

The Effect of Using Fit Light Exercise in Some Physiological Indicators and Smash Shot for Badminton's Players

Asst. Prof. Dr. Abeer Dakhil Hatem Al-Selmi¹

²Lect. Mostafa. S. Hosen

Abstract

The reason for applying the project is for the development of some physiological variables and skill performance using a device for the first time applied in Iraq to a sample of badminton players, and this device has a patent on 7/2/2019. An experimental method is used for a sample of (12) players from (Al-Orthodoxy club). The experimental group is applied the proposal technique, while, the control group is instructed by the coach. The results of the research attribute to the role of the proposal exercises of fit light technology, thus, this technology has increased the attention and focusing of the sample and some physiological variables and smash shot skill. It has been concluded that the exercises using fit light technology is helped to improve their anaerobic abilities, also the exercises some physiological indicators. Furthermore, the exercises are helped to reduce the heart rate before and after the tension of the sample.

Keywords: BMC Sports Science, Medicine & Rehabilitation

Background

The research problem lies in the lack of a variety of exercises in which some stimuli are compatible with the capabilities of the players and within the period of their numbers, so this requires special training to develop the players' skill and physiological capabilities, and this habituation to the application of exercises instructs the brain to neglect the various stimulates that the player may need to serve the requirements competition, and the nature of the matches, which are characterized by rapid strikes and rapid movements of their skills inside the small field.. There is a need in it to advance the level of mental processes and employ them towards developing the skill and physiological capabilities of players in order to meet the requirements of speed and excitement that characterize this game, the role of stimuli must be activated according to the change in circumstances. The researchers note the variance in the training process. Which called for the need to prepare specific exercises that depend on the investment of modern technology to assist in the training process to help coaches and players to meet the requirements of this game, so the interest in the continuous renewal in the type of exercises taking into account the game's characters and the individual differences of its players according to the determinants of the principles of sports training.

The aim of the research is preparing fit light exercises and introducing their effect experimentally on some physiological indicators and the smash hit skill of badminton players.

The advantages of Fit Light technology

The following are the advantages of the exercises:

¹ University of Baghdad, College of physical education and sport sciences for Women, Iraq.
abeer@copew.uobaghdad.edu.iq

²University of Misan, College of physical education and sport sciences, Iraq.
Slamalslan1980@gmail.com

1. Easy to move and transport from one place to another.
2. The presence of lamp holders so that these lamps can be placed anywhere.
3. It contains a long-lasting battery.
4. Considering age differences by setting up the time between turning on and turning off the lights and because the level of the trainees differs from one to the other.
5. Provide safety and security when performing exercises, which encourages the player to continue training.
6. This device is designed to be used in all sports activities
7. works to introduce fun and joy into the psyche of the player through the element of suspense and excitement

The summary of the literature is a collection of supporting information for the study and evidence of the nature of our work in the field of specialization.

The reasons for applying the project is a device for developing the speed of the kinetic response and compatibility between the eye and the man and between the eye and the hand. It is a circular lamps with a diameter of 15 cm where there are sensors of movement and carriers to place these lamps in any place and the position of exercises, and the distance between the lamp And another stationary, and the player stands at a distance from it, where it is determined according to the stadium and exercises put in place by the coach and extinguished by passing the arm or foot or any other tool. If the player cannot reach these lights according to the specified time, the device will make a sound and cause him to lose as it appears on the screen, and in the event that the person arrives at the specified time, the device records a winning point and displays it on the screen and no sound is output. These lights are controlled by randomly and unexpectedly operating which of them will work. Likewise, the time period between lighting and switching off lights is determined, so the player must access these lamps during the specified time.

Methods

The aim of the research is preparing fit light exercises and introducing their effect experimentally on some physiological indicators and the smash hit skill of badminton players. The experimental approach has been chosen for its suitability of the research problem. The sample of the research is 12 badminton players from Al-Orthodoxy Club in Baghdad at the age 16-18 years. It has been chosen purposely but they were randomly divided into two groups an experimental and control one. The experimental group is taken the proposal exercises by using the fit light technique, while the control group is trained according the coach's instructions. Also, (3 players) were elected for the pilot study for insuring the procedures of the research. Furthermore, the sample is matched for insuring the homogeneity of the sample as it shown in Table (1).

Table (1) The X mean, Standard Deviation and Coefficient of Torsion of the Sample

Variables	n	X mean	Median	Standard deviation	Coefficient of Torsion
BMI	12	21,14	21	0,864	0,527
Length	12	1,80	1,78	0,10	0,82
Training (years)	12	17,06	17,00	0,44	0,39
Training age (years)	12	17,42	18	2,021	0,37-

*Body mass index (BMI) = body weight (kg) / square body length (meters).

The results from table 1 shows homogeneity by the low torsion coefficient (less from ± 1)

This indicates the normality of sample. The following tests are used with the two groups, they are;

First: the test for non-oxygenic phosphate ability (Winkett test) (Radwan, 1998:163).

Second: anaerobic step test (non-oxygenic lactic ability) (Ibid:164).

Third: The difference in the heartbeat rate per minute and the rate of oxygen saturation (Al-Nesary, 2011:25)

Fourth: Smash shot skill (Abid- Al-Husissan, 2013:45)

Fifth: Speed of nervous flow test (Baghdad Hospitals Guid, 2016: 266).

clinical EMG device was used to measure the electrical activity of the three variables under investigation.

The process of registering was done in a room with an average temperature of (22-25) degrees Celsius by attaching the recording electrode at the origin of the muscle behind the brachialis (coracoid) that Works in the front and back strokes, the other electrode is attached to the muscle Electrical indicators of the muscle will appear on the EMG.

After performing the pre-tests for the sample, an executing of training schedule has been started, by using the prepared exercises of fit light technology

- The execution of the training curriculum on the experimental research sample started on 4/6/2019 until 30/7/2019.
- The experimental has lasted 8 weeks, while the number of training units reached 24 units, at the rate of 3 units per week (Sunday, Tuesday, Thursday).
- The training curriculum has been applied in a part of the main section of the training unit, which has a duration of (90) minutes, with the duration of the main section including (60) minutes.
- The curriculum Performing was during the special preparation period.
- The repetitive training method was used with an intensity of 90% -100%, and the researchers adopted calculating the intensity of the exercises through the number of frequencies within the exercise time and reducing the moving time and extinguishing between the lamps.
- (4) seconds were applied between turning the lights on and off in the first and second week, and after that, the time was reduced to (3) seconds in the third and fourth week, and then the time in the fifth and sixth week was reduced to (2) seconds.

Results analyzing:

The results of the pre and post-tests of the experimental group

After the results are analyzed, the data of the results are showed the following,

Table (2) Pre and Posttests of the Experimental group in the Variables of the Research

Statistical significance	Error level	calculated t-test value	f \bar{x}	f \bar{x}	Post-test		Pre-test		Research variables
					Standard Deviation	X mean	Standard Deviation	meanX	
sufficient	0,000	9,64	30,40	12,42	0,97	37,56	3,28	25,14	Phosphorene anaerobic power ((kW
sufficient	0,001	9,26	2	7	1,215	28,86	1,21	21,86	Lactic anaerobic (power (kW
sufficient	0.000	12,60	2,309	11	1,27	112,43	1,718	123,43	Difference in the number of heartbeats before and after the effort
Un-sufficient	0,522	0,67	1,113	0,28	0,816	98	0,95	98,29	Measuring oxygen saturation (percentage
sufficient	0.000	22.838	1.966	18.333	0.516	114.67	1.751	96.33	Speed of sensory (nerve flow (m / s
sufficient	0.000	-7.36	7.83	0.021	0.836	7.80	0.72	4.16	Smash shot

The results of the pre and posttests of the control group in the variables of the research

Table 3 Pre and Posttests of the Control group in the Variables of the Research

			f \bar{x}	f \bar{x}	Post-test	Pre-test	
--	--	--	-------------	-------------	-----------	----------	--

Statistical significance	Error level	calculated t value			Standard Deviation	X-Mean	Standard Deviation	X-Mean	Research variables
sufficient	0,000	3,26	5,55	6,85	1,21	33,86	4,47	27	Phosphogenic anaerobic power (kW
sufficient	0,000	3,87	1,46	2,14	1,97	25,29	2,41	23,14	Lactic anaerobic (power (kW
sufficient	0.007	4,85	3,50	6,42	1,29	118	2,76	124,43	Difference in the number of heartbeats before and after the effort
Un-sufficient	0.522	0,67	1,13	0,28	0,9	98,14	0,78	98,43	Measuring oxygen saturation (percentage
sufficient	0.001	7.393	2.927	8.833	1.862	103.67	2.639	94.83	Speed of sensory (nerve flow (m / s
sufficient	0,000	-6.03	7.33	0.79	0.83	6.800	0.61	4.00	Smash shot

sufficient significance under the level ≤ 0.05 and the degree of freedom 9

The results of differences in (t value) for the two tests of the experimental group and the control group

for the Skill tests under investigation, analysis and discussion:

Table (4) It shows the results of the control and experimental groups in the variables under study in the post tests

Statistical significance	Error level	calculated t value	Control group		Experimental group		Research variables
			Standard Deviation	X-Mean	Standard Deviation	X-Mean	
Sufficient	0,000	6,30	1,21	33,86	0,97	37,57	Phosphogenic (anaerobic power (kW
Sufficient	0,002	4,07	1,97	25,29	1,21	28,86	Lactic anaerobic (power (kW
Sufficient	0.003	8,132	1,29	118	1,27	112,43	Difference in the number of heartbeats before and after the effort
Un-sufficient	0.761	0,311	0,9	98,14	0,81	98	Measuring oxygen saturation (percentage
Sufficient	0.000	13.945	1.862	103.67	0.516	114.67	Speed of sensory (nerve flow (m / s
Sufficient	0.000	6,43	0,61	4,00	0,72	4,16	Smash shot

Discussion

The results of the research attribute to the role of the proposal exercises of fit light technology, thus, this technology has increased the attention and focusing of the sample. therefore, the players have selected the best and quick stimulus through limited the muscle cumin by showing the right stimulus . Also, these exercises have increased the expectation of sudden movement and shot, and deviated the surrounded environment. Finally, the results obtain from the research have positive effect on the sample of the research when the players have used the forehead smash shot of badminton.

Accordingly, the results are matched with Wady & Al-Janaby (2005) that the mission of nervous system is stimulate the organs for doing their jobs as well the continuous stimulate the organs increase the human motor activity.

Furthermore, Al-Jebaly (2000) mentioned that if the player has high corresponded abilities , he/she could avoid expected mistakes also, the player might have high performance. Because, the central nervous system function is selecting the quick right response for the varieties of stimulus

The current research is agreed with Mahoad (2011) that the player could reach the high performance by developing the abilities and directing these abilities by using methods and techniques to reach the high competitions. So, the players of the experimental group have developed their abilities in smash shot of badminton.

According the results of heart rate, the current research is agreed with Abid Al-Hameed & Al-Hasaneen (1997) the increasing the repeating of training cause the effect of heart and the function of the heart. So, the differences between the pre and post tension are developed for the experimental groups because the using of fit light technology exercises.

Also, the current research has paralleled with (Halliwill, 2001) but the study mentioned the recovery and with long-term adaptations to exercise training. WB-EMS stimulates all main muscle groups simultaneously during a moderate exercise and can be considered as a time-efficient option to high-intensity resistance exercise improving the general strength (Wolfgang Kemmler et al., 2016). Furthermore, WB-EMS affects positively the body composition and fitness parameters by enhancing the energy expenditure and by improving the isometric strength (Boccia et al., 2017; Maggioni et al., 2010), and it has been observed to be an effective method for cardio-metabolic risk factors prevention in previous studies (Wolfgang Kemmler, Kohl, Freiburger, Sieber, & von Stengel, 2018; Wittmann et al., 2016).

Conclusions

- 1- The exercises using Fit Light technology has helped to improve their anaerobic abilities and outperform the players who train without them.
- 2- That the application of exercises using the (Fit Light) technology helped to reduce the difference in the rate of heartbeat ahead and before the badminton players exercise, also their superiority to increase this adaptability with the players who train without them.
- 3- The exercises using the Fit Light technology for badminton players did not achieve an improvement in the rate of oxygen saturation, nor did the control group who trained without them.
- 4- The employment of exercises using the Fit Light technology helped the badminton players to improve the speed of their sensory flow and excel in these improvements among the players who train without them.
- 5- The exercises using Fit Light technology helped develop the smash shot skill of badminton players, and their superiority over the players who trained without them.

References

- Abid Al-Hameed & Al-Hasaneen (1997) *Fitness and its Components*. Al-Qahera: Dar-Al-Feqer Al-Araby.
- Al-Jebaly, Auas (2000) *Physical Training between the Theory and Practice*. Egypt: G.M.S. publishers.
- Amaro-Gahete, F. J., De-la-O, A., Sanchez-Delgado, G., Robles-Gonzalez, L., Jurado-Fasoli, L., Ruiz, J. R., & Gutiérrez, A. (2018). Functional Exercise Training and Undulating Periodization Enhances the Effect of Whole-Body Electromyostimulation Training on Running Performance. *Frontiers in Physiology*, 9, 720. <https://doi.org/10.3389/fphys.2018.00720>
- Arthur C. Gayton and John Hall; *Reference in Medical Physiology*, 9th edition, 1997
- Bahaa El-Din Ibrahim Salama: *Physiology of Sport and Physical Performance of Blood Lactate*: Cairo, Dar Al-Fikr Al-Arabi, 2000.
- Boccia, G., Fornasiero, A., Savoldelli, A., Bortolan, L., Rainoldi, A., Schena, F., & Pellegrini, B. (2017). Oxygen consumption and muscle fatigue induced by whole-body electromyostimulation compared to equal-duration body weight circuit training. *Sport Sciences for Health*, 13(1), 121–130. <https://doi.org/10.1007/s11332-016-0335-4>.
- Halliwill, J. R. (2001). Mechanisms and clinical implications of post-exercise hypotension in humans. *Exercise and Sport Sciences Reviews*, 29(2), 65–70.
- Maggioni, M. A., Cè, E., Rampichini, S., Ferrario, M., Giordano, G., Veicsteinas, A., & Merati, G. (2010). Electrical stimulation versus kinesitherapy in improving functional fitness in older women: a randomized controlled trial. *Archives of Gerontology and Geriatrics*, 50(3), e19-25. <https://doi.org/10.1016/j.archger.2009.04.015>

Mahoad, Moafaq (2011) Basic of Physical Training. Baghdad: Book and Documents House.

Wady, Ali & Al- Al-Janaby (2005) Fundamentals of Physiological Psychology. Amman: Jarir Publishing and Distribution House.

Wittmann, K., Sieber, C., von Stengel, S., Kohl, M., Freiburger, E., Jakob, F., ... Kemmler, W. (2016). Impact of whole body electromyostimulation on cardiometabolic risk factors in older women with sarcopenic obesity: the randomized controlled FORMOsA-sarcopenic obesity study. *Clinical Interventions in Aging*, 11, 1697–1706.
<https://doi.org/10.2147/CIA.S116430>