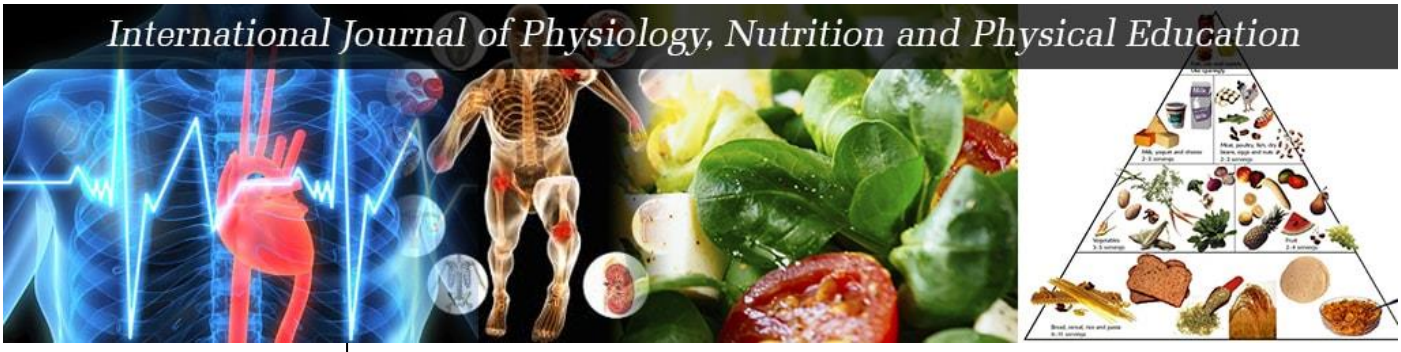

ISSN: 2456-0057
IJPNPE 2018; 3(2): 987-990

www.journalofsports.com
Received: 08-05-2018
Accepted: 09-06-2018

Praveen Mathew
Ph. D Scholar, Department of Physical Education, Annamalai University, Chidambaram, Tamil Nadu, India

Dr. N Prem Kumar
Associate Professor, Dept. of Physical Education, Annamalai University Chidambaram, Tamil Nadu, India

Correspondence
Praveen Mathew
Ph. D Scholar, Department of Physical Education, Annamalai University, Chidambaram, Tamil Nadu, India

Effect of SAQ training and detraining induced adaptation on agility performance of badminton players

Praveen Mathew and Dr. N Prem Kumar

Abstract
The intention of this study was to examine the effect of SAQ training and detraining induced adaptation on agility performance of badminton players. To achieve the purpose of this study, twenty male badminton specialization students from the Department of Physical Education and Sports Sciences, Annamalai University, Chidambaram, Tamil Nadu, India were selected and they were divided into two equal groups of ten each. The experimental group performed SAQ training and the second group acted as control. After the completion of twelve-weeks training period the subjects of group I and II were physically detrained for thirty days. The pre and posttest data on agility performance was statistically analyzed by applying the analysis of covariance (ANCOVA). The data collected on post experimentation and during detraining were statistically analyzed by using two way (3 x 4) factorial ANOVA with last factor repeated measures. Statistical analysis found significant improvement in agility performance due to SAQ training and significant decline during detraining period.

Keywords: SAQ training, detraining, agility performance and badminton players

Introduction
Badminton is a game that is increasing in popularity. Badminton is an extremely demanding sport. At an elite level, players are often required to perform at their limits of speed, agility, flexibility, endurance and strength. On top of all of this, players must maintain a high state of concentration in order to meet the tactical/mental demands of dealing with their opponents. The varied potential stresses of competitive play are considerable. It is therefore essential that everyone involved with the modern game ought to be familiar with the fitness requirements of the game and how 'Badminton fitness' can be enhanced.

The participants use modern training methods to improve technique and increase strength and fitness. The coaches and competitors in these sports are well aware of the advantages to be gained from applying modern methods in training for the sport. The application of modern training methods in a particular sport has improved standards of performance out of all recognition during the last decade. The actual amount of time spent on practice and training by participants in other sports is no longer than that spent by the badminton enthusiast. The difference is that other sports are willing to use modern training methods to improve technique, fitness and strength, whereas the badminton player still relies to a large extent on ability only and the playing of games for self improvement. Very few badminton players use modern methods of training and very many do not know anything about modern training methods.

SAQ training is fast becoming the most popular exercise in the world today. Even in the sports world, many players and coaches did not emphasize the importance of SAQ training if their particular sport did not require them to have high levels of muscular power in order to be competitive. However, in recent years the amount of information and research on SAQ training has exploded. Players of all types, from the professional to the weekend enthusiast now understand the potential benefits of partaking in SAQ training program.

Detraining is also equally important but that has been given considerably less attention by the players and the coaches and practically ignored by the research scholars in exercise and sports sciences. Detraining induces a partial or complete loss of training induced adaptations in response to insufficient training stimuli.

The influence of detraining on agility performance has received little attention and not completely understood. The aim of the present study was to assess the effectiveness of SAQ training and detraining impact on agility performance of badminton players.

Methodology

To achieve the purpose of the study, twenty male badminton specialization students from the Department of Physical Education and Sports Sciences, Annamalai University, Chidambaram, Tamil Nadu, India were selected and they were divided into two equal groups of ten each at random. The age of the subjects ranged from 20 to 23 years. The selected subjects were randomly assigned in to two groups. The experimental group performed SAQ training and group-II acted as control. Further, the researcher was interested in finding out the detraining impact on agility performance. The data on agility performance was collected by administering 'T' test. Pretest data were collected prior to the training programme and posttest data were collected immediately after the twelve-weeks of training programme from both the experimental and control groups. During the detraining period the data were collected once in ten days for 30 days from both the experimental and control groups.

Training Protocol

After the initial measurements the specially designed training programme was given to the subjects of the experimental group-I named as SAQ (speed, agility and quickness) training. The training commenced with one week of general physical conditioning for the experimental groups, so that the subjects were ready physically and mentally to take on specific load administrated to them for the purpose of the study. After one week of conditioning the training was administrated to the experimental group, which includes speed, agility, and quickness drills. The SAQ training sessions were supervised by experienced coaches. The experimental group undertook six SAQ training sessions a week. Sessions were progressively structured to gradually increase intensity over each of the 12 weeks. The load intensity was kept low to moderate in first week and increased progressively in proceeding week moderate to high. The density was adjusted according to intensity because it is inversely related to intensity. The repetition and sets were increased progressively from first week to proceeding week. After the completion of twelve-weeks training period the subjects of group I and II were physically detrained for thirty days.

Statistical Technique

The data collected from the two groups prior to and post experimentation on agility performance was statistically analyzed to find out the significant difference if any, by applying the analysis of covariance (ANCOVA). Whenever the obtained F ratio value was found to be significant for adjusted posttest means, the Scheffe's test was applied as post hoc test. The data collected on post experimentation and during detraining were statistically analyzed by using two way (3 x 4) factorial ANOVA with last factor repeated measures. The simple effect and the Scheffe's test were used as follow up and post hoc test. The analysis of data on agility performance was presented in table-1 to 5.

Results

The mean and standard deviation values on agility performance of SAQ training and control groups at five different stages of tests have been analyzed and presented in table-1

Table 1: The Mean and Standard Deviation on Agility of Pre, Post Tests and Three Cessations of SAQ Training and Control Groups

Groups		Pre Test	Post Test	First Cessation	Second Cessation	Third Cessation
SAQ Training Group	Mean	11.34	9.99	10.09	10.58	10.82
	SD	0.16	0.27	0.31	0.28	0.20
Control Group	Mean	11.33	11.31	11.29	11.39	11.26
	SD	0.16	0.15	0.14	0.11	0.24

The pre test, post test, first, second and third cessation mean values of experimental and control groups on agility are graphically represented in the figure – 1.

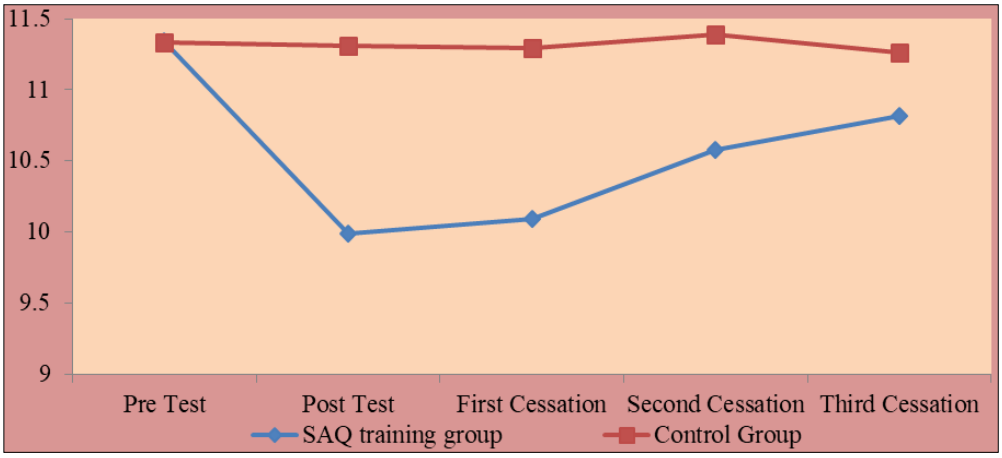

Fig 1: Mean Values of Pre Post Tests and Three Cessations of SAQ Training and Control Groups on Agility

The pre and post test data collected from the experimental and control groups on agility were statistically analyzed by ANCOVA and the results are presented in table- 2.

Table 2: Analysis of Covariance on Agility of SAQ Training and Control Groups

	SAQ Training	Control Group	SoV	SS	df	MS	'F' ratio
Adjusted Post test Mean	9.98	11.31	B	0.32	1	8.85	265.29*
			W	8.85	17	0.033	

The required table value for degrees of freedom 1 and 17 is 4.45.
*Significant at .05 level of confidence

The adjusted post-test mean on agility of SAQ training and control groups are 9.98 and 11.31 respectively. The obtained 'F' ratio value of 265.29 for adjusted post test mean on agility of experimental and control groups was greater than the required table value of 4.45 for the degrees of freedom 1 and 17 at 0.05 level of confidence. Hence it was concluded that due to the effect of twelve weeks of SAQ training the agility performance of the badminton players were significantly improved.

In order to find out the detraining impact, the data collected from the two groups during post test and three cessation periods on agility have been analyzed by two ways factorial ANOVA (2x4) with repeated measures on last factor and the obtained results are presented in table – 3.

Table 3: Two Factors ANOVA on Agility of Groups at Four Different Stages of Tests

Source of Variance	Sum of Squares	df	Mean Squares	Obtained "F" ratio
A factor (Groups)	15.44	1	15.44	110.28*
Group Error	2.50	18	0.14	
B factor (Tests)	1.86	3	0.62	26.95*
AB factor (Interaction) (Groups and Tests)	1.98	3	0.66	28.69*
Error	1.22	54	0.023	

(Table values required for significance at 0.05 level with df 1 and 18, 3 and 54 are 4.41 and 2.72 respectively).

Table – 3 shows that the obtained 'F' ratio value of Interaction A x B (Groups x Different Tests) is 28.69 which is greater than the table value of 2.72 with degrees of freedom 3 and 54 required for significance at 0.05 level of confidence. The result of the study shows that significant difference exist between groups at each test and also between tests for each group on agility.

The results of the study indicate that significant differences exist in the interaction effect between rows (groups) and columns (tests) on agility. Since the interaction effect is significant, the simple effect test has been applied as follow up test and they are presented in table – 4.

Table 4: Simple Effect Scores of Groups at Four Different Stages of Tests on Agility

Source of Variance	Sum of Squares	df	Mean Squares	Obtained "F" ratio
Groups at Post test	8.73	1	8.73	379.56*
Groups at First Cessation	4.44	1	4.44	193.04*
Groups at Second Cessation	3.28	1	3.28	142.60*
Groups at Third Cessation	0.96	1	0.96	41.73*
Tests and Group I	1.29	3	1.29	56.08*
Tests and Group II	0.05	3	0.05	2.17
Error	1.22	54	0.023	

(Table values required for significance at .05 levels with df 1 and 54, & 3 and 54 are 4.03 and 2.79 respectively.)

Table – 4 shows that the obtained 'F' ratio values for groups at post test, first, second and third cessation are 379.56, 193.04, 142.60 and 41.73 respectively, which are higher than the table value of 4.03 with degrees of freedom 1 and 54 required for significance at 0.05 level of confidence. The result of the study indicates that significant difference exists between the paired means of groups at post test, first, second and third cessation on agility.

Table – 4 also shows that 'F' values obtained for tests and group-I is 56.08 which is greater than the table value of 2.79 with the degrees of freedom 3 and 54 whereas, for tests and group-II is 2.17 which is lower than the table value of 2.79 with the degrees of freedom 3 and 54 required for significant at 0.05 level of confidence. The result of the study indicates that significant difference exists between various tests of SAQ training group, however no significant difference exists between various tests of control group on agility.

Since, the obtained 'F' ratio value in the simple effect is found to be significant, the Scheffe's test is applied as post hoc test to find out the paired mean difference, and it is presented in table – 5.

Table 5: Scheffe's Test for the Differences Among Paired Means of SAQ Training Group with Different Tests on Agility

Post test	First cessation	Second cessation	Third cessation	Mean difference	Confidence interval
9.99	10.09			0.10	0.11
9.99		10.58		0.59*	0.11
9.99			10.82	0.83*	0.11
	10.09	10.58		0.49*	0.11
	10.09		10.82	0.73*	0.11
		10.58	10.82	0.24*	0.11

*Significant at .05 level of confidence

Table – 5 shows that the mean differences between post test and second cessation, post test and third cessation, first and second cessation, first cessation and third cessation, second cessation and third cessation of SAQ training group are 0.59, 0.83, 0.49, 0.73 and 0.24 respectively, which are higher than the confidence interval value 0.11. However there is no mean difference between post test and first cessation of SAQ training groups on agility.

Hence it was concluded that the improved agility performance of the participants were sustained only for 10 days during determining period, there after it was started decline towards the base line.

Discussion

The results of the study showed significant improvement on agility performance due to speed, agility and quickness training. This result is in agreement with Polman *et al.,* (2004) [5] who found that SAQ training was effective in the physical conditioning due to a significant improvement in lateral agility. Rienzi *et al.,* (2000) [6] & Bloomfield *et al.,* (2007) [2] viewpoint is that the SAQ regimen is an important training method for the improvement of speed and quickness. Agility has also been shown to be an important fitness component (Jovanovic *et al.,* 2011) [3]. Jullien *et al.,* (2008) demonstrated that a short-term agility training programme (3 weeks duration) improved agility test results. However Jovanovic *et al.,* (2011) [3] found SAQ training is an effective way of improving some aspects of agility performance. Logically, given the nature of SAQ training, this type of training should improve agility, although this would depend on the specific nature of the training and its duration.

The results of the study also indicated that the improved agility performance due to SAQ training was decreased significantly due to detraining. But the significant decrease started after the first cessation toward the base line. Bompa (1999) [1] stated that, speed tends to be the first ability affected by detraining, since the break down of protein and the degenerations of motor units decreases the power capabilities of muscle contraction. He pointed out that, speed loss may also be due to the nervous system's sensitivity to detraining. Also in consistent with the result of the present study Subramaniam & Sivarajan (2005) [8] observed, no significant decrease in speed during the detraining period of first and second cessation, but in the third cessation the efficiency of speed was decreased significantly. A similar investigation was undertaken by Linossier *et al.,* (1997) [4] and Rose & Leveritt (2001) [7] revealed that, long interruption in training has negligible effects on short sprint ability and performance adaptations.

Conclusion

The results of the study showed significant improvement on agility performance due to speed, agility and quickness training. It is also observed in the present study that throughout the detraining period, the gradual decline of agility performance for SAQ training group was found. However, the improved agility performance of the participants were sustained only for 10 days during determining period, there after it was started decline towards the base line. Since gradual loss of training induced adaptations on agility performance was found, it is suggested that the athlete must resume training within ten days of detraining.

References

1. Bompa Tudor O. Periodization Training for Sports, Champaign: Human Kinetics, 1999, 368.
2. Bloomfield *et al.,* Effective Speed and Agility Conditioning Methodology for Random Intermittent Dynamic Type Sports. J Strength Cond Res. 2007; 21(4):1093-100.
3. Jovanovic M *et al.* Effects of Speed, Agility, Quickness Training Method on Power Performance in Elite Soccer Players. J Strength Cond Res. 2011; 25(5):1285-92.
4. Linossier MT *et al.* Enzyme Adaptations of Human Skeletal Muscle during Bicycle Short Sprint Training and Detraining. Acta Physiol Scand. 1997; 161(4):439-45.
5. Polman R *et al.,* Effective Conditioning of Female Soccer Players. Journal of Sports Sciences. 2004; 22(2):191-203.
6. Rienzi E *et al.* Investigation of Anthropometric and Work-Rate Profiles of Elite South American International Soccer Players. Journal of Sports Medicine and Physical Fitness. 2000; 40(2):162-169.
7. Ross A, Leveritt M. Long Term Metabolic and Skeletal Muscle Adaptations to Short Sprint Training: Implications for Sprint Training and Tapering. Sports Med. 2001; 31(15):1063-82.
8. Subramaniam PK, Sivarajan S. Effect of Plyometric Training and Detraining on Speed and Explosive Power. Journal of Physical Education and Exercise Sciences, 2005; 2(1):16-21.