

Regular physical exercise during physical education classes and its relationship to improving the psychomotor performance level in middle school students from the teachers' point of view
A field study in some middle schools of Djelfa municipality

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Abstract :

Through our current study, we aim to shed light on the relationship between regular participation in sports during the physical education class and the enhancement of the psychomotor aspect in middle school students from the perspective of physical education teachers. A questionnaire was distributed to a group of teachers totaling 50 in order to collect data related to the current study. The chi-square test was used as the statistical test to process the data obtained from the sample members.

Our current study concluded that there is a relationship between regular participation in sports during physical education class and the enhancement of the psychomotor aspect in middle school students.

Keywords: Regular sports practice, physical education class, enhancement, psychomotor aspect, middle school students.

Article info

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1. Introduction:

Physical and sports education is a fundamental component of the educational process, as it contributes to the comprehensive development of the pupil's personality, combining physical, mental, social, and emotional aspects. Physical activities are not merely a means of entertainment or psychological release; they are an educational field that seeks to build motor competencies and physical abilities that help the learner adapt to various life situations. In this context, regular sports practice during physical and sports education lessons is of great importance, as it allows pupils to acquire diverse motor skills and improve their physical fitness level.

This practice is also closely linked to the improvement of sensorimotor performance, which is fundamental for controlling balance, motor coordination, accuracy in performance, and rapid response to external stimuli. The more regular and scientifically and pedagogically guided the pupils' practice is, the more it positively affects their sensory and motor capacities, contributing to improved performance both inside and outside the classroom. Therefore, studying the relationship between regular sports practice and the improvement of sensorimotor performance opens the way to a deeper understanding of the role of physical education in shaping a pupil who is physically and psychologically balanced and capable of meeting the demands of school and daily life.

2 .Study Problem:

Physical and sports education is considered an integral part of the comprehensive educational system, as it aims to improve the individual in his physical, mental, psychological, and social dimensions. The school is no longer merely a space for cognitive learning; it has also become a field for developing motor abilities and sensory skills that contribute to preparing students able to adapt to various daily and life situations.

In this context, the importance of regular sports practice during physical and sports education lessons emerges, as it constitutes a fundamental factor in developing the student's physical and physiological abilities. It also enhances the level of control over sensorimotor performance by improving balance, neuromuscular coordination, accuracy, and speed of response to stimuli. Regular practice, according to purposeful educational planning, helps students raise their motor competence and makes them more capable of learning and interacting within the school environment.

Based on the above, we can pose the following general question:

Is there a correlational relationship between regular sports practice during physical and sports education lessons and the improvement of sensorimotor performance levels among middle school students?

Sub-questions:

1. Is there a correlational relationship between regular sports practice during physical and sports education lessons and the improvement of neuromuscular coordination levels among middle school students?

2. Is there a correlational relationship between regular sports practice during physical and sports education lessons and the improvement of balance and coordination levels among middle school students?

3. Is there a correlational relationship between regular sports practice during physical and sports education lessons and the improvement of accuracy and response levels among middle school students?

3 .Study hypotheses:

3.1 General hypothesis:

There is a correlational relationship between regular sports practice during physical education classes and the improvement of sensory-motor performance among middle school students.

3.2 Specific hypotheses:

1 .There is a correlational relationship between regular sports practice during physical education classes and the improvement of neuromuscular coordination among middle school students.

2 .There is a correlational relationship between regular sports practice during physical education classes and the improvement of balance and coordination among middle school students.

3 .There is a correlational relationship between regular sports practice during physical education classes and the improvement of accuracy and response among middle school students.

4 .Study objectives:

Through our current topic we aim to determine the extent of:

- ✓ The existence of a correlational relationship between regular sports practice during physical education classes and the improvement of sensory-motor performance among middle school students.
- ✓ The existence of a correlational relationship between regular sports practice during physical education classes and the improvement of neuromuscular coordination among middle school students.
- ✓ The existence of a correlational relationship between regular sports practice during physical education classes and the improvement of balance and coordination among middle school students.
- ✓ The existence of a correlational relationship between regular sports practice during physical education classes and the improvement of accuracy and response among middle school students.

5. Importance of the topic:

It is manifested in highlighting the educational and scientific role of physical and sports education as a means of building motor competencies and enhancing students' sensory-motor capacities. This study also provides educators with guidance toward more effective pedagogical methods to improve motor performance.

6. Reasons for choosing the topic:

1 .To determine the impact of regular sports practice on the development of students' sensory-motor performance.

2 .To highlight the relationship between physical education and the enhancement of basic motor capacities.

3 .To present practical recommendations for educators on how to effectively utilize the physical education lesson to raise the level of motor performance.

7. Definition of terms and concepts mentioned in the research:

7.1. Definition of regular sports practice (terminological):

Regular sports practice is defined as the repeated performance of physical or sporting activity according to a specific and systematic program aimed at developing the individual's physical and skill capacities. (Al-Omari, 2015)

Holmann (2001) affirms that regular physical practice helps improve the functional efficiency of the neuromuscular system and enhances motor learning processes, making the student more able to control their movements accurately and effectively.

Bouchard (Bouchard, Shephard, & Stephens, 1994) also points out that regular physical activity brings about positive changes in physical growth and motor development, especially during childhood and adolescence.

7.2. Definition of regular sports practice (operational):

In our current study, by the term regular sports practice we mean those motor and physical activities performed by the individual repeatedly and in a planned manner, according to a specific program either within or outside the physical and sports education lesson.

7.3. Definition of sensorimotor performance (terminologically):

Sensorimotor performance is the integrated coordination between the sensory system and the motor system in order to produce precise and appropriate responses to external stimuli. (Al-Sartawi, 2008)

Guthrie (Guthrie,1952) defines it as "the ability to execute coordinated and accurate motor responses as a result of the continuous interaction between sensory perception and neuromuscular mechanisms".

Schmidt (Schmidt & Wrisberg, 1999) states that sensorimotor performance is an aspect of "motor learning" that requires practice and regular repetition until the learner reaches mastery.

7.4. Definition of sensorimotor performance (operationally):

In our current research, by sensorimotor performance we mean the functional integration between sensory processes (visual, auditory, tactile...) and motor abilities (balance, coordination, accuracy, reaction).

7.5. The relationship between regular physical exercise and sensorimotor performance

Numerous educational and sports studies have shown a positive relationship between regular physical practice and improved sensorimotor performance in students. Regular repetition of motor activities enhances:

7.5.1. Neuromuscular coordination: that is, the ability of the nervous system to control the muscles in a coordinated manner. (Magill, 2007)

7.5.2. Balance and coordination: continuous exercises help develop the sense of body position (proprioception) and thus improve balance.

7.5.3. Accuracy and reaction speed: repeated exercises strengthen the neural pathways responsible for rapid transmission of sensory information to the motor system. (Schmidt & Wrisberg, 2008)

In this context, Abdel Karim Zahir (**Zahir, 2003**) believes that regular physical education represents a "practical laboratory" for developing the student's sensorimotor performance, as it combines the physical, cognitive, and sensory aspects in an integrated learning process.

8 .Previous studies:

8.1. Study by Tahir Adnan, Ben Abdelrahman Sayed Ali, and Tahir Yasmin, titled: "**Teaching methods and their impact on motor learning in the physical education and sports class.**" Article published in the Journal of the Laboratory of Sciences and Expertise and Technology of Physical and Sports Activity. Issue 03.

This study aimed to demonstrate the effects of teaching methods on motor learning in the physical education and sports class.

It concluded that teaching methods have an impact on motor learning in the physical education and sports class.

8.2. Study by Sulaimani Nour al-Din, titled: "**Control levels of the physical education and sports teacher and their relationship to improving motor performance in middle school students.**" Article published in the Journal of the Sports System. Volume 09, Issue 02.

This study aimed to identify the control levels of physical education teachers and their relationship to improving motor performance in middle school students, and to determine the role of good control over equipment, time, and students in the physical education class to improve motor skills.

It concluded regarding the control levels of the physical education and sports teacher and their relationship to improving motor performance in middle school students.

8.3. Study by Bouhajj Meziane, Meziane Fateh, Sassi Abdelaziz, Hamani Ibrahim, titled: "**Enhancing the sensorimotor aspect through quasi-sport games among minor handball practitioners.**" Article published in the Academy Journal for Social and Humanistic Studies, Issue 21 — January 2019.

This study aimed to determine the benefits of quasi-sport games for childhood from all aspects (psychological, social, physical–health, moral), and to highlight the importance of quasi-sport games in enhancing sensory-motor abilities.

It concluded that quasi-sport play has a positive role in improving a child's health behavior and also helps form initial motor experiences that contribute to the quick acquisition of motor skills.

8.4. Study by Qoull Khaira, Hamza Ja'rein. Titled: "**Quasi-sport games in enhancing the sensory-motor and socio-emotional aspects in physical education classes for secondary school students.**"

Article published in a peer-reviewed journal issued by the Laboratory of Sciences and Techniques of Physical and Sports Activity, Issue No. 1, June 2010.

This study aimed to fully address adolescence, a stage in which psychological disorders and problems are abundant, and to help the sports educator understand students' psychological states and respect and value their personalities.

It concluded that quasi-sport games have a positive role in improving sensory behavior, motor performance, and the socio-emotional aspect of secondary school students in physical education classes.

9. Commentary on previous studies:

9.1. Regarding topic selection:

Our current study resembled previous studies in topic selection, especially in terms of identifying the relationship between the role that sports practice plays in raising and improving students' sensory-motor aspects.

9.2. Regarding the study objectives:

The objective was unified between our current study and previous studies in identifying the relationship and role that sports practice plays in raising and improving students' sensory-motor aspects.

9.3. Regarding the methodology used:

Our current study agreed with previous studies in the choice of methodology, which is the descriptive method.

9.4. Regarding the study population:

Our study differed from some previous studies in the choice of population: we relied on middle school teachers in our study, whereas previous studies selected the secondary level.

9.5. Regarding the study sample:

Our study differed from some previous studies in the choice of the sample: we relied on middle school teachers in our study, whereas previous studies selected the secondary level.

9.6. Regarding the information-gathering instrument:

Our current study agreed with all previous studies in choosing the information-gathering instrument from respondents: we relied on a questionnaire as the instrument for collecting information from respondents.

9.7. Regarding the statistical method used to collect information:

Our current study differed from previous studies, except for the third study, in the choice of the statistical method used to collect information from respondents: we relied on the chi-square test to determine the existence of relationships between the study variables, while one previous study used frequencies and percentages as the statistical method for collecting information from respondents.

9.8. Regarding the obtained results:

The results were very similar across all studies and our current study; they all pointed in the same direction and toward the same goal: that physical exercise in its various forms plays an effective role in raising and improving students' psychomotor (sensory-motor) aspects.

9.9 .Regarding benefit from previous studies:

We benefited from all previous studies in that they provided the theoretical heritage for our current study; they helped us in the methodological construction of the study problem and clarified the methodological approach to be followed in such studies.

10 .Methodological procedures followed in the research:

10.1. Study method:

The choice of one method over another may be due to several factors and reasons, including the subject of the study and the characteristics of the problem the researcher wishes to study. In this study we used the descriptive method, considering it the appropriate method for the current study, which Ammar Bouhouch and Muhammad Mahmoud Al-Dhuneibat define as: "a method of analysis and interpretation in a scientifically organized manner in order to achieve specific purposes for a particular situation or social problem" (Bouhouch & Al-Dhuneibat, 1995).

The descriptive-analytical method was relied upon in our current study.

10.2. Study population:

In the language of the humanities, the study population is "a finite or infinite set of elements predetermined and on which observations are based" or it is a group that shares one or several characteristics distinguishing it from other elements to which the test or inquiry is applied. (Maurice, 2001)

The size of the original population in our current study reached 50 subjects from middle school teachers at some middle schools in the municipality of Djelfa.

10.3. Study sample:

In our current study, the survey sample was used, and the number of sample members reached 50 subjects from middle school teachers at some middle schools in the municipality of Djelfa.

10.4. Data collection instrument: (questionnaire)

10.4.1. Introduction to the study instrument:

The questionnaire scale was relied upon to collect information from the subjects, which was designed according to the requirements and objectives of the current study.

10.4.2. Scoring key:

Each alternative is given scores as follows: (Disagree = 1, Neutral = 2, Agree = 3).

10.5. Study variables:

10.5.1 Independent variable:

It is the factor the researcher wants to measure the extent of its effect on the studied phenomenon and is generally known as the independent variable or experimental factor, and in our current study it represents regular physical exercise during the physical education and sports lesson.

10.5.2. Dependent variable:

It is the affected factor whose degree of being influenced the researcher wants to determine in the studied phenomenon, and in our study it represents the level of sensorimotor performance among middle school students. Usually the researcher establishes whether there is a relationship between the independent variable and the dependent variable.

10.6. Statistical methods used in the study:

After the implementation phase, the data were extracted using the instruments employed (the scale) in order to analyze and process them statistically with the SPSS program, using a set of procedures relied upon, which are:

10.6.1. Chi-square test: By this test we will attempt to determine whether there is a correlational relationship in respondents' answers to the scale items.

10.6.2. Significance level (alpha) = 0.05

10.6.3. Degrees of freedom: $df = N - 1$

where N represents the sample size

10.6.4. Arithmetic mean:

The aim is to obtain the standard deviation, in addition to comparing the results among sample members.

And speaking of the arithmetic mean, its formula is as follows:

$$\bar{X} = \frac{\sum X}{N}$$

X: repetitions.

N: number of teachers

10.6.5. Standard deviation:

The standard deviation is considered one of the most important and most accurate measures of dispersion; it is the square root of the mean of the sum of the deviations of the values from their

arithmetic mean, Thus it indicates how far a subject's score deviates from the central point. (Salah Al-Din, B. S.)

11 .Presentation, analysis and discussion of the study hypotheses:

11.1. Presentation, analysis and discussion of the first hypothesis:

Text of the first hypothesis: "There is a correlational relationship between regular physical exercise during the physical education lesson and the improvement of neuromuscular coordination levels among middle school pupils."

Regular physical exercise during the physical education class									
Level of neuromuscular coordination among middle school students	Arithmetic mean	Standard deviation	Chi-square goodness-of-fit test	Moral value sig	Level of significance	Differences within groups	Differences between groups	degrees of freedom (df)	The statistical decision
	120.2250	14.56636	30.756	0.0328	0.05	-0.280	0.365	49	Function

Table No. 01: Statistical methods used in testing the first hypothesis

Through Table No. 01, which represents the statistical methods used in testing the first hypothesis, we note that the arithmetic mean value reached 120.2250, while the standard deviation value reached 14.56636, and the chi-square goodness-of-fit test value reached 30.756, with a significance value (sig) of 0.0328, at degrees of freedom (df) of 49, at a significance level of 0.05. The within-group differences amounted to -0.280, while the between-group differences amounted to 0.365.

When comparing the significance value (sig) with the significance level, we note that the significance value is less than the significance level.

Thus, there is a correlational relationship between regular sports practice during the physical education lesson and the enhancement of neuromuscular coordination among middle school students, achieved.

11.2. Presentation, analysis, and discussion of the second hypothesis:

Text of the second hypothesis: "There is a correlational relationship between regular sports practice during the physical education lesson and the improvement of balance and coordination among middle school students."

Regular physical exercise during the physical education class									
Level of balance and harmony	Arithmetic mean	Standard deviation	Chi-square goodness-of-fit test	Moral value sig	Level of significance	Differences within groups	Differences between groups	degrees of freedom (df)	The statistical decision
	120.2250	14.56636	30.756	0.0328	0.05	-0.326	-0.226	49	Function

Table No. 02: Statistical methods used in testing the second hypothesis

Through Table No. 02, which represents the statistical methods used in testing the second hypothesis, we note that the mean value reached 120.2250, while the standard deviation value reached 14.56636, and the chi-square goodness-of-fit test value reached 30.756, with a significance value (sig) of 0.0328, at degrees of freedom (df) equal to 49, at a significance level of 0.05; the within-group differences were -0.326, while the between-group differences were -0.226.

When comparing the significance value (sig) with the significance level, we note that the significance value is less than the significance level.

Thus, there is a correlational relationship between regular sports practice during physical education lessons and the improvement of balance and coordination levels among middle school students, realized.

11.3. Presentation, analysis, and discussion of the third hypothesis:

Text of the third hypothesis: "There is a correlational relationship between regular sports practice during physical education lessons and the improvement of accuracy and responsiveness among middle school students."

Regular physical exercise during the physical education class									
Level of accuracy and responsiveness	Arithmetic mean	Standard deviation	Chi-square goodness-of-fit test	Moral value sig	Level of significance	Differences within groups	Differences between groups	degrees of freedom (df)	The statistical decision
	120.2250	14.56636	36.537	0.0129	0.05	-0.396	-0.432	49	Function

Table No. 03: Statistical methods used in testing the third hypothesis

Through Table No. 03, which represents the statistical methods used in testing the third hypothesis, we note that the mean value reached 120.2250, while the standard deviation was 14.56636, and the chi-

square goodness-of-fit test value was 36.537, with a significance value (sig) of 0.0129, at degrees of freedom (df) of 49, at a significance level of 0.05. The within-group difference was -0.396, while the between-group difference was -0.432.

When comparing the significance value (sig) with the significance level, we note that the sig value is less than the significance level.

Thus, a correlational relationship between regular exercise during physical education classes and the improvement of accuracy and responsiveness in middle school students has been established.

11.4. Presentation and discussion of the general hypothesis:

Text of the general hypothesis: "There is a correlational relationship between regular sports practice during physical education classes and the improvement of sensorimotor performance among middle school students".

Through presenting, analyzing, and discussing the three sub-hypotheses, which state: "There is a correlational relationship between regular sports practice during physical education classes and the improvement of neuromuscular coordination among middle school students" for the first sub-hypothesis; "There is a correlational relationship between regular sports practice during physical education classes and the improvement of balance and coordination among middle school students" for the second sub-hypothesis; and "There is a correlational relationship between regular sports practice during physical education classes and the improvement of accuracy and response among middle school students" for the third sub-hypothesis—all are confirmed.

Thus the general hypothesis, which states: "There is a correlational relationship between regular sports practice during physical education classes and the improvement of sensorimotor performance among middle school students," is confirmed.

12 .General conclusion:

From the results reached in the study we conclude that there is:

- ✓ correlational relationship between regular sports practice during physical education classes and an increase in visuomotor performance among middle school students.
- ✓ correlational relationship between regular sports practice during physical education classes and an improvement in neuromuscular coordination among middle school students.
- ✓ correlational relationship between regular sports practice during physical education classes and an improvement in balance and coordination among middle school students.
- ✓ correlational relationship between regular sports practice during physical education classes and an improvement in accuracy and responsiveness among middle school students.

13 .Conclusion:

It can be said that regularity in engaging in physical exercise during the physical education class not only contributes to the development of general physical abilities, but also plays a pivotal role in raising the level of students' sensorimotor performance, making physical education and sports a fundamental field for building motor and cognitive competencies that accompany the student in his academic and daily life.

14. List of references used in the research:

- 1 .Bouchard, Shephard, and Stephens. (1994). Physical Activity, Fitness, and Health. Champaign, IL: Human Kinetics.
- 2 .Guthrie. (1952). The Psychology of Learning. New York: Harper & Row.
- Holmann. (2001). Principles of Exercise Physiology. London: Routledge.
- 3 .Magill. (2007). Motor Learning and Control: Concepts and Applications. New York: McGraw-Hill.
- 4 .Schmidt & Wrisberg. (2008). Motor Learning and Performance: A Situation-Based Learning Approach. Champaign, IL: Human Kinetics.
- 5 .Schmidt & Wrisberg. (1999). Motor Learning and Performance: A Situation-Based Learning Approach. Champaign, IL: Human Kinetics.
- 6 .Ingers Morris. (2001). Methodology of Scientific Research in the Human Sciences (Volume, 2nd ed.). Kuwait: Dar Al-Maarefa.
- 7 .A. Salah Al-Din. (n.d.). Educational and Psychological Measurement and Evaluation: Its Methods, Applications, and Contemporary Guidelines. Egypt: Dar Al-Fikr Al-Arabi.
- 8 .Abdel Aziz Al-Sartawi. (2008). Sports Psychology and Its Applications. Amman: Dar Al-Maseera.
- 9 .Abdel Karim Zahir. (2003). Physical Education and Sports Between Theory and Practice. Cairo: Dar Al-Fikr Al-Arabi.
- 10 .Imad Abdel Baset Al-Omari. (2015). Physical Fitness and Sports Activity. Amman: Dar Al-Fikr.
11. Ammar Bouhouch & Ammar Al-Dhunaibat. (1995). Scientific Research Methods and Ways of Preparing Research. Algeria: Diwan of University Publications.