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The effect of special exercises using the optical defender device designed in the development of some physical abilities and performance composite skill of handball players

Hanan Murad Marzouk ¹, Huda Badawi Shabib ²

E-mails: hanan.morad1104a@copew.uobaghdad.edu.iq ¹, hudash@copew.uobaghdad.edu.iq ²

1&2 Physical Education and Sport Sciences college for women, University of Baghdad

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Abstract

The countries of the world tended to harness all capabilities, expertise and science in order to reach advanced levels in various sports. Sports training aims to prepare the players well. The research problem lies through the field experience of the two researchers and the follow-up of the training of the players of the specialized school of handball. It was noticed that there is a clear weakness in the skillful performance and must Developing weaknesses to achieve a better level of achievement. The research aims to prepare exercises for using the optical defender device for handball players and to identify the effect of special exercises using the optical defender device designed to develop some physical abilities and complex skill performance for handball players. 14 players aged 14-17 years, and physical and skill tests were used to collect research data. Among the most important results: - The exercises prepared using the optical defender device have a positive effect in developing the complex skill performance of the handball players. The use of modern devices in handball skills training. The prepared exercises have an effect Positive in developing the physical abilities under discussion. The two researchers recommend the use of the optical defender device in developing basic skills in handball, the use of modern devices in the process of sports training.

Keywords

Special exercises, light defender, composite skill performance

Introduction:

The achievement of good sports results at the high level has become the distinctive character of our current era, and this did not come from a vacuum, but rather came as a result of the use of knowledge, various sciences, and modern training equipment, as well as scientific research in the field of sports training. Therefore, it is necessary to follow sound scientific formulas in the systematization of the sports training process. Considering that handball is a team sport that requires physical and skill requirements for the players, all scientific research has been directed to find the necessary solutions and effective ways to develop the physical capabilities and complex skill performance of the players by creating new methods and using innovative devices in order to reach the best levels and

achieve the best results. Physical abilities are an important requirement for the success of the skill aspect and achieving the best achievement.

The importance of the research lies in the need to use modern training devices, including the optical defender device, which forces the athlete to break the usual line in developing the skilful performance of handball players and bring about tangible changes in the field of training and the use of modern training methods and methods with auxiliary training tools and devices and stay away from everything that is Familiar with sports training.

Reaching the higher levels is the focus of attention of specialists, which led to the search for the best methods, various methods, and modern equipment in training, which rely

heavily on research and scientific studies through proper planning and a comprehensive scientific and practical vision in the process of preparation and training. It has proven that the use of training means and equipment has a role Positive in sports training (14)

The problem of the research lies through the field experience of the two researchers and the follow-up of the training of the players of the specialized school in handball. It was noticed that there is a clear weakness in the skilful performance, and the weaknesses must be investigated to achieve a better level of achievement.

The aim of the research: - To prepare special exercises using the optical defender device designed for handball players and to identify the effect of exercises using the optical defender device designed on the physical abilities and the complex skill performance of handball players.

Research hypotheses: - There are no statistically significant differences between the pre and post-

tests of physical abilities and composite skill performance of the research sample.

Method and tools:

The two researchers used the experimental approach with a pre-post-measurement for one group to suit the nature of the research problem, since the experimental approach gives real results (7)

Research community and sample:

The research community is determined by the players of the Specialized School in handball, and their number is 17 players. Goalkeepers are excluded, with ages (14-17) years, as the research sample reached (14) players, as the percentage of the sample from the community reached (82.35%). height, weight and age on Wednesday and on 1/26/2022 to carry out homogenization, as the value of the torsion coefficient ranged between (-+3). Determining it accurately is choosing a sample that accurately represents the community of origin.” (3)

Table (1)

Shows the arithmetic mean, standard deviation, and coefficient of torsion for the homogeneity of the sample

.Seq	Variables	Measurement unit	Arithmetic mean	Median	Standard deviation	coefficient of torsion
1	chronological age	Year	15.87	16.00	0.80	0.42
2	Length	.Cm	1.70	1.70	0.57	0.02
3	Wight	.Kg	67.25	67.50	3.56	0.21

And by looking at the sources, references and previous studies in handball and sports training, the two researchers determined the physical abilities and chose the composite skill performance in handball (being scientific, accurate and standardized tests and characterized by scientific foundations of honesty, stability and objectivity according to what was applied in similar research) and the research exercises were prepared using a device The designed optical defender, and the two researchers conducted pre-tests on the research group on Monday,

7/2/2022, in the handball court of the Specialized School, at exactly ten o'clock in the morning, for physical abilities.

- Test the explosive ability of the arms. (5)

- Explosive strength test for the two men (1)

Speed test for the arms (4)

- A test of strength distinguished by speed for the two legs (4)

- Composite skill performance test in handball (6)

The experiment was implemented on the experimental group in the main section of the training unit over the course of 9 weeks, with 3

training units per week, i.e. 27 training units. After completing the implementation of the training program, the post-tests were conducted for the two groups, taking into account the same spatial and temporal conditions for the pre-tests,

and the researcher used the statistical program spss to analyse the data and extract the results.

Results: -

Table (2)
Shows the results of the pre and post-tests of the physical abilities under study

Statistical parameters to physical capabilities	Pre test		Post test		M D	D D	Calculated T	Error level	
	A	STD±	A	STD±					
The explosive power of the arms	6.53	0.18	7.62	0.74	1.08	0.53	5.80	0.00	Sign
The explosive power of the legs	1.83	0.07	1.97	0.06	0.14	0.02	15.6	0.00	Sign
Distinctive strength with speed for the arms	7.25	3.01	11.12	3.13	3.87	0.64	17.10	0.00	Sign
Distinctive strength with speed for the legs	6.25	1.32	4.83	0.46	1.44	1.05	3.88	0.00	Sign

Significant under significance level < 0.05 and below 13 degree of freedom

Table (3)
Shows the results of the pre and post-tests of the composite skill performance

Statistical parameters variables	Pre test		Post test		MD	DD	Calculated T	Error level	
	A	STD±	A	±STD					
Combined skill performance	2.23	0.81	4.23	1.00	2.00	1.24	4.32	0.00	Sign

* Significant under significance level < 0.05 and below 13 degrees of freedom

Discussion:

Table (2) and (3) show that there are statistically significant differences between the pre and post-tests of the research sample in the physical capabilities under study (the explosive power of the arms, the explosive power of the legs, the strength characteristic of the speed of the arms, the power characteristic of the speed of the legs) and the endurance of the composite skill performance.

The researchers attribute these differences to the nature of the exercises prepared by the

researchers, which were characterized by multiplicity and diversity, whether physical or skillful, and associated with defensive and offensive movements, which had a clear impact on the development of physical capabilities. It was designed by the two researchers. “The importance of physical and skill exercises at the present time is not only on the training side, but on the health and functional aspects as well, and the practice of regular physical exercises that help build strength and this development shows

the person's ability to withstand daily hardships and resist stress and fatigue." (8)

"The use of auxiliary tools and devices is a means of developing the level of technical performance for its effectiveness in developing special physical characteristics such as explosive power and maximum speed, because these tools come out through training methods with traditional exercises that cause boredom and fatigue." (10)

The special exercises prepared by the two researchers aim to develop the muscle groups working in the sport of handball, and most importantly, to ensure the development and preparation of muscle groups with motor skills similar to the performance of the sport of handball. and the development of motor skills." (2)

Despite the development of modern technology and its entry into most aspects of life, the interest and the use of modern devices and modern training methods that simulate the training reality and are similar to the steps of play have increased. Application of modern training methods based on actual experimentation. (15)

The two researchers were keen to prepare exercises with multiple and varied directions in the ball, because this will contribute to the player's ability to perform better skillfully.

"The explosive force and the force distinguished by speed are among the effective capabilities that affect the preparation of the players physically" and skillfully. "Therefore it has become necessary to conduct research and studies in this field that directly affects the skillful and tactical performance" (13)

"Because one of the requirements of the handball game is speed, diversification, and change in play from one skill to another, and to keep pace with developments in the handball game, which require the player to have a high degree of strength and speed in particular, as Muhammad Qasim confirms, quoting Nour Abdel-Azim, Nada Muhammad Amin In addition, the use of modern tools and devices makes the individual

more focused in performing skills, learning and developing them, as well as "the great diversity in performing skills, which works to improve performance." (12)

In addition to the fact that the exercises prepared by the two researchers are compound exercises (physical - skill) and the use of the optical defender device had a clear impact on the development of the physical capabilities and skillful performance of the players of the specialized school in handball because of their adoption of diversity and avoidance of boredom in training, and this indicates the importance of sports training in creating Spirit of cooperation, suspense and excitement. "Following the scientific method in trying to track skills is one of the important foundations that must be taken care of when directing them in the correct technical manner, especially the most used skills" in the match, in order to reach the top by building sound and strong foundations to overcome the changing, fast and escalating play situations. (11)

And the use of auxiliary devices in the implementation of special exercises accompanied by the improvement of strength has become a "necessary" matter, as the preparation of exercises according to these devices helps to master performance and to integrate muscular strength." (9)

Conclusions:

The two researchers concluded the following:

- The prepared exercises have a positive effect on the development of the physical abilities under study (the explosive power of the arms, the explosive power of the two legs, the power characteristic of the speed of the arms, the power characteristic of the speed of the legs).
- The prepared exercises and using the optical defender device have a significant impact on the development of the complex skill performance of the research sample.

The two researchers recommended:

- Adopting the exercises prepared by the two researchers in other team games (basketball, football, volleyball), taking into account the specificity of each sport.
- Adopting training devices, including the optical defender, in developing the skillful performance of different games and for different age groups.
- The necessity of adopting modern training devices and means and moving away from traditional training methods and devices in the training process.

Author's declaration:

Conflicts of interest: None

We confirm that all tables and figures and pictures in this article are ours and written by the researchers themselves.

Ethical-Clearance: this manuscript approved by local ethical committee of physical education and sport sciences college for women on (February /2023)

Author's contributions:

All contributions of this study were done by the researchers (H.M. and H.B.) who get the main idea and work on writing and concluding also with number of experts, Hanan Murad in Statistics, Suaad Sebti in revision, Inaam Ghalib in translating, Ahmed Rajab in proofreading

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Appendix (1)

Optical Defender

The device consists of a plastic frame with a height of (200) cm representing the defending player. Lighting tapes are installed on the arms and on both sides of the structure. The length of the lighting tape ranges between 30-45 cm on both sides. They represent light stimuli that give options to the attacking player to face the playing conditions. It is located at the bottom of the device. A box with an electrical circuit installed inside that operates the traffic lights randomly, either to the right or left, up or down.

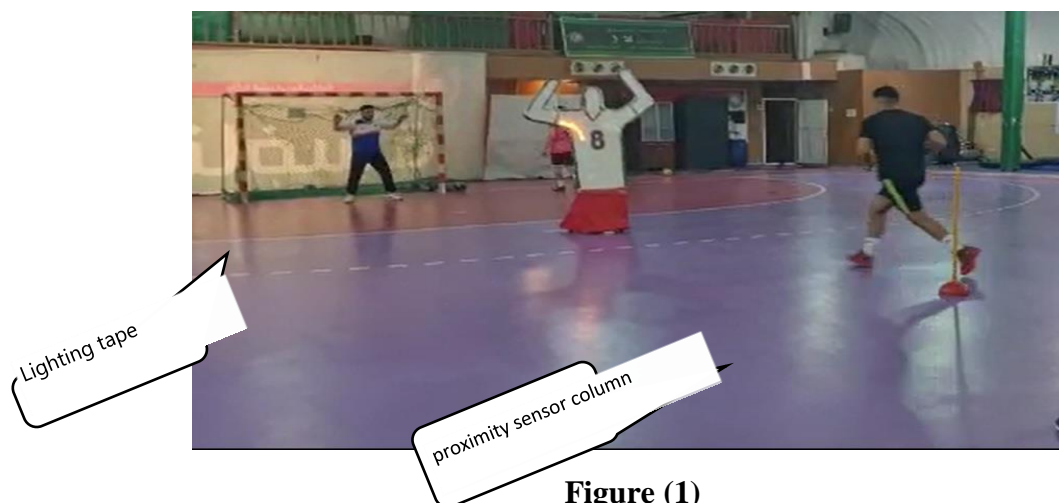


Figure (1)

A wireless signal comes from the approaching pole, which is an infrared approaching sensor, and is placed at a certain distance determined by the coach. After the player approaches the motion-sensing device, it sends a wireless signal to the plastic structure (the defending player) to turn on one of the light signals either to the right. Either left, top or bottom.



Figure (2)

There is a lighting strip in the shape of a circle that distracts the attention of the attacking player and is located in the middle of the plastic structure in the abdomen area, as it is chosen to turn it on or not voluntarily, so that it works randomly between attempts, meaning that the distractor works only if it is chosen from the control panel.

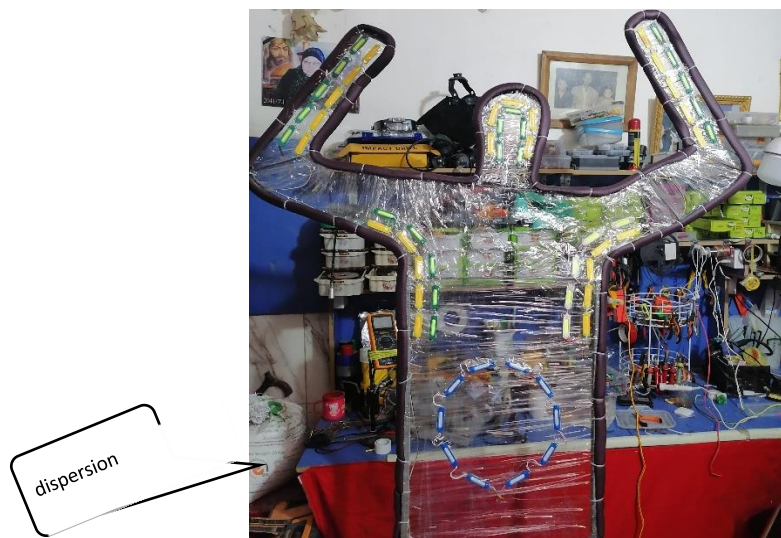


Figure (3)
dispersion site

Appendix (2)
Sample exercises used in the training unit

The first training unit intensity 75%	Shooting from jumps using light cannons -	(7*4)2 complete rest	45 .min
	From a running position with a plump, then aiming from - jumping using light cannons	(7*4)2 complete rest	
	From the running position with the plump, then receiving - and delivering, then targeting from jumping using light cannons	2* 4 complete rest	

اثر تمارين خاصة باستخدام جهاز المدافع الضوئي المصمم في تنمية بعض القدرات البدنية والاداء المهاري المركب
لدى لاعبي كرة اليد

حنان مراد مرزوك¹، هدى بدوي شبيب²
جامعة بغداد / كلية التربية البدنية و علوم الرياضة للبنات

اتجهت دول العالم الى تسخير جميع الإمكانيات والخبرات والعلوم من اجل الوصول الى مستويات متقدمة في الرياضات المختلفة ويهدف التدريب الرياضي إلى إعداد اللاعبين إعدادا جيدا تكمن مشكلة البحث من خلال خبرة الباحثان الميدانية ومتابعة تدريبات لاعبي المدرسة التخصصية كرة اليد فقد لوحظ هناك ضعف واضح في الأداء المهاري ولا بد من تطوير أوجه الضعف لتحقيق مستوى انجاز افضل . ويهدف البحث اعداد تمارين خاصة باستخدام جهاز المدافع الضوئي لدى لاعبي كرة اليد والتعرف على تأثير تمارين خاصة باستخدام جهاز المدافع الضوئي المصمم في تطوير بعض القدرات البدنية والاداء المهاري المركب لدى لاعبي كرة اليد، واستخدمت الباحثان المنهج التجريبي ذو القياس القبلي البعدي لمجموعة واحدة واشتملت عينة البحث على 14 لاعب بأعمار 14-17 سنة واستخدمت الاختبارات البدنية والمهارية لجمع بيانات البحث ومن اهم النتائج:-ان التمارين المعدة باستخدام جهاز المدافع الضوئي لها تأثير ايجابي في تطوير الاداء المهاري المركب لدى لاعبي كرة اليد استخدام اجهزة حديثة في تدريب للمهارات بكرة اليد ، للتمارين المعدة تأثير ايجابي في تطوير القدرات البدنية قيد البحث وتوصي الباحثان باستخدام جهاز المدافع الضوئي في تطوير المهارات الاساسية في كرة اليد ، استخدام اجهزة حديثة في عملية التدريب الرياضي

مستخلص البحث

تمارين خاصة ،المدافع الضوئي، الاداء المهاري المركب

الكلمات المفتاحية