

THE EFFECT OF SAQ EXERCISES ON PHYSICAL FITNESS LEVEL AND PERFORMANCE OF BASKETBALL PLAYERS

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ABSTRACT

Basketball is a team sport that contains varied activities and various technical skills that a player must perform during the game. Basketball player required to perform a combinations of speed, agility and jumping abilities to achieve the best performance. SAQ training is known as one of the most effective training methods to improve performance in team sports. This study aimed to identify the effect of the of SAQ exercises training on the level of physical fitness and skillful performance levels of basketball players. Sixteen female basketball players was included in this study. The mean of their age, weight and height were (18.29 ± 1.17) years, (63.91 ± 1.25) kg, and (165 ± 2.33) cm, respectively. Participants was divided into two groups, experimental and control. All participants agreed to participate in the study and were familiar with SAQ training. Pre - posttest measurements were taken. The most important results obtained from this study that 8 weeks of SAQ exercises training was effective on improving physical fitness level and skill performance in basketball players. SAQ training showed an improvement in muscles strength and some skills performance.

Keywords: Basketball, SAQ training, fitness.

1. INTRODUCTION

Basketball is one of the most dynamic game that required various technical and tactical skills that player must perform in order to meet the game nature. It requires players to perform different movements in multiple planes of motion with rapid transitions from jogging to sprinting and jumping. Players are required to perform a mixture of physical abilities including muscular strength, speed, change of direction, power and endurance. Therefore, improving the speed and accuracy of the motor compatibility of the basketball player requires the development of different combinations of the skills performance. The association between performance skills together with psychological characteristics of basketball players certainly determines the successful game of basketball which determine the achievement of the players during the game (Trunić & Mladenović, 2014). Research was focused on the most training methods that may improve sprinting, strength, and muscular power which are considered as the most important fundamentals for successful participation in basketball (Pena et al., 2018). Recently speed, agility and quickness training (SAQ) were used as a common method to produce an integral effect in athlete's fitness level. The development of speed, agility and quickness (SAQ) are essential for developing motor abilities and body motion which represent the development of the neuromuscular system (Azmi & Kusnank, 2018). Polman et al. (2004) indicated that training of the SAQ is an integrated training system designed to improve acceleration, eye-to-hand compatibility, explosive capability, and response speed. In soccer, SAQ training is thought to enable to become better at reacting to

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stimuli, improve acceleration, move effectively in multiple directions and change direction or stop quickly to make a play in a fast, efficient, smooth, and repeatable manner (Polman et al, 2009). Jovanovic et al. (2011) suggest that the SAQ is derived from the initial characters of both the speed, agility and speed. Velmurugan & Palanisamy (2012) adds that SAQ training is a modern training system that results in integrated effects of many physical abilities within a single training program. Research has demonstrated the importance of speed and agility training for basketball players, thus the aim of this study was to examine the effectiveness of using SAQ training on the development of some physical variables and performance of offensive skills in basketball players.

2. METHODS AND MATERIALS

2.1 Participants

The research sample for the study were 20 female students of physical education department from Sultan Qaboos University in Oman. Participants were divided into two groups, experimental and control group. All participants agreed to participate in the study and were familiar with SAQ training. For the present study pre and posttest randomized group design which consists of control group and experimental group was used. The mean and standard deviation of age, weight and height of the participants were (18.29 ± 1.17) years, (63.91 ± 1.25) kg, and (165 ± 2.33) cm, respectively.

2.2 ANTHROPOMETRICS VARIABLES AND TESTING PROCEDURES

Participants were asked to report to the female sport complex in the morning. Their height (cm), body mass (kg) and percentage of body fat were taken before conducting the study. Height was recorded using stadiometer accurate to 1 cm (SECA, Germany), while body mass was measured using electronic scale (Tanita, Japan) accurate to 0.1 kg.

The subjects were matched in the experimental group and control group and were exposed to SAQ exercise training for 8 weeks, 3 sessions /week for 40 minutes. At the beginning of each session, 10 minutes of warm up was applied to experimental group. Participants performed 20 minutes of exercises including vertical jump, hand strength, balance, leg strength and speed and agility exercises. Vertical jump was measured using Optojump test, hand strength was measured using handgrip dynamometer, balance was measured using Standing Balance test, leg strength was measured using leg Dynamometer test, Maneuver Speed was measured using Maneuver Speed test (20m) and Throwing speed was measured using Throwing Speed for (30s).

2.3 STATISTICAL ANALYSIS

Data analysis was performed using the SPSS v.15.0 and level of statistical significance was set at 0.05. Mean, standard deviation, median and interquartile range were calculated. Categorical data are presented as frequencies and percentages. Unpaired student's *t*-test was used to detect differences between groups.

3. RESULTS AND DISCUSSION

Results of the statistical analysis is presented in the following tables which is followed by their interpretation and discussion.

Table 1: M±SD for anthropometrics, fitness and the skills performance of the research sample

Variables	Units	SMA	Standard deviation	Mediator	Torsion coefficient
Age	Year	18.29	1.17	18.20	0.230
Height	Cm	165.82	2.33	165.00	1.055
Weight	Kg	63.91	1.25	63.50	0.984
Arm Strength	No	18.15	1.22	18.00	0.368
Leg strength	Kg	41.13	1.45	41.00	0.268
Legs capacity	Cm	29.70	1.17	29.60	0.256
Arm capacity	M	6.63	0.32	6.50	1.695
RLB	S	7.23	0.45	7.00	1.533
LLB	S	7.10	0.22	7.00	1.363
MWS	S	8.41	0.11	8.40	0.833
T S	No	7.38	0.21	7.35	0.967
MS(30s)	S	11.32	0.29	11.30	0.358

Right leg Balance (RLB), Left leg Balance (LLB), maneuver with shooting, (MWS) Maneuver Speed(MS), Throwing Speed(TS).

Table 2: The differences between pre and non-pre standards in the level of some physical variables and the skillful performance of basketball players of experimental research group

variable	unit	Experimental group		Aver	Improv %	Control group		Diffe aver	Improv %	(T) Value Post-Test (EXP - CON)	Sig
		Pre test	Post test			Pre test	Post test				
		Mean ± SD	Mean ± SD			Mean ± SD	Mean ± SD				
Arm Strength	Num	18.10±1.25	24.45±0.26	5.35	29.55%	18.15±1.31	20.60±0.51	2.45	13.49%	3.11	S
Leg strength	Kg	41.35±0.96	46.70±0.36	5.35	12.93%	41.32±0.69	43.90±0.25	2.58	6.26 %	3.24	S
Legs capacity	Cm	29.65±0.47	34.18±0.32	4.53	15.27%	29.20±0.47	31.17±0.32	1.97	6.74 %	3.64	S
Arm capacity	M	6.62±0.32	8.15±0.47	1.53	23.11%	6.68±0.32	7.15±0.47	0.47	7.03 %	3.48	S
RLB	S	7.15±0.15	11.12±0.36	3.97	55.52%	7.12±0.47	9.20±0.32	2.08	29.21%	2.98	S
LLB	S	7.09±0.25	12.60±0.85	5.51	77.71%	7.10±0.62	9.18±0.15	2.08	29.29%	3.87	S
MWS	S	8.38±0.25	6.22±0.11	2.16	34.72%	8.38±0.62	7.88±0.11	0.48	6.09 %	3.32	S
T S	Num	7.32±0.14	12.25±0.02	4.93	67.34%	7.31±0.21	9.50±0.24	2.19	29.95%	3.45	S
MS(30s)	S	11.31±0.17	8.55±0.15	2.76	32.28%	11.28±0.52	10.60±0.18	0.68	6.41 %	3.66	S

Significant Difference ($p \leq 0.05$) = 1.746 between post-test for experimental and control group.

Table 2 shows significant differences between the averages of pre and post measurements at the physical fitness variables and the skill level of the basketball players ($p \leq 0.05$).

Results showed there was an improvement in physical fitness variables and skills performance between pre and post SAQ training for the experimental group. The average rate of improvement using the SAQ training was higher than the improvement rate of the control group. The reason for this may be that the proposed training program using SAQ training enhanced performance by developing the ability to link the technical skills used in the offensive skills of the experimental group. The increase in the rate of improvement of physical abilities may be due to the positive impact of the group of exercises, which led players to put more effort that effect the efficiency of the nervous system which led to increase the correlation between sensory nerves affected by the stimuli found within the program and its link with the motor nerves which led to the development and improvement of the physical abilities that included in this study.

The researchers suggested that the proposed program using the SAQ training has included the training of compatibility in the development of the element of the speed of transition, which generated an involuntary muscle contraction that raises other sensory organs and thus increase the number of motor units in the muscles working on these joints to increase muscle strength as well as to match the training of the SAQ with the movements that lead to competition. This results were consistent with what Milanović, Sporiš Trajković, Sekulić, James, and Vučković (2014) that showed SAQ training contributed to the improvement of some special physical abilities.

The researchers also attribute this progress to the competence of the control group as regularity and continuity of practice, as well as continuous competition among the players to provide the best physical and skillful performance has had a significant impact on raising the level of physical abilities, which reflected the impact on the development of skills.

These results were in consistent with the findings of Zaidan (2007) that found skill training alone was not sufficient to improve skill and obtain successful results. In addition to skill development, it is necessary to develop the motor abilities of the skill itself. Since basketball requires high physical and professional abilities, muscle compatibility, motor creativity, sense of time, space and a sense of dynamic performance that is diverse and inclusive, the SAQ training was effective on improving muscles strength of both legs and arms as well as improving balance as the success of offensive skills in basketball requires the ability of the muscles of the two legs in order that players can jump forward and higher for the maximum distance and the strength and ability of the arms so characterized by the beating force marked by speed. These results were in agreements with Fan and Zhao (2009) who pointed out the importance of physical components (strength and muscular strength) in basketball and its effect in skill performance.

The researchers attributed the results of this study to the performance of the offensive skills that required the participation of many muscle groups along with arms and shoulder to be performed with the required force. This might have occurred by transferring the force generated from the leg muscles through the trunk to end with the player fingers, which requires a motor transport in which the transfer of the body force and apply it in a way that ensures that the shooting is as strong and quick as possible. The results of this study agree with the study of John (2009) who demonstrated that the SAQ training play an important role on the improvement of athlete's leg strength, arms strength and balance.

4. CONCLUSION

On the basis of obtained results it is concluded that- SAQ training has improved the physical fitness of basketball players as well as the skill level of basketball players.

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