due to the followings, aspects

Difference in the basic movement patterns(athletes in different games) and the extent of muscle relaxation obtained through the stretching, myofacial release, viscero myofacial release, active release techniques used in this study as the natural movement patterns require appropriate, symmetrical mobility and stability in order to perform the movement properly, Physical & emotional changes as addressing the entire core mostly marked in athletic groups & flexibility is less in individuals with stress & emotion.

Volume of soft tissues where lean individuals have less restriction compared to obese, as they have longer muscle length and less in breadth of bulk of the muscles. Characteristics of muscle tissue as in fiber type of muscles results in endurance individuals having more flexibility than other individuals. Joint capsule influenced by articular neurobiology, Psychological and physiological effects enhances joint flexibility during both active and passive stretching. In this study all the measurements were taken by the investigator with a consistent technique to overcome the usual error in goniometric measurements.

The type of stretch used in the group 1 was structured stretching protocol When performing a structured stretch, the lower extremity being stretched and kept extended at the knee, elongating the hamstrings. However, the hamstring muscle may not elongate fully if the back chain (spinal extensors hamstrings & calf) is muscle is tight. To completely elongate the hamstrings muscle to the absolute end range of tissue resistance, the holistic physiotherapeutic approach can be used, but the lower extremity being stretched should be addressed for a key link including aspects of stress & emotion. This would address the faulty pattern & taut area associated for hamstring tightness to release and be actively insufficient. If the hamstring muscle had been isolated and stretched in structured manner, greater increases in range of movement temporarily (post stretch) might have occurred, but possibly resulted in lack of flexibility during post test measurement of structured stretching group compared to holistic physiotherapeutic group. Physiotherapists who realize the limitations of the symptomatic structured stretching can avoid the disappointment of achieving only less on results. Holistic physiotherapeutic implication must be joined together to achieve lasting results. Mastering the ability to evaluate functional chains and finding a key link amenable to unlock is the first step. Then, it is necessary to search for extrinsic factors which can be addressed through education and awareness to reduce exposure to harmful stress and strain predisposing to the aspect of inadequate flexibility. Finally, specific motor fitness goals must be such as relaxing overactive muscles, facilitating weak muscles, and improving the quality of basic movement patterns (ie, gait, lifting, jogging etc.).Holistic approach has proven it can accelerate both hamstring flexibility and lower limb motor performance. Athletic Education and tailor made exercise in the holistic perspective are the keys to maintain flexibility and excel in motor fitness. We face it, for us physical therapists to justify our services for athletes with musculoskeletal problems; we need to achieve clinical outcomes superior to those

associated with natural history or due course of time. If a patient's presentation is unclear or if the response to intervention is less favorable than expected, practical of the holistic physiotherapeutic approach may add clarity to the athlete's clinical picture and guide following interventions. Likewise, further research in holistic aspects concept in a well defined fashion may add transparency to the nature of many musculoskeletal problems and guide successive decision making in athletic fitness & sports medicine

CONCLUSION

Both the experimental groups in this study produced significant increases in the extensibility of hamstring muscles, increases in the vertical jump performance, shuttle run & 40 meters sprint when compared with the control group.

The group addressed with holistic physiotherapeutic approach obtained the greatest extensibility of hamstring muscles, increases in the vertical jump performance, shuttle run & 40 meters sprint over

6 weeks period. This study will allow clinicians more options in effectively increasing the extensibility& flexibility of hamstring muscles to prevent, to treat, and to rehabilitate hamstring tightness in athletes and to improve their motor fitness.

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