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The Effect of a Tae Bo Exercise Program on Physical Fitness and Some Kinesthetic Perceptions for University Level Basketball Players in Egypt

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Abstract: The aim of this study was to examine the effect of a modified Tae Bo training program on some kinesthetic perceptions of basketball players. The kinesthetic perceptions tested in this study were perceptions of speed, motion, strength and distance. The special elements of physical fitness tested were musclar ability, circular respiratory endurance, speed and agility. The study was conducted on 20 players (M age = 19.45 , SD = 1.2; males) divided into two groups of Suez Canal University team. The Tae Bo exercises were modified from martial arts exercises to exercises suitable for performance in basketball – dribbling, passing, shooting and footwork. Training is performed in the physical preparation part using modified Tae Bo exercises and last for the rest of the training unit for the skilful and tactic part in basketball. Post measures showed differences of statistical significance in the physical abilities and kinesthetic perceptions in favor of the experimental group.

Key words: Modified Tae bo % Basketball % Kinesthetic perceptions

INTRODUCTION

Greer [1] said that Tae Bo, a form of high impact aerobics that combines the moves of Tae Kwon Do, karate, boxing, ballet and hip-hop dancing. Tae Bo, which stands for Total Awareness Excellent Body Obedience, was developed by Billy Blanks in the late 1980's.

Troy Obrero, a well-educated personal trainer in San Francisco, CA gives Tae Bo his approval: "Tae Bo is an excellent cardiovascular workout with very good distractions." Obrero targets lack of variety as the reason for failure of many workout regimens, he claims that Tae Bo provides the necessary novelty and challenge to keep users hooked. Very few people have done the type of movements done in Tae Bo on a regular basis, continues Obrero; this leads to its extreme effectiveness in toning and defining the entire body, Greer [1].

Tae Bo workouts can improve balance, coordination, flexibility and will tone and define muscles. The workout regimen is exhaustively aerobic and therefore yields phenomenal cardiovascular benefits. When done properly, Tae Bo can increase lean body mass, decrease body fat, improve coordination and flexibility, this what the analytical study of Greer [1] reached.

This pushes me to explore the effect of these Tae Bo exercises, as a phenomenon after modifying their way of performance, to be suitable for the basketball players on the special physical elements, such as musclar ability, circular respiratory endurance, speed and agility; and the kinesthetic perceptions, such as perception of speed, motion, strength and distance.

I have modified these exercises being of Tae Kwon Do, karate, boxing, ballet to be exercises similar to the motor course of performance in basketball (shooting, dribbling, passing and legs motion).

- Posture of punching by the two hands in traditional Tae Bo was modified to shooting and passing by one hands and two hands in basketball.
- Posture of pushing in traditional Tae Bo was modified to passing by two hands and one hand and dribbling.
- Posture of lifting leg with hand upwards was modified to pivoting in basketball and footwork in basketball.
- Posture of kicking in the traditional Tae Bo was modified to leg posture in the jump shooting and side footwork in basketball.

These modifications on the new postures derived from Tae Bo to basketball were submitted to a group of ten experts of physical education in the Faculty of

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physical education, Suez Canal University in Port Said. They approved these modifications and their convenience for basketball players.

Basketball is a sport, which demands kinesthetic perceptions such as perception of speed, motion, strength and distance. These are the perceptions which were tested in this study based on the opinion the experts of basketball professors in the Faculty of physical education in Suez Canal University.

Kinesthesia, in its simplest form, is the awareness of movement and body position Gabbard [2]. Kinesthetic perception is a complex system and, therefore, hard to separate into either a physiological or psychological construct. Gabbard [2] introduces a key point with kinesthetic perception: "any one of the kinesthetic receptors in isolation from the other is generally ineffective in signaling information about the movements of the body" Within kinesthetic perception are five sub-categories of perception. They include body awareness, spatial awareness, directional awareness, vestibular awareness and rhythmic awareness. The word awareness can be used interchangeably with perception.

Within sport and physical activity, research tends to focus on vestibular and spatial awareness. Vestibular awareness is essential for all individuals, but especially in the elderly. Spatial awareness is evaluated in the sport realm with respect to individuals' perception of vertical and horizontal direction. Lejeune *et al*. [3] attempted to show a linkage between postural vertical and subjective vertical. They added that, based on errors scores, participation in sport did have some influence on vertical perception (Lejeune *et al*. [3]). Postural vertical refers to the orientation of the body in relation to the earth's vertical (Mittelstaedt [4].

The eastern scientists in that field agreed with the western ones that physical fitness and its basic elements is the corner stone for all sports activity performers; either the specialization is for the sports field or the practice is for personal health [5-7].

The Kinesthetic perception is important in the learning process. The more the motion and skill are felt. The better the skill or motion are performed, which leads to increasing the performance level remarkabley [8]. According to Gordon [9], the kinesthetic perception has its role in improving the skilful performance and gaining new skills. The players showed the role of visualization, concentration and attention in reducing mistakes. The motor learning situations also need the sight and touching senses, some inner feelings like feeling direction, distance and time feeling is more than any other sense.

The Kinesthetic perception is imporatnt in general motor performance and more important in sports motor performance since it allows to control and correct the movement while it is performed either in terms of shape, extent or direction [10].

Baumgartner and Jackson [11] assure that The Kinesthetic perception is the ability to determine the body postures and its parts in space, the power required for the muscles to be shrunk, control of direction and distance required during performance.

This is what the study of Quintana *et al*. [12] reached. It was conducted on adolescents (N=473, Age 11-13) with high skills in basketball. There was positive and significant relationship between the skills of sight perception and the sports achievement level. A lot of players showed high degrees in sight-motor collaboration resulted from the training program applied to them, especially collaboration of arm movement with sight, which is one of the most important skills in basketball.

Michael [13] designed a study to determine the relationship between kinesthetic sense and the ability of participants to replicate a multijoint movement sequence. The participants were males and females between 18 and 35 years old (N=22). Kinesthetic positional sense was assessed at the shoulder, elbow and wrist according to the accuracy participants maintained while attempting to reproduce target joint angles. Movement sequence consistency was analyzed based upon how accurately a movement pattern could be replicated. The results of this investigation are indicative of a link between the level of performance of multijoint movement sequences and the positional sense within the joints involved in the movement sequence.

MATERIALS AND METHODS

Participants: .Twenty Suez Canal University basketball team players (2004-2005), 19.5±1.2 years of mean age, 87.8±5.23 kg of mean weight, 182.6±3.51 cm of mean height, volunteered to participate in the study

Measures*:* The tests selected were based on the refernces and scientific researches related to the physical fitness tests [14-16] the kinesthetic perceptions tests for the basketball players.

Physical Tests: Shuttle Run (55m x 5 times) was used as a measure of circular respirtory endurance (consistency 0.91 and reliability 0.92 in this study). 30m Sprint Test

(one time) was used to measure speed (consistency 0.84 and reliability 0.86 in this study). Vertical jump (3 times) was used to measure the musclar abilitiy of legs (consistency 0.98 and reliability 0.89 in this study). The Zigzag Run Test (one time) was used to measure to measure agility (consistency 0.90 and reliability 0.88 in this study)[14, 17-19].

Kinesthetic Perceptions: The kinesthetic perception tests were designed and selected based on several references [20-24] in that field and submitted to the experts who are qualified professors in the Faculty of Physical Education in Port Said. The said kinesthetic perceptions are very important and supposed to be affected by the modified Tae Bo exercises in basketball.

Procedure: The researcher has found the coefficients of consistency by applying the test and re-applying it after a week passes on a sample of 10 players from the basketball team of the Faculty of Physical Education–Port Said, of the same research Population and apart from the sample used in the study.

Statistical Analysis: All data were analyzed using the Statistical Package for Social Sciences (version 10.0; SPSS Inc, Chicago, IL) for Microsoft Windows. The á level was set at $P = .05$ and 0.01 for statistical significance. ANOVA was used to compare the pretests and post tests for both control and experimental groups in all variables. Mann-Whitney was used to compare both control and experimental groups in the posttests.

RESULTS AND DISCUSSION

Data in Table 1 and Fig. 1 showed that a skew coefficient varied from -1.57 to 2.38, that is to say all measures are limited between +3 to - 3, that illustrates the homogeneity of the research Population in the variables of age, weight, height, the physical variables and the Kinesthetic perceptions.

Table 1: Improvement percentage between both controlling and experimental groups in tests under discussion

Variables	Imp. Per. Controlling%	Imp. Per Experimental. %	Difference in the imp. Per.	Notes
Shuttle run 55m.X5	14,27	18,86	4,59	In favor of the exp. G.
30-m Sprint	12,5	24,76	20,64	In favor of the exp. G.
Vertical jump	4,81	12,11	7,3	In favor of the exp. G.
Zigzag Run	5,7	17,82	12,12	In favor of the exp. G.
Half strength of legs	4.76	23.56	18.8	In favor of the exp. G.
Accuracy of the arm	5.87	32.54	26.67	In favor of the Con. G
Legs motion distance aside	3.87	12.45	8.58	In favor of the Con. G
Preferred arm motion speed vertically	2.45	15.53	13.08	In favor of the Con. G

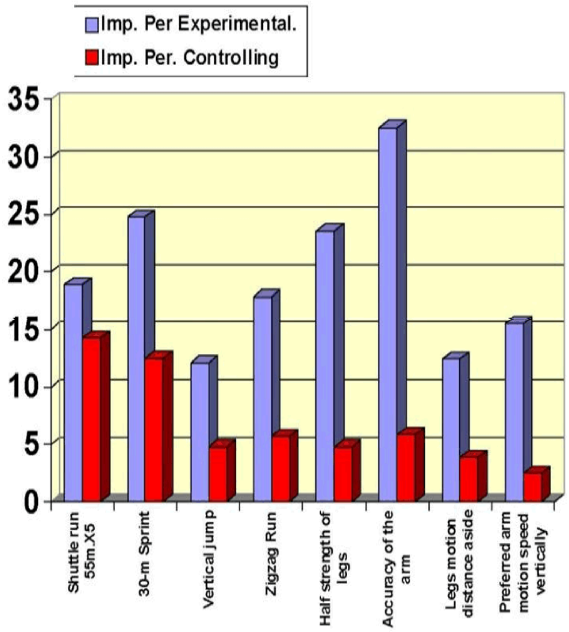

Fig. 1: Improvement percentage between both controlling and experimental groups in variables of present study

The value of P calculated between both controlling and experimental groups in the variables of age, weight, height and the physical variables and the Kinesthetic perceptions varied between 29.0 and 47.5. The significance of the value varied between 0.06 and 0.09 at a statistical significance level of 0.05 that refers to absence of statistical significant value. That refers to equipollence of both groups in the variables of the study.

The tests used are of high consistence degree, varied between 0.69 and 0.92, that refers to the consistence of all said tests.

There are statistical significant differences between pre and post measures in the control group in the tests under discussion. F Value varies between 6.521 and 73.505 at 0.01 in favor of posttest.

There are statistical significant differences between pre and post measures in the control group in the tests under discussion. F Value varies between 53.83 and 12671 at 0.01 in favor of posttest.

There are statistical significant differences between both controlling and experimental groups in the post measure, in favor of the experimental group in physical variables and kinsetich perceptions. Calculated Mann-Whitney value was lower than Table Mann-Whitney value. Mann-Whitney Value varied between 0.00 and 21.500 at 0.05.

There are differences in the improvement percentage in favor of the experimental group in the tests under discussion. The improvement percentage has varied from 4.59% to 71.12%.

The first hypothesis was that there would be statistical significant differences between pre and post measures for the special physical fitness elements of basketball players and some kinesthetic perceptions in the variables of special physical fitness and some kinesthetic perceptions for the control group, in favor of the post measure, which did not use the Tae Bo exercises.

A remarkable improvement has occurred in the physical variables in the present study. There are statistical significant differences between the pre and post measures, in favor of the post measure. The value of the significance level varied between 15.131 and 59.436 at the statistical level of significance of 0.05. This improvement has occurred because the control group applied a training program containing exercises to develop the elements of physical fitness relating to basketball. This agrees with the studies of, Matveev [5], Platonov [6] and Shephard [7].

There are statistical significant differences between the pre and post measures in the kinesthetic perceptions. The value of the significance level has varied between 6.521 and 73.505. This slight improvement in the level of the kinesthetic perceptions related to the basketball players of the control group in favor of the post measure was due to the controlling group implementation of the program applying to them. Practicing the activities led to the improvement of the level of the kinesthetic perceptions in general. Thus, the first hypothesis was supported. This agrees with Nichols [10] and Quintana *et al*. [12].

The second hypothesis was that there would be statistical significant differences between pre and post measures for the special physical fitness elements of basketball players and some kinesthetic perceptions in the variables of special physical fitness and some kinesthetic perceptions for the experimental group, in favor of the post measure, which used the Tae Bo exercises.

A remarkable progress has occurred in all special physical qualities. There are statistical significant differences between the pre and post measures, in favor of the post measure. The value of the significance level has varied between 108.208 and 1160.44 at the level of 0.05. This progress was due to the training program containing diverse group of aerobic and anaerobic exercises through modified Tae Bo exercises that was applied in the scientific method in terms of intensity, volume and rest periods. The modified Tae Bo exercises work on improving strength, flexibility, endurance, agility. This agrees with Matveev [5], Platonov [6] and Shephard [7] who stated that physical fitness and its basic elements is the corner stone for all sports activity performers; either the specialization is for the sports field or the practice is for personal health.

The experimental group applying the Tae Bo exercises permanently and regularly, 3 training units a week for 12 wk, 36 training units, considering grading in the training and ripple in the intensity of the training load, all the previous led to a remarkable improvement in the physical qualities of the players. This agrees with Markovic *et al*. [15] and Chimera *et al*. [16].

A progress has occurred in all the kinesthetic perceptions of the present study. The results refer that there are statistical significant differences between the pre and post measures of the experimental group, in favor of the post measure. The value of the significance level has varied between 53.830 and 720.790 at the statistical level of 0.05. The current progress was due to the training program containing a group of Tae Bo exercises. It led to an improvement in the functional state of the players and raising the level of the kinesthetic perceptions, depending

on kinesthetic perception of the performance on the sensory receptors existing in the muscles, sinews, joints to send the nervous and sensory signals to the central nervous system that directs the body to perform the movements required .Thus, the second hypothesis was supported. This agrees to the study of Michael [13].

The third hypothesis was that there would be statistical significant differences between the control and experimental groups in the post measure in the variables of special physical fitness and some kinesthetic perceptions in favor of the experimental group.

There are statistical significant differences between both controlling and experimental groups in the post measure, in favor of the experimental group in the physical variables of the present study. Calculated Mann-Whitney value varied between 0.000 and 21.500 that are lower than table Mann-Whitney value of 23. indicates that is related to improvement percentages between both controlling and experimental groups in the physical variables. There are differences improvement percentages in favor of the experimental group varied between 4.59% and 20.64%. The researcher attributes this improvement to the training program containing the modified Tae Bo exercises that contain exercises to develop the aerobic and anaerobic ability. The Modified Tae Bo exercises work on increasing the muscular strength, endurance, flexibility, agility and speed. Aerobic and anaerobic exercises lead to a significant improvement in the motor speed of the players and that speed plays an important role in the sports when shooting, passing, running, or dribble with the ball. Developing speed is based on developing the muscular strength and agility. This agrees with Greer [1] and the study of Tavino *et al.* [18] who indicated that Tae Bo exercises resemble the muscular work of the working muscles in basketball. That is characterized by continuous motion with jumps work on developing strength, speed, endurance, agility. Music brings about the pleasure factor and getting rid of the routine performance of the exercise.

There are statistical significant differences between both controlling and experimental groups in the post measure in favor of the experimental group in the in the kinesthetic perceptions. Calculated Mann-Whitney value varied 0.00 and 12.000. They are lower than table Mann-Whitney value of 23 indicates, which is related to improvement percentages between both controlling and experimental groups in the in the kinesthetic perceptions tests, that there are differences in the improvement percentages in favor of the experimental group. The researcher attributes this improvements to that the Tae Bo exercises work on increasing the motor speed and agility that led to an increase of in the kinesthetic perceptions level since the proposed Tae Bo exercises contain similar to the performance in basketball. This agrees with Nichols [10], Quintana *et al.* [12] and Michael [13]. Thus, the third hypothesis was supported.

CONCLUSION

The results of this study showed statistically significant differences in the posttests of control and experimental groups, in favor of the experimental group in the special physical fitenss elements for basketball players (muscular ability, circular respiratory endurance, speed and agility) and the kinesthetic perceptions (perceptions of speed, motion, strength and distance) with hight improvement percentage in favor of the experimental group. The present study can be a starting point for future studies in drawing inspiration from Tae Bo, Ti Chi, yoga and aerobics to obtain postures that can be useful in the sports of basketball, volley ball, handball and football.

REFERENCES

1. Greer, N., 2000. Tae Bo: Fitness Craze or Effective Workout? Vanderbilt University, Tennessee, U.S.A. http://www.vanderbilt.edu/AnS/psychology/health_psychology/TAEBO.htm.
2. Gabbard, C.P., 2004. Lifelong motor development. San Francisco, Benjamin Cummings, U.S.A.
3. Lejeune, L., D. anderson, D. Leroy, R. Thouvarecq and F. Jouen, 2004. Kinesthetic perception of the vertical as a function of sport experience. Research Quarterly for Exercise and Sport, 75: 440-445.
4. Mittelstaedt, H., 1998. Origin and processing of postural information. Neuroscience and Biobehavioral Reviews, 22: 473-478.
5. Matveev, L.P., 1998. Oat Theories Sportivnoi Trenirovki k obzsei Theories Sports. Theory and Practical. Physical Culture Publishers, 5: 324-329.
6. Platonov, V.A., 1994. A book for Physical Education Institutes, Physical and Sport. Physical Culture Publishers, Kiev.
7. Shephard, Y., 1999. Relationship between Perception of physical Activity and Health Related Fitness. J. Sports Medicine and Physical Fitness, 35: 149-158.
8. Schmidt, R., 2000. Motor Learning and performance. Second edition Human Kinetics Published. United Kingdom.

9. Gordon, A.B. and E.S. Diane, 2002. A team Building Mental skills Training Program with an intercollegiate Equestrian Team. J. Sport Psychol., 4: 149-158.
10. Nichols, B., 1994. Moving and Learning. St. Louis, Times Mirror Mosby, U.S.A.,
11. Baumgartner, T.A. and A.S. Jackson, 1995. Measurement for Evaluation in Physical Education and Exercise Science. Dubuque Brown and Benchmark, U.S.A.,
12. Quintana, M.S., I.R. Roman, A.L. Calvo and J.S. Molinuevo, 2007. Perceptual Visual Skills in Young Highly Skilled Basketball Players. Perceptual and Motor Skills, 104: 547-561.
13. Michael, A.J., 1998. Kinesthetic Sense and Consistency in Multijoint Movement Sequences. Microform Publications, University of Oregon, U.S.A.,
14. Stone, W.J. and P.M. Steingard, 1993. Year-round conditioning for basketball. Clinics in Sports Med., 12: 173-191.
15. Markovic, G., I. Jukic, D.Milanovic and D. Metikos, 2007. Effects of sprint and plyometric training on muscle function and athletic performance. Journal of Strength and Conditioning Research / National Strength and Conditioning Association, 2: 543-549.
16. Chimera, N.J., K.A. Swanik, C.B. Swanik and S.J. Straub, 2004. Effects of Plyometric Training on Muscle-Activation Strategies and Performance in Female Athletes. J. Athletic Training, 39: 24-31.
17. Ramsbottom, R., J. Brewer and C. Williams, 1988. A progressive shuttle run test to estimate maximal oxygen uptake. British J. Sports Med., 22: 141-144.
18. Tavino, L.P., C.J. Bowers and C.B. Archer, 1995. Effects of Basketball on Aerobic Capacity, Anaerobic Capacity and Body Composition of Male College Players. The J. Strength and Conditioning Research (JSCR), 9: 75-77.
19. Stapff, A., 1998. Basketball players. In Gore J (Ed): Test Methods Manual. 3rd Ed, Canberra: Australian Sports Commission, Australia.
20. Laszlo, J.I. and P.J. Bairstow, 1980. The measurement of Kinesthetic sensitivity in children and adults. Developmental Medicine and Child Neurol., 22: 454-464.
21. Laszlo, J.I. and P.J. Bairstow, 1983. Kinesthesis: its measurement, training and relationship to motor control. Quarterly J. Experimental Psychol., 35: 411-421.
22. Cordo, P.J., 1990. Kinesthetic control of a multijoint movement sequence. American Physiological Society's J. Neurophysiol., 63: 161-172.
23. Adamovich, S.V., M.B. Berkinblit, O. Fookson and H. Poizner, 1998. Pointing in 3D space to remembered targets. Kinesthetic versus visual target presentation. American Physiological Society's J. Neurophysiol., 79: 2833-46.
24. Crollick, J.L., 2005. Music and Movement: An Investigation of the Influence of Formal Music Training and Significant Athletic Experience on Rhythmic Perception. M.Sc. Thesis, Florida University, U.S.A.,