S Tamilselvan
Ph.D., Research Scholar,
Department of Physical
Education, Annamalai
University Study Centre Delhi,
New Delhi, India

Dr. MA Hassan
Professor, Department of Sports
Sciences, Annamalai University
Study Centre Delhi, New Delhi,
India

Impact of Saq (Speed, audio reaction time and QuickNes) and skill based training adaptations on reaction time and coordination among male Kabaddi players

S Tamilselvan and Dr. MA Hassan

Abstract
The purpose of the present study was to find out the impact of SAQ and skill based training adaptations on audio reaction time and coordination among male Kabaddi players. To achieve the purpose of the study, forty five male Kabaddi players from Annamalai University, Annamalainagar, Chidambaram were selected as subjects. The age of the selected subjects were ranged from 18 to 23 years. The selected subjects were classified into three equal groups of fifteen each at random. Group-I (n=15) underwent SAQ training, group-II (n=15) underwent skill based training for twelve weeks and three day per week (Monday, Wednesday and Friday), and group-III (n=15) which did not underwent any training during the period of study apart from their regular routine activities acted as control. The following variables namely audio reaction time and coordination were selected as dependent variable for the study. Audio reaction time was measured by administering Digital Chronoscope and coordination was assessed by alternative hand wall toss test. The result of the study shows that SAQ training and skill based training were remarkably enhanced the audio reaction time and coordination of male Kabaddi players.

Keywords: SAQ training, skill based training, audio reaction time, coordination and Kabaddi

Introduction
Many team sports include complex human movement, which can be observed at different levels of detail. This is especially true for team sports Kabaddi. Kabaddi is one of the most popular team based sports and has been played by both men and women throughout the world. Kabaddi is basically an outdoor team game, played in the tropical countries of Asia. The excitement and thrill provided by the game has made it very popular and Kabaddi is rightly called the 'Game of the masses', since spectators totally involve themselves and give the players a great deal of encouragement. Speed, audio reaction time, and quickness to cover the complete spectrum intensity of exercise, from low intensity to high intensity. SAQ drills can also be used to improve the physical condition of athletes (Prasad & Dhapola, 2014) [7]. The SAQ exercise is a training method that has been commonly used by athletes, both beginners and advanced, in recent times. SAQ is an acronym of the transitional Speed, Agility and Quickness. SAQ exercises incorporated in the modern training system produced, within a single training programme, the integrated effects of many physical capacities. Also, Remco, Jonathan, & Andrew, (2009) [6] contend that training systems integrated with SAQ are designed for improvement of compatibility of acceleration between the hand and the eye along with the explosive power and the response speed. That exercises SAQ integrated training system is designed to improve acceleration, compatibility between the Eye and the hand, the explosive power, the speed of response (Remco, Jonathan, & Andrew, 2009) [6]. Exercise of speed, agility, and quickness (SAQ) has become a popular way to train athletes. Speed, agility and quickness to cover the complete spectrum intensity of exercise, from low intensity to high intensity. SAQ drills can also be used to improve the physical condition of athletes (Prasad & Dhapola, 2014) [7].

High-intensity, intermittent team sports require athletes to have well developed speed, muscular strength and power, audio reaction time, and maximal aerobic power. However, while well-developed physiological capacities are important for team sports, athletes are also required to have well-developed technical skill and decision-making ability.

Corresponding Author:
S Tamilselvan
Ph.D., Research Scholar,
Department of Physical
Education, Annamalai
University Study Centre Delhi,
New Delhi, India

In addition, athletes are often required to demonstrate these qualities under high levels of pressure and fatigue. Studies of team-sport athletes have consistently shown higher skilled players to have superior speed, muscular power, and maximal aerobic power than their lower skilled counterparts. Similarly, in the team-sport environment, significant expert-novice differences have been demonstrated in pattern recognition (Williams *et al*., 2006) [3], decision-making, dual-task performance, and anticipation. Given the importance of these physiological and skill qualities to team-sport performance, coaches have great interest in finding the most effective methods of developing these attributes in their athletes.

Game-based training is increasingly being used to improve the skill and physical fitness of team-sport athletes. The use of games in training is based on the premise that the greatest improvements in performance occur when the physiological demands and movements patterns replicate the demands of the sport. However, studies investigating the effectiveness of game-based training are limited, with many of the suggested advantages and disadvantages of game-based training based on anecdotal evidence.

Methods

The purpose of the study is to investigate the relative effect of SAQ training verses skill based training on selected audio reaction time and coordination of Kabaddi players. To achieve the purpose of the study, forty five male Kabaddi players from Annamalai University, Chidambaram, Tamil Nadu, India were selected as subjects. Their age ranged from 18 years to 23 years. The selected subjects were randomly assigned into three equal groups of 15 subjects each. Group-I underwent SAQ training, Group-II underwent skill based training and group-III acted as control. The training programme was carried out for three days (Monday, Wednesday and Friday) per week during morning session only (6 am to 8 am) for twelve weeks. Audio reaction time was measured by administering shuttle run test and coordination was assessed by alternative hand wall toss test. Before applying the experiment all the subjects of the SAQ training, skill based training and control groups were attended the pre-test, which was conducted a day prior to the commencement of the training and the data were collected on shuttle run and alternative hand wall toss test. After twelve weeks of training the post-test was conducted one day after the training period to find out any changes in the criterion variables.

The 't' ratio and analysis of covariance (ANCOVA) was used to find out the significant difference if any, among the experimental groups and control group on selected criterion variables separately. In all the cases, 0.05 level of confidence was fixed to test the significance, which was considered as an appropriate. Since there was three groups were involved in this study, the Scheffě *S* test was used as pos-hoc test and it was shown in Table -2.

Analysis of Data

The data collected prior to and after the experimental periods on audio reaction time and coordination on SAQ training group, skill based training group and control group were analysed and presented in the following table - 1.

Table 1: Paird't' test results and % of changes on audio reaction time & coordination of chosen experimental and control groups

Group	Test	N	Mean	SD	DM	't' - ratio	%
Audio reaction time							
SAQ Training	Pre	15	124.20	2.07	4.60	8.10*	3.70
	Post	15	119.60	1.63			
Skill Based Training	Pre	15	123.60	1.99	2.44	4.00*	1.99
	Post	15	120.40	1.57			
Control	Pre	15	124.00	1.92	0.001	0.02	0.21
	Post	15	123.93	2.05			
Coordination							
SAQ Training	Pre	15	11.66	1.17	3.13	13.25*	26.85
	Post	15	14.80	1.26			
Skill Based Training	Pre	15	12.06	1.38	1.06	2.78*	8.83
	Post	15	13.13	1.06			
Control	Pre	15	11.20	1.69	0.06	0.12	0.59
	Post	15	11.26	1.09			

Table value for df 14 is 2.15(*significant)

The pre and post values of both training groups differ considerably since the 't' values of SAQ (8.10) as well as skill based training (4.00) groups were greater than the table value (df14=2.15). After 12 weeks of treatment, SAQ (3.70%) and skill based training (1.99%), group's audio reaction time performance enhanced considerably. The pre and post values of both training groups differ considerably since the 't' values of SAQ (13.25) as well as skill based training (2.78) groups were greater than the table value (df14=2.15). After 12 weeks of treatment, SAQ (26.85%) and skill based training (8.83%), group's Co-ordination performance enhanced considerably. By using ANCOVA statistics, the audio reaction time and co-ordination performance of all 3 groups were analyzed and exhibited in the following table.

Table 2: Ancova statistics output on audio reaction time and coordination performance of experimental and control groups

	SAQ Training	Skill Based Training	Control	SoV	SS	df	MS	'F' ratio
Audio reaction time								
Adjusted Mean	119.54	120.98	123.53	B	121.85	2	60.92	26.22*
				W	95.26	41	2.32	
Coordination								
Adjusted Mean	14.79	13.04	11.36	B	86.92	2	43.39	34.97*
				W	50.87	41	1.24	

Table value for df 2 & 41 is 3.23*Significant (.05 level)

In table – 2, it was shown that the ANCOVA result proved about the adjusted final means (SAQ=119.54 SBT=120.98 & CG=123.53) on audio reaction time performance of all 3 chosen groups significantly differs, as the derived 'F' value (26.22) is better than the required value (*df 2 & 41* =3.23). The ANCOVA result proved that the adjusted final means (SAQ=14.79, SBT=13.04 & CG=11.36) on Co-ordination performance of all 3 chosen groups significantly differs, as the derived 'F' value (34.97) is better than the required value (*df 2 & 41* =3.23). As the adjusted final means is significant, the follow up test was applied as put on view in table - 3.

Table 3: Scheffe's Test Outcome on Audio reaction time and Coordination Performance of Experimental and Control Groups

Variable	SAQ Training	Skill Based Training	Control	MD	CI
Auditory Reaction Time	119.54	120.98		1.44*	1.41
	119.54		123.53	3.99*	1.41
		120.98	123.53	2.55*	1.41
Co-ordination	14.79	13.04		1.75*	1.03
	14.79		11.36	3.43*	1.03
		13.04	11.36	1.68*	1.03

*Significant (0.05)

The adjusted post-test mean difference on auditory reaction time between SAQ training group and skill based training group was 1.44, SAQ training group and control group was 3.99 and skill based training group and control group was 2.55 which was significant at 0.05 level of confidence. The adjusted post-test mean difference on coordination between SAQ training group and skill based training group was 1.75, SAQ training group and control group was 3.43 and skill based training group and control group was 1.68 which was significant at 0.05 level of confidence.

Conclusion and Discussion
The results of the study indicated that there is a significant improvement on motor fitness and psycho-physiological variables due to the effects of 12 weeks of SAQ training among Kabaddi players. These results demonstrate that specific speed and audio reaction time training (SAQ), as part of the overall training process, can be considered a useful tool for the improvement of speed and audio reaction time among kabaddi players. Azmi, & Kusnanik, (2018) [1] found greater increase in speed, audio reaction time and acceleration due to speed, audio reaction time and quickness training program. Further, Milanovic *et al*., (2014) [4] found significant increase speed and flexibility in young soccer players due to 12 week speed, audio reaction time and quickness (SAQ) training program. Hence this form of training is thought to encourage the adaptation of movement mechanics, length and frequency of steps, and increased hip height in the pursuit of increased speed, audio reaction time and quickness (Pearson, (2001) [5]. Jullien *et al*., (2008) [2] demonstrated that a short-term audio reaction time training programme (3 weeks duration) improved audio reaction time test results. A study conducted by Sakthivel and Kumaresan (2020) [8] also found significant improvement in physical fitness variables like audio reaction time, leg explosive power and muscular strength endurance and overall playing ability of inter university level male Kabaddi players due to specific Kabaddi skill training.

References
1. Azmi K, Kusnanik NW. Effect of Exercise Program Speed, Audio reaction time, and Quickness (SAQ) in Improving Speed, Audio reaction time, and Acceleration. Journal of Physics: Conf. Series. 2018;947:012043.
2. Jullien H, Bisch C, Largouët N, Manouvrier C, Carling CJ, Amiard V. Does a short period of lower limb strength training improve performance in field-based tests of running and audio reaction time in young professional soccer players? The Journal of Strength and Conditioning Research. 2008;22(2):404–411.
3. Little T, Williams AG. Specificity of acceleration, maximum speed and audio reaction time in professional soccer players. The Journal of Strength and Conditioning Research. 2006;19(1):76–78.
4. Milanovic Z, Sporis G, Trajkovic N, Sekulic D, James N, Vuckovic G. Does SAQ training improve the speed and flexibility of young soccer players? A randomized controlled trial. Hum Mov Sci. 2014;38:197-208.
5. Pearson, A. Speed, Audio reaction time and Quickeness for Soccer. London, United Kingdom: A & C Black, 2001.
6. Polman, Remco. Bloomfield, Jonathan., and Edwards, Andrew. Effects of SAQ training and small-sided games on neuromuscular functioning in untrained subjects. International journal of sports physiology and performance. 2009;4(4):494-505.
7. Prasad, Rahul Kumar, Dhapola MS. Effect of eight weeks S.A.Q. training programme on selected physical fitness variables, Golden Research Thoughts. 2014;3(7):1.
8. Sakthivel, Kumaresan. Effect of Specific Kabaddi Skill Training with Video Feedback Instructional Training on Physical Fitness Variables and Overall Playing Ability among Inter University Level Male Kabaddi Players, Journal of Information and Computational Science. 2020;10(3):976-988.