Effectiveness of Combined Skill Performances in Improving the Level of Passing Skill in Volleyball

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Abstract

This study aimed at evaluating the effectiveness of combined skill performances in improving the overhead passing and forearm passing skills in volleyball among female students in the Sports Science program at Al-Baha University. The study used an experimental methodology with pre-test and post-test measurements for one experimental group. The study sample consisted of 25 randomly selected third-level female students. Data collection tools included physical abilities tests related to the skills of overhead passing and forearm passing, as well as basic skill tests for both passing techniques. The most important results were statistically significant improvements in both overhead passing (11.24% increase) and forearm passing (8.57% increase) from pre-test to post-test, confirming the effectiveness of the proposed combined skill performance drills in enhancing students' volleyball skill

Introduction and Research Problem

Every sport is characterized by multiple skill performances that differ in form and structure according to the requirements of the activity, such as the nature of the sport, the type of skill performances, and the nature of competition. These skill performances, whether individual or combined, have various forms and uses that differ entirely in terms of timing, performance style, and purpose.

A motor skill is a mental program for executing a specific movement acquired by the learner or player through motor learning. This mental program is distinguished by high stability, enabling the movement to be executed voluntarily and consistently under all circumstances and conditions. The effectiveness of mastering this performance during practice depends on psychological, physiological, and psychological criteria. (Abdel Khaleq, 2005, p.219–220)

In volleyball, motor skills refer to all purposeful movements performed for a specific goal within the framework of the volleyball rules. These movements, whether performed with or without the ball, differ from other games due to the nature of the sport. Skill performance in volleyball involves the use of both hands together, either with the fingertips, forearms, or one hand. (Hassan, 2002, p.24)

Keshk and Al-Bassati (2000) stated that the modern approach to teaching and training skills emphasizes the necessity of integrating skills to form combined (offensive–defensive) performances. These combined skills should be taught and trained on early for beginners, taking into account the characteristics of the age stage, the level of beginners, and the factor of gradual training difficulty. This ensures stability in performance and improves speed and accuracy during application. (p.77)

Farag (2004) pointed out that beginners find it difficult to use volleyball skills if they learn them away from the court environment and gameplay situations. This is due to their inability to understand individual tactics for basic volleyball skills and their lack of appreciation for how to effectively use the newly learned skills in actual gameplay. (p.80)

Combined motor performance generally represents a structure consisting of several interconnected motor performances, with each influencing the other reciprocally to achieve a specific motor action. These combined skill performances usually arise from the interconnection between parts and phases of movement and their relationship to one another, forming what is called a combined skill performance. Each skill performance in the sequence comprises stages (preparatory phase, main phase, and final phase). A combined skill performance may consist of several repeated performances or several performances combined together. (Salah, & Youssef, 2012, p.19)

In activities with variable circumstances, players must exhibit speed and coordination to execute different movement sequences. This is achieved by integrating skill performances to form combined performances. Combined skill performance in the motor system is crucial and should

be viewed as a unit where its various parts function in integration, connected through multiple and interrelated links that give it new properties. (Aldleimy, Khazal, &Meshtet, 2015, p. 35)

Volleyball is a sport requiring fast and precise execution of skills, as well as consecutive performance of these skills in relation to one another. The repeated connection between players' movements and the ball's movement adds an element of excitement and attraction to the game. (Hassanein, 2011, p.98) (Ahmed, 2009)

Several studies have addressed combined skill performances in various sports to improve and develop different skills, such as Abu Bakr (2002) study in basketball, Shadad (2003) study in Judo, El-Dardiri et al (2008) study in handball), Zakki (2008) study in football, and Hattal (2011) study in handball. The results of these studies demonstrated the importance of using combined skill performances (offensive–defensive) in improving motor skills across various activities.

In volleyball, studies such as Kamel (2006) focused on the libero player's skill performances, Fathy (2007) study on high school female students at the sports school, and Mahmoud (2012) study on female students from the Faculty of Physical Education for Girls, Teaching Division.

The researcher observed that students find it challenging to apply learned skills during group training or mini-games at the end of the lecture (lasting 10 minutes). The performance lacks consistency in ball exchange, leading students to feel bored and find no excitement or enjoyment during this part of the lesson. This observation motivated the researcher to conduct this study to improve the students' performance levels in the learned skills.

Research Objective

This study aims to evaluate the effectiveness of combined skill performances in improving the performance of overhead passing and forearm passing in volleyball among female students in the Sports Science program at the Faculty of Education, Al-Baha University.

Research Hypotheses

1. There are statistically significant differences between the pre-test and post-test averages for the experimental group in the performance level of overhead passing and forearm passing.
2. The proposed combined skill performances are effective in improving the performance of overhead passing and forearm passing skills.

Research Terminology

- **Combined skill performances in volleyball**: The integration of overhead passing and forearm passing into a single motor sequence characterized by coordination, fluidity, and continuity to enhance combined motor performance.

Research Plan and Procedures

First: Research Methodology

The researcher used the experimental method with pre-test and post-test measurements for one experimental group.

Second: Research Domains

- **Study Population**:

The study population consisted of 47 third-level female students in the Sports Science program, Faculty of Education, Al-Baha University, during the third semester of the 2023/2024 academic year.

- **Study Sample**:
  - **Main Study Sample**: Consisted of 25 female students selected randomly and assigned to the experimental group.
  - **Pilot Study Sample**: Consisted of 22 female students also selected randomly but outside the main study sample.
- **Study Timeline**:
  - **Pilot Study**: Conducted from March 4, 2024, to March 7, 2024.
  - **Main Study**:
    - **Pre-Test Measurements**: Conducted on March 10, 2024, for the experimental group's performance in overhead passing and forearm passing.
    - **Implementation of Combined Skill Performance Drills**: Conducted from March 11, 2024, to April 4, 2024.
    - **Post-Test Measurements**: Conducted on April 8, 2024, adhering to the same conditions as the pre-test.
    -

Third: Data Collection Tools

1. **Physical Abilities Tests**: Tests linked to the skills of overhead passing and forearm passing (appendix 1):

   Based on relevant literature to determine tests most associated with overhead passing and forearm passing, including

   Agility: Shuttle run test (seconds) (Farag, 2004; Fouad, & Zaid, 2005)

Accuracy: Hand shooting at overlapping circles (score) (Allawi, & Radwan, 2001; Farag, 2004)

Abdominal muscles strength: Sit-ups from a lying position (count) (Allawi, & Radwan, 2001; Fathy, 2007)

Hand-eye coordination: Basketball passing test against the wall for 30 seconds (count) (Allawi, & Radwan, 2001)

Motor reaction speed: Four-direction speed test (seconds) (Allawi, & Radwan, 2001)

2. **Basic Skill Tests**(Appendix 2):
    - Overhead passing against a wall. (Appendix 2a)
    - Forearm passing against a wall (Broumbach). (Appendix 2b)

3. Validity of Tests (Appendix 3)

The tests' validity and reliability were confirmed through the exploratory study conducted from March 4 to March 7, 2024.

Validity: The researcher used the discrimination validity using Man Whitney test to find significance of differences between (the distinguished group, 10 female students from the volleyball team at Al-Baha University in the same age group) and (the non-distinguished group, 12 female students from the pilot study group. Man Whitney Z value ranged between 2.017 and 4.140 all significant at 0.05 level.

Reliability: The Reliability of the physical abilities and basic skills tests was confirmed using the re-application method with a time interval of one day. correlation coefficient between the results of the first and second tests in the physical abilities tests and skill tests ranged between 0.763 and 0.988 , which is statistically significant at 0.05 level, and the Cronbach's alpha reliability coefficient is statistically acceptable (0.70 or more), which indicates the reliability of the tests and its validity for application to the current research sample

Forth: Homogeneity of the Study Sample

The researcher ensured the normal distribution of data for both the main and pilot study samples before conducting the experiment by testing homogeneity in the variables (age, height, weight) as shown in table (1).

Table (1)
Homogeneity of the Study Sample in main variables (n=47)

Variables	Experimental Group				Pilot Group			
	Mean	Std. Deviation	Skewness coefficient	Kurtosis coefficient	Mean	Std. Deviation	skewness coefficient	kurtosis coefficient
Age (years)	19.67	0.443	0.74	0.903	19.624	0.390	-0.273	1.554
Wight (Kg)	58.88	7.434	1.13	1.312	57.040	7.780	0.294	-0.681
Height (cm)	161.6	5.163	0.43	-1.267	161.64	4.931	0.312	-1.059

It is clear from Table (1) that all the skewness coefficients of the basic variables of the research sample are close to zero and all the kurtosis coefficients are between (±3), which indicates normality of values distribution and the homogeneity of the individuals of the research sample.

Fifth: Pilot Study

The pilot study was conducted on the exploratory study sample, consisting of 22 students from the third level of the Sports Science program during the third semester of the 2023/2024 academic year. The study was conducted between March 4, 2024, and March 7, 2024, with the following objectives:

1. Planning the combined skill performances.
2. Ensuring the readiness of the court and the tools used for measurement and their validity.
3.

Pilot Study Results

The following was achieved:

1. Identification of training exercises for combined skill performances:
    - The researcher referred to scientific references, including Zaki (1998), Lenberg (2006), Al-Jameeli (2009), and American Volleyball Coaches (2015).
    - Previous studies were also consulted, such as Gouida (2004), Fathy (2007), and Mahmoud (2012).
    - The researcher also utilized international online resources (Sport Plan, n.d.) to identify a set of exercises focused on combined skill performances in volleyball.
2. Verification of the readiness of the court and the tools used for testing and measuring their validity.

Sixth: Main Study

- **Pre-Test Measurements**:

  Pre-test measurements were conducted on the main study sample to evaluate the performance of the two skills, overhead passing and forearm passing, on March 10, 2024.

- **Implementation of Combined Skill Performance Drills: (Appendix 4)**

  - **Purpose of the Combined Skill Performance Drills:** To enhance and master the skills of overhead passing and forearm passing in volleyball by using combined skill performances.

  - **Principles for Selecting Combined Skill Performance Drills**:

    1. Selection of diverse and gradually challenging drills, ranging from easy to difficult.
    2. Choosing drills that match the students' skill level.
    3. Adjusting the difficulty of certain drills to ensure continuity in performance.
    4. Ensuring that the combined skill performances fulfill the objective of the practical activity in the lecture.
    5. Repetition and reinforcement to help students connect the skills easily.
    6. Logical sequencing of the skills.

  - **Time Distribution of the Program:**

    The combined skill performance drills were applied according to the time distribution of the volleyball curriculum, with two sessions per week, each lasting 90 minutes. The program was implemented with the experimental group during the practical activity portion of the lecture, the (14) skill performance drills distributed among eight educational units (35 Minutes per unit) as follows: Week1: unit 1 & 2: drills 1, 2 &3. Week2: unit 3 & 4: drills 4, 5 &6. Week3: unit 5 & 6: drills 7, 8, 9 &10. Week4: unit 7& 8: drills 11,12,13 &14.

  - **Sample of an Educational Unit for the Experimental Group**:

    1. **Administrative Tasks (5 minutes)**: Attendance, introducing students to the lecture's objectives and content.
    2. **General Physical Preparation (5 minutes)**: Warm-up exercises including free-form warm-ups, obstacle-based warm-ups, and varied warm-ups.
    3. **Specific Physical Preparation (15minutes)**: Implementation of physical preparation drills specific to volleyball skills using cones, hoops, medicine balls, and hurdles. Appendix **(5)**

4. **Teaching Methods and Educational Activities (25 minutes)**: Step-by-step learning and practice of volleyball skills.
5. **Practical Activity (35 minutes)**: Application of combined skill performance drills according to the objective of each session. Appendix **(4)**
6. **Lesson Conclusion and Cool-Down (5 minutes)**: Light movements to cool down, collecting tools, and placing them in their designated areas.

- **Post-Test Measurements**:

  Post-test measurements were conducted on the experimental group to evaluate the performance of overhead passing and forearm passing on April 8, 2024, ensuring the same conditions and circumstances as the pre-test.

Seventh: Statistical Analysis

To achieve the research objective and test its hypotheses, the researcher used SPSS version 23 for statistical analysis, employing the following: Percentages, Standard deviation, Arithmetic mean, (T) test for differences, Correlation coefficient, Cronbach's Alpha reliability coefficient

Presentation and Discussion of Results

After conducting the main study on the research sample within the specified period and recording the pre- and post-test scores, the researcher performed the necessary statistical analyses and arrived at the following results:

Table (2)

Significance of differences between experimental group's pre and post-tests for basic skills under study (n=25)

Variables	Pre-test		Post-test		Mean Difference	T Value	Improvement Percentage (%)
	Mean	SD	Mean	SD			
Overhead Pass	24.92	3.328	27.72	2.59	2.80	-6.062	11.24
Forearm pass	19.12	1.563	20.76	1.738	1.64	-7.364	8.57

(T-table value at 0.05 significance level = 2.01)

The results in Table (2) show statistically significant differences between the pre-test and post-test results in the experimental group for the skills under study, in favor of the post-test. The (T) value was -6.062 for the skill of overhead passing and -7.364 for the skill of forearm passing, both of which are significant at the (0.05) level.

The researcher attributes the differences in the skills of overhead passing and forearm passing to the combined skill performance drills applied to the students. The interrelation between these skills in combined performances means that performing one skill affects the subsequent skill. Through repeated practice of these performances, the students understood the correct way to execute the skill to achieve its purpose.

AlKobisy, AlEbidy, & Mohammad (2013) emphasized that players must have the ability to combine skills and perform them in a combined manner to improve and develop them within a reasonable timeframe. (p. 2-3)

Activities with variable scenarios require players to perform skill movements quickly and in coordination. Abu Bakr (2002) stressed the importance of students being able to combine skills in a composite form, where the overall composition represents a structure consisting of multiple interconnected forms, each influencing the other reciprocally to achieve a specific motor action. (p. 5)

These findings align with those of previous studies, including Abu Bakr (2002), Hattal (2011), and El-Dardiri et al. (2012), as well as Mahmoud (2012).

The researcher concludes that volleyball is a sport characterized by multiple basic skills, and it is essential to integrate these skills into a single framework distinguished by coordination, interconnection, and fluidity in the form of a combined motor performance.

Thus, the first hypothesis stating that : **"There are statistically significant differences between the pre-test and post-test averages of the experimental group in the performance level of overhead passing and forearm passing."** is confirmed

To verify the validity of the second hypothesis and calculate the program's effectiveness, the mean, standard deviation, "T" values, and improvement percentage between the pre-test and post-test measurements of the basic skills under study for the experimental group were calculated.

The results presented in Table (1) indicate the effectiveness of the proposed educational program using combined skill performances. This is evident from the improvement percentages for variables under study.

These improvement percentages in the performance can be interpreted as a reflection of the experimental group undergoing the combined skill performance program. The variation in the improvement percentages is also noticeable, with the overhead passing test achieving the highest improvement rate (11.24%) and the forearm passing test achieving an improvement rate of (8.57%).

Combined skill performances are executed through various gameplay scenarios and in different spatial settings, which helped the students acquire the technical requirements necessary to practice the game proficiently, enhancing the technical aspect of their performance. Acquiring a variety of

skills proves highly beneficial, as it serves as an optimal investment due to the unique nature of team sports, which are characterized by diverse movement situations. (Salah, & Youssef, 2013)

Hassanein (2011) affirms that volleyball requires the development of movement capabilities, coordination, and skills, as well as the knowledge of when, where, and how to move. The proper stance and readiness enable players to receive the ball from the opponent's court or teammates effortlessly, regardless of its power. Training to be in the correct position minimizes skill errors and facilitates accurate skill execution. (Hassanein, 2011, p.19)

In this context, diverse gameplay scenarios impose numerous combined forms of motor skills involving the ball, encompassing a set of integrated motor performances. Hence, employing combined performances that resemble competitive situations becomes crucial, as motor performance in team sports is characterized by a series of interconnected and integrated movements executed to achieve a specific goal and relies on basic skills. (Abdullah, 2004)

The researcher believes that the combined performances applied to the experimental group positively influenced the improvement of the skills under study. The accuracy of the performance significantly increased by the end of the program. This result aligns with the findings of Abu Bakr (2002), Hattal (2011), and Mahmoud (2012) (23).

Thus, the second hypothesis, stating that " The proposed combined skill performances are effective in improving the performance of overhead passing and forearm passing skills. is confirmed.

Conclusions:

In light of the research objectives, the presentation of results, and within the scope of the research community, the researcher concluded:

1. The use of combined skill performances led to an improvement in the students' performance levels in basic skills.
2. Integrating skills during the teaching and training of volleyball skills resulted in better improvement percentages compared to fragmenting volleyball skills under study during teaching.

Recommendations:

1. Use combined skill performances to improve volleyball skill levels among Sports Science students at Al-Baha University.
2. Focus on integrating skills during teaching and training rather than fragmenting them.

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Appendix (1)

Physical fitness tests most related to skills (overhead passing) (forearm passing)

Hand-straightening test on overlapping circles

The purpose of the test: to measure the accuracy of the arm

Hardware and tools: Five basket balls - a wall with a level floor in front of it - paints on the wall three overlapping circles, the bottom limit of the large circle rises 24 inches from the ground - draws a line on the floor 10 feet away from the wall.

Implementation of the test: The schoolgirl stands behind the line and then straightens the five balls (back-to-back) on the circles trying to infect the minor circle, the schoolgirl has the right to use either hand or both in the aim.

Registration: If the ball hits the small circle (inside the circle or on the lines specified for it), the student calculates three degrees.

If the ball hits the medium circle (inside the circle or on the lines specified for it), the student is calculated at two degrees.

-If the ball hits the grand circle (inside the circle or on the lines specified for it), the student is counted to one degree.

If the ball comes out of the three circles, the student counts zero.

he grades obtained by the student are collected in 5 attempts

Basketball passing test on wall for (30 seconds)

T**he purpose of the test**: to measure the compatibility between the eye and hand.

Hardware and tools: Basket balls - wall with a smooth vertical surface on the floor - stop hour - start line drawn on the ground 2.75m

Implementation of the test: The lab stands behind the starting line with the basketball and against the wall When you give the initiation signal, the schoolgirl passes the ball to the wall in whatever way you see it and then receives it again to pass it back... And so as fast as possible for 30 seconds.

Test instructions:

The schoolgirl must keep the feet behind the starting line, praising the passing of the ball towards the wall.

-If the schoolgirl cuts the starting line during the moment of passing the ball towards the wall, the pass is not counted in the count.

-If the ball falls between the wall and the starting line, it has the right to cross the starting line and retrieve the ball and return it behind the line before resuming the pass again on the wall.

The student has two attempts between them.

-Registration: - The final score is the number of times the ball touches the wall during a time (30 sec).

The pupil counts for the best attempt.

Response Test Four Way Alternate

The purpose of the test: Measuring response time

Tools: stopwatch, registration form, draw a square on the floor with an area of 4.75 m as in shape.

Performance specifications:

- The player stands on point (×) and focuses on the Yemeni hand of the coach. When the coach gives the signal to start moving his hand, the player moves in the direction the coach refers to.

Registration: The examiner presses the clock when the player moves in the right direction, time is stopped at the end of each direction, repeat this in the other directions

shuttle run test

Purpose of testing: Measuring agility

Tools: Two parallel line The distance between them 10 meters Stop clock

Performance specifications: The lab stands behind the start line when hearing the start signal running at full speed to the opposite line to overtake both feet of the line and then turns to do again to cross the start line in the same way and then repeats the work again i.e. the lab is running (40) meters back and forth.

Conditions The lab must cross the starting line and the opposite line with both feet

Registration: The laboratory records the time it travels in running the specified distance (4 × 10 m) from the start signal line until it exceeds the start line after the distance (40 m) is travelled back and forth.

Sit-up test from lying with legs extended

The purpose of the test: to measure the muscle strength of the abdominal groups and flexor muscles of the torso.

tools: A rug of felt or cloth on which the lab lies.

Performance method:

The player takes a bounce on the back.

One of the helpers holds the butts with the hands.

When giving the start signal, the lab bends the trunk to take the long seating position while observing that the knees remain elongated.

Test instructions: The knee position must be kept outstretched

The test ends in the long seating position

Calculation of grades: Calculate the number of times the correct performance

Appendix (2)

Basic skills tests

<u>Passing test from above on the wall (attachment 2/A)</u>

Purpose of the test: To measure the ability to pass forward and upward with the fingertips

Tools: A smooth wall with a line drawn parallel to the ground and 3 m above the ground, a line is drawn parallel to the wall and 180 cm away from it, a volleyball, a stopwatch.

Performance specifications: The test subject stands 180 cm away from the wall (passing line), holding the ball with both hands in front of the face, passing towards the wall and above the line drawn on it, so that the ball bounces back to reach him again behind the passing line to continue passing from above with the fingers of the hands, the test subject continues to perform this task for half a minute (30 seconds)

Condition: Scroll in all performance periods from behind the scroll line

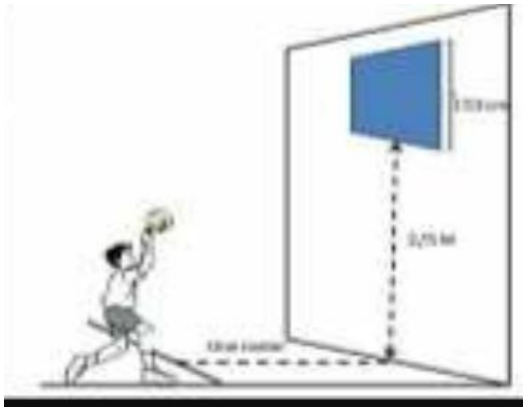
The scroll must be the highest line drawn on the wall The time calculation starts from the initial pass for 30 sec

At the beginning of the test, the ball must be held in the hands in front of the face and then perform a finger swipe

If the ball goes off the wall or touches the wall below the line painted on the wall and is worn in such a way that the lab follows the scroll from the front of the scroll line, in all these cases the lab has to hold the ball and return the start in the same way as the beginning of the agreed test.

The skill should be used from the top of the fingers without other types of passes.

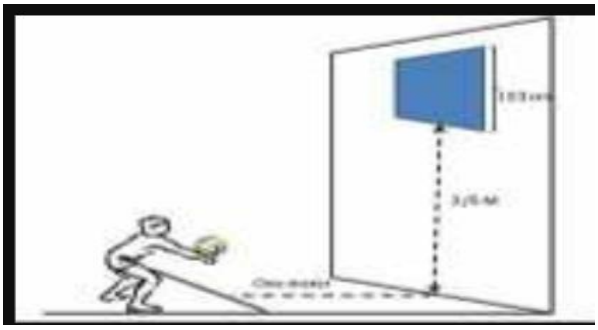
- The examinee must stop performing immediately after the referee announces the end of the 30-second period



, wall forearm passing (attachment 2/b) Broumbach

Tools: A smooth wall with a line drawn on it, 2.50 meters long and 2.44m centimeters above the ground and parallel to it, a stopwatch - a score sheet - a volleyball.

Performance specifications The player stands in front of the wall with the ball behind the starting line. When the start signal is given, he throws the ball towards the wall. When the ball bounces off the wall, he passes it with both hands (forearms) from below towards the wall continuously, as many times as possible within (1 **minute). - If** the student loses the ball, he retrieves it and the test is resumed from behind the starting line.



Appendix 3
Validity of Tests

1- Validity

The researcher used the discrimination validity using Man Whitney test to find significance of differences between (the distinguished group, 10 female students from the volleyball team at Al-Baha University in the same age group) and (the non-distinguished group, 12 female students from the pilot study group as shown in the following table.

Table (3)

Discriminant Validity of Physical Abilities and Basic Skills tests under Study

Tests		Measurement Unit	Descriptive statistics				Mann-Whitney Test						
			distinguished group (n=10)		Non-distinguished group (n=12)		distinguished group (n=10)		Non-distinguished group (n=12)		U	Z	Significance (P)
			Mean	Std. Deviation	Mean	Std. Deviation	Mean Rank	Sum of Ranks	Mean Rank	Sum of Ranks			
Hand-eye coordination	Basketball passing test against the wall for 30 seconds	count	12.50	2.121	10.42	1.505	14.90	149.00	8.67	104.00	26.000	2.269	0.023*
Accuracy	Hand shooting at overlapping circles	score	21.30	2.627	18.08	2.906	14.80	148.00	8.75	105.00	27.000	2.192	0.028*
Motor reaction speed	Four-direction speed test	seconds	9.56	0.726	10.32	0.712	8.45	84.50	14.04	168.50	29.500	2.026	0.043*
Agility	Shuttle run test	seconds	10.40	1.181	11.46	1.183	8.45	84.50	14.04	168.50	29.500	2.017	0.044*
Abdominal muscles strength	Sit-ups from lying position	count	9.30	0.675	4.75	0.453	17.50	175.00	6.50	78.00	0.000	4.140	0.001*
Overhead passing	Overhead passing against a wall	count	21.00	1.247	5.17	0.937	17.50	175.00	6.50	78.00	0.000	3.998	0.001*
Forearm passing	Forearm passing against a wall (Broumbach)	count	10.80	0.919	7.42	1.505	17.35	173.50	6.63	79.50	1.500	3.906	0.001*

*Statistically significant at 0.05 (P<0.05)

The results in Table (3) show statistically significant differences between the distinguished and non-distinguished groups (Mann-Whitney test) in Physical Abilities and Basic Skills tests ($p < 0.05$), indicating good discriminant validity of all tests.

2- Reliability:

The Reliability of the physical abilities and basic skills tests was confirmed using the re-application method with a time interval of one day.

Table (4)

Reliability of the physical abilities and basic skills tests using the re-application method (n = 22)

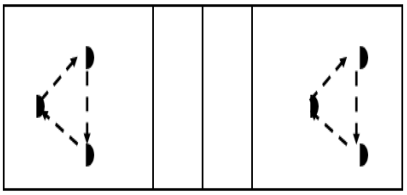
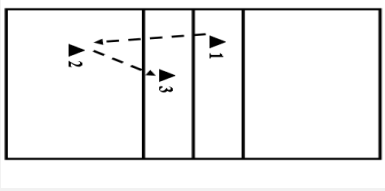
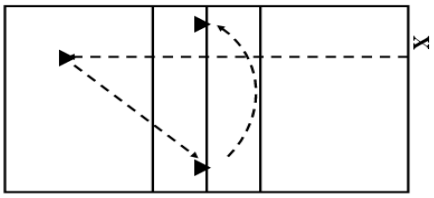
Tests		Measurement Unit	1st test		2nd test		Spearman Correlation Coefficient	Cronbach's Alpha Coefficient
			Mean	Std. Deviation	Mean	Std. Deviation		
Hand-eye coordination	Basketball passing test against the wall for 30 seconds	count	11.36	2.060	11.09	2.266	0.919*	0.968
Accuracy	Hand shooting at overlapping circles	score	19.55	3.173	19.82	3.202	0.915*	0.980
Motor reaction speed	Four-direction speed test	seconds	9.97	0.799	9.98	0.614	0.763*	0.753
Agility	Shuttle run test	seconds	10.98	1.274	10.75	1.125	0.853*	0.874
Abdominal muscles strength	Sit-ups from lying position	count	4.55	1.056	4.73	1.077	0.890*	0.942
Overhead passing	Overhead passing against a wall	count	5.45	0.800	5.50	0.783	0.965*	0.982
Forearm passing	Forearm passing against a wall (Broumbach)	count	8.95	2.126	8.77	2.308	0.988*	0.992

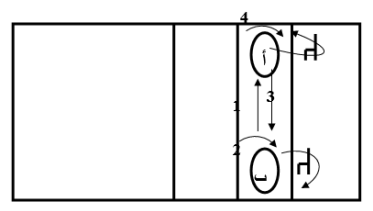
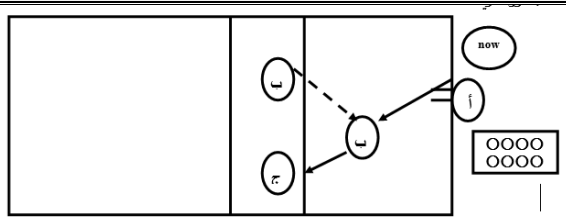
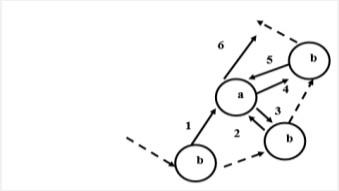
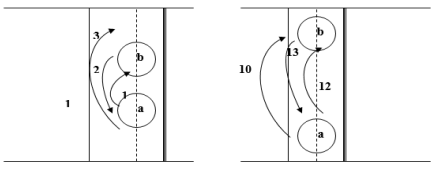
* Significant at 0.05 (Spearman's tabular correlation coefficient = 0.425)

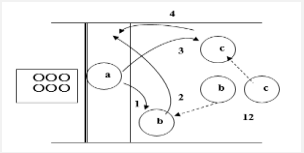
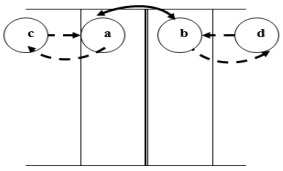
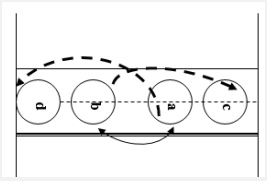
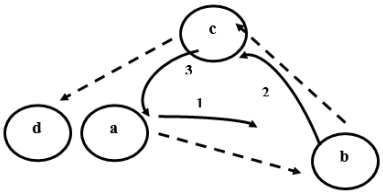
It is clear from Table (4) that the correlation coefficient between the results of the first and second tests in the physical abilities tests and skill tests is statistically significant, and the Cronbach's alpha reliability coefficient is statistically acceptable (0.70 or more), which indicates the reliability of the tests and its validity for application to the current research sample.

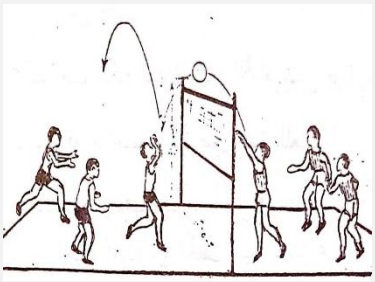
Appendix (4)

compound skills performances

1- Female students stand in the groups of each group of 3 female students in the form of a triangle with a ball, the ball is formally passed between female students inside the triangle while moving forward and backwards. Scroll directions are changed with beep hearing.	
٢-Two students stand facing each other, with a distance of (4:9 m) between them. The student passes the ball high above her head for a distance of (1.5:2 m), then passes the ball on the second touch to the colleague who receives the ball. The same exercise is repeated, as she throws it to herself above her head, then passes it to the colleague.	
٣-Same as the previous pass, but the student receives the ball using a pass from below with the forearms, then passes it forward and up to her colleague.	
٤-The student standing on the opposite side must receive the ball using the skill of passing from below with both hands, directing it to the second student standing in position (3) on the net, who passes it back to the student in the opposite court.	
٥- Student (1) receives the ball using a pass from below with the forearms and directs it to the prepared student in the front area who prepares it in position (4) while Student (1) moves quickly to pass the ball using a pass with the fingertips and directs it to the opposite court.	

6-Two students stand opposite each other on one side of the net with a distance of (25) feet between them. The two chairs are placed on a drawn line with each chair facing one of the students. Student (A) passes to student (B) and then runs around the chair and returns to her position near the net. Student (B) passes to herself and then passes to student (A) and then runs around the chair and returns to her position near the net. This exercise can be practiced with four students. In this case, the students pass to each other directly to the other side of the net.	
7 Student A stands on the back line of - the court. Student B stands close to the net with her back to Student A. A throws the ball high into the court and calls out "now." Student B turns when she hears the voice and moves to where the ball is and hands it to Student C. Continue quickly.	
8- Two students stand fifteen feet apart. Student A remains stationary while Student B moves around Student A, keeping the same distance as she moves around Student A. Student B passes the ball accurately to Student A. Student A must receive the ball before Student B to force her to move quickly to make the pass. Emphasize correct body position and foot alignment and try to speed up the pass and be steady while making the pass.	
9- Two students with one ball: Two students stand five feet apart, facing each other, close to the net or wall. Each time they make a pass, they each step back until they are thirty feet apart. Then, they	

each step forward after each pass until they are five feet apart.	
10- Three students and fifteen (15) balls: Student (A) stands close to the net while students (B) and (C) stand in the middle of the court. Student (A) throws each of the fifteen balls to a place on the court and students (B) and (C) alternate the throws to a target. Maintain fast movement.	
11- Two students stand on one side of the net and the other two students stand on the other side of the net, two students behind each other. The students pass the ball across the net and then step back so that the two students behind them step forward after each pass and so on, alternating.	
12- Four students with one ball: Students (A, C) stand about ten feet from the sideline of the court and inside it and close to the net, while students (B, D) stand the same distance but on the opposite sideline and also close to the net. Students (A, B) lift the ball while jumping and then change their positions so that each of them is behind the student on the opposite side. Continue making the passes.	
13- Four students with one ball: Three students form a triangle with each side approximately fifteen feet long. The fourth student (D) stands at the same angle as student (A). The three students pass the ball among themselves, with each pass accompanied by the student who sent the pass moving to the location of the student who received the pass, and so on.	

14- Two teams of three students each, two in front and one in back, in a triangle. Each team stands on its court. After the draw, the student raises the ball vertically at a height of 1:2 and then touches it the next time after it turns to face the teammate who passed it and turns towards the net so that the ball passes over the net. The ball is passed between the teammates in a triangle, provided that it passes to the opposing team on the third touch. It is required to use the pass from above only in training.	

Appendix (5)

physical fitness exercises

1- Sitting half-kneeling - facing a colleague at a distance of [3-4 m] Pass the ball with the hand from above 2- [Standing - facing a wall] Lean forward to lean on the wall with the fingers of the hands while bending the elbows, then push the wall with the fingers to return to the standing position 3- Standing between two lines with a distance of 4.5 m between them - move towards the line on the left using the side step, then move to the right to touch the right line with the right hand 4- [Standing - holding a tennis ball] Squeeze the ball between the fingers and thumb [squeeze the ball].
5- (Horizontal crouching) Lower the buttocks backwards downward with the palms of the hands fixed on the ground, pushing the shoulders down continuously. 6- (Standing) Throw the ball up and run to catch it while in a semi-crouching position. 7- Shoot at the basket and then receive the ball with the hands from above the head. 8- (Standing - facing the partner) Pass the ball after touching the ground each time.

9- (Standing) Throw the medicine ball high over the head and catch it with the striking hand.
10- (Squatting) Throw the legs backwards to reach the prone position and return quickly [number / 30 seconds]
11- (Standing on one side of a Swedish bench) One foot on the bench and the other on the floor, climb onto the bench to walk a step then land with the left foot on the floor... and so on.
12- (Standing open - weight in the right hand) Bend the torso and pass the weight between the legs while swinging the right arm forward high (weight 4-6 kg)

13- ((Long sitting) Pull knees to chest with hands interlocked (10 times x 3 sets)
14- Jump rope on feet together
15- (Prone. Torso high and arms in front. Holding a tennis ball in one hand) Pass the ball from hand to hand.
16- (Prone on a Swedish bench) Raise the torso high with arms swinging side to back while carrying a weight (2-3 kg) Repeat

17- (Standing facing the wall and 8-10 m away) Pass a tennis ball to the wall from above with one hand, then move forward to receive the ball after it bounces off the wall
18- (Prone. Interlocking hands behind the head) Raise the torso high and hold for 10 seconds.
19- (Standing face to face. Clasping hands, tilting high in front of body) Body rotation 180°
20- (Arms lying high. Partner standing crossed with body. Holding partner's hands) Raising trunk and arms high behind. Arching body backwards to help partner.

21- (The man stands in front of the wall and 5m away) Pass the ball with one hand on a specific mark drawn on the wall and then catch it with one hand after it bounces.
22- .(Lying on a Swedish bench. Arms to the side. Holding a weight with both hands) Raise the torso high while raising the arms high in front of you. Repeat the performance quickly