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The Effect of Practicing Handball on the Development of Fundamental Motor Skills and the Improvement of Physical Fitness among Middle School Students

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Abstract:

This study aimed to reveal the extent of the impact of practicing handball on the development of fundamental motor skills and the improvement of physical fitness among middle school students. This was done through adopting the descriptive quantitative method and applying a questionnaire tool to a sample consisting of 107 students, using the SPSS program to analyze the collected data. The results showed a statistically significant positive correlation between practicing handball and both the development of motor skills and physical fitness, as the practice of this sport explained a considerable proportion of the variance in the dependent variables. The study also revealed highly positive attitudes among students toward practicing handball, which increases the value of adopting it in educational programs. Accordingly, the study confirms the effectiveness of handball as an educational means to improve motor and physical growth within the school environment.

Keywords: Handball – Motor Skills – Physical Fitness – Middle School Students

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Introduction:

Physical and sports education is considered one of the essential educational fields that contribute to achieving balance between physical, mental, emotional, and social development of the learner. School sports activities are among the most effective tools in this context, especially when they are directed and well planned. Among these activities, the sport of handball occupies a prominent position as a collective sport characterized by dynamism, interaction, and speed, making it an effective educational means capable of developing many physical, motor, and social abilities. Its technical and tactical characteristics motivate students to develop their skills in various areas that go beyond the limits of play, including increased self-confidence, team spirit, and discipline. Hence, the importance of researching the effect of this sport on student development, particularly in the middle school stage, which represents a pivotal phase in the student's motor and physical formation.

Previous studies have shown that regular sports activities significantly contribute to developing fundamental motor skills and improving physical fitness indicators, which confirms the educational and developmental role of physical practices in the school environment. In this context, motor skills such as running, jumping, balance, and throwing are considered the foundations upon which the student builds more complex sports skills, while physical fitness is directly related to his ability to perform daily tasks and achieve academic performance. Since handball combines complex movement with repeated physical effort, it constitutes a suitable sports model to study this effect in a school context. Therefore, this study seeks to shed light on the role of handball in supporting motor and physical development among middle school students within a scientific approach that integrates theoretical and practical aspects.

Research Problem:

Considering the importance of physical activity in the life of the learning student, the following problem was raised:

To what extent does practicing handball contribute to the development of fundamental motor skills and the improvement of physical fitness among middle school students?

To answer this main question, the following sub-questions were raised:

1. To what extent does practicing handball contribute to the development of fundamental motor skills among middle school students?
2. What is the extent of the effect of practicing handball on improving physical fitness among middle school students?

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Hypotheses:

To answer the sub-questions, the following hypotheses were proposed:

H1: Practicing handball positively affects the development of fundamental motor skills among middle school students.

H2: Practicing handball positively affects the improvement of physical fitness among middle school students.

Significance of the Study:

This study is of particular importance as it focuses on one of the vital aspects of physical education, namely, the relationship between practicing handball and the development of fundamental motor skills and the improvement of physical fitness among middle school students. This educational stage is one of the most important stages witnessing rapid development in students' physical and motor capacities, which makes sports educational intervention an effective factor in directing this growth. This study also contributes to filling a research gap in the Algerian school environment by providing scientific data that may benefit teachers and specialists in designing appropriate training programs. The significance of this study also lies in the possibility of adopting its results by educational institutions to improve physical activities and develop sports curricula consistent with the requirements of the student's comprehensive growth, especially through enjoyable and effective team sports such as handball.

Methodology of the Study:

This study relied on the descriptive analytical method as its main methodological framework, as it suits the nature of the topic aiming to describe the relationship between practicing handball and the development of motor skills and the improvement of physical fitness among middle school students. This method allows collecting data from the field and analyzing it scientifically to interpret phenomena as they are without interference in variables. The questionnaire was used to collect students' opinions about the studied variables, which allowed measuring attitudes and analyzing relationships using appropriate statistical analysis tools.

1. Literature Review

1.1 Fundamental Motor Skills

Fundamental motor skills form the cornerstone of human physical development, as they represent the base upon which various life and sports activities are built. Below, we attempt to understand this phenomenon.

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1.1.1 Definition of Fundamental Motor Skills:

Fundamental motor skills are essential in human physical development; therefore, understanding their nature is of great importance for sports educators, teachers, and parents. Developing them at early age stages facilitates the acquisition of more complex skills later on. Below are some scientific definitions that clarify the meaning of these skills:
The term *fundamental motor skills* refers to some aspects of motor performance that appear during the early stages of physical maturity, such as crawling, walking, running, rolling, jumping, throwing, climbing, and hanging. Since these motor patterns appear in humans in a primary form, they are called *fundamental or basic motor skills* (Abu Al-Nasr, 2007). Fundamental motor skills are defined as a set of primary movements that form the basis for developing motor competence in various forms of physical activity. These skills are a key component in building more complex motor abilities, allowing the individual to interact with the surrounding environment and gain diverse motor experiences. They are as important as the alphabet in learning language, being a necessary foundation for acquiring complex sports and artistic skills (Gallahue, 2006, p.187).
In another definition, fundamental motor skills refer to a set of acquired, purposeful, and voluntary motor patterns that form the foundation for learning complex movements in sports and other physical activities. These skills do not depend solely on biological maturity but require learning and practice within an appropriate developmental environment that provides repeated opportunities for success. They are the *motor alphabet* through which an individual can explore and interact with his environment, just as letters are used to form meaningful words and sentences (Famelia, 2018, p.27).
Based on the above, it can be said that fundamental motor skills are a set of basic body movements such as walking, running, jumping, throwing, balancing, climbing, and others, which can be observed and measured through the precise and coordinated motor performance of the individual. These skills are acquired through learning and practice and are not limited to biological maturity alone; rather, they depend on interaction with the environment and various motor situations, thus forming the necessary foundation for building more complex motor skills in various areas of physical and sports activity.

1.2.1 Classification of Fundamental Motor Skills:

Fundamental motor skills are classified into three types:

- **Locomotor Skills:**

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Locomotor or movement skills refer to various basic movement patterns involving the movement of the body from one place to another. These include walking, running, jumping, hopping, skipping, side running, long jumping, and sliding. These skills are essential for children's motor growth and form the basis for learning more complex movement skills used in sports and daily activities (Gallahue, 2006, p.187).

Locomotor skills play an important role in three interconnected areas: physical, social, and cognitive growth. Physically, they strengthen muscles and develop balance and motor coordination, enabling the child to control his body more efficiently. Socially, participation in activities based on locomotor movements such as group play, running, and jumping increases interaction with peers and helps develop communication and cooperation skills. Cognitively, these skills are related to the development of spatial perception, as the child learns through them how to perceive his position in space and make appropriate motor decisions, supporting thinking and problem-solving indirectly (Barnett et al., 2008, p.2142).

- **Object Control Skills:**

Object control skills, also called gross motor skills, are a group of basic motor skills involving handling or moving objects using the hands, feet, or an implement (such as a racket or ball). These skills form the basis of many physical and sports activities and are essential for developing fine movement and coordination between eye and hand or eye and foot. Therefore, object control skills are a key element in developing physical fitness, as they help improve motor coordination and active participation in sports games (Gallahue, 2006, p.187). These skills are essential in the following aspects (Barnett et al., 2011, p.899):

• Motor coordination and physical fitness that support the individual's ability to perform complex movements smoothly and effectively;

• Developing eye-hand or eye-foot coordination, which is fundamental for activities requiring interaction with the surrounding environment, such as throwing or catching;

• They form the basis for participation in many collective and individual sports activities.

- **Stability Skills:**

Stability or balance skills, sometimes known as non-locomotor skills, refer to a category of fundamental motor skills involving the ability to control body posture and maintain balance, whether in a stationary position or during movement. These skills are essential for achieving postural orientation and equilibrium and form a basic foundation for acquiring complex movements (Haywood & Getchell, 2014, p.78).

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2.1 Physical Fitness

Physical fitness is a vital element that has a direct impact on the efficiency of motor performance and general health. Sports activities such as handball contribute to its development through intensive training that increases strength, endurance, and flexibility.

2.1.1 Definition of Physical Fitness:

Despite the widespread and increasing concern for physical fitness around the world, reaching a unified definition agreed upon by specialists in the field remains difficult. Therefore, some definitions that highlight different aspects of the concept are presented below: Physical fitness expresses the individual's ability to perform daily activities efficiently and with endurance, with the ability to adapt to illness, fatigue, and stress, and to reduce sedentary behaviors (Campbell et al., 2013).

In another definition, physical fitness refers to the physical condition through which an individual can perform his daily duties with high efficiency. It is an individual matter meaning one's ability to accomplish daily tasks within his physical capacities, depending on bodily, psychological, mental, emotional, and spiritual components (Hussein Aziz, 2015, p.138). Caspersen defined it as a set of characteristics that people possess or achieve and that are related to their ability to perform various physical activities. This indicates that physical fitness depends partly on current physical activity levels (characteristics achieved and acquired by individuals) and partly on heredity (characteristics individuals are born with). Therefore, physical fitness can be said to depend on heredity plus daily physical activity level (Biddle, 2007, p.13). Physical fitness also refers to the body's ability to perform various activities without feeling rapid fatigue, having enough energy to perform daily and recreational tasks and cope with physical stress with alertness and vigor. Fitness manifests in muscle strength, endurance, and the activity of the heart and lungs. It is usually measured through components such as physical endurance, muscle strength, flexibility, motor coordination, and agility—all indicators of the body's efficiency in performing physical functions effectively (Rani, 2021, p.8). Based on the above definitions, physical fitness means the individual's ability to perform daily activities efficiently and effectively without excessive fatigue, with the availability of muscular strength, endurance, flexibility, agility, and motor coordination. It is measured through standard physical tests including indicators such as endurance time in running or walking, number of strength repetitions, joint flexibility range, speed of motor response, and efficiency of cardiovascular and respiratory systems.

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2.2.1 Main Components of Physical Fitness:

Physical fitness is a multidimensional concept manifested through several main components reflecting the individual's ability to perform movements efficiently and effectively in various physical activities. These components are classified as follows:

- **Muscular Strength:**

Muscular strength is the amount of force produced by muscles when performing a specific movement. This force is transmitted through joints as moments and becomes an external force that changes the movement of the athlete's body or the tool used, such as a ball or weights. Muscular strength is a fundamental component of physical fitness as it enables movement, pushing, pulling, or jumping. Forms of muscular strength vary between *maximal strength* (the maximum force produced in one attempt, as in weightlifting) and *explosive strength* (force produced rapidly, as in jumping or sprinting). Each type plays a specific role depending on the sport's nature (Moir, 2015, p.195).

- **Muscular Endurance:**

Muscular endurance is the ability of muscles to perform a physical activity that depends on strength repeatedly or to maintain a static contraction for a long period, especially under fatigue conditions. This type of physical ability is an important indicator of general health and well-being, as it is related to the ability to live independently and serves as a predictor of mortality. It includes the ability to perform repeated movements under a given load or maintain a posture without losing strength, influenced by factors such as exercise type, number of muscle groups used, load level, age, biological maturity, and gender differences (Kević, 2013, p.385).

- **Speed:**

  It refers to the ability of the individual to perform a specific movement or sequence of movements in the shortest possible time, being an important factor in sports requiring rapid reaction or immediate start.

- **Flexibility:**

  Flexibility is one of the physiological criteria involved in most forms of human movement and is a necessary element for general health, fitness, and even specialized athletic training. It refers to the range of movement in joints and surrounding muscles and reflects the body's ability to perform movements through their full range without resistance or pain, helping prevent injuries and achieve smoother movement performance (Holt et al., 2008, p.1).

- **Balance:**

  Balance refers to the vital ability enabling an individual to perform daily life activities and movements requiring great effort, strength, or speed. It forms the basis for independent movement through proper control and integration of necessary adjustments during voluntary motion (Ragnarsdóttir, 1996, p.370).

- **Agility:**

  Agility is a composite skill influenced by many physical, technical, and cognitive factors, represented by the ability to move quickly and effectively in response to changing field situations, especially during encounters between attackers and defenders (Young et al., 2022, p.1).

- **Neuromuscular Coordination:**

It refers to the ability of the nervous and muscular systems to work harmoniously to perform movements smoothly and accurately, being important for complex movements requiring high synchronization between neural signals and muscular execution (Grabiner et al., 2005, p.1450).

3.1 Handball as a School Sport:

Handball is a popular sport in Europe and has gained increasing interest in North Africa and South America in recent years. Due to its fast pace, it has attracted growing attention from both the public and the scientific community (Felice, 2023, p.1). Through this study, we will examine the impact of handball on motor skills and physical fitness among school students.

3.1.1 Definition of Handball:

Handball is a dynamic and fast-paced team sport played indoors between two teams of seven players each, with the main objective of scoring goals by throwing the ball into the opponent's net (Bilous & Kononenko, 2023, p.19). The match is based on collective interaction and intensive team tactics, making it a sport that requires a high level of coordination and discipline on the court.

Handball evolved through several stages. Initially, it was played outdoors with eleven players per team, similar to football. However, structural transformations in its rules and playing styles contributed to its transition to indoor spaces and the adoption of the reduced format of seven players, which is the form currently used in international competitions. This transformation culminated in the inclusion of handball as an Olympic sport for men in 1972 and for women in 1976, which reinforced its global spread and enhanced its organizational and professional level (Saavedra, 2018, p.5).

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Handball is characterized by its competitive nature, which relies on intermittent and high-intensity activities including throwing, passing, jumping, and running. These require players to maintain high levels of physical and tactical readiness. Athletic performance in handball is thus the result of the integration of several factors, most notably anthropometric characteristics, physical strength, and tactical abilities (Saavedra, 2018, p. 05).

From this perspective, handball is not merely a sport based on individual skills or physical effort, but rather an integrated model combining physical, technical, mental, and tactical aspects, making it a rich field for academic study and applied research in sports sciences.

2.3.1 Characteristics of Handball as a School Team Sport

Handball is a complex team sport characterized by frequent variations in performance intensity, specific technical skills, and strong physical confrontations. These features require players to possess high levels of coordination, physical fitness, and cognitive abilities. Given the growing interest in physical education sports that promote social and educational values, handball has been included among school sports activities. It has proven effective in developing social skills, team spirit, and discipline, in addition to being a stimulating means of encouraging active participation among students from various groups.

In general, the characteristics of handball as a school team sport can be summarized as follows (Arias et al., 2021; Wagner, 2014):

- **Development of social skills:** helps improve communication, cooperation, and teamwork among students;
- **Promotion of civic values:** such as fair play, discipline, responsibility, and mutual respect;
- **Mixed cooperative learning:** allows participation of both boys and girls together, enhancing skills, enjoyment, and engagement;
- **Varied physical requirements:** handball as a sport requires endurance, strength, speed, and motor coordination;
- **Stimulation of thinking and decision-making:** helps develop mental abilities through fast and complex game situations;
- **Creation of a positive social climate:** contributes to team cohesion and fosters a supportive school environment;
- **Adaptability to all levels:** can be modified to suit different age groups and abilities;

- **A motivating learning environment:** its competitive and enjoyable nature encourages students to participate and be active.

3.3.1 The Importance of Practicing Handball in Developing Motor Skills and Improving Physical Fitness among Students

Practicing handball plays an important role in developing motor skills and improving the physical fitness level of school students, which makes it one of the recommended sports activities in educational and pedagogical programs. Results from many studies show that handball effectively contributes to developing speed—one of the essential elements for improving performance quality during play—especially given the dynamic and fast-paced nature of the sport, which requires accurate and rapid motor responses (POPESCU, 2019, p. 101).

The benefits of practicing handball are not limited to skill aspects only but also extend to developing both general and specific physical traits such as strength, flexibility, endurance, balance, and motor coordination—essential components for any successful athletic activity. This makes handball an ideal training environment for the comprehensive development of students' physical capacities (Zhunisbek, 2016, p. 12184).

Comparative studies between students who practice handball and those whose physical activity is limited to traditional physical education classes have shown that the first group achieved significant improvement in locomotor and object-control skills such as throwing, catching, and dribbling—skills classified as basic and complex motor skills (Krebs, 2010, p. 3). This confirms that regular practice of handball enhances motor control and the ability to execute complex movement patterns within a collective and interactive context.

Additionally, engaging in handball activities has a positive effect on students' morphological and functional growth by directly influencing body composition, muscle strength, and the efficiency of vital systems such as the circulatory and respiratory systems. Handball also plays a motivational role, increasing students' desire to participate in physical activities and cultivating a continuous interest in exercise and self-improvement, which is a key element in building lifelong healthy habits (Hutuleac et al., 2023, pp. 97–98).

Furthermore, research has shown that adopting standardized training methods that take into account the students' age and developmental characteristics maximizes training benefits. Programs are designed to ensure gradual intensity and exercise variety corresponding to developmental stages, effectively and safely enhancing motor and skill potential.

Based on the above, handball is not merely a means to enhance athletic skills but an integrated educational tool contributing to the overall development of students by improving physical and motor aspects. Therefore, integrating handball into school activities and training programs represents an effective step toward preparing a generation with good health, outstanding physical abilities, and advanced social and cooperative skills.

2. Method and Tools

2.1 Sample

The study sample included **107 students** from the fourth year of middle school selected from *El-Akhawat Barakat* and *Youssef Amoudi* middle schools in Biskra Province. The purposive sampling method was used, given that the students met specific criteria, including regular attendance in physical education classes and active participation in handball activities. Their ages ranged between **14 and 16 years**, which is an appropriate age group for this study. The sample's demographic variables were verified for homogeneity to minimize external factors.

2.2 Study Tool

The main tool used was a **questionnaire** consisting of three main axes, each representing one variable of the study, in addition to a descriptive data section. The first axis addressed handball practice as an independent variable, while the second and third axes dealt with the development of basic motor skills and improvement of physical fitness as dependent variables. Each axis was measured through six items, and responses were measured using a **Five-Point Likert Scale**. The questionnaire's validity and reliability were confirmed by presenting it to researchers specialized in physical education.

2.3 Statistical Analysis

Data were processed using the **SPSS (Statistical Package for the Social Sciences)** software, one of the leading tools for quantitative analysis. Arithmetic means and standard deviations were calculated to describe the data, and a **simple linear regression test** was used to test the hypotheses at a significance level of ($\alpha \leq 0.05$). This analysis helped interpret the results scientifically and reliably.

3. Study Results

The following section presents the results of the data analysis collected from the study sample, starting from the validity and reliability test to the hypothesis testing.

3.1 Validity and Reliability Test

Validity and reliability are fundamental to ensuring the quality of data collection tools in scientific research. Validity expresses the degree to which a tool accurately measures the intended concept, while reliability indicates the consistency of results when measurements are repeated under similar conditions. Both are necessary to ensure the credibility and generalizability of results.

a. Cronbach's Alpha Test

Results from the **Cronbach's Alpha** reliability test (Table 01) show that all dimensions had high to excellent internal consistency, with values ranging between **0.871 and 0.930**, exceeding the acceptable minimum of 0.70. This indicates that the questionnaire items are homogeneous and measure the same dimension, thus increasing the reliability of the tool. Consequently, the questionnaire results can be confidently relied upon in hypothesis analysis and drawing conclusions.

Table (01): Cronbach's Alpha Reliability Test

Dimension	**No. of Items**	**Cronbach's Alpha**	**Internal Consistency Level**
Handball Practice	6	0.871	High
Development of Basic Motor Skills	6	0.913	Excellent
Improvement of Physical Fitness	6	0.895	High
Total Questionnaire (18 items)	18	0.930	Excellent

Source: Based on SPSS outputs.

b. Internal Consistency Test

This test measures the degree of agreement among items in assessing the same phenomenon, ensuring that the instrument consistently measures the concept.

First: Internal consistency of Axis 1 (Handball Practice)

Table (02) shows that all six items correlated strongly with the main variable, with Pearson correlation coefficients ranging between **0.65 and 0.77**, and all *Sig.* values less than 0.05, indicating statistically significant relationships. Thus, the items are homogeneous and reliably represent the variable "Handball Practice."

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Table (02): Internal Consistency of Axis 1 (Handball Practice)

Item	Pearson (r)	Sig.
I regularly play handball during PE classes.	0.72	0.000
I participate in school or external handball matches.	0.68	0.000
I enjoy playing handball and feel enthusiastic while playing.	0.75	0.000
I dedicate time outside school to play handball.	0.70	0.000
I feel that I improve in handball over time.	0.77	0.000
I watch handball matches and learn from them.	0.65	0.000

(Source: SPSS outputs)

Second: Internal consistency of Axis 2 (Development of Motor Skills) Table (03) shows strong correlations between all six items and the main variable, with coefficients ranging from **0.76 to 0.85** and *Sig.* < 0.05. Thus, the items reliably represent the "Development of Motor Skills" variable.

Table (03): Internal Consistency of Axis 2 (Motor Skill Development)

Item	Pearson (r)	Sig.
I feel my balance abilities have improved.	0.80	0.000
I have become better at coordinating different movements.	0.85	0.000
My running and jumping skills have developed well.	0.78	0.000
I feel my reaction time has become faster while playing.	0.82	0.000
I have improved the accuracy of my movements in various sports.	0.76	0.000
I can now control my body better during movement.	0.79	0.000

(Source: SPSS outputs

Third: Internal consistency of Axis 3 (Improvement of Physical Fitness) Table (04) shows strong correlations between all six items and the variable, with coefficients ranging between **0.68 and 0.77**, and *Sig.* < 0.05, indicating that the items reliably represent "Improvement of Physical Fitness."

Table (04): Internal Consistency of Axis 3 (Physical Fitness Improvement)

Item	Pearson (r)	Sig.
I feel my physical fitness has improved since starting school sports.	0.74	0.000
I have become more enduring during physical activities.	0.69	0.000
I noticed an increase in my physical strength due to handball practice.	0.77	0.000
I feel my flexibility has improved.	0.71	0.000
I feel more active and energetic in daily life.	0.73	0.000
School sports helped me maintain a healthy weight.	0.68	0.000

(Source: SPSS outputs)

3.2 Demographic Data of the Study Sample

Table (05) shows a relatively balanced distribution of the 107 students. Males represented **60.7% (65 students)**, while females represented **39.3% (42 students)**. The majority were aged **15 years (42.1%)**, followed by **14 years (37.4%)**, and **16 years (20.5%)**. Regarding handball practice outside school, **54.2%** had prior experience, while **45.8%** had none. This diversity enhances the representativeness of the sample.

3.3 Attitudes of Participants toward Questionnaire Items

a. Attitudes toward "Handball Practice"

Table (06) shows generally positive attitudes toward handball practice, with means between **3.70 and 4.25**, and relatively low standard deviations (0.62–0.80), indicating homogeneity of opinions.

b. Attitudes toward "Motor Skill Development"

Item (07) shows mean values between **3.70 and 4.15**, with low deviations (0.67–0.81), indicating strong positive attitudes and improved motor capacities due to handball.

c. Attitudes toward "Improvement of Physical Fitness"

Item (08) shows mean values between **3.75 and 4.20**, with low deviations (0.60–0.77), indicating agreement on the importance of school sports—especially handball—in improving physical fitness.

3.4 Testing the Study Hypotheses

The hypotheses aimed to evaluate the relationship between handball practice and the development of basic motor skills and physical fitness among middle school students using **simple linear regression**.

Hypothesis 1:

H_1: Practicing handball positively affects the development of basic motor skills among middle school students.

Regression analysis showed an R^2 value of **0.48**, meaning 48% of variance in motor skill development is explained by handball practice. The regression coefficient was **B = 0.69 (positive)**, and *Sig.* < 0.05, confirming a statistically significant positive relationship. Hence, **H_1 is accepted.**

Regression equation:

$Y_1 = 1.20 + 0.69X$

Hypothesis 2:

H_2: Practicing handball positively affects the improvement of physical fitness among middle school students.

Regression results showed **$R^2 = 0.52$**, indicating that 52% of variance in physical fitness improvement is explained by handball practice. The regression coefficient **B = 0.72** (positive), and *Sig.* < 0.05, confirming a significant positive relationship. Hence, **H_2 is accepted.**

Regression equation:

$Y_2 = 1.05 + 0.72X$

Based on the results of the simple linear regression analysis, statistically significant positive relationships exist between **handball practice (X)** and both **motor skill development (Y_1)** and **physical fitness improvement (Y_2)**, confirming the effectiveness of handball-based physical activities in supporting the physical and motor development of middle school students.

4. Discussion of Results

Discussion of the First Hypothesis Result:

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The first hypothesis aimed to verify the existence of a statistically significant positive relationship between practicing handball and developing basic motor skills among middle school students. This hypothesis was accepted. These results are consistent with the educational and sports literature, which emphasizes that participating in team sports—especially handball—effectively contributes to developing a range of motor skills such as balance, agility, neuromuscular coordination, and movement speed. This is due to the nature of the game, which requires frequent use of the limbs, constant changes in direction and movement, and collective interaction that stimulates quick response and motor decision-making. Therefore, the findings of this study support the view that including handball in the school curriculum can be an effective means of developing basic motor skills during a sensitive stage of student growth—namely, the middle school phase—which is considered one of the most important stages of motor and physical development.

Discussion of the Second Hypothesis Result:

As for the second hypothesis, which proposed a positive effect of practicing handball on improving physical fitness among middle school students, it was also confirmed. This result is expected, given the physical demands of handball, which require players to use multiple components of fitness such as muscular strength, cardiorespiratory endurance, speed, flexibility, and balance.

Activities involving running, jumping, shooting, defending, and physical contact in handball stimulate the muscular, nervous, and circulatory systems and help improve overall physical performance. Moreover, the competitive and interactive nature of the game contributes to increasing students' motivation, which positively affects their consistency in participation, effort expenditure, and consequently, improvement of physical fitness levels.

It becomes clear from the analysis of both hypotheses that practicing handball is one of the effective educational tools that contribute to developing motor skills and improving physical fitness among middle school students. These results support the tendency to strengthen team sports activities within school curricula and open new avenues for further research to explore the impact of other sports on the holistic developmental aspects of learners.

Conclusion

Handball is a collective sport that combines physical, skill-based, and social aspects. This study aimed to explore the impact of practicing handball on developing basic motor skills and improving physical fitness among middle school students. Using quantitative research tools and

statistical data analysis through the SPSS program, the results demonstrated a statistically significant positive correlation between handball practice and both dependent variables. It was found that students who practice this sport achieve higher levels of balance, coordination, motor control, and physical endurance compared to their peers. This confirms the importance of integrating sports into educational programs as an effective tool for comprehensive development.

These findings reinforce educators' and policymakers' conviction about the importance of handball in improving students' physical and motor health and suggest incorporating it as a strategic component of school physical education.

Study Results

The most important results reached by this study are:

1. There is a strong and statistically significant positive correlation between practicing handball and developing basic motor skills, with a coefficient of determination (R^2) of **0.48** and a regression coefficient (B) of **0.69**.
2. There is an even stronger positive correlation between practicing handball and improving physical fitness, with R^2 = **0.52** and B = **0.72**.
3. The sample (107 students) showed positive attitudes toward practicing handball, as the arithmetic means of all questionnaire items recorded high rates.
4. The study showed that handball-playing students possess higher levels of balance, strength, and agility, confirming the impact of sport on physical growth.

Recommendations

Based on the study results, the following recommendations are proposed:

1. The necessity of supporting the integration of handball in middle school curricula due to its positive impact on students' motor and physical development.
2. Encouraging students to practice handball both inside and outside school through motivational programs and friendly competitions.
3. Developing physical education curricula to include composite activities focused on the basic skills targeted in this study.
4. Providing specialized training courses for physical education teachers on developing motor skills through handball.
5. Allocating appropriate times and sports facilities for practicing handball within educational institutions.

6. Conducting periodic studies to measure the effects of sports activities on students' psychological and social health, not only their physical health.

Prospects for Future Research

This study opens important prospects for future research, as the scope can be expanded to include other age groups or various team and individual sports. Comparative studies could also be conducted between genders or between urban and rural schools to assess differences in impact. Integrating psychological and social indicators alongside physical ones would further enrich the comprehensive understanding of the role of sport in shaping students' personalities.

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