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The Impact of Facilitative Training Means on Developing the Speed and Accuracy of High Jump Shooting Performance in Handball among Kanaan Youth Forum Players

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Abstract: The current study investigates the impact of Facilitative Training Means on enhancing the speed and accuracy of high jump shooting performance in handball among players of the Kana'an Youth Forum. An experimental design was employed due to its appropriateness for the study's objectives. A purposive sample of (20) players was selected and randomly assigned into two equal groups: an experimental group that followed a training program incorporating Facilitative Training Means, and a control group that adhered to conventional training methods. Pre- and post-tests measuring high jump shooting speed and accuracy were conducted, and the data were analyzed using appropriate statistical procedures. The findings revealed statistically significant improvements in the experimental group's post-test results, indicating the effectiveness of Facilitative Training Means in developing both the speed and accuracy of high jump shooting in handball.

Keywords: Handball, Facilitative Training Means, Shooting Speed, Shooting Accuracy, High Jump Shooting

Introduction

Handball is a fast-paced team sport that demands exceptional motor performance, combining high levels of physical fitness with advanced technical skills. The game involves rapidly changing situations that require players to make immediate decisions and execute precise movements under competitive pressure. Among the fundamental and decisive skills in handball is **high jump shooting**, which plays a critical role in scoring goals and determining match outcomes. This skill represents a blend of explosive power, motor coordination, and execution accuracy. Achieving optimal performance in high jump shooting requires a high level of specific physical fitness, along with systematic skill repetition under training conditions that closely simulate competitive environments. However, field observations of players from the **Kana'an Youth Forum** reveal noticeable deficiencies in the speed and accuracy of this skill. These shortcomings may be attributed to an overreliance on traditional training methods and the limited use of modern **Facilitative**

Training Means.

Facilitative Training Means are considered one of the most important components in the development of the training process, as they provide a stimulating environment and contribute to enhancing both physical and technical performance. They achieve this by diversifying motor stimuli and increasing player motivation. Based on this premise, the current study was designed to examine the impact of using Facilitative Training Means on improving the speed and accuracy of high jump shooting among Kana'an Youth Forum handball players. The ultimate goal is to identify the most effective skill preparation strategies that enhance performance efficiency and lead to better competitive outcomes. Given the technical advancement across all sports disciplines, athletes have reached a level of convergence in physical, technical, and tactical performance. Consequently, researchers and specialists in the field of sports have turned their attention to studying the finer details that differentiate performance levels and move away from conventional training approaches in pursuit of the ultimate goal—victory—which coaches and sports professionals strive to achieve. The **significance** of this study lies in its focus on the effect of Facilitative Training Means in developing the speed and accuracy of high jump shooting performance in handball among **Kana'an Youth Forum** players. These means aim to replicate match-like conditions during training as closely as possible. Training devices and aids play a vital and active role in player development, while the psychological aspect they provide is equally important in fostering motivation and creating a desire to engage in training. They help reduce effort and save time for both coach and player, allow for independent practice, facilitate knowledge transfer, clarify ambiguous aspects, reinforce skill acquisition, and enhance players' physical and technical capabilities. Therefore, the researcher sought to explore the significant impact of specialized exercises based on Facilitative Training Means in improving the speed and accuracy of high jump shooting performance in handball.

Problem **of the** Study

High jump shooting is considered one of the most decisive skills in handball, given its significant role in determining match outcomes. This skill combines elements of speed and accuracy in execution and requires a high level of motor coordination and explosive strength. However, field observations of players from the **Kana'an Youth Forum** indicate a relative weakness in both the speed and accuracy of this skill, which negatively affects offensive effectiveness and goal achievement during competitions. This issue is partly attributed to the continued reliance on traditional training methods and the limited use of **Facilitative Training Means**, which are essential for enhancing players' physical and technical performance. Consequently, the need has emerged to investigate the impact of employing Facilitative Training Means as a modern training approach that contributes to the development of high jump shooting speed and accuracy, ultimately aiming to elevate players' skill levels and achieve better competitive results. Therefore, the researchers sought to address this problem by **answering the following question:**

- What is the impact of using Facilitative Training Means on developing the speed and accuracy of high jump shooting performance in handball among players of the Kana'an Youth Forum?

Objectives **of the** Study

1. To identify the impact of using Facilitative Training Means on improving the speed and accuracy of high jump shooting performance in handball among Kana'an Youth Forum players.
2. To compare the results of the experimental group that used Facilitative Training Means with those of the control group that trained using conventional methods in high jump shooting speed and accuracy tests.

Hypotheses **of the** Study

1. There are statistically significant differences between the pre- and post-test results of high jump shooting speed and accuracy in favor of the post-test for the experimental group.
2. There are statistically significant differences between the post-test results of the experimental and control groups in high jump shooting speed and accuracy, favoring the experimental group.

Methodology

Method of the Study

The researcher adopted the experimental method due to its suitability for the nature of the problem under investigation. The problem itself determines the appropriate approach for obtaining accurate data and results. The experimental method is defined as "a deliberate and controlled alteration of the conditions surrounding a phenomenon, followed by observation of the resulting changes in the phenomenon under study. It is also defined as the use of experimentation to test hypotheses" (Nofal & Freil, 2010, p. 244). In designing the study, the researcher employed the **equivalent groups design** (experimental and control). Pre-tests were administered to both groups in the skill of handball shooting. The independent variable was then applied to the experimental group only, while the control group continued with conventional training. Post-tests were subsequently conducted for both groups, and the differences between the results were analyzed statistically.

Population and Sample of the Study

To conduct the study and implement its components with scientific precision, the sample must be selected from the original population, upon which the researcher applies the study procedures. Sample selection is a critical element of scientific research and is considered "the model upon which the researcher bases the entirety of their work" (Alawi Rateb, 2002, p. 140). The researchers purposively selected the study population and sample from youth handball teams affiliated with youth and sports forums participating in the **Youth and Sports Directorate Championship** for the 2024–2025 season. The participants were aged between 17 and 18 years. The sample consisted of (25) youth players from the **Kana'an Youth Forum**, of whom (5) were excluded due to inconsistent attendance during the training sessions. Thus, the final study sample included (20) players out of a total of (99)

youth handball players affiliated with the Youth and Sports Directorate in Diyala Governorate, representing 20.20% of the original population. **The pilot experiment** was conducted on youth players from the **Baladrooz Youth Forum**, and the sample was randomly divided by lottery into two groups: experimental and control, with (10) players in each group.

A. Sample Equivalence

Equivalence between the experimental and control groups was established based on the results of the pre-test in handball shooting, as shown in Table (1).

Table 1. Equivalence of the Study Sample Participants

No	Variables	Unit	Experimental Group		Control Group		(T) Value	*P*-value	F
			Mean	SD	Mean	SD			
1	Shooting in Handball	Mark	2.875	1.126	2.750	1.282	0.207	0.839	0.085

It is evident from Table (1) that the p- values exceed the significance level of (0.05), indicating that the sample groups are statistically equivalent.

Data Collection Tools Used in the Study

The study relied on a variety of data collection tools, including Arabic and foreign sources and references, questionnaires, data recording and extraction forms for measuring handball shooting skill, direct observation, personal interviews, exploratory trials, a supporting research team, and statistical methods.

As for the instruments and equipment used in the study, they included:

- (10) handballs
- Fluorescent markers
- Adhesive tape
- (6) hurdles
- Benches
- Boxes
- Rings
- (1) medicine ball weighing 3 kg
- (2) medicine balls weighing 2 kg

Test Specifications

Test Title: Speed and Accuracy of High Jump Shooting Performance (Source: Hussein, 2022, p. 68)

Test Objective:

- To assess the speed of high jump shooting execution
- To evaluate the accuracy of high jump shooting

Required Equipment:

- (5) handballs
- (4) target squares (60 cm × 60 cm) placed in the goal corners
- A blocking wall positioned 20 cm in front of the player and 3 meters wide
- Stopwatch

Performance Procedure:

- The five balls are placed 2 meters from the 9-meter line, facing the goal.
- Upon the start signal, the player performs high jump shooting toward any of the four goal corners as quickly as possible, following three preparatory steps and shooting over the blocking wall.

Test Conditions:

- No more than three steps may be taken before shooting
- The shot must be executed over the blocking wall

Scoring Criteria:

- Time is recorded from the start signal until the final ball is released
- One point is awarded for each ball that successfully enters any of the four goal corners
- Zero points are given for shots that miss the target squares
- Shots performed with more than three steps are disqualified

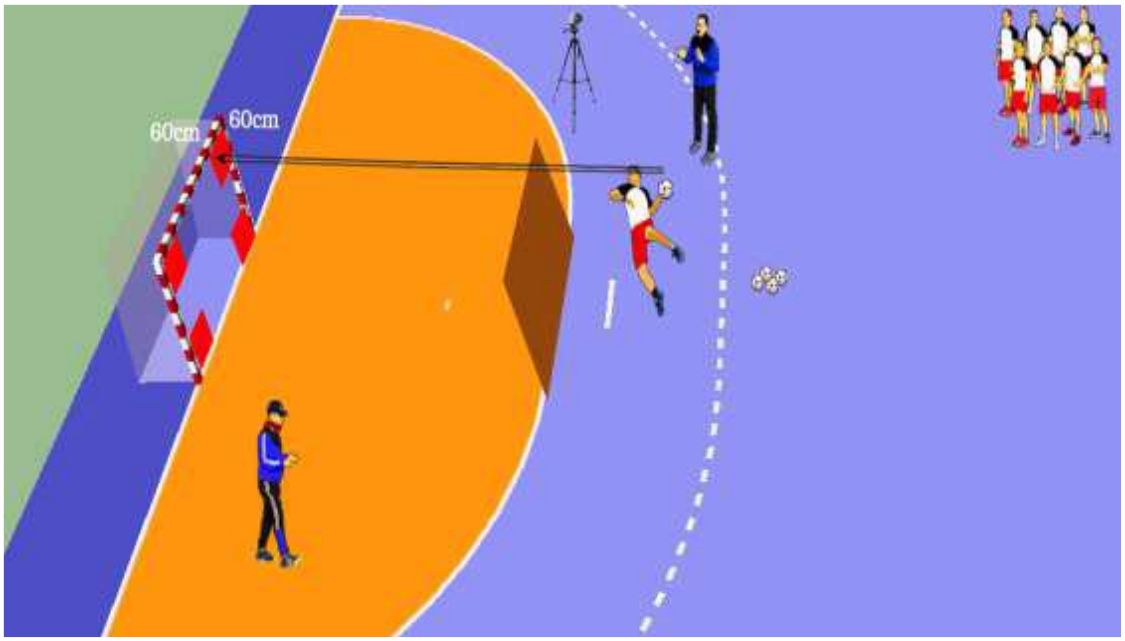

Figure 1. Illustration of the High Jump Shooting Test in Handball

The Pilot Experiment

To avoid potential difficulties and obstacles that may arise during the implementation of the study and to ensure procedural accuracy and feasibility, exploratory trials were conducted on a sample from the study population. The pilot experiment is

considered "a practical rehearsal to identify the strengths and weaknesses encountered during test administration in order to address them" (Al-Mandalawi et al., 2001, p. 107).

Accordingly, the researchers conducted The pilot experiment s as follows:

1. First Pilot Experiment

To identify potential challenges in administering the handball shooting skill test and to assess its suitability for the study sample, the first exploratory trial was conducted on December 4, 2024, involving (10) players from the Baladrooz Youth Forum, affiliated with the Youth and Sports Directorate in Diyala Governorate. The objectives of this trial were:

1. To assess the appropriateness of the tests for the sample's skill level
2. To identify difficulties and problems that may arise during test implementation
3. To determine the time required to administer the tests
4. To evaluate the validity of the tools and equipment used in the study
5. To train the supporting research team on proper test administration
6. To identify errors that may occur during test execution
7. To establish the scientific foundations of the tests (validity, reliability, objectivity)

2. Second Pilot Experiment

After implementing the necessary modifications to all test components, the second exploratory trial was conducted on December 10, 2024, using the same sample from the first trial—(10) players from the Baladrooz Youth Forum. The purpose of this trial was to apply the revised test procedures and further confirm the scientific foundations of the tests.

3. Third Pilot Experiment

The third exploratory trial focused on exercises involving devices and **Facilitative Training Means**, and was conducted on the main study sample consisting of (20) handball players from the **Kana'an Youth Forum** on December 12, 2024. The objectives of this trial were:

1. To assess the suitability of the exercises using devices and Facilitative Training Means for the sample's skill level
2. To identify challenges and issues during the implementation of these exercises
3. To evaluate the compatibility of the exercises with the scheduled training unit durations

Scientific Foundations of the Tests Used

1. Test Validity

Validity refers to "the extent to which a measurement tool accurately measures what it is intended to measure." It is considered the most critical criterion for evaluating the quality of a test (Al-Emadi, 2004, p. 170). The researcher employed **content validity** to determine the validity of the proposed tests by presenting them to a panel of experts in testing, measurement, and handball. Expert evaluations conducted under carefully controlled experimental conditions help minimize subjective bias and are essential for establishing the content validity of physical, motor, or skill-based tests. The validity of the

tests was confirmed through expert consensus that the tests effectively measure the intended objectives.

2. Test Reliability

Reliability is a fundamental characteristic of a good test and is considered the second most important criterion after validity. Tuckman (2005) states that "administering the same test to the same group of individuals on two separate occasions under similar conditions is a reliable method in experimental research" (Alawi, 2005, p. 259). To verify the reliability of the tests, the researcher administered them to a group of youth handball players from the Baladrooz Youth Forum, affiliated with the Youth and Sports Directorate in Diyala Governorate, on December 4, 2024. The same tests were re-administered to the same group on December 10, 2024, under similar conditions. Notably, this group of (10) players was excluded from the main study sample. After collecting and statistically analyzing the results from both test sessions, a high correlation was found between the two sets of measurements, confirming that the tests were reliable and accurately measured the intended objectives, as shown in Table (2).

Table 2. Test Reliability

No.	Variables	Tests	Unit	Reliability Factor
1	Shooting in Handball	Test of Speed and Accuracy of performance in High Jump Shooting	Mark	0.831

3. Objectivity of the test

Objectivity is considered the third criterion of a good test. Experts regard objectivity as a form or dimension of reliability, particularly influential in tests that rely on evaluators' judgments. Therefore, it is closely tied to the clarity of test administration instructions and the understanding of how the test should be performed. By clearly outlining the test protocol and strictly adhering to the procedures for test administration and score recording, objectivity can be enhanced. A test is deemed objective if it "yields the same scores in all cases, regardless of who evaluates it" (Thouless, 2006, p. 231).

Field Procedures

1. Pre-Tests

The researchers conducted the pre-tests for the study sample on January 5, 2025, focusing on the handball shooting skill test. The tests were administered at 2:00 PM on the handball court located within the indoor hall of the Kanaan Youth Forum. The researchers ensured consistency in testing conditions, procedures, and the supporting team to replicate the same environment as closely as possible during the post-tests.

2. Main Experiment (Exercise Implementation)

The main experiment and training program were applied exclusively to the experimental group, while the control group followed the training regimen prescribed by the team coach. The training units were supervised directly by the researchers, with assistance from the team coach and support staff, starting on Tuesday, January 7, 2025, and

concluding on Saturday, March 1, 2025. The experimental group underwent three training sessions per week—on Saturdays, Tuesdays, and Thursdays—for a duration of eight weeks, totaling 24 training units. The researchers employed a set of 40 exercises using equipment and auxiliary tools tailored to the nature of the game and the players' skill levels. The researchers focused primarily on the technical aspect of the handball shooting skill within each training unit, dedicating 45 minutes to this component. The training program followed a low-intensity interval training approach with a load fluctuation ratio of 2:1. The experimental phase was conducted during the preparatory sessions preceding competitions, as detailed in Table (3).

Table 3. Presents the schedule of the training program.

No.	Day	Date	No.	Day	Date
First session	Tuesday	7-1-2025	Thirteenth session	Tuesday	4-2-2025
Second session	Thursday	9-1-2025	Fourteenth session	Thursday	6-2-2025
Third session	Saturday	11-1-2025	Fifteenth session	Saturday	8-2-2025
Fourth session	Tuesday	14-1-2025	Sixteenth session	Tuesday	11-2-2025
Fifth session	Thursday	16-1-2025	Seventeenth session	Thursday	13-2-2025
Sixth session	Saturday	18-1-2025	Eighteenth session	Saturday	15-1-2025
Seventh session	Tuesday	21-1-2025	Nineteenth session	Tuesday	18020195
Eighth session	Thursday	23-1-2025	Twentieth session	Thursday	20- 2-2025
Nineth session	Saturday	25-1-2025	Twenty-first session	Saturday	22-2-2025
Tenth session	Tuesday	28-1-2025	Twenty-second	Tuesday	25-2-2025
Eleventh session	Thursday	30 -1-2025	Twenty third session	Thursday	27-2-2025
Twelfth session	Saturday	1-2-2025	Twentieth session	Saturday	1-3-2025

- **Preparatory Section**: The total duration of this section was 240 minutes, with an average of 10 minutes per training unit, representing **16.7%** of the overall training time.
- **Main Section**: This section lasted a total of 1080 minutes, with an average of 45 minutes per training unit, accounting for **75%** of the total training duration.
- **Final Section**: The total time allocated to this section was 120 minutes, with an average of 5 minutes per training unit, comprising **8.3%** of the overall training time.

Table 4. Training Session Sections and their Percentage Distribution

Sections of Training Session	Time during training session	Total time durations of 32 training sessions	Percentage of a Single Training Session
Preparatory	10 minutes	240 minutes	16.67 %
Main	45 minutes	1080 minutes	75 %
Final	5 minutes	120 minutes	8.3 %
Total	60 minutes	2560 minutes	100 %

The training program was based on the following principles (Ibrahim, 2013, p. 88):

- Observing the principle of **variety and flexibility** in performing exercises within the training unit to prevent boredom and monotony among youth.
- Considering **individual differences** among players.
- Applying the principle of **progression**, moving from easy to difficult and from simple to complex tasks.
- Contributing to the enhancement of players' **morale and willpower**.

- Supporting the achievement of both **general and specific objectives**.

Table 5. Presents the sections of the training session, their durations, and corresponding percentage distributions.

Session	Weeks of Training Session								
	First Week	Second Week	Third Week	Fourth Week	Fifth Week	Sixth Week	Seventh Week	Eighth Week	Percentage
Sections	1,2,3	4,5,6	7,8,9	10,11,12,	13,14,15	16,17,18	19,20,21	22,23,24	
Preparatory	10 m.	10 m.	10 m.	10 m.	10 m.	10 m.	10 m.	10 m.	16.67 %
Main	45 m.	45 m.	45 m.	45 m.	45 m.	45 m.	45 m.	45 m.	75 %
Final	5 m.	5 m.	5 m.	5 m.	5 m.	5 m.	5 m.	5 m.	8.33 %
Total Time of a Session	60 m.	60 m.	60 m.	60 m.	60 m.	60 m.	60 m.	60 m.	100 %

3. Post-Tests

The researchers conducted the post-tests for the study sample on Monday, January 3, 2025, following the completion of the scheduled training program, which consisted of 24 training units over a period of eight weeks. The same procedures used in the pre-tests were applied to ensure consistency in test administration.

Statistical Means

The researchers utilized the Statistical Package for the Social Sciences (**SPSS**) to perform the necessary data analyses.

Results and Discussion

Presentation and Analysis of Pre- and Post-Test Results for the Experimental Group

1. Presentation and Analysis of Pre- and Post-Test Results for the Experimental Group

The researchers presented and discussed the results obtained to determine the impact of the specialized exercises using equipment and supportive training tools on improving the performance of the handball shooting skill. After applying the appropriate statistical treatments, the results were as follows:

Table 6. displays the values of the means, standard deviations, differences in means and standard deviations, calculated (T) values, and the p-value for the pre- and post-tests of the experimental group.

Variables	Unit	Pre-test		Post-test		Mean Differences	SD Differences	Calculated T	T value	Significance
		Mean	SD	Mean	SD					
Shooting in Handball	Mark	1.83	0.97	4.90	1.92	3.07	0.48	6.38	2.26	Significant

t-values *(α) (0.05) Freedom degree (9)*

Table (6) presents the mean scores, standard deviations, and both calculated and tabulated t-values for the jump shot performance test. The pre-test mean was **1.83** with a

standard deviation of **0.97**, while the post-test mean reached **4.90** with a standard deviation of **1.92**. To determine the significance of the differences between the pre- and post-test scores, the calculated t-value was **6.38**, compared to the tabulated t-value of **2.26** at a degree of freedom (df = 9) and a significance level of **0.05**. Since the calculated t-value exceeds the tabulated value, this indicates a statistically significant difference in favor of the post-test.

The analysis of pre- and post-test results for the experimental group in the jump shot skill in handball revealed a clear improvement in players' performance regarding this offensive skill. The observed differences between the two test phases confirm that progress occurred in this specific skill. The researcher attributes this development to the structured use of specialized exercises designed to serve the movement's objective and enhance motor awareness.As Taha (1994, p. 84) emphasized, *sensory knowledge is essential for skill development*. Hale (1982, p. 91) also noted that *motor sensation reinforces neural pathways by generating organized mental imagery of the skill, thereby engaging the body's muscles during execution*. Furthermore, Alawi (1982, p. 187) highlighted that *motor sensations play a vital role in coordinating complex movements that require differentiation among their components*.

2. Presentation and Analysis of Pre- and Post-Test Results for the Control Group

1) Presentation and Analysis of Control Group Results

Table 7. presents the mean scores, standard deviations, differences in means and standard deviations, calculated t-values, and p -value for the pre- and post-tests of the control group.

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Variables	Unit	Pre-test		Post-test		Mean Differences	SD Differences	Calculated T	P value	Significance
		Mean	SD	Mean	SD					
Shooting in Handball	Mark	4.750	0.581	3.625	1.134	0.875	0.991	4.351	0.000	Significant

Upon reviewing Table (7), the following statistical values are evident for the control group: Mean scores (pre- and post-tests), standard deviations, differences in means standard deviation of the differences, calculated t-value and error rates of the following:

The mean score for handball shooting in the **pre-test** was **4.750**, with a standard deviation of **0.581**. In the **post-test**, the mean score decreased to **3.625**, with a standard deviation of **1.134**. The **difference in means** between the pre- and post-tests was **0.875**, and the **standard deviation of the differences** was **0.991**. The **calculated t-value** was **4.351**, and the **error probability (p-value)** was **0.000**, which is lower than the significance level of **0.05**. This indicates that there is a **statistically significant difference** between the pre- and post-test results.

3. Presentation and Analysis of Post-Test Results for the Experimental and Control Groups

1) Presentation and Analysis of Post-Test Results for Both Groups

To assess the mean scores, standard deviations, calculated and tabulated t-values, and the significance level of the post-test results for both the experimental and control groups in handball shooting skills, the data were analyzed as presented in **Table (8)**.

Table 8. displays the mean and standard deviation values for the pre- and post-tests of both the experimental and control groups, along with the calculated t-value and the error probability (p-value).

Variables	Unit	Experimental Group		Control Group		Calculated T	P value	Significance
		Mean	SD	Mean	SD			
Shooting in Handball	**Mark**	**4.750**	**0.581**	**0.581**	**1.134**	**2.263**	**0.040**	**Significant**

Reviewing **Table (8)**, the following statistical indicators are clearly observed for both the experimental and control groups: **Mean scores**, **standard deviations**, **differences in means**, **standard deviation of the differences, calculated t-value , and error probability (p-value)** : The **mean score** for handball shooting skill in the **post-test** for the experimental group was **4.750**, with a **standard deviation** of **0.581**. In contrast, the control group recorded a **mean score** of **0.581** with a **standard deviation** of **1.134**. The **calculated t-value** was **2.263**, and the **error probability (p-value)** was **0.040**, which is lower than the significance level of **0.05**. This indicates the presence of a **statistically significant difference** between the two groups in favor of the **experimental group**.

2) Discussion of Post-test Results for the Experimental and Control Groups

The researchers attribute the observed differences to the following factors: The results of the study revealed statistically significant differences between the pre- and post-test measurements in favor of the post-test for the variables of **speed and accuracy of jump shooting** among players in the experimental group. This indicates that the use of **supportive training tools** had a clear positive impact on the development of this skill. This improvement can be explained by the fact that the facilitative means contributed to creating a **stimulating training environment**, enabling **structured repetition of performance**, and enhancing players' focus on the correct execution elements. These factors positively influenced **movement speed** and **execution accuracy**. Moreover, the results showed that the **experimental group outperformed the control group** in the post-test measurements, confirming that relying solely on traditional methods may not yield the same level of progress as training programs that incorporate supportive tools. This aligns with findings from previous studies in handball training, which emphasized that integrating facilitative meanswith skill-based exercises leads to greater improvements in **motor and technical performance** compared to conventional approaches. The noticeable enhancement in shooting speed is likely due to increased **explosive power in the lower limbs** and improved **neuromuscular coordination** resulting from targeted training using supportive tools. The

improvement in shooting accuracy, on the other hand, can be attributed to better **arm control**, **timing of the jump**, and **precision in execution**—all of which were reinforced through the proposed training program.

The researchers' findings are consistent with those of **Furat Jabbar Saadallah (2015)**, who emphasized the significant and effective role of facilitative meansin the training process. He stated that:

> *"Supportive training tools help attract participants' attention and increase their engagement with the training content. They promote active and positive participation, enhance general and specific physical abilities, improve technical performance, and contribute to the development of trainees' skills and knowledge sources. These tools also increase cognitive awareness, attention, and mental imagery, and improve the athlete's ability to respond positively." (Saadallah, 2015, p. 257)*

As for the **control group**, its limited improvement may be attributed to the **absence of facilitative means and equipment**, which, if used, could have fostered a sense of challenge among players. Additionally, the lack of **exercise variety**, **scientific structuring**, and **sufficient repetition**, along with the absence of **complex stimuli**, may have hindered the activation of their motor programs, ultimately affecting performance outcomes. This is supported by **Dan Austin & Bryan Mann (2015)**, who stated:

> *"Training with facilitative means and equipment is a practical and essential aspect of athletic preparation. It aims to guide the athlete toward correct performance by providing proper movement mechanics, necessary strength, speed, and optimal timing." (Austin & Mann, 2015, p. 211)*

Conclusion

Based on the findings, the researchers reached the following conclusions:

1. The use of facilitative means significantly improved the **speed of jump shooting** performance among players at the Kanaan Youth Forum.
2. Facilitative means had a positive impact on enhancing the **accuracy of jump shooting** in handball among the experimental group compared to the control group.
3. Training with facilitative means proved to be **more effective** than traditional methods in developing the **technical aspect** of high jump shooting.

Recommendations

1. Systematically integrate facilitative means into **training programs for handball players**, especially when developing high jump shooting skills.
2. Diversify the use of facilitative means according to **different preparation phases** and **player characteristics** to ensure continuous skill development.
3. Conduct similar studies on **different age groups** or **other handball skills** to evaluate the effectiveness of facilitative means in performance enhancement.
4. Train coaches on how to **optimally utilize facilitative means** to achieve the maximum benefit.

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