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Original article

INFLUENCE OF SAQ TRAINING ON REACTION TIME OF 100 SPRINT START AND BLOCK ACCELERATION

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Abstract

Aim. Speed, Agility, Quickness is a system of training that enhances performance levels in all sports. SAQ exercises integrated training system designed to improve acceleration, compatibility between the eye and the hand, the explosive power, the speed of response. The nature of the correlation between the three training elements (transitional speed, agility and speed motor). The aim of this study was to investigate influence of SAQ drills on the reaction time and acceleration block for male college students.

Methods. Forty male college students from first grade at the Faculty of Physical Education, Mansoura University, divided into two groups. The experimental group (n = 20) performed SAQ training and control group (n = 20) performed traditional exercise. Subjects were required to read and complete a health questionnaire and informed consent document; there was no history of injuries, diabetes or recent surgery.

Results. The results revealed Significant Difference between the experimental group and control group in Standing Long Jump Test, Flying Start 30m Sprint and Reaction time for posttest to the experimental group.

Conclusion: our suggestion is that male college students can benefit by reinforcing muscles and improving the speed types and reaction time through SAQ exercises.

Key words: SAQ exercises, 100m Sprinting, Acceleration, Speed

Introduction

The coaches Players Sports scientists looking continuously on the roads of modern training with the aim of improving the sport performance and to gain a competitive advantage, S.A.Q training is one of the latest of these techniques used in the sports field.

If look to all sports events almost without exception, observed that it requires rapid movements; S.A.Q training could to improve the efficiency of the sports performance through the development of this aspect.

Amr (2016) indicated that S.A.Q training has become one of the exercises commonly used in the sports field, and has proved its effectiveness in improving the physical abilities and mobility of players in many sports events.

It is additional program (Supplementary) practice beside resistance exercises, which exercise in the gym halls, in order to take advantage of the output of the muscular strength gained from the training and transfer of field performance through S.A.Q. training.

S.A.Q Training focus on the model of the proper running (running technique), as well as patterns of explosive mobility in the sports which require the maximum speed, agility and Quickness essential for the sports achievement.

It is possible to use the S.A.Q training unilaterally any training on each element whether the speed of transition or grace or speed in response to the dynamics of alone from the other, will achieve the desired results. However, if used together in an integrated manner within the unit daily training they will achieve great results in improving the professional sport performance.

It is already note that S.A.Q training designed to fit the requirements of the athletes of a high level with the aim of reaching them to the summit of the sport performance that called the Edge. Nevertheless, it can used in an objective to the beginners and young people through the training loads Sunni their ages, but studies have shown its effectiveness also disabled persons.

In addition, refers (Mario, et al., 2011) that the term SAQ derived from the first letters of both of the transitional Speed, agility and Quickness.

Velmurugan and Palanisamy (2012) noted that SAQ exercises modern training system produces integrated effects of many physical capacities within a single training program.

Moreover, refers (Remco, et al., 2009) that SAQ exercises integrated training system designed to improve acceleration, compatibility between the eye and the hand, the explosive power, the speed of

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response.

On the nature of the correlation between the three training elements (transitional speed, agility and speed motor).

Baechle, et al., (2000) noted that the transition speed is the player's ability to perform sequential and similar movements in the shortest possible time, while it is agility to change the conditions in the air, and the ability of the motor speed is the maximum contraction or motor response to muscle in as little time as possible.

Vikram (2008) explains the difference between the transitional speed and speed motor that transition speed need time to reach the maximum speed of which must be incremental, and this is evident in the running races. in which the player for a time sufficient needs to get from speed zero to maximum speed, while speed motor. They do not need to this time, but the maximum muscle contraction in the shortest possible time and appear in the explosive movements of some sports.

While (Baechle, et al., 2000) sees that existence of similarity between the terms of motor speed and speed of reaction time.

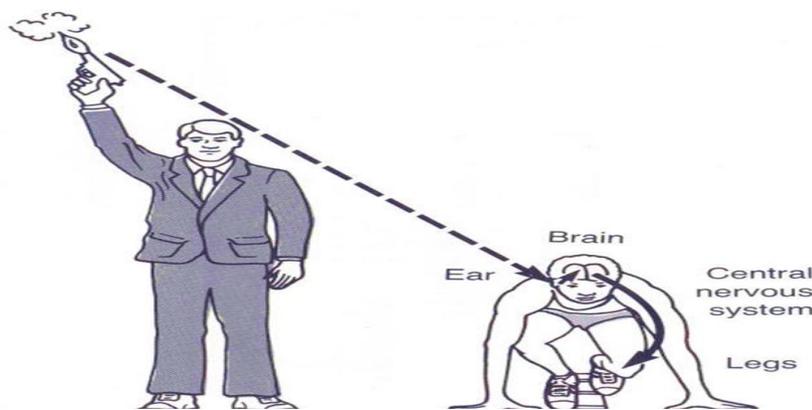


Fig 1 explain the primary step of reaction Time

Every time a foot makes contact with the ground, there is a slight braking before pushing off again. For elite athletes this contact is quicker than the blink of an eye.

Reaction time is an inherent ability. However, overall response time can be improved by practice. Coach and athletes need to analyze the type of skill and the requirements of their sport and decide where overall response gains can be made. Consider the following:

1. Detecting the cue :
2. Decision making :
3. attention focus :
4. Controlling anxiety :

In 100m sprinting event, sprinting speed is the most important factor for predicting success.

Sprinting is a holistic activity and it is difficult to separate exercise into individual component parts. Nevertheless, for training purposes, we emphasize these separate components of sprinting speed development: sprinting (full-speed- full recovery), relaxation, and power production.

Sprinting is absolute speed, can be trained through repetitions of short distances (30-100m), done at or near full speed, in a relaxed manner. Sprinters emphasize relaxation in all of our speed training and do not want the athlete to train to hold full speed (in training). Also, emphasize variety in these sprint work intervals, which may help avoid a plateauing effect that possible in repetitive exercise at the same intensity. (Amr, 2016)

When athletes are in the starting phase, they have to block everything out. Just concentrate and be steady. Starting pistol fired, the brain sends a signal to the muscles and everything goes into automatic mode. A runner's body remains low; muscles contract to create the force necessary to push against the starting blocks. Then it is time to accelerate. (Lee et al., 2005)

5. Creating optimum levels of motivation - 'psyching up'
6. Warm up :

Reaction time in track and field known to be a pivotal aspect of a top-level athlete's technical arsenal, separating the gifted from the elite. Reaction time defined as the interval of time between the onset of a stimulus, and the initiation of a response (Magill & Anderson, 2014).

It is through access to the global information network (Internet) noted researcher modernity SAQ training in the sports field indicates. Where (Velmurugan, Palanisamy, 2012) noted that SAQ training is one of the modern training trends in the

field of sports and studies on physical & physiological effects for youth and adult players differed in results and different way to dealt with in the sports field.

Based on the foregoing, the aim of this study was to investigate influence of SAQ drills on the reaction time and acceleration blockfor male college students.

Methods

Samples

Forty male college students from first grade at the Faculty of Physical Education, Mansoura University, divided into two groups. The experimental group (n = 20) performed SAQ training and control group (n = 20) performed traditional exercise.

Subjects were required to read and complete a health questionnaire and informed consent document; there was no history of injuries, diabetes or recent surgery.

Experimental Approach to the Problem

Two groups (experimental and control) performed a pre and post - training designed intervention in which Standing Long Jump Test, Flying Start 30m Sprint and reaction time test. The experimental group (EG) (20 male college students) trained 1 hour per day twice time a week on SAQ exercises for ten weeks. The control group (20 male collegestudents) continued their normal training, while the experimental group completed SAQ exercises program to see whether this type of training modality would have a positive or negative or no effect on physical variables and reaction time and acceleration block.

Conditions of sample selection :

- Chronological age at least 17years not more than 19 years .
- Have a desire to participate in the search and regularity until the end of the experiment .
- Not have a previous history of patients or their injuries predecessor .
- Student's developments and non-survivors of the restart .
- Enrolled in a faculty that students taught by the researcher.

Reasons for selecting community and the research sample:

- 100m sprint contest taught in core courses of the second semester of the first year students at the Faculty of Physical Education - Mansoura University.
- Student's research community have no previous experience of 100m sprint event (beginners).

- Possibility of the availability of stadiums, as well as hardware and tools within the college, and used by researchers to achieve the objectives of the research.

Testing Procedures

Subjects assessed before and after ten weeks of SAQ exercises program. All measurements taken one week before and after training at the same time of day. Tests followed a general warm-up that consisted of running, calisthenics, and stretching

Flying Start 30m Sprint Test

- Equipment: 40 m tape measure, stopwatch.
- Target Population: 100m sprinter.
- Advantages: Gives an idea of speed regardless of reaction time.
- Disadvantages: Subject to timing errors.
- Procedure: Mark out a 40 meter run with a 'timing' start line 10 m into the run. Using a standing start run the 40 m as quickly as possible. Have someone start the run and time it from the 10 m line to the 40 m line, so a flying 30 m time is gained.

Standing Long Jump Test

To undertake this test it will require:

- Long Jump pit
 - 30 meter tape measure
 - Assistant
- Conduct the test
- The athlete warms up for 10 minutes
 - The athlete places their feet over the edge of the sandpit, crouches down and using the arms and legs jumps horizontally as far as possible landing with both feet into the sandpit
 - The assistant measures and records the distance from the edge of the sandpit to the nearest impression made by the athlete in the sand pit
 - The athlete repeats the test 3 times
 - The assistant uses the longest recorded distance to assess the athlete's leg strength

Reaction time Test

To undertake this test it will require reaction timer tool.



Fig 2 explain the American Educational Reaction Timer tool.



- The number of training units:
- The number of weekly units (3) units weekly at a rate of 3×10 weeks = 30 units proposed program.
 - Training method used:
 - The researcher used the interval method of high intensity, speed training, quickness training, in addition to the content of the exercises of a nature similar performance.
- The scientific basis of the training program in a way pregnancy is high intensity interval:
- Repetition maximum 30 w determined for each exercise of exercise selected.
 - Identify load each exercise.
 - weightlifting exercises for the development of the transition speed is determined by intensity of 75% taking into account the gradient in those wrenches, and to be a repetition of 8-12mrh.
 - Rest between each exercise 60 leads, including the prolongation exercise because a circuit training exercises, taking into account the use of the pulse at rest and after effort in determining rest periods used under discussion.
 - Training department selected lead three times punctuated by periods of rest between each of them because the circuit training group.
 - 2-4q rest between groups.
 - Repetition maximum is measured through the 30th of each exercise every 3 weeks to determine the load each stage of the program.
 - Determine the severity of the loads and weight of the weights or resistors used in kg according to the weight and the objective to be emerging from the training.
 - Selection and training department content:
 - (50) Exercise to put it inside the training departments in the form of plants have been identified each circle on the number of exercises ranked according to the objective to achieve. With the performance of the departments, training has also mentioned in training programs, this taking into account the researcher in the selection of quality exercise to be similar to the nature of the performance in the hand and muscles working in performance, along with muscle work between the muscles working and anti-balance.

Module parts:

A - Part primer (preparatory):

- This section includes warm-up exercises for the purpose of heating up the muscles and blood movement within the muscles and raising the body temperature and the development of the central nervous system.
- This part takes between (12-20q) from the module time.

(B) The main part:

- SAQ includes exercises for the development of physical capabilities, and this part take between (40-45q) and (60-70q) Max.

C-concluding part:

- This is followed by the main part of the period of calm and relaxation, it included a set of exercises designed to physiological responses return to normal levels, and this part take between (5-10q).

- Accordingly, the researcher form the training load cycles within period cycle, consisting of (8) weeks training in accordance with the foundations of the formation of the training load, where the division of the total period to weeks and then was division per week (3) training units daily used wave way. (1: 1), (2: 1),

Steps to implement Search:

- After selecting the key variables, tools and devices used, the researcher conducting physical measurements and the level of performance of Jump Shoot in light of the following procedures.
- Tribal measurements of the physical tests and lasted two days.
- Start implementation of SAQ training program where the implementation of the program took (10) weeks and consists of (30) by a training unit (3) training units per week
- A posteriori measurements directly after the completion of the application of the basic experience will held on as the same tribal m measurements sequence.

Statistical analysis

All statistical analyses were calculated by the SPSS statistical package. The results are reported as means and standard deviations (SD). Differences between two groups were reported as mean difference $\pm 95\%$ confidence intervals (meandiff $\pm 95\%$ CI). Student's t-test for independent samples was used to determine the differences in fitness parameters between the two groups. The $p < 0.05$ was considered as statistically significant.



Results

Table 1. Anthropometric Characteristics Training experience of the Groups (Mean \pm SD)

| Group | N | Age [years] | Weight [kg] | Height [cm] |
|--------------|----|-----------------|---------------|----------------|
| Experimental | 20 | 18.17 \pm 0.4 | 69 \pm 2.87 | 176 \pm 3.67 |
| Control | 20 | 18.09 \pm 0.6 | 71 \pm 3.43 | 175 \pm 4.11 |

Table 1 shows the age and anthropometric characteristics of the subjects. There were no significant differences observed in the anthropometric characteristics for the subjects in the different groups.

Table 2. Mean \pm SD and "T" Test between the two Groups (experimental and control) in Dynamic balance, Hand Grip Strength, Static strength test (LS) (BS) and Performance level of javelin throw

| Variables | Experimental group | | Control group | | Sign. |
|-------------------------|--------------------|-----------------|-----------------|-----------------|-------|
| | Before | After | Before | After | |
| Standing Long Jump Test | 2.15 \pm 0.23 | 2.25 \pm 0.31 | 2.19 \pm 0.21 | 2.20 \pm 0.29 | S |
| Flying Start 30m Sprint | 5.99 \pm 0.18 | 5.82 \pm 0.23 | 5.96 \pm 0.14 | 5.90 \pm 0.26 | NS |
| Reaction time | 0.26 \pm 0.03 | 0.21 \pm 0.06 | 0.27 \pm 0.08 | 0.25 \pm 0.03 | S |

Table 2 shows that Significant Difference between the experimental group and control group in Standing Long Jump Test, Flying Start 30m Sprint and Reaction time for posttest to the experimental group.

Discussion

Speed is max velocity. Generally, max speed development requires about 6-8 seconds at max or near max effort with a full rest recovery so your heart rate is about normal before beginning the next exercise. (Jon, Robert, 2009)

SAQ structured by a system a progressive sequence of training 'phases'. Called the 'Continuum' it gives coaches a natural confidence in delivery. Players guaranteed to see improvements in their explosive, multi-directional speed, agility and quickness, acceleration/ deceleration, quality and speed of response control as they progress. A brief description follows:

The results confirmed by (Neitzke, et al., 2010) that the activity of reflection rubber allows excellent transport special force to the same speed and similar movements that require high capacity of the trunk and legs and show results when the performance of the broad jump.

Velmurugan, Palanisamy (2012) confirm that work to stimulate muscle spindles, resulting in high-voltage motor units in the liberal and raise other receptor is working to increase the number of active motor units, which are the cause of increasing the power generated.

This is in line with what was said Zoran, et al. (2012) that SAQ training is one of the training forms that contribute to the improvement of some physical capabilities and that of the most important kinds of speed.

The results of this study are consistent with the study of both (Vikram, 2008; Mario, et al., 2011; Vikram, 2008) in that SAQ exercises contribute to an

improvement in acceleration and the ability of the two men muscle, agility and speed motor time.

(Amr, 2016) confirms that S.A.Q training system modern resulting integrated impacts of many physical abilities within one training program. Because it is an integrated complementary aims to simulate the positions of playing competitiveness through the fragmentation of speed to three major components written speed, speed of change of direction, Quickness and Agility. In addition, S.A.Q exercises practice in athletics to improve:

- Acceleration
- Arm action
- Footwork
- Response time
- Explosion
- Visual awareness
- Hand-eye co-ordination
- Power

Recommendations

In light of the findings of the researcher of the research recommends the following results:

- Application SAQ exercises in athletics.
- Diversity in training SAQ between the upper end and the lower taking into account the gradient in intensity and taking into account individual differences and motivation for each individual.
- Further similar studies to determine the role of SAQ exercises to improve the morphological and physiological variables for players in different sports.



Conclusion

Our suggestion is that male college students can benefit by reinforcing muscles and improving the speed types and reaction time through SAQ exercises.

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