

## **The Impact of a Proposed Motor Education Program on Selected Motor Skills in Kindergarten Children Aged 5–6 Years**

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### **Abstract:**

This study aimed to investigate the effect of a proposed motor education program on selected motor skills in kindergarten children aged 5–6 years, in light of the growing importance of motor activities in shaping children's personalities and developing their physical, psychological, and social abilities. To achieve the study objectives, the researchers adopted the experimental method due to its suitability for the nature of the study.

The research population consisted of 90 boys and girls, while a purposive sample of 60 kindergarten children was selected and equally divided into two groups: an experimental group (30 children) and a control group (30 children). The experimental group was subjected to the proposed motor education program, whereas the control group continued with the traditional program implemented in the kindergarten.

As a data collection tool, the researchers used fundamental motor skills tests. The results of the study revealed that the children in the experimental group outperformed those in the control group in all the motor skills examined, indicating the effectiveness of the proposed program in improving and developing fundamental motor skills among kindergarten children.

In light of these findings, the researchers recommend the integration of motor education programs into kindergarten curricula.

**Keywords:** Program; Motor Education; Motor Skills; Child; kindergarten.

### **1. Introduction:**

The current era is characterized by rapid developments across various fields, placing a significant responsibility on societies to ensure the comprehensive preparation of their children to face these challenges and keep pace with the changes of the new century.

The preschool stage has gained a distinguished position in the attention of many countries in recent years. Interest in this stage is considered one of the most important indicators by which the progress and advancement of nations are measured. Indeed, the wealth of nations is no longer assessed by the natural resources they possess, but rather by how effectively they nurture the talents of their children and support their healthy development, enabling them to contribute to the construction and advancement of civilizations. One of the most notable characteristics of this stage is the child's natural inclination toward play and movement. Through this inclination, children learn by practice. Modern educational scholars have recognized the importance of play and movement, considering them essential features that must be utilized and invested in. Children's physical, cognitive, psychological, social, and moral capacities can be developed effectively when they are engaged in enjoyable and meaningful physical activity (Rateb & El-Khouly, 1994, p. 45)

In this regard, Gallahue emphasizes that this age period represents the most fertile stage for the performance of fundamental motor skills, which constitute the foundation for performing sport-related skills. Any deficiency in the development of these fundamental motor skills during this stage negatively affects subsequent stages of motor development (Al-Badri, 2002, p. 20) . Gallahue further adds that motor skills play a crucial role in a child's development, as children initially use reflexive movements and gradually interact with their environment. They then gain voluntary control over their movements, which facilitates future learning. Through movement, children explore their surroundings, interact with their peers, and develop social skills. Thus, motor skills form the basis for development in other domains such as motor learning and motor control.

Kindergarten institutions play a vital role in fostering various aspects of child development during early childhood, whether physical, social, emotional, cognitive, or motor. Most educators agree that attending kindergarten significantly benefits children across all developmental domains. The preschool stage has become a well-defined psychological phase with distinct characteristics, and many countries have established structured motor education programs for this stage. Initially, kindergartens emerged as a social necessity rather than purely an educational one. However, numerous studies have emphasized the importance of motor programs practiced by preschool children, as they serve as a means of releasing excess energy, expressing oneself, exploring the surrounding world, and developing cognitive, emotional, social, and motor abilities.

By the time children enter school, they have already developed some fundamental motor skills in their daily lives, such as running, throwing, and jumping. Motor skills give observers an impression of both the nature of the activity and the quality of

performance. In this context, Fatima Awad Saber states that fundamental motor skills are the primary building blocks of children's movement repertoire and are performed for their own sake. Therefore, it is essential to ensure that children acquire a rich set of fundamental movement patterns during the kindergarten stage (Saber, 2007, p. 97).

Most scholars and experts in physical education and psychology agree that children begin acquiring fundamental motor skills from their early years. These skills vary and may involve the whole body or specific parts, and may be performed either in motion or in stability. There is also a consensus that fundamental motor skills are essential and central to children's lives from an early age, forming the basis for many individual and team sports activities. Well-designed motor programs contribute significantly to children's growth and help develop their abilities (Ali & Rizk, 2006, p. 119).

Based on the above, the following research question is raised:

- Does the proposed motor education program have a significant effect on selected motor skills in kindergarten children (aged 5–6 years)?

#### **Sub-questions:**

1. Are there statistically significant differences between the pre-test and post-test measurements of the control group in the level of fundamental motor skill performance?
2. Are there statistically significant differences between the pre-test and post-test measurements of the experimental group in the level of fundamental motor skill performance?
3. Are there statistically significant differences between the control group and the experimental group in the post-test measurements regarding the level of fundamental motor skill performance?

## **2. Research Framework**

### **2.1. Hypotheses**

#### **General Hypothesis:**

- The proposed motor education program has a significant effect on selected motor skills in kindergarten children (aged 5–6 years).

#### **Sub-hypotheses:**

1. There are no statistically significant differences between the pre-test and post-test measurements of the control group in the level of fundamental motor skill performance.
2. There are statistically significant differences between the pre-test and post-test measurements of the experimental group in the level of fundamental motor skill performance.

3. There are statistically significant differences between the control group and the experimental group in the post-test measurements in the level of fundamental motor skill performance.

## **2.2. Research Objectives**

1. To design a proposed motor program aimed at developing selected fundamental motor skills in kindergarten children (5–6 years).
2. To identify the effect of the proposed motor program on selected fundamental motor skills in kindergarten children.

## **2.3. Significance of the Study**

The importance of this study lies in the following:

1. Highlighting the importance of physical activity and its effect on some fundamental motor skills in kindergarten children.
2. Enriching and expanding researchers' knowledge, as well as contributing to studies in this field.
3. Evaluating the role of this developmental stage in the successful acquisition of certain motor skills.

## **2.4. Definition of Terms**

- **Program:**

A program, in its general sense, refers to a plan to be followed. A physical education program is a set of planned experiences practiced by participants through sports activities (Saleh Abdel Moneim, 1981: 199).

- **Motor Education:**

Defined by Frey and Kiphard (1979) as "that aspect of physical or basic education concerned with the development and training of fundamental natural movement patterns, as distinct from sport-specific motor skills."

- **Fundamental Motor Skills:**

According to Allawi and Radwan, these are basic forms of motor performance that appear during early stages of physical maturation, such as walking, rolling, jumping, throwing, climbing, and hanging. They are considered fundamental because they appear in a primary form (1987, p. 30).

- **Kindergarten Child:**

A child aged between 4 and 6 years who is enrolled in a kindergarten institution (Mohamed & al, 1999, p. 25).

- **Kindergarten:**

An educational institution that receives children aged 3–6 years and provides appropriate educational conditions and a suitable environment to nurture children's

latent abilities and facilitate their physical, cognitive, social, and psychological development (Mortada & Abu Al-Nour, 2006: 15).

## 2.5. Previous and Related Studies

### 2.5.1. Study by Nawal Ibrahim Sheltout (1989–1990)

**Title:** The effect of an organized motor program for nursery children on the level of some fundamental motor skills.

- **Objective:** To identify the effect of an organized motor program on fundamental motor skills.
- **Methodology:** Descriptive method.
- **Sample:** 225 children aged 4–6 years.
- **Tools:** Fundamental motor skill tests (running, jumping, throwing).
- **Statistical Methods:** Mean, standard deviation, t-test, Pearson correlation.
- **Results:** Structured motor programs with supervision and opportunities for play positively affect the development of fundamental motor skills.

### 2.5.2. Study by Tarek Abdelrahman (2000–2001)

**Title:** The effect of a proposed motor education program on some fundamental motor skills and physical attributes of preschool children (4–5 years).

- **Objective:** To examine the effect of a proposed motor education program.
- **Methodology:** Experimental method.
- **Sample:** 50 children (experimental and control groups).
- **Tools:**
  - Motor skill tests (running, throwing, jumping).
  - Physical fitness tests (flexibility, jumping, balance, hurdle running).
- **Statistical Methods:** Mean, standard deviation, t-test, Pearson correlation.
- **Results:** The proposed program had a statistically significant positive effect on motor skills and physical attributes.

### 2.5.3. Study by Ibtisam Mohamed El-Mahdi (1985–1986)

**Title:** The effect of a proposed program on some fundamental motor skills of nursery children in Sharkia Governorate.

- **Objective:** To design a recreational program to improve motor skills and physical growth.
- **Methodology:** Experimental method.
- **Sample:** 100 children (experimental and control groups).
- **Tools:**
  - Motor skill tests (running, jumping, throwing).
  - 20m sprint test.

- Tennis ball throw distance.
- Standing long jump.
- **Statistical Methods:** Mean, standard deviation, t-test, improvement percentage, Pearson correlation.
- **Results:** Significant differences were found between genders and age groups, with better results for the experimental group in improving motor skills.

### 3. Field Research Procedures

#### 3.1. Research Method

The researcher adopted the experimental method due to its suitability for the nature of this study.

#### 3.2. Population and Sample of the Study

The study population consisted of 90 children. The research sample included 60 children, who were purposively selected and divided into two groups: an experimental group (30 children), to which the proposed program was applied, and a control group (30 children), which continued practicing the regular kindergarten activities.

A pilot study was also conducted on 10 children from outside the main sample. The remaining 20 children were excluded from the study.

#### 3.3. Scientific Bases of the Tests

##### 3.3.1. Test Validity

Content validity was established by presenting the tests to five experts in the field to obtain their opinions. Their feedback was taken into consideration, and the necessary and appropriate modifications were made accordingly.

##### 3.3.2. Test Reliability

Test reliability was determined using the test-retest method on a sample of 10 children drawn from the study population but outside the main sample. The time interval between the first and second administrations was five days.

**Table 1:** Correlation Coefficients Between the First and Second Test Administrations for the Tests Used in the Study

| Fundamental Motor Skills Tests | First Administration |          | Second Administration |          | Correlation Coefficient (r) | Statistical Significance |
|--------------------------------|----------------------|----------|-----------------------|----------|-----------------------------|--------------------------|
|                                | Arithmetic           | Standard | Arithmetic            | Standard |                             |                          |

|          | Mean | Deviation | Mean | Deviation |      |             |
|----------|------|-----------|------|-----------|------|-------------|
| Running  | 6.2  | 0.50      | 5.8  | 0.45      | 0.92 | Significant |
| Jumping  | 3.9  | 0.40      | 4.2  | 0.35      | 0.89 | Significant |
| Throwing | 4.1  | 0.45      | 4.4  | 0.40      | 0.91 | Significant |
| Kicking  | 4.1  | 0.65      | 4.3  | 0.60      | 0.87 | Significant |

Based on **Table (01)**, it is evident that there are statistically significant differences between the first and second administrations for the pilot sample in the fundamental motor skills tests (running, jumping, throwing, and kicking). The correlation coefficients ranged between (0.87–0.92), indicating a high level of test reliability.

### 3.3.3. Test Objectivity

In this study, the test was presented to a group of expert professors specialized in the field, who unanimously agreed on its objectivity and its freedom from bias.

### 3.4. Control of Research Variables

#### 3.4.1. Independent Variable

The proposed motor education program.

#### 3.4.2. Dependent Variable

Motor skills of kindergarten children.

### 3.5. Scope of the Study

- **Human Scope:** Kindergarten children aged 5–6 years.
- **Spatial Scope:** Kindergartens.
- **Temporal Scope:** From 05/01/2020 to 15/03/2020.

### 3.6. Research Tools

- Use of Arabic and foreign sources and references.
- Interviews.
- Fundamental motor skills tests, including:
  - 20-meter running test
  - Standing long jump test
  - Throwing test
  - Kicking test

#### 3.6.1. Description of Fundamental Motor Skills Tests

##### 1. Running Test (20 m)

- **Objective:** Measure speed.
- **Equipment:** Flat straight surface, stopwatch, whistle.
- **Procedure:** The child stands behind the starting line and runs as fast as possible upon the signal until crossing the finish line.
- **Scoring:**

- Two trials are given.
- The best time is recorded.

## 2. Standing Long Jump Test

- **Objective:** Measure motor ability related to explosive strength.
- **Equipment:** Flat surface, starting line, measuring tape.
- **Procedure:** The child stands behind the starting line and jumps forward with both feet, attempting to reach the maximum distance by bending the knees and swinging the arms backward. Two practice trials are given, followed by three actual attempts.
- **Scoring:**
  - Distance is measured from the starting line to the nearest landing point.
  - The best attempt is recorded.

## 3. Throwing Test

- **Objective:** Measure arm strength.
- **Equipment:** Flat surface, tennis balls, measuring tape.
- **Procedure:** The child stands behind the starting line and throws the ball forward as far as possible using the preferred arm, with an overhead throw.
- **Scoring:**
  - Three trials are given.
  - The best throw is recorded.

## 4. Kicking Test

- **Objective:** Measure leg strength.
- **Equipment:** Flat surface, measuring tape, whistle, football.
- **Procedure:** The child stands behind the starting line, runs a distance of 3 meters upon hearing the whistle, then kicks the ball as far as possible.
- **Scoring:**
  - Two trials are given.
  - The best kick is recorded.

## 3.7. Proposed Educational Program

The program is defined by Laila Karam El-Din (1999) as a set of structured experiences designed to provide individuals with knowledge, skills, or attitudes in a specific area of behavior.

### 3.7.1. Tools Used in the Program

The researcher used various tools, including tennis balls, measuring tape, medical scale, flags, basket, colored vests, whistle, stopwatch, adhesive colored strips, cones, hoops, and rope.



### 3.7.2. Program Implementation Phases

#### 1. Preparatory Phase:

This phase involves warming up the body to prevent injuries. It includes simple exercises appropriate for the children's age group and lasts approximately 10 minutes.

#### 2. Main Phase:

This phase includes a set of activities in the form of motor games aimed at improving fundamental motor skills in the experimental group. It lasts approximately 30 minutes per session.

#### 3. Final Phase:

This phase consists of light exercises aimed at relaxing the body muscles and lasts about 5 minutes.

### 3.7.3. Program Implementation Steps

- **Pre-test:** From 05/01/2020 to 09/01/2020.
- **Program Implementation:** From 12/01/2020 to 08/03/2020.
- **Post-test:** From 15/03/2020 to 19/03/2020.

### 3.8. Statistical Methods

- Pearson correlation coefficient
- Arithmetic mean
- Standard deviation
- Percentage
- t-test

## 4. Results Analysis and Discussion

### 4.1. First Hypothesis

There are no statistically significant differences between the pre-test and post-test measurements of the control group in the fundamental motor skills tests.

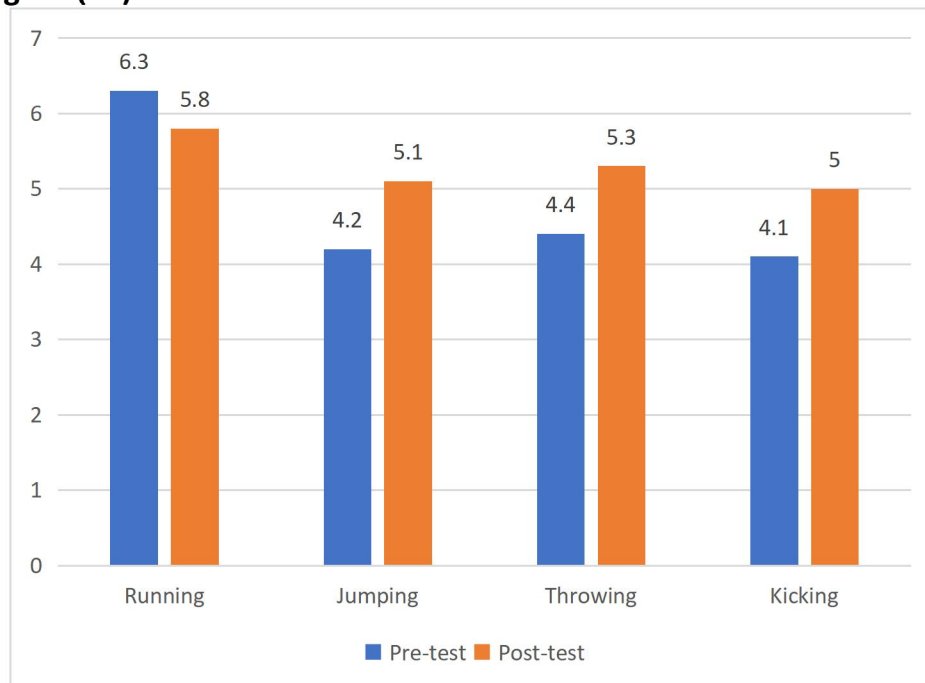
**Table (02)** presents the arithmetic means, standard deviations, and t-values, as well as their significance, between the pre-test and post-test measurements of the control group.

| Samples   |                     | Pre-test        |                    | Post-test       |                    | t-calculated | Degrees of Freedom | Critical t-value |
|-----------|---------------------|-----------------|--------------------|-----------------|--------------------|--------------|--------------------|------------------|
| Variables | Unit of Measurement | Arithmetic Mean | Standard Deviation | Arithmetic Mean | Standard Deviation |              |                    |                  |
| Running   | Second              | 6.3             | 0.85               | 5.8             | 0.8                | 1.95         | 58                 | 2.04             |
| Jumping   | Centimeter          | 4.2             | 0.7                | 5.1             | 0.75               | 1.88         |                    |                  |
| Throwing  | Meter               | 4.4             | 0.8                | 5.3             | 0.85               | 1.76         |                    |                  |
| Kicking   | Meter               | 4.1             | 0.65               | 5               | 0.7                | 1.88         |                    |                  |

Based on Table (02), it is evident that there are no statistically significant differences between the pre-test and post-test measurements of the control group in the fundamental motor skills tests. The tabulated t-value at the 0.05 significance level was (2.04), which is greater than the calculated t-values.

This indicates that the traditional method applied to the control group did not have a positive effect on the fundamental motor skill variables.

**Figure (01): Pre-test and Post-test Measurements of the Control Group**



#### 4.1.1. Discussion of the First Hypothesis Results

Table (02) presents the values of the arithmetic mean, standard deviation, and calculated t-value between the pre-test and post-test measurements of the control group in the fundamental motor skills tests (running, jumping, throwing, and kicking).

From the table, it can be observed that all calculated t-values are lower than the tabulated values, indicating the absence of statistically significant differences between the pre-test and post-test in the fundamental motor skills tests for the control group. This confirms the inadequacy of the traditional program applied in the kindergarten and its unsuitability for children aged 5–6 years.

The researcher attributes this to the limited academic training of educators in dealing with children at this stage using appropriate methods that require motivation and engagement to facilitate learning. It may also be due to the lack of training programs

provided by the supervising authorities to help educators design suitable programs for this age group, which negatively affected the outcomes.

This finding is supported by Al-Baqi (2001), who emphasized that preschool curricula should be based on active learning, child participation, and guided play. The responsibility for such guidance lies with those who design educational programs for children at this age.

These results are also consistent with the studies of Sheltout Ibrahim (1990), Tarek Abdelrahman (2000), and Ibtisam El-Mahdi (1985).

Based on the above, it can be concluded that the control group's lack of exposure to the proposed motor education program led to no improvement in fundamental motor skills (running, jumping, throwing, and kicking). Therefore, the first hypothesis is confirmed.

#### 4.2. Second Hypothesis

There are statistically significant differences between the pre-test and post-test measurements of the experimental group in the fundamental motor skills tests.

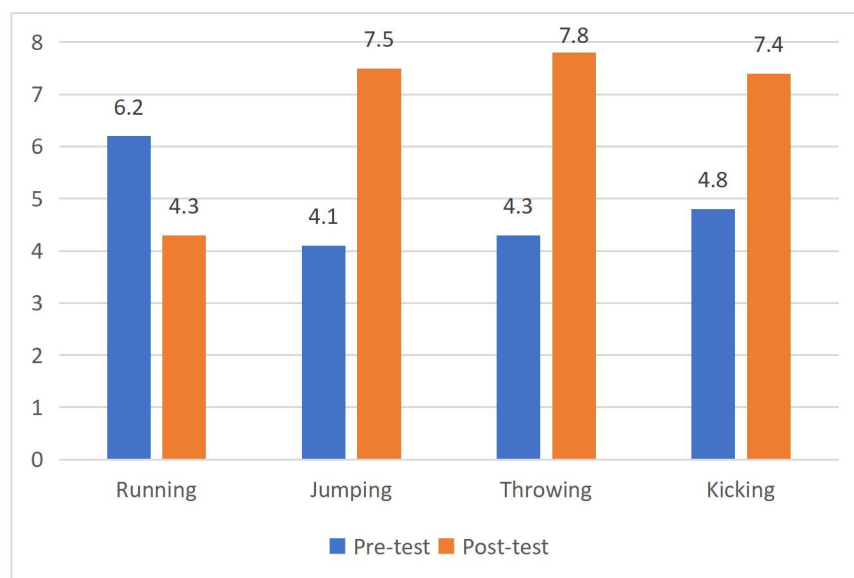
**Table (03)** presents the arithmetic means, standard deviations, calculated t-values, and their significance between the pre-test and post-test measurements of the experimental group.

| Samples   |                     | Pre-test        |                    | Post-test       |                    | t-calculated | Degrees of Freedom | Critical t-value |
|-----------|---------------------|-----------------|--------------------|-----------------|--------------------|--------------|--------------------|------------------|
| Variables | Unit of Measurement | Arithmetic Mean | Standard Deviation | Arithmetic Mean | Standard Deviation |              |                    |                  |
| Running   | Second              | 6.2             | 0.8                | 4.3             | 0.6                | 7.1          | 58                 | 2.04             |
| Jumping   | Centimeter          | 4.1             | 0.7                | 7.5             | 0.6                | 7.45         |                    |                  |
| Throwing  | Meter               | 4.3             | 0.75               | 7.8             | 0.65               | 7.20         |                    |                  |
| Kicking   | Meter               | 4.8             | 0.7                | 7.4             | 0.6                | 7.25         |                    |                  |

Based on **Table (03)**, it is evident that there are statistically significant differences between the pre-test and post-test measurements of the experimental group in the fundamental motor skills tests. The tabulated t-value at the 0.05 significance level was (2.04), which is lower than all the calculated t-values.

This confirms the effectiveness of the proposed motor education program applied to the experimental group, in contrast to the control group.

**Figure (02):** Pre-test and Post-test Measurements of the Experimental Group



#### 4.2.1. Discussion of the Second Hypothesis Results

Based on the results presented in **Table (03)**, it is evident that there are statistically significant differences between the pre-test and post-test measurements of the experimental group in the motor skills tests. Moreover, a noticeable improvement was observed, as the children in the experimental group outperformed those in the control group in the fundamental motor skills tests (running, jumping, throwing, and kicking).

The researchers attribute this improvement to the content of the proposed motor education program applied to the experimental group. The program included a variety of purposeful and engaging activities designed to develop motor abilities, which significantly contributed to the improvement of fundamental motor skills such as running, jumping, throwing, and kicking.

The findings of the present study are consistent with those of Ibtisam Mohamed El-Mahdi (1986), Tarek Abdelrahman (2001), and Nawal Ibrahim Sheltout (1990), all of whom reported a positive effect of proposed programs on motor skills development. In this regard, (Abdel Wahab, 1995, p. 59) Farouk Abdel Wahab emphasized that motor games are of great importance for kindergarten children if balanced and healthy development is to be achieved (1995, p. 59).

Based on the above, it can be concluded that the success of the experimental group is attributable to the effectiveness of the proposed motor education program implemented. Therefore, the second hypothesis is confirmed.

#### 4.3. Third Hypothesis

There are statistically significant differences in the post-test measurements between the control group and the experimental group in the fundamental motor skills tests.

**Table (04)** presents the arithmetic means, standard deviations, calculated t-values, and their statistical significance between the two groups (control and experimental) in the fundamental motor skills tests.

#### 4.3. Third Hypothesis

There are statistically significant differences in the post-test measurements between the control group and the experimental group in the fundamental motor skills tests.

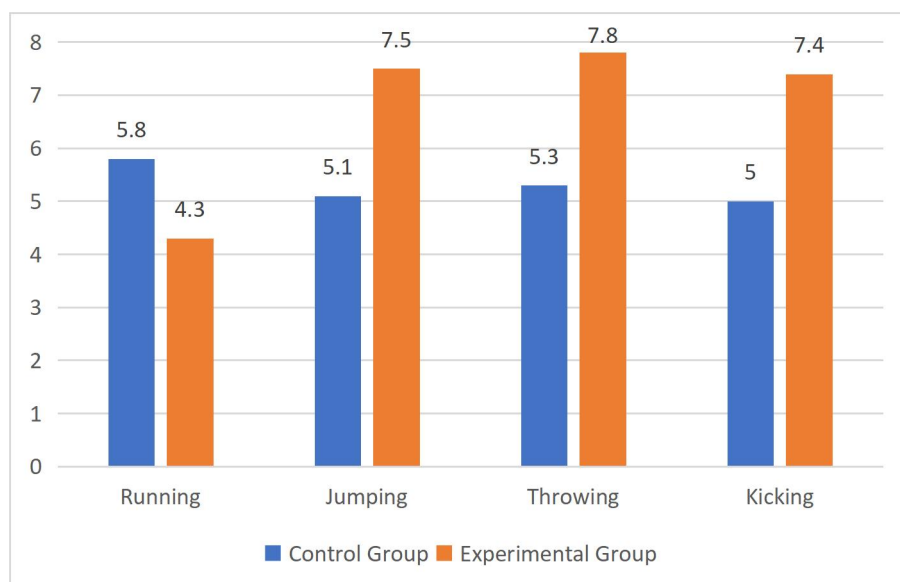
**Table (04)** presents the arithmetic means, standard deviations, calculated t-values, and their significance between the two groups (control and experimental) in the fundamental motor skills tests.

| Samples   |                     | Control Group   |                    | Experimental Group |                    | t-calculated | Degrees of Freedom | Critical t-value |
|-----------|---------------------|-----------------|--------------------|--------------------|--------------------|--------------|--------------------|------------------|
| Variables | Unit of Measurement | Arithmetic Mean | Standard Deviation | Arithmetic Mean    | Standard Deviation |              |                    |                  |
| Running   | Second              | 5.8             | 0.8                | 4.3                | 0.6                | 6.1          | 58                 | 2.04             |
| Jumping   | Centimeter          | 5.1             | 0.75               | 7.5                | 0.6                | 6.45         |                    |                  |
| Throwing  | Meter               | 5.3             | 0.85               | 7.8                | 0.65               | 6.2          |                    |                  |
| Kicking   | Meter               | 5               | 0.7                | 7.4                | 0.6                | 6,25         |                    |                  |

Based on **Table (04)**, it is evident that there are statistically significant differences in the post-test measurements between the control group and the experimental group in the fundamental motor skills tests used in this study, in favor of the experimental group. The tabulated t-value at the 0.05 significance level was (2.04), which is lower than all the calculated t-values.

This indicates an improvement in fundamental motor skills (running, jumping, throwing, and kicking). Accordingly, the proposed motor education program was effective and had a positive impact on motor skills.

**Figure (03):** Post-test Measurements of the Control and Experimental Groups



#### 4.3.1. Discussion of the Third Hypothesis Results

Based on the results presented in **Table (04)**, it is evident that there are statistically significant differences in the post-test measurements between the control group and the experimental group in the fundamental motor skills test. This difference is in favor of the experimental group.

The researchers attribute this result to the effectiveness of the proposed program. They also explain that one of the main factors contributing to the significant differences across all variables is the nature of the motor games included in the program, which provided meaningful motor tasks that strongly attracted children and increased their engagement and motivation.

Furthermore, the elements of competition and encouragement played an important role in developing and improving fundamental motor skills (running, jumping, throwing, and kicking), especially since children at this stage tend to exert greater effort during play activities. Mansour (1999) states that “guided motor programs and activities have a positive effect on children’s motor and skill development.”

These findings are consistent with the results of Ibtissam Mohamed El-Mahdi (1986), Nawal Ibrahim Sheltout (1990), and Tarek Abdelrahman (2000), all of which confirmed the positive effect of proposed programs on motor skill development.

Therefore, it can be concluded that there are statistically significant differences in the post-test measurements between the control and experimental groups in fundamental motor skills (running, jumping, throwing, and kicking) in favor of the experimental group. Thus, the third hypothesis is confirmed.

### 5. Conclusions and Recommendations

### 5.1. Conclusions

1. The proposed motor education program has a positive effect on some motor skills in children aged 5–6 years.
2. The experimental group that applied the proposed program outperformed the control group.

### 5.2. Recommendations

1. Include motor education programs within kindergarten curricula.
2. Organize training courses for kindergarten teachers on motor education methods suitable for this age group.
3. Design motor games programs appropriate for children aged 5–6 years.
4. Provide adequate equipment and space in kindergartens to support the implementation of motor education programs.
5. Integrate motor education with the cognitive and emotional development of the child.
6. Conduct future studies on larger samples and different age groups.

### Conclusion

This study aimed to investigate the effect of a proposed motor education program on selected motor skills in kindergarten children aged 5–6 years. The findings indicate that the preschool stage is an appropriate period for learning through play and both free and guided motor activities. Play at this stage is a fundamental need and a natural right for the child.

Therefore, parents, educators, and decision-makers must provide appropriate opportunities for children to engage in such activities. The preschool stage represents a critical period for supporting overall child development, establishing social and moral foundations, and fostering positive emotions and cooperative behavior.

Greater attention to early childhood leads to the development of human abilities, talents, creativity, and innovation. Accordingly, focusing on improving fundamental motor skills during this stage is essential through well-designed motor programs that meet the child's needs and capabilities.

Educators emphasize the importance of early childhood experiences, as they significantly influence children's attitudes, behaviors, and future learning success. The experiences gained during early years play a fundamental role in shaping later developmental stages and have a long-lasting impact on the child's future growth.

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