European Journal of Molecular & Clinical Medicine
ISSN 2515-8260 Volume 07, Issue 01, 2020

THE INFLUENCE OF SPECIAL EXERCISES USING A DEVICE DESIGNED TO DEVELOP AND MEASURE THE ACCURACY OF SOME SHOOTING TYPES IN HANDBALL

Dr. Hardan Azeez Salman[1], Dr. Haider Ghazi Azeez Salman[2]
[1]*Asst. Prof. Faculty of Physical Education and Sport Sciences, Al-Mustansiriyah University*
[2]*Asst. Prof. Faculty of Physical Education and Sport Sciences, Al-Mustansiriyah University*

Abstract: This paper contains the introduction and problem of research, which is the conventional training methods used by coaches in the process of handball shooting, as they measure the player's shooting process with old codified scientific methods of measurements and tests, and this is what the two researchers considered a research problem to shed light on. Hence, it is thought of designing a device for the development and measurement of shooting for handball players. The objectives included designing a device to develop and measure the accuracy of some types of handball shots, developing special exercises to improving the accuracy of some types of handball shooting and identifying the reflections of the special exercises in the improvement of some types of handball shooting accuracy for individuals in the sample of the research. As for the hypotheses of the research, there is a significant influence of the exercises using the device developed by the researcher in the improvement of the accuracy of some types of handball shots. The research community comprised of 16 players from Al-Mustansiriyah University handball team. The research sample was represented by the same 16 players.

Keywords: Special Exercises, Device Designed, Shooting Types, Handball

1. INTRODUCTION

The modern scientific and technological developments witnessed by the world today are the result of the application of modern scientific foundations that contributed to the development and upgrading of the scientific level in general, and sports level in particular. There is no doubt that the high and advanced level of sports achievements in the present day are largely linked with the achievements of science and technological development. These achievements and developments included the science of training, measurement and evaluation, which has a significant impact in improving and developing the level of technical and digital performance of the type of the activity practiced.

Collective games have witnessed a great development in various physical, skill, planning and psychological aspects, and handball is one of the collective games covered by this development with the attention of many followers and researchers due to its excitement, strength and speed in physical and skill performance. The training process is geared towards achieving some educational goals by the employment of the different methods and possibilities available in order to bring the player to the maximum level possible in the activity practiced.

Modern technological means have helped researchers, scholars and practitioners in the process of overcoming the old means and methods relied on, and them out of speculation and

coincidence into the adoption of modern scientific methods that lead to know the reflection of sports training on capacity development, which increases the athlete's ability to reaching the highest level of achieving top accomplishments in record-breaking. This is achieved not only through training, but through the creation of appropriate conditions for the athlete in the improvement of his capabilities on which he adapts within his capacities, and improvement comes only with the different circumstances through which he trained, and this is done through devices that help create these conditions and keeping away from what is usual to create new adaptations that lead to their capabilities and capacities improvement to suit new circumstances.

The importance of research lies in the manufacture of this device, which in turn contributes to the advancement and measurement of the accuracy of some types of handball shooting which is an important part in the development of this game and can be used by coaches and workers in the fields of training, education, measurement and testing.

2. RESEARCH PROBLEM

The increased interest in handball players is intended to achieve the goals of training and winning, and this comes only through several variables, including testing and metrics to suit their abilities accurately and the special abilities of skill and physical performance requirements they have, which requires specialized tests with specific conditions and specifications based on scientific bases. And since the two researchers are among the experts and trainers of handball, teaching in the Faculty of Physical Education and Sports Science, informed with the scientific and resources and references, pursuing handball and making consultations with some of the experts specialized in testing, measurement and training, they noticed that some types of shooting accuracy trained and measured with measurements and tests built and codified in an ancient scientific way, and this is what the two researchers considered a research problem to shed light on, so they felt to design device to develop and measure some types of handball shooting.

3. RESEARCH OBJECTIVES

1- Designing a device to develop and measure the accuracy of some handball shooting types.
2- Developing special exercises to improve the accuracy of some handball shooting types.
3- Identifying the impact of exercises using the device designed to improve the accuracy of some handball shooting types of the research sample.

4. RESEARCH METHODOLOGY

The researchers used the empirical method to suit the nature of the research using the empirical design method. The empirical approach is “the deliberate and exact change of the specific conditions of a particular event, and then observing the changes resulted in this event per se, as well as its interpretation” (5: 148).

5. RESEARCH SAMPLE

The sample of the research represented by the 16 Al-Mustansiriyah University players and they were chosen by deliberate method. Homogeneity was carried out on the sample of the research for the length, weight and age variables as in table 1.

Table 1:Sample homogeneity

S	Variables	Arithmetic mean	Medium	Median	Standard deviation	Skewness
1	Height	**185** cm	184cm	0.454	0.464	Random
2	Weight	**78.56** kg	77kg	0.638	-0.321	Random

3	Age	**20.98** years	19 years	0.254	0.524	Random

.

6. THE IDEA OF DESIGNING THE DEVICE TO DEVELOP AND MEASURE SOME SHOOTING TYPES

The idea of designing the device came up through the observation of the researchers for several sports devices in general and measuring instruments in particular, and the training and testing of some types of shooting available are general exercises and tests and not specialized, which made them design a device to develop and measure some types of handball shooting in the field, that is, the designed device simulates the actual and kinetic performance of the players, which gives high accuracy results. When shooting process is done by the player by throwing the balls on an electronic target, light signals are given, alerting the player of throwing balls into squares which in total represents the goal of handball, which is 2m high and 3m wide, the number of squares is 12 of 70cm length and 70cm width each, their total is 4x3. These squares give light signals that change randomly and travel between the twelve squares for each shooting process for each stage of the device controlled by the coach according to the ability and capability of the player and as follows:

Phase one: The signals change randomly amongst the 12 squares and the light signal travels from one square to another with a time period of 7sec.

Phase two: The signals change randomly amongst the 12 squares and the light signal travels from one square to another with a time period of 5sec.

Phase three: The signals change randomly amongst the twelve squares and the light signal travels from one square to another with a time period of 3sec.

Phase four: The signals change randomly amongst the 12 squares and the light signal travels from one square to another with a time period of 1sec.

7. PARTS OF THE DESIGNED DEVICE TO DEVELOP AND MEASURE SOME HANDBALL SHOOTING TYPES

Components:

1- Central device: This device was made of the open source microcontroller (Arduino MEGA) techniques, to suit the nature of the device. The device also consists of a 16x2 LCD screen to display information and buttons (select, start) to operate and choose the difficulty program by the four phases. The device is also equipped with a 12v rechargeable battery.

It also consists of 12 LED light and 12 buttons simulating interactive scoring squares developed to test the device, all these components installed in a plastic box measuring 15x25x30 cm. Figure 1

Fig. 1 Central device

The central device is wired to 12 interactive scoring squares. Figure 2

Fig. 2 Interactive scoring squares

The device contains four difficulty programs: simple (7sec), medium (5sec), difficult (3sec) and very difficult (1sec).

2- Interactive scoring square: It is a square made of leather measuring 70x70cm, inside it contains the touch sensor electrical connectors and also red color LED shows the readiness of the scoring for shooting, and it contains velcro tapes on the edges to enable the scoring square fixing itself tightly with another scoring square. Figure 3

Fig.3 Interactive scoring square

Interactive scoring square after they are installed together (12 squares) constitute the interactive scoring square plate measuring about 2x3m. and becomes looking like a handball goal. Figure (4)

Fig. 4 The total squares of the handball goal

Scoring squares can be arranged and placed in a special bag that protects them from damage and facilitates their carrying. Figure 5

Fig. 5 The bag of the device

The benefit of the device: This device accurately records the correct scorings during the process of random selection of goals through different difficulty times and is used to test the accuracy of scoring players and also used as a training device for the same skill.

Features of the device: This device is characterized by the possibility of use in any place even in the absence of a playground or goal, just needs a wall to fix the scoring squares on.

The device working method: When shooting process is done by the player by throwing the balls on an electronic target, light signals are given, alerting the player of throwing balls into squares which in total represents the goal of handball, which is 2m high and 3m wide, the number of squares is 12 of 70cm length and 70cm width each, their total is 4x3. These squares give light signals that change randomly and travel between the twelve squares for each shooting process for each stage of the device controlled by the coach according to the ability and capability of the player and as follows:

Phase one: The signals change randomly amongst the 12 squares and the light signal travels from one square to another with a time period of 7sec.

Phase two: The signals change randomly amongst the 12 squares and the light signal travels from one square to another with a time period of 5sec.

Phase three: The signals change randomly amongst the twelve squares and the light signal travels from one square to another with a time period of 3sec.

Phase four: The signals change randomly amongst the 12 squares and the light signal travels from one square to another with a time period of 1sec.

8. PERFORMANCE METHOD

The player stands at a distance of 9 meters with a basket of balls close to him while he is in the standby mode, he looks at the designed device and when he sees the instruction by the light fixed on the square inside the electronic target, he begins shooting process on the device with shooting types (in place, vertical and leaning forward jumps). Note that the lighting is random and programmed by the device. When the ball hits the square specified by the device, the device starts counting for each successful shoot during each phase as well as changing the other square randomly, and according to the instructions of the device they are of four phases: first 7sec, second 5sec, third 3 sec and the fourth 1 sec. Each player is given one try and the device runs randomly.

Recording: The best scores recorded by the player is calculated by the device for each of the four phases that are moved to after the completion of the entire phase by the electronic system for the accuracy of some types of handball shooting and be calculated through the time taken in each phase as well as the aiming of the ball in the square gives 1, thus the highest score for the test is 12 with the lowest recorded time for each phase of the test for each player.

1. Validity of the test

Criterion related validity: This type is known as the empirical validity because it uses an external test to judge the criterion scores, or estimates the correlation between test scores and criterion scores. It is defined as "the relation between performance scores on the tests and performance scores on some other measurements (criterions) that measure the same phenomenon (measured power or attribute etc.)" (7: 186). The criterion is defined as "an independent external measurement that basically measures the same phenomenon that the test is supposed to measure or scale to be codified" (7: 190). The researchers used the shooting accuracy test as a criterion, and the correlation between the criterion and test scores was conducted as shown in table 2.

2. Stability

Stability coefficient was found through retesting, as "a stable test is a test that gives the same results if restarted in the same conditions and circumstance during a period that does not allow learning or training" (2287). Through the results of the first exploratory experiment on 14/01/2018, the test was restarted and the results were recorded and treated with Pearson correlation coefficient. Results came out as shown in table 2.

3. Objectivity

Objectivity is "the extent to which the arbitrator or examiner is free from subjective factors" (1: 227). The objective test is not subject to self-assessments. In order to extract objective values, it is necessary to use the objectivity of the test that Mustafa Bahi sees as "the non disagreement between the estimators in judging something or a certain subject" (8: 169). Since the designed device measures the accuracy of some shooting types in terms of time and the score calculated, it is characterized by high objectivity.

Table 2: The scientific bases (validity, stability)

S	Variables	Validity	Stability
1	Some shooting types accuracy	0.87	0.92

9. PRE-TESTS

The pre-test on the research sample was conducted at Faculty of Physical Education and Sports Sciences hall on the 16 player of university team on Thursday 25/01/2018 at 1:00 pm, under the supervision of the researcher and with the assistance of the assistant team, appendix 1, The conditions and method of testing were fixed in order to achieve the same conditions as possible and to record the results in a special results recording form.

10. MAIN EXPERIMENT

After completing all procedures, making sure of device work validity, fulfilling the scientific conditions and their suitability for research sample, ensuring the possibility of conducting tests and distributing the work to the assistant team, the main experiment was carried out through the implementation of special exercises prepared by the researcher, appendix 2, in the main part of the training module. Appendix 3, by the coach under the supervision of the two researchers for the period from Sunday 28/01/2018 to Wednesday 28/03/2018.

11. POST-TESTS

After the application of special exercises formulated by the researcher in the main section of the training module over a period of 8 weeks as of Sunday, 28/01/2018 until Wednesday, 28/03/2018, and naturally without obstacles, a three days break was given, and on Sunday 01/4/2018, post-tests were conducted on research sample. The researchers were keen to provide the conditions for the pre-testing in terms of the assistant team work, time, place and necessary tools.

12. PRESENTATION, DISCUSSION AND ANALYSIS OF RESULTS

After the end of the proposed exercises application period on the research sample, conduction of post-tests and obtaining the data from the tests, the researcher arranged and statistically processed the results for the pre- and post-tests. The results were formulated in an illustrative table form in order to analyze the reality of the differences between the pre- and post-tests of the members of the research sample, find out the evolution of the research sample for the three types of shooting in these tables and then discuss the results for the purpose of achieving the objectives of the research. The researchers used the T-test to find out whether the differences were significant between the results of pre-test and post-test of the members of research sample in the test results as in table 3.

13. CONCLUSION

In view of the findings and scientific facts of the research, the researchers have found that:

1- The device designed by the researchers proved its validity in developing and measuring the accuracy of some shooting types of the research sample.

2 - The emergence of a significant influence of the special exercises by the use of the device designed by the researchers to develop the accuracy of some shooting types of the research sample.

14. REFERENCES

[1] Abdulhameed, Kamal and Mohammed Sobhi Hassanain. Modern Handball Quad. Cairo, Marakz Al-Kitab for Publishing, 2001.

[2] Bahi,Mustafa Hussein. Scientific Transactions between Theory and Practice. Cairo, Marakz Al-Kitab for Publishing, 2011.

[3] Ismail, Sa'ad Mohsen. The Influence of Training Methods on the development of the Explosive Power of the Legs and Arms in the Accuracy of the Long Shot by Vertical

Jump in Handball. Unpublished Ph.D. Thesis. Baghdad University, Faculty of Sports Education, 1996.

[4] Khooli, Ameen Anwar. Physical Education is the Class Teacher and Physical Education Student Guide. Cairo: Al-Fikr Al-Arabi, 1998.

[5] Melhem, Sami Mohammed. Curricula in Education and Psychology. 1st ed. Amman, Al-Maisara, 2000.

[6] Melhem, Sami Mohammed. Measurement and Assessment in Education and Psychology. 3rd Amman: Al-Maisara for Publication, Distribution and Printing, 2005.

[7] Owen, B., et al. Beginners Outdo to Scoring and Caching. Pehan Book, London, 1975.

[8] Qandeelji, Amir Ibrahim. Methodology of Scientific Research. 1st ed., Amman, Al-Yazouri for Publishing, 2012.

[9] Radhwan, Mohammed Nasruldeen. Introduction to Measurement in Physical and Sports Education. 2nd ed., Cairo, Marakz Al-Kitab for Publishing, 2011.