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A Learn on the Consequence of Mobility Exercise on the Modification of Performance in Agility

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Abstract

It is needless to stress the fact that agility is the most important factor that contributes to successful performance in a broad spectrum of competitive sports. Here, the very purpose of the study was to examine whether there is any casual relationship with agility performance on the degree of functional flexibility. In order to conduct the experiment, 26 male physical education students of Annamalai University were taken at random to serve as subjects all the twenty six students were tested before they were once again assigned to two experimental conditions viz, treatment and control conditions. The subjects in the treatment group were trained with five stretching exercises (both ballistic and static types) which were specially designed for the purpose for improving flexibility at trunk and hip. All the subjects of both control and experimental groups were tested for agility before the treatment. 'Right Boomerang Run' test was used to measure the agility as it was the most reliable and valid agility test compared to any other test. 'Sit and reach' test was used to measure the flexibility of the hip and trunk. Each subject was given three trials to do his best. The best trail was used for the analysis. Analysis of Co –Variance (ANCOVA) was used to test the hypothesis. The pre test scores were used as (Covariate) control variable.

Keywords: Mobility, Ballistic and Static type.

Introduction

We love to ooh and aah at what flexible people can do: Gymnasts, dancers and acrobats are fun to watch because their bendy bodies move in cool and unexpected ways. But for the rest of us, flexibility doesn't have to be a floor show. It's not about trying to contort you into a pretzel. Rather, it's about good health — and joints that have a fuller range of motion are healthier joints. That means more enjoyment and ability to move in all the ways that your busy life demands. The way babies move is the best illustration of range of motion: Their loosey-goosey bodies allow them to eat their toes and sleep completely folded in half. But unfortunately, as we get older, those toes just get further and further away.

Decreasing flexibility is partially the result of normal aging: Your connective tissue and collagen lose water content and get stiffer and weaker, which limits what your joints can do, says sports medicine physician Susan Joy, MD, director of women's sports health at Cleveland Clinic Sports Health. But the way we live is also a huge factor: We sit hunched at desks, in cars and on couches our shoulders creep more forward with each passing year, our hips become misaligned and muscle fibers become shorter. "We stop taking our joints through the range of motion," says yoga teacher and fitness coach Sage Rountree, author of *The Athlete's Guide to Yoga*. Eventually, your body just adapts and figures out ways of moving that require less range of motion. "The muscles we use get strong, and everything else gets tight," Rountree says. However, with some lifestyle changes and specific attention paid to stretching, you can really improve flexibility even in middle age (and older). Increasing your flexibility can make you feel younger and more energized, improve your posture, help reduce the risk for injury and when combined with a cardiovascular and strength-training regimen help you get in shape.

Agility is the ability to change direction quickly and to control body movements, skill requiring rapid movement of the entire body in different directions and in response to unexpected circumstances. In some activities, the ability to stop and start and to change direction accurately and quickly is much more important than in some others (Hockey, 1973). Agility in a general sense is one's ability to quickly adjust to changing environmental conditions. As related to competitive sports and motor movements, agility is defined as the physical ability, which enable an individual to rapidly change body positions and directions in a précised manner" (Johnson and Nelson, 1979). In the context of human motor movements two types of agility viz, specific and general agility are recognized. Specific agility is concerned with movements of body segments

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Methodology

The purpose of the study was to analyses whether flexibility training has any positive influence on the agility performance. The experimental design adopted, the testing procedure and the statistical analysis involved to realize the purpose of the study are explained in the following sections. Twenty six adult male BPE students of Department of physical education were randomly selected for the purpose served as subjects of the study. All the twenty six students were tested before they were once again assigned to two experimental conditions viz, treatment and no treatment (control) conditions. Treatment the subjects in the treatment condition were trained with some specific stretching exercises three times a week on alternate days for four weeks before they were tested finally (post – test) . Prior to each training session, the subjects adequately warmed up. All the subjects of control group as well as experimental group were tested before (pre- test) and after the treatment (post – test) for agility performance (dependent / criterion variable) as well as flexibility. The testing procedure was as described below. For the purpose of measuring performance in agility of the subjects, "Right Boomerang Run" (RBR) test was used. RBR test was selected because of its high validity co-efficient (r = 0.82) using the sum of T – scores for sixteen tests of agility as criterion (Johnson & Nelson, 1979). There were no other tests of agility with validity co efficient as high as that of RBR test. In the RBR test, the time duration is noted for completing run through the stipulated path by changing the direction within the shortest possible time. Time was recorded to the nearest tenth of a second. There was a penalty of one tenth of one second for violating rules. For the purpose of measuring performance inflexibility of the subjects "Modified sit and Reach test "is used. The equipment used for this test is flexo measure case with yardstick and tape. Statistical Treatment Analysis of co-variance (ANCOVA) was used to test the stated hypothesis. Since the primary purpose of this type of analysis to provide an adjustment of post test scores for the difference existing among subjects before the start of the experiment, the pretest scores on agility performance was used as the (Co-Variate) control variable to adjust for chance difference among treatment groups (Keppel,1973). Campbell and Stanley (1963) have also recommended ANCOVA as more precise and highly desirable in such pre-test post-test control design.

Results

The purpose of the study was to see, whether the improvement in flexibility resulting from flexibility training resulted in improvement in agility performance. In order to test the stated hypothesis, the data collected after the treatment conditions (Post-test scores) was subjected to "Analysis of Co-Variance"(ANCOVA) with the test scores collected prior to treatment condition(pre-test scores) as the co Variate or the control variable. The results of statistical analysis and descriptive statistics are presented in the following sections. Presented in table 1 are the descriptive statistics of pre and post test scores of dependent (agility) and independent (flexibility) variables of control and treatment groups. Also presented in the table are the gain scores from pre test to post test which were obtained by subtracting pre test scores out of post test scores. The gain scores thus indicate change in scores from pre to post test situation due to different treatment conditions. Positive gain score in the case of flexibility indicates improvement in flexibility. Since the units of measure for agility is time, the negative gain scores in the case of agility indicates increments in agility performance.

Table I. Mean and Standard Deviations of Agility and Flexibility Pre-test, Post –test and Gain scores of Control and Flexibility Training Groups

		Control group			Flexibility training group		
Variables		pre test	post test	gain score	pre test	post test	gain score
Agility							
	X	14. 355	14.465	0.109	14.503	14.317	-0.187
	Sd	0.499	0.461	0.473	0.688	0.588	0.285
Flexibility							
	X	11.154	12.923	1.769	8.333	14.667	6.333
	Sd	6.162	6.137	2.315	5.025	5.220	2.693

A cursory examination of the table 1 indicates that the control group became slower at the post test situation compared to pre test, while the flexibility training group improved in agility. Same trend can be observed in the case of flexibility.

Table II. Summary of Analysis of Covariance of Agility Post test Scores with Pre Test Scores as Co Variate

Source	sum of Squares	df	mean square	F ratio
Treatment	0.317	1	0.317	2.256 NS
Co – variate	2.651	1	2.651	
Error	2.667	19	0.140	

NS - Not Significant

Evidently, the improvement of performance in agility by the flexibility training group compared to that of the control group was not large enough to be statistically significant. This insignificant result raised doubt whether the flexibility of the experimental group did in fact increase as result of flexibility training. Therefore the flexibility post test scores were also subjected to ANCOVA with its pre test scores as the covariate or control variable. The results of the ANCOVA of flexibility post test scores are summarized in table –III.

Table III. Summary of Analysis of Covariance of Flexibility Post test Scores with Pre Test Scores as Co variate

Source	sum of Squares	df	mean square	F ratio
Treatment	96.121	1	96.121	15.259*
Co – variate	577.329	1	577.329	
Error	119.684	19	6.299	

The results of the flexibility data analysis indicated that the treatment group did in fact become more flexible compared to control group as a result of flexibility training. Therefore, it was decided to cross check the results of ANCOVA for agility by the analysis of gain score. The ANCOVA of agility gain scores are presented in table – IV.

Table IV. Summary of Analysis of Variance of Agility Gain Scores

Source	sum of Squares	df	mean square	F ratio
Treatment	0.466	1	0.466	2.789 NS
Error	3.338	20	0.167	

NS – Not Significant

Therefore the Null hypothesis has been accepted and the alternate hypothesis has been rejected. In other words, under the conditions of present investigation improvement flexibility did not significantly influence the performance in agility of physical education students.

Discussion on Findings

The results of the experimental investigation did not establish any casual relationship between flexibility and performance in agility and the stated hypothesis has been rejected. However, the experimental group did improve in agility more than control group though the difference did not reach the desired level of significance. The analysis of flexibility scores resulted in significant F- ratio showing the experimental group had in fact improved its flexibility significantly. Therefore, it was surprising to observe a result that contradicted the predicted hypothesis. This has raised a suspicion regarding the significant correlation between agility and flexibility.

Conclusion

Based on the discussion, it was concluded that the experimental investigation has resulted in conclusive evidence that flexibility is not casually related to agility. In other words, the performance in agility is independent of one's level of flexibility. If any correlation is observed between flexibility and agility, it may have been only incidental.

Recommendation

It was recommended that similar study be undertaken to investigate the dependency of agility on other factors like strength, power, speed in combination or independently.

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