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Scientific Translation for Publication: The Impact of Using Rubber Ropes and Balance Tools on Some Physical Abilities and Offensive Skills of Al-Karkh First Education Team Players Aged (14-16) Years

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Abstract

The study aimed to prepare exercises using rubber ropes and balance tools together, and to determine their effect on some of the physical abilities and offensive skills of the Karkh Primary Education players aged 14-16 years in handball. The researchers used the experimental method with two control and experimental groups with a pre-test and a post-test. As for the sample, it was chosen intentionally, namely the players of the first Karkh education team, aged (14-16) years, in handball. They were randomly divided into two groups, control and experimental, with (8) players for each group. The most important physical abilities were identified (strength characterized by speed, explosive power, and endurance of speed), and some offensive skills (dribbling, handling, and shooting). After which the appropriate tests for each variable were chosen and the exploratory experiment was conducted on a sample of the research community, for the purpose of identifying the suitability of the tests and tools used. After conducting the main experiment and extracting the results, appropriate statistical methods were used to treat them statistically. The researchers concluded that the use of rubber ropes and balance tools had a positive effect in developing some physical abilities and offensive skills in handball. The experimental group also achieved better results in the variables studied compared to the control group.

Keywords: rubber bands, balance tools, physical abilities, offensive skills, handball

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Introduction

The educational process is the cornerstone of progress for societies throughout different eras. The primary task falls upon the coach to develop the players' capabilities and various skills to reach the highest levels by using educational aids and tools, as well as diversifying exercises using these assistive tools and integrating them. This is due to the added value and importance they provide in learning and training (Ahlam & Shaghati, 2015).

Rubber ropes are among the tools used in all sports because they work to develop the process of muscle contraction at high speed, in addition to stimulating nerve units and muscle fibers to a greater extent, and creating rapid timings for nerve signals. This was confirmed by (Sherzad Mohammed, 2015). They also work to increase neuromuscular work and have a direct impact on physical abilities, which is suitable for performing basic handball skills that require high speed in muscle contraction. (Khamees et al., n.d.)

Training with rubber ropes can be called flexible resistance training, which provides many directions of movement during exercise. This means a higher level of neuromuscular control. The resistance in them depends on the extent of elongation that occurs in the rope, unlike free weights and machines. In addition, it is possible to perform the exercise in the full range of motion of the joints, which improves flexibility, reduces muscle and ligament tears, and saves energy. (Mondil et al., 2023)

Exercises that use balance tools are appropriate for the skill in terms of different playing situations. The choice of method or style is the fundamental pillar of all development (Sadiq, Haitham; Sabaa, Ahmed; 2023). Balance exercises have a direct relationship with the physical and skill aspects in most handball skills, due to the requirements of changing direction, jumping, and then performing handling, dribbling, feinting, and shooting under the pressure of the defender and physical contact in many cases. Also, the player jumps and flies in the air, which requires maintaining balance in order to shoot and score a goal in the opponent's net.(Shukr, 2024)

Handball has a special character compared to other games due to the nature of modern performance, as well as the modifications and changes that have occurred in the rules of the game. It is also characterized by its need for high physical abilities and tactical aspects. However, without high offensive skills, the team will not be able to face other teams (Al-Sudani Ahmed, 2010). The application of exercises designed using rubber ropes and balance tools and their execution in play in the best possible way, achieving objectives with minimal effort and in the shortest time, and achieving victory, (Shukur et al., 2022) is crucial. Therefore, we see that coaches strive to use these tools to aid in developing various aspects of players. This leads to improving levels and achieving high results, in addition to using modern training methods and diversifying techniques to create a distinctive educational and training mix that helps prepare for training, reduces boredom, and brings joy to the players. (Wahed Issa et al., 2024)

The importance of this research also stems from breaking the usual pattern in developing physical abilities and offensive skills in handball, by implementing exercises that

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use balance tools and rubber ropes together on the one hand, and linking them with offensive skills on the other.

Among the most important studies that addressed physical abilities and offensive skills are: the study by (Shaker, 2014) ("The most important physical abilities and their relationship to the performance of some offensive skills in handball for youth players"), the study by (Naji, 2014) ("Some special physical abilities and their relationship to the accuracy of performing the shooting skill from a pivot in handball"), and the study by (Qassem Muhammad, 2017) ("The effect of exercises with rubber ropes in developing some physical abilities for youth basketball players").

Method and Tools

The researchers used the experimental method with two groups, a control group and an experimental group, due to its suitability to the research problem and objectives. The research population was intentionally selected and consisted of the players of the Al-Karkh First Education team aged (14-16) years in handball, totaling (18) players. The research sample was determined to be (16) players after excluding players who were not committed to training times, representing (88.88%) of the research population. Through a lottery, (8) players were selected as a control group, and (8) players were selected as an experimental group.

The researchers utilized the following research tools: sources and references, the internet, tests, an assistant work team (Appendix 1), and training tools (Appendix 2).

Tests for physical abilities in handball were identified as: (front support test for 10 seconds for distinctive arm strength, triple hop test for distinctive speed-strength for the legs, Sargent jump test for explosive power of the legs, throwing a 600g ball for explosive power of the shooting arm, and 25m x 8 shuttle run for speed endurance) (Jabbar & Khamees, 2020).

As for the tests of offensive skills in handball, they were: (passing and receiving against a wall for 30 seconds, dribbling in a zigzag pattern for a distance of 30m, and shooting accuracy test) (Al-Sudani, Ahmed; Mutaib, Fouad, 2018).

An exploratory experiment was conducted to ensure the safety of the equipment and tools and the efficiency of the assistant work team, as well as to standardize the training intensity and the time taken to apply the tests and exercises.

The designed exercises were implemented within the training program for the research sample using the tools (rubber ropes and balance tools). This was done by applying the exercises gradually and including them during the main part of the training unit. The time allocated for applying the exercises was (25-35) minutes of the training unit. The duration of implementing the exercises was (723) minutes over (24) training units. The researchers used the interval training method and the repetitive method when applying the exercises. Both research groups were trained on some physical abilities (strength characterized by speed, explosive power, and speed endurance) and some offensive skills (dribbling, shooting, and passing). It is noteworthy that the experimental research group used rubber ropes and balance tools together when

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applying the exercises. After completing the necessary period for implementing the exercises, a post-test was conducted on the research sample, providing the same accompanying conditions as the pre-test. During this, the results were recorded and obtained through the use of the statistical package (SPSS) and by using the laws of arithmetic mean, standard deviation, and T-test for paired and independent samples.

Results

Table (1)

Arithmetic Means, Standard Deviations, T-value, and Significance Level for the Pre- and Post-tests of the Control Group

Research Variables	Tests	Pre-test Mean	Pre-test SD	Post-test Mean	Post-test SD	Mean Diff.	SD Diff.	T-value	SIG	Significance
Explosive Power	Arms (600 g medicine ball throw)	17.25	.707	19.88	.835	-2.625	.916	-8.104	.000	Significant
	Legs (Sargent test)	35.25	3.651	40.63	4.069	-5.375	5.397	-2.817	.026	Significant
Speed Strength	Arms (Front supp	8.25	.707	11.13	.835	-2.875	1.264	-6.524	.000	Significant

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	Legs (Triple hop right leg)	5.402	.3286	5.926	.08141	-.523	.32566	-4.549	.003	Significant
	Legs (Triple hop left leg)	5.3888	.2740	5.966	.07367	-.5775	.25645	-6.369	.000	Significant
Speed Endurance	Shuttle run 25m x 8	43.88	1.262	41.887	.92447	2.000	1.845	3.062	.018	Significant
Passing	Passing and receiving against wall 30s	20.50	1.414	23.13	1.959	-2.625	2.774	-2.676	.032	Significant
Dribbling	Zigzag dribblin	8.328	.5832	7.412	.33238	.91625	.55606	4.661	.002	Significant

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	g 30m									
Shooting	Shootin g accuracy test	1.88	.641	2.88	.835	-1.000	1.195	-2.366	.050	Significant

[Table data translated from source 94]

Table (2)

Arithmetic Means, Standard Deviations, T-value, and Significance Level for the Pre- and Post-tests of the Experimental Group

Research Variables	Tests	Pre-test Mean	Pre-test SD	Post-test Mean	Post-test SD	Mean Diff.	SD Diff.	T-value	SIG	Significance
Explosive Power	Arms (600 g medicine ball throw)	16.88	1.126	21.38	1.506	-4.500	2.070	-6.148	.000	Significant
	Legs (Sargent test)	35.00	3.464	43.50	1.604	-8.500	3.780	-6.361	.000	Significant

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Speed Strength	Arms (Front support 10s)	8.25	1.035	12.50	.926	-4.250	1.753	-6.859	.000	Significant
	Legs (Triple hop right leg)	5.4563	.34513	6.1213	.25091	-.66500	.46208	-4.071	.005	Significant
	Legs (Triple hop left leg)	5.3875	.27312	6.1700	.33954	-.78250	.45703	-4.843	.002	Significant
Speed Endurance	Shuttle run 25m x 8	43.7813	1.2239	41.152	.78290	2.6287	1.75262	4.242	.004	Significant
Passing	Passing and receiving against wall 30s	20.50	1.690	24.38	1.847	-3.875	2.997	-3.657	.008	Significant

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Dribbling	Zigzag dribbling 30m	8.2875	.49796	7.0150	.52016	1.2725	.58292	6.174	.000	Significant
Shooting	Shooting accuracy test	2.00	.535	3.38	.744	-1.375	.916	-4.245	.004	Significant

Table (3)

Difference in Arithmetic Means, Standard Deviations, T-value, and Significance Level for the Two Groups in the Post-tests

Research Variables	Tests	Mean Diff.	SD Diff.	T-value	SIG	Significance
Explosive Power	Arms (600g medicine ball throw)	-2.125	.718	-2.959	.010	Significant
	Legs (Sargent test)	-2.500	1.493	-1.675	.116	Random
Speed Strength	Arms (Front support 10s)	-1.375	.441	-3.120	.008	Significant
	Legs (Triple hop right leg)	-.22250	.08182	-2.719	.017	Significant

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	Legs (Triple hop left leg)	-.27500	.11942	-2.303	.037	Significant
Speed Endurance	Shuttle run 25m x 8	.91625	.38614	2.373	.033	Significant
Passing	Passing and receiving against wall 30s	-1.750	.821	-2.131	.051	Significant
Dribbling	Zigzag dribbling 30m	.49375	.22640	2.181	.047	Significant
Shooting	Shooting accuracy test	-.652	.350	-1.784	.096	Random

Discussion

From the tables, it is evident that the differences between the pre- and post-tests are significant in Favor of the post-test in the results of physical abilities and offensive skills. The researchers attribute these results to the continuity in training, the use of appropriate training aids and methods, and their preparation based on scientific foundations. Additionally, the exercises given during the training program were suitable for the sample's level in terms of intensity, volume, and rest. This aligns with what (Abdullah et al., 1991) indicated: that providing exercises according to the correct scientific method leads to an increase in the efficiency of the work of the muscle groups involved in performing various motor skills and physical abilities that the player acquires during training. (Al-Azawi & Kathom, 2012)

Furthermore, the experimental group achieved better results than the control group in most of the research variables. The researchers attribute this to the use of necessary tools such as rubber ropes and balance tools together, which achieved significant improvement in physical abilities. This forced the members of the experimental group to adopt the correct posture during performance for safety and to avoid the risk of injury, which positively reflected on the performance of the tests. Indeed, "rubber rope exercises require the correct body posture during performance to achieve the full benefit of the exercise, (Kzar & Kadhim, 2020) as the body position at the beginning of the movement, during performance, and at the end is very important to achieve direct resistance against the targeted muscles, thus achieving the exercise's

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effectiveness represented in reaching the highest level of efficiency for the working muscles while achieving the greatest degree of safety and with the least risk" (Mohammed, Ahmed, 2016).

Also, the application of exercises using rubber ropes and balance tools on one hand, and linking the physical aspect with offensive skills on the other hand during the special preparation period, led to the noticeable development in the results of the experimental group and its superiority over the control group. This was confirmed by (Abd Al-Baseer, 1999), who stated that it is a mistake to think that there is a separation between the development of physical abilities and the development of motor skills.

Moreover, a handball player needs arm strength to be able to perform movements and shoot, as well as leg strength to be able to jump high and with the required speed to reach the appropriate place to perform the essential role in offensive skills (Tawfiq, 1989). Also, (Sobhi, Mohammed Hassanein, 2001) emphasizes that no matter how high the level of physical fitness of an athlete, they will not achieve the desired results unless all of this is linked to the complete mastery of sports motor skills in the type of specialized activity they practice.

The researchers also attribute the observed development to the positive impact of the applied exercises using assistive aids and tools (rubber ropes and balance tools), which were suitable for the players, their ages, and their physical and skill capabilities. In addition, their novelty and previous non-application were factors. Handball is one of the games that relies heavily on varied exercises. (Kadhim, 2024) This was pointed out by (Nassif & Hassan, 1988), who stated that the level of athletic achievement rises rapidly when using diverse and new exercises that the athlete is not accustomed to and that carry special loads.

Conclusions

- The application of special exercises using rubber ropes and balance tools has a positive impact on the development of physical abilities (strength characterized by speed, explosive power, and strength endurance).
- Special exercises using rubber ropes and balance tools have a positive impact on the development of offensive skills (passing, dribbling, and shooting).
- The experimental group achieved better results in the studied variables compared to the control group.

Recommendations

- Emphasis should be placed on applying special exercises using rubber ropes and balance tools due to their significant impact on physical abilities and offensive skills in handball.

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- Emphasis should be placed on exercises that integrate physical abilities with offensive skills, according to the specificity of the game of handball.

Support staff

Workplace •	Profession	the name
		Hassanein
Sports activity/education in Al-Karkh 1	Handball coach	Noman Munther
Sports activity/education in Al-Karkh 1	Handball coach	Ali Saadoun

Appendix (1) "Assistant Work Team" lists names, professions (Handball Coach), and workplace (Sports Activity/Karkh 1 Education).

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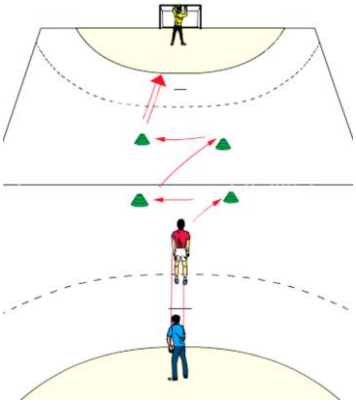
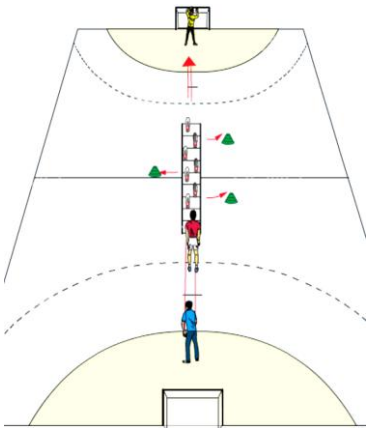
- Appendix (2) "Rubber Ropes and Balance Tools Used" contains images of the equipment.





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Appendix (2) also contains "Applied Exercises Combining Rubber Ropes and Balance Tools" with diagrams and a sample training unit plan.

الاسبوع: الاول
الوحدة: الاولى
اليوم: السبت
التأريخ: ١١\2023

«« تطبيق التمرينات خلال وحدة تدريبية »»

مكان العمل: قاعة النشاط الرياضي / المنصور
عدد افراد العينة: (8) لاعبا
زمن الوحدة التدريبية: 112 د

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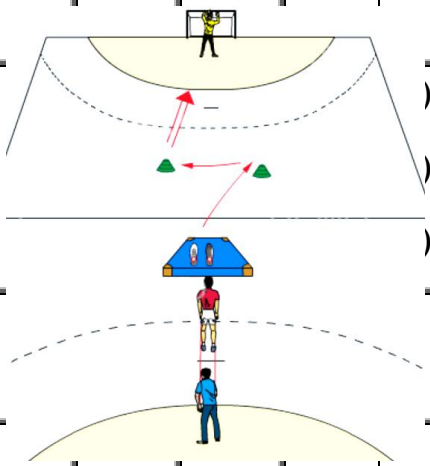

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