



Intelligence Levels Among Athletic and Non-athletic Students: A Comparative Study

Hamad Abdulsalam ¹, Waad Gharbi Salih², Mohammed Essam Dara ³

¹ Kirkuk General Directorate of Education, Iraq

² Kirkuk General Directorate of Education, Iraq

³ University of Kirkuk / Faculty of Physical Education and Sports Science., Iraq

Corresponding Author: email; mohammed.es.dara@uokirkuk.edu.iq

Abstract

The aim of this study was to **investigate** differences in intelligence levels between students **who participate in sport and those who do not**, and to demonstrate **the impact of** sporting activity on the development of cognitive abilities. The researchers employed a descriptive, comparative approach. The sample comprised 40 secondary school pupils in Kirkuk Governorate, who were divided into two equal groups: 20 pupils who participated in sporting activities and 20 who did not. The Raven Progressive Matrices test was administered to measure intelligence, and a t-test was used to analyse the differences between the two groups. The results showed statistically significant differences in favour of the students **who practise sport**, with an average score of 11500. compared to 10600. for non-athletes, at a significance level of 0000. The results indicate that sporting activity has a positive effect on the development of intelligence, which underscores the importance **of integrating** sporting activities into the school environment. The study recommended the need to support sporting programmes and encourage **pupils** to participate in them to enhance their cognitive and psychological well-being.

Objectives:

1. To determine the intelligence levels of student athletes.
- 2- To determine the intelligence levels of non-athletic students.
- 3- To compare intelligence levels between the two groups.
4. To investigate the effect of sporting activity on intelligence levels.

Materials and Methods:

The study employs a descriptive and correlational approach, as this is appropriate to the nature of the research. The research population consists of preparatory school pupils in Kirkuk Governorate, they are a group of lower secondary school pupils of the same age and academic year; the first group consists of 20 pupils who participate in sporting activities and games, whilst the second group consists of 20 pupils who do not participate in sporting activities.

Conclusions:

The study's results indicate a marked positive effect of sporting activity on intelligence levels, with student athletes clearly outperforming their non-athletic peers in terms of intelligence. This scientific finding emphasises the need to prioritise school sporting activities, as they are a factor contributing to academic excellence.

Keywords: intelligence, sporting activity, Raven's test, lower secondary school pupils.



Introduction

Intelligence is considered an innate trait that varies from one person to another, just like other innate traits; it can be trained, developed and improved through programmes designed for that purpose or through certain games and intellectual sports. It is one of the most important mental abilities possessed by humans, referring to a range of mental processes such as thinking, analysis, planning, problem-solving, and adapting to different situations. Definitions of intelligence have varied across different schools of psychology; however, most agree that it is an individual's ability to use their experiences and mental skills effectively to achieve success in their daily life' (Abu Jado, 2010). Intelligence, as a physiological trait like any other, can be influenced by an improvement in the body's overall efficiency, which in turn results from engaging in sporting activities, whether physical or mental. This is because the enhanced functioning of organs—such as the heart, respiratory system, nervous system and other internal systems—resulting from training loads can improve brain function, and there is a possibility of an increase in an individual's intelligence. 'Physical exercise contributes to improved brain function' (Hillman, 2008). Furthermore, mental and strategic training, as well as dealing with the changing situations of competition and interacting with opponents, serve to enhance the quality of thinking.

On the other hand, sporting activity is considered one of the main factors influencing a person's physical, mental and psychological development. Exercising does not merely improve physical fitness; its effects extend to stimulating mental abilities, such as concentration, attention and decision-making speed." Numerous studies have demonstrated a positive correlation between intelligence and sporting activity, as regular physical exercise helps to improve brain function by increasing blood and oxygen flow to the brain" (Al-Zaghloul, 2012)

Furthermore, sporting activities, particularly team sports, contribute to the development



of what is known as social and emotional intelligence, as individuals learn communication skills, teamwork, self-control and decision-making under pressure. Gomez (2013) points out that “there is a relationship between physical activity, processing speed and attention”; conversely, intelligence plays an important role in sporting performance, as athletes need to think quickly, plan effectively and understand game strategies to achieve the best results. On this basis, it can be said that the relationship between intelligence and sporting activity is a complementary one, with each positively influencing the other, thereby contributing to the development of a well-rounded and balanced personality.

1-1 Research question:

The growing interest in sporting activities is considered one of the factors contributing to improved physical health amongst school pupils; however, its impact on improving mental abilities, such as intelligence, remains open to further research and investigation in order to find irrefutable scientific evidence and to determine the level of intelligence and the extent to which it is linked to and influenced by sporting activity. The research problem is highlighted by the following questions:

1. Are there statistically significant differences in intelligence levels between student athletes and their peers at the same academic level who do not participate in sporting activities?
- 2- Does participating in sport contribute to the development of students’ cognitive abilities?
3. What is the nature of the relationship between sporting activity and intelligence levels among the sample?
4. Is the relationship between intelligence and sporting activity influenced by the level of sporting activity?

1.2 Research Hypotheses:

Based on the research problem, the research hypotheses can be formulated as follows:

1. There is a statistically significant difference in intelligence levels between students who participate in sporting activities and their peers who do not.



2. There is a positive relationship between participation in sporting activities and intelligence levels amongst the sample participants.
3. Regular participation in sporting activities contributes to the development of mental abilities, including intelligence.
4. Students' intelligence levels vary depending on their participation in sporting activities.

1.3 Research Objectives:

1. To determine the intelligence levels of student athletes.
- 2- To determine the intelligence levels of non-athletic students.
- 3- To compare intelligence levels between the two groups.
4. To investigate the effect of sporting activity on intelligence levels.

1.4 Scope of the Research:

1.4.1 Temporal scope: 1 January 2026 – 2 April 2026

1-4-2 Spatial scope: Classrooms at Al-Baroudi Preparatory School.

1-4-3 Human scope: Two groups of preparatory school pupils, each comprising 20 pupils of the same age and at the same academic stage; the first group consisting of athletes and the second of non-athletes.

2- Materials and Methods

2.1 Research methodology: The study employs a descriptive and correlational approach, as this is appropriate to the nature of the research.

2.2 Research Population and Sample: The research population consists of preparatory school pupils in Kirkuk Governorate

Research sample: A group of lower secondary school pupils of the same age and academic year; the first group consists of 20 pupils who participate in sporting activities and games, whilst the second group consists of 20 pupils who do not participate in sporting activities.

2.3 Research instruments:

2-3-1 Standardized intelligence test (RAVEN IQ): This test is characterized by being cross-linguistic and suitable for different cultures, and it possesses a high degree of reliability and validity.

2-3-2 Statistical software (SPSS)

3.1 Research Procedures: The study was conducted as follows:

1. Selection of the research sample comprising student athletes and a comparable group of non-athletes.



2. Testing the sample participants by administering the intelligence test (RAVEN IQ) to all members of the sample.
- 3- Compiling the results of the intelligence test for all sample members
- 4- Calculate the mean and standard deviation of the test results.
5. Comparison of the two groups using a t-test

3.2 Presentation and discussion of results:

Table 1. IQ levels by Raven IQ test

No	Variable	Test	mean	Standard deviation	t	sig	Significance
1	Intelligence	Athletes	115,000	4,225	4,895	000.	Moral
		Non-athletes	106,000	5,732			

The results of the statistical analysis revealed statistically significant differences between sports students and non-sports students in intelligence levels as measured by the RAVEN IQ test, with the average intelligence score for sports students being (115.000) and for non-athletes (106.000). The standard deviation was (4.225) for athletes and (5.732) for non-athletes, with a mean difference of (9.000) and a t-value of (1.838) and a calculated t-value of 4.895 with a significance level of 0.000. The results of the statistical analysis reveal a clear superiority of student athletes over their peers who do not participate in sporting activities. Al-Khouli (2001) confirms “that sporting activity does not merely improve physical aspects, but also contributes to the development of an individual’s mental and psychological aspects, thereby enhancing their abilities to think and learn”.

The findings of the present study indicate that physical activity contributes to the development of mental abilities such as intelligence, which in turn enhances an individual’s cognitive abilities. This has been demonstrated by scientific sources and studies, such as (Cui, L., Xing, Y., Zhou, H., et al. 2024) “Physical activity contributes to the development of cognitive ability”

Athletes have a clear advantage over their non-athletic peers in terms of physical, physiological and psychological characteristics; consequently, they outperform non-athletes in mental abilities, which include intelligence. Previous studies have confirmed this superiority, including the study by (Voss, M. W., et al., 2022). “The study showed that athletes excel in attention and cognitive flexibility compared to non-athletes.”

This clear superiority in intelligence can be attributed to the positive impact of physical activity on all the body’s systems, enhancing the efficiency of the internal organs and the



functioning of the circulatory and respiratory systems, which in turn improves brain function, leading to the development of intelligence, improved thinking and interaction with the environment, problem-solving, and enhanced mental health and social communication skills, relieving psychological stress and providing recreation. Taken together, these factors contribute to physical and psychological well-being, which in turn enhances the quality of thinking and facilitates sound decision-making. The findings of a study (Al-Tamimi, 2020) “to a positive relationship between physical activity and improved mental health, as sporting activity helps to enhance cognitive functions and reduce psychological stress” It can be concluded from the study’s findings that there is a positive relationship between sporting and physical activities and levels of intelligence. (Abdulkhaliq, 2005) stated “Intelligence is influenced by several factors, including environmental and behavioral ones, amongst which is physical activity, which helps to stimulate mental processes and improve cognitive performance.” Everything we have mentioned supports and corroborates the study’s findings and emphasizes that the quality of thinking and intelligence can be influenced by several factors, including sporting activity.

4- Conclusions and Recommendations:

Based on the final results of the study, we have reached the following scientific conclusions, which we shall set out below

4.1 Conclusions:

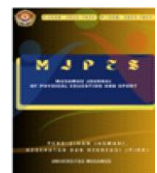
The study’s results indicate a marked positive effect of sporting activity on intelligence levels, with student athletes clearly outperforming their non-athletic peers in terms of intelligence. This scientific finding emphasizes the need to prioritise school sporting activities, as they are a factor contributing to academic excellence.

4.2 Recommendations:

1. Work towards establishing regular school sports programmes.
2. Efforts should be made to encourage pupils to take part in sporting activities.
3. Expand scientific studies examining intelligence and its relationship with sport.
4. Link other variables to similar studies, such as academic achievement.

References

Abu Jadu, S. M. (2010). Educational psychology. Dar Al-Masira.



- Al-Zaghou, I. A.-R. (2012). Learning theories. Dar Al-Shorouk.
- Al-Tamimi, A. J. (2020). The effect of physical activity and sport on mental health. Journal of the Faculty of Physical Education, University of Baghdad, 32(1), 120–135.
- Al-Khouli, A. A. (2001). The fundamentals of physical education and sport. Dar Al-Fikr Al-Arabi.
- Abd Al-Khaliq, A. M. (2005). Intelligence and personality. Dar Al-Ma'rifah Al-Jami'iyyah.
- Hillman, C. H., Erickson, K. I., & Kramer, A. F. (2008). Be smart, exercise your heart: Exercise effects on brain and cognition. Nature Reviews Neuroscience, 9(1), 58–65. <https://doi.org/10.1038/nrn2298>.
- Gómez-Pinilla, F. (2013). The influence of exercise on cognitive abilities. Comprehensive Physiology, 3(1), 403–428. <https://doi.org/10.1002/cphy.c110063>.
- Cui, L., Xing, Y., Zhou, H., et al. (2024). Physical activity promotes the development of cognitive ability in adolescents. Frontiers in Psychology, 15.
- Voss, M. W., et al. (2022). Trained athletes and cognitive function: A systematic review and meta-analysis. International Journal of Sport and Exercise Psychology, 21(4), 725–749.