REGULAR FUNCTIONAL EXERCISES AND THEIR IMPACT ON DEVELOPING SOME PHYSICAL FITNESS COMPONENTS FOR INTERMEDIATE STUDENTS

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ABSTRACT

Background. This research was initiated due to the observed weakness among second-grade intermediate students in several basic components of physical fitness, particularly balance, flexibility, and muscular strength. This condition is largely attributed to a lack of structured physical activity and the absence of lessons incorporating suitable functional exercises. **Objectives.** Therefore, the study aimed to (1) design a regular functional exercise program to enhance specific physical fitness components and (2) identify the impact of these exercises on the physical fitness development of second intermediate grade students. **Method.** The research population consisted of 80 students, from which a sample of 50 was selected and divided equally into an experimental group (n=25) and a control group (n=25). The study ensured sample homogeneity and utilized various tools and measurement instruments, including appropriate physical tests. Functional exercises were implemented for the experimental group over a specified period, while the control group followed the standard curriculum. Data were analyzed using appropriate statistical methods to determine significant differences between pre- and post-test results. **Results.** The results revealed significant improvements in the experimental group compared to the control group across the targeted fitness components: motor balance, flexibility, and muscular strength. The implementation of functional exercises and motor games contributed to better muscular coordination, improved balance, and faster response times. These enhancements positively influenced the students' performance in daily physical activities. **Conclusion.** The study concluded that regular functional exercise programs are effective in improving key components of physical fitness among second-grade intermediate students. Functional training not only strengthens motor abilities but also enhances students' engagement and physical performance in everyday sports and physical education contexts.

Keywords; functional exercises, physical fitness, intermediate students, muscle strength, motor balance.

A. INTRODUCTION

Physical education and regular exercise play a crucial role in helping the body achieve an optimal level of fitness and maintaining a healthy weight, especially when implemented using proper methods. Within the school context, physical education classes serve as the only outlet where students can engage in various physical and motor activities amid predominantly academic subjects. These classes not only offer movement variety but also serve as an important medium to improve students' physical and motor abilities through weekly scheduled lessons. Therefore, it is essential to focus on enhancing students' physical capabilities through well-planned and consistent programs (Karasievych et al., 2021).

One of the key areas that requires serious attention is the development of students' physical fitness components. The researcher believes this matter calls for more targeted investigation, especially through the use of a structured set of regular and effective functional exercises. These exercises are designed specifically for second-grade intermediate students, as this age group is characterized by high energy and rapid physical and mental growth. This stage requires the implementation of diverse programs and activities that not only improve physical fitness but also contribute to character development. Integrating functional exercises into physical education classes becomes a central aspect of this research, aiming to examine the impact of these exercises on physical fitness improvement, particularly among second-grade intermediate students who represent a vital age group requiring special attention to ensure balanced physical and motor development (Ahmed et al., 2022).

Recent years have witnessed rapid developments in many aspects of life, including physical education and its related components, particularly physical fitness. This area has gained growing interest from educators and professionals due to its significance in improving both general and school-based sports. However, many schools still apply outdated teaching methods, failing to keep up with modern advancements in physical education. As a result, student physical activity levels have continued to decline (Fikret & Leyla, 2020).

This decline in fitness is concerning as it negatively affects students' physical and psychological well-being. The core problem lies in the weakness of some essential fitness components, including explosive power, transitional speed, and agility. One of the main contributing factors is the lack of structured functional exercise programs within school

physical education lessons. The current curricula often lack innovative strategies and methods, and their absence limits the opportunities for students to effectively develop physical fitness (Shareef, 2019).

Based on this background, the current research aims to: (1) develop a set of regular functional exercises that contribute to enhancing the physical fitness of second-grade intermediate students; and (2) identify the effect of regular functional exercises on improving physical fitness in this age group.

B. METHOD

Participant

The study involved a purposive sample drawn from a population of 80 male students enrolled in the second-grade intermediate level at a boys' middle school. From this population, two intact classes were selected to participate in the experiment. Class A was assigned as the control group (n = 25), and Class B was designated as the experimental group (n = 25), making the total sample size 50 students, which represents approximately 63% of the target population. All participants were confirmed to be homogenous in terms of age, height, and body mass, as shown by their descriptive statistics: the mean age was 13.52 years (SD = 0.39), mean weight was 62 kg (SD = 7.96), and mean height was 158.4 cm (SD = 7.39). The torsion coefficients for all variables were within acceptable limits, indicating a normal distribution

Research Design

The study employed an experimental design with two groups: one experimental and one control. Pre-tests were administered on October 1, 2024, under standardized conditions. The experimental group then participated in a regular functional exercise program from October 8 to December 31, 2024, consisting of three structured sections: (1) Preparatory phase (10 minutes) involving warm-up activities to increase heart rate and body temperature, (2) Main phase (30 minutes) featuring targeted exercises to develop motor balance, flexibility, and muscular strength, and (3) Cool-down phase (5 minutes) comprising slow walking and static stretching to return the body to resting state.

Three physical fitness tests were used in both pre- and post-assessments:

1. Motor balance test – standing on one leg with eyes closed (Malíř et al., 2023),
2. Flexibility test – lateral trunk flexibility test (Al-Harbi, 2020),
3. Lower body muscle strength test – sit-to-stand test for 30 seconds (Guo, 2022).

The reliability and objectivity of the tests were confirmed using test–retest procedures with a 7-day interval and Spearman correlation coefficients. The reliability coefficients ranged from 0.80 to 0.87, and objectivity coefficients ranged from 0.90 to 0.92, indicating high scientific validity. An exploratory experiment was conducted on September 25, 2024, with five students from the target population to ensure readiness of the tools, assess the assistant team's performance, and identify any procedural obstacles. Post-tests were conducted on January 6, 2025, replicating the pre-test conditions to maintain consistency and ensure the reliability of the results.

Statistical Methods

Descriptive statistics were used to establish sample homogeneity and equivalence between groups prior to the intervention. Independent samples t-tests were conducted to compare pre-test means and ensure there were no statistically significant differences between the control and experimental groups in motor balance, flexibility, and muscular strength ($p > 0.05$). The significance of differences between pre- and post-test results within and between the groups was then assessed using paired t-tests and independent t-tests, with a significance level set at 0.05. All statistical analyses were conducted to evaluate the impact of regular functional exercises on selected physical fitness components

C. RESULTS AND DISCUSSION

Results

Presentation, analysis and discussion of the results of the pre- and post-tests of the control group. It is clear from Table (1) that the arithmetic mean in the pre-test of the control group for the kinetic balance variable amounted to (30.01) and a standard deviation (3), while the arithmetic mean in the post-test reached (31.03) and a standard deviation (3), while the calculated value of (T) amounted to (0.85) and when compared with the tabular value of (2,145) and under the level of significance (0.05), it was found that the calculated

value of (T) is smaller than the tabular value, which indicates that there is no significant difference between the pre- and post-test in the balance variable. Motor.

It is clear from Table (1) that the arithmetic mean in the pre-test of the control group for the elasticity variable amounted to (8.5) and a standard deviation of (0.5), while the arithmetic mean in the post-test reached (8.7) and a standard deviation (0.6), while the calculated value of (T) amounted to (0.72) and when compared with the tabular value of (2,145) and under the level of significance (0.05), it was found that the calculated value of (T) is smaller than the tabular value, which indicates that there is no significant difference between the pre- and post-test in the flexibility variable.

Table 1. Shows results of pre- and post-tests of the control group

Test	Measurement Unit	Pre-tests		Post-tests		Calculated value	T Tabular value	T Significant differences
		Mean	Standard deviation	Mean	Standard deviation			
Balance	Second	**30,01**	**3**	**31,03**	**3**	**0,85**	**2,145**	Insig.
Flexibility	cm.	**8,5**	**0,5**	**8,7**	**0,6**	**0,72**		Insig.
Muscular strength	Second	**5,2**	**0,3**	**5,3**	**0,4**	**0,68**		Insig.

*Under significance level 0.05 and freedom score 11

It is clear to us from Table (1) that the mean in the pre-test of the control group for the variable of muscle strength amounted to (5.2) and a standard deviation (0.3), while the arithmetic mean in the post-test reached (5.3) and a standard deviation (0.4), while the value of (T) calculated amounted to (0.68) and when compared with the tabular value of (2,145) and under the level of significance (0.05), it was found that the value of (T) calculated is smaller than the tabular value, which indicates that there is no significant difference between the pre- and post-test in muscle strength.

Table 2. Shows results of pre- and post-tests for the experimental group

Test	Measurement Unit	Pre-tests		Post-tests		Calculated value	T Tabular T value	Significant differences
		Mean	Standard deviation	Mean	Standard deviation			

Balance	Second	**30**	**3**	38	**4**	4,65	2,145	Sig.
Flexibility	cm.	**8,5**	**0,5**	7,0	0,6	3,92		Sig.
Muscular strength	Second	**5,2**	0,3	4,5	0,4	4,21		Sig.

*Under significance level 0.05 and freedom score 11

It is clear from Table (2) that the arithmetic mean in the pre-test of the experimental group of the kinetic balance variable amounted to (30) and a standard deviation (3), while the arithmetic mean in the post-test reached (38) and a standard deviation (4), while the calculated value (T) amounted to (4.65) and when compared with the tabular value of (2,145) and under the level of significance (0.05), it was found that the calculated value of (T) is greater than the tabular value, which indicates a significant difference between the pre- and post-test in the kinetic balance variable And in favor of the post-test.

It is clear from Table (2) that the arithmetic mean in the pre-test of the experimental group for the lateral elasticity variable was (8.5) and a standard deviation of (0.5), while the arithmetic mean in the post-test was (7.0) and a standard deviation (0.6), while the calculated value of (T) was (3.92) and when compared with the tabular value of (2,145) and under the level of significance (0.05), it was found that the calculated value of (T) is greater than the tabular value, which indicates a significant difference between the pre- and post-test in the side elasticity variable. And in favor of the post-test.

It is clear from Table (2) that the arithmetic mean in the pre-test of the experimental group of the variable of muscle strength amounted to (5.2) and a standard deviation (0.3), while the arithmetic mean in the post-test reached (4.5) and a standard deviation (0.4), while the value of (T) calculated amounted to (4.21) and when compared with the tabular value of (2,145) and under the level of significance (0.05), it was found that the value of (T) calculated is greater than the tabular value, which indicates a significant difference between the pre- and post-test in the variable of muscle strength And in favor of the post-test.

Discussion

Results of the control group showed that there are no significant differences between the pre- and post-tests for all components of the targeted physical fitness (motor balance, flexibility, muscular) and this shows us that the control group was not exposed to the

functional exercises included in the units of the applied program and therefore no significant change in the level of physical fitness was achieved during the application period and the main reason for not having this change in the components of physical fitness for the survival of the control group in weekly routine physical education lessons without a noticeable change and this matter It has a great impact on the absence of any significant difference between the pre- and post-tests (Sonchan et al., 2017).

Regular functional exercises are an effective and influential educational tool for the development of the components of physical fitness for students in this research has been designed and prepared a program that includes functional exercises directed to the development of some components of physical fitness for students of the second grade intermediate (motor balance, lateral flexibility and muscle strength) The results of the post-test showed significant differences between the experimental group and control and in favor of the experimental (Ihsan et al., 2023)

This indicates the clear positive impact of regular functional exercises on the components of the targeted physical fitness in the motor balance test the results showed a clear and positive change due to the use of functional exercises that suit the target variable and the age stage of students and showed their ability to maintain balance during the exercise of movement and performance of functional exercises, including walking on a wooden board and various stretching exercises because they contribute to the development of motor balance for students and enhance their physical fitness, and this was confirmed by Khazaal that such regular exercises in daily activities and classes contribute to the overall development of physical performance in general because they include different movements in directions, increase joint flexibility, and improve the fixed and mobile balance of students (Khazaal, 2025). Van indicated that functional exercises have a major role in developing muscular and neural coordination, which positively affects the improvement of motor balance through regular programs for students (Van der Woude et al., 2022).

With regard to flexibility and the role played by functional exercises in their development, this is evident through the use of many functional exercises, including lateral bending and its importance confirmed by Hassan Abdel Rahman, as such exercises help to develop flexibility and increase the range of motion of the two sides with the combination of sitting exercise and lateral extension during the application of units for functional exercises

because they improve the flexibility of joints and ligaments (Hassan Abdel Rahman: 2019, 136), and because flexibility is one of the components of general fitness, it participates in all exercises and activities performed by students in physical education lessons, but it needs to be organized and coordinated, as shown by Muhammad Ahmed and others that whenever flexibility takes the wide range of movement, this has contributed to its development in different forms, which helps to reach the ideal performance of the intended activities and exercises (Muhammad Ahmed et al.: 2022, 4).

Guo stressed the role of great flexibility in developing the basic skills of the components of physical fitness, including flexibility through the performance of exercises in a technical manner free of performance and characterized by high flexibility for the different joints of the body because most of the exercises and applied need a wide range of movement.(Guo, 2022). As for the variable of muscle strength, the functional exercises that have been applied have a great, clear and positive impact on students using and applying several exercises, activities and games, including ropes, squats and fast running, which were applied regularly during the activities that were chosen, which contributed to the development of fitness components, including muscle strength. And short running there is no speed without muscle strength during motor performance (Fiľo & Janoušek, 2022).

The improvement in muscular strength was highlighted by observing the good performance of students for most of the functional exercises that have been developed, and this is consistent with what Abdullah Al-Lami showed that the development required for physical fitness in terms of sports is evident in the ability to perform the required sports events with high efficiency and optimal performance as required by the conditions of performance of this specific event (Borges et al., 2022).

The researcher believes that multiple and different types of functional exercises must be used because they contribute to the participation of more groups of muscle fibers to achieve the specific and required sports goal, provided that the exercises and sports activities are in line with the usual exercises for students and are consistent with their age stage, and here it turns out that the use of regular functional exercises clearly contributed to the development of the components of the targeted physical fitness as it focused on exercises that almost match what students practice in their daily lives, depending on the extent of Movement for

the variable of flexibility exercise lengthening and others and other directed towards the development of muscle strength with various exercises (Umamaheswari, 2024).

D. CONCLUSION

The findings of this study indicate that regular functional exercises are highly effective in improving key components of physical fitness, particularly explosive power, transitional speed, and agility. Consistent implementation of these exercises not only enhanced students' physical abilities but also fostered enthusiasm and active participation during lessons. The engaging and well-structured design of the training program created a positive learning environment, encouraging students to participate more effectively. The success of this approach among second-grade intermediate students also highlights its broader potential for application across different age groups and educational settings. Therefore, functional exercises should be integrated into school physical education curricula as a core element for developing students' fitness. To maximize their benefits, physical activities in PE lessons should be diversified to ensure comprehensive improvement in all aspects of fitness. In addition, physical education teachers should be provided with specific training to design and deliver engaging functional exercise programs. Further research with larger, more diverse samples and longitudinal approaches is needed to validate these findings and explore their adaptability to various groups. Moreover, the outcomes of this study should be shared with coaches and training committees to support the development of more effective programs. Finally, incorporating diverse training curricula along with modern technological tools, such as smart applications, can further enrich the learning process, enhance student motivation, and extend the positive impact of functional exercises on skill development and physical fitness overall.

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F. AUTHOR CONTRIBUTION STATEMENT

All authors contributed significantly to the development of this research. The first author (Faculty of Physical Education and Sports Science, University of Basrah, Iraq) was primarily responsible for the research design, data collection, and analysis. The authors also contributed to data interpretation, manuscript preparation, and critical revision. AHA approved the final version of the manuscript and agreed to be accountable for all aspects of the research.

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