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A comparative study of the level of physical health between practitioners and non-practitioners of healthy sports activity among physical education teachers in Algeria

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Abstract

Aim. The study aimed to determine the significance of engaging in healthy sports and physical activity among physical education and sports professors. It was carried out on a sample of 30 professors, 15 practitioners and 15 non-practitioners, who were chosen at random from different secondary schools in Guelma (Algeria)

Material and method. Three applied physical tests were used to assess the physical activity levels between the practicing and non-practicing professors: the endurance test, the strength and flexibility test, we used the comparative analytical descriptive approach in this investigation, and the Statistical Package for Statistics (SPSS) software was used for statistical processing.

Results. The study's findings were as follows:

- At a significance level of ≤ 0.05 , there is a statistically significant difference in endurance (Brixie 5-minute test) between practitioners and non-practitioners, in favor of practitioners.
- At a significance level of ≤ 0.05 , there is a statistically significant difference in Strength (2 kg medicine ball throw test) between practitioners and non-practitioners, in favor of practitioners.
- At a significance level of ≤ 0.05 , there is a statistically significant difference in Flexibility (Test of bending the torso forward and lower from standing) between practitioners and non-practitioners, in favor of practitioners.

Key words: *physical health; health; sports physical activity; physical education teachers*

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Introduction

Being physically healthy involves more than just being able to manage the physical demands of daily life. In order to cope with times of heightened physical activity, the body's interacting physiological systems the heart, blood vessels, lungs, and muscles. Exercise gets easier when muscles are stronger. The capacity of a muscle to maintain a fixed contraction throughout time or to withstand repeated contractions is known as muscular endurance. One example of this is performing push-ups or sit-ups. A muscle's range of motion is referred to as its flexibility. Lack of flexibility might make it harder to execute exercises or raise your risk of being hurt. Cardiorespiratory endurance is the capacity of the heart, lungs, blood vessels, and muscles to work as a team during physical activity (Ryan, 2008).

Teachers of physical education have been dealing with more complex issues related to the several components of physical fitness, including strength, endurance, agility, power, flexibility, balance, and other concepts that have been identified but not precisely defined for a long time (Leighton, 1960).

Physical education in schools has been prescribed internationally to promote physical activity and weight control. Even the purpose of physical education has changed from enhancing physical fitness to encouraging physical exercise in order to meet daily physical activity recommendations. Because of this, it is essential for physical education instructors who are worried about encouraging physical activity and body-fit in their pupils, starting with themselves. The ideal physical education teacher believes in at least three things: standards for body form, maintenance, and health. When seeking to be a teacher at a school, candidates for physical education positions may even be required to have a trim body (Priambodo et al., 2020). Since their primary responsibility is to instruct, guide, and assess pupils, teachers are the most important decision-makers in the educational system. Therefore, in order to produce professional and high-quality educators, every attempt to enhance it must also increase the quality of educators and a decent educational system. Cooperative learning is being used in physical education and sports as one of such systems (Asrianti et al., 2020). The relationship between sports physical activity and teachers' health is through the continuous practice of physical fitness exercises, muscle strength, and flexibility, which in turn improves their general health (Rosales et al., 2017).

Higher levels of physical activity are associated with improved body image, self-efficacy, and general health, which in turn improves physical fitness, muscular strength, and flexibility in primary and secondary school teachers. Physical exercise also considerably improves the health status of teachers (Gao et al., 2024). As advised by the American College of, muscular strength and endurance training is sometimes disregarded in physical education programs, even though it is an essential part of health-related fitness along with aerobic endurance, flexibility, and body composition (Ayers & Barton, 2001).

Given this, the study's significance rests in the ways that participating in healthy sports practices influences several facets of physical fitness and its health advantages for secondary school physical education instructors, which motivates us to look into the realities of these healthy sports practices.

Materials and method

Study participants

The research comprised 30 secondary school physical education teachers from the Algerian wilaya of Guelma, 15 of whom were sports physical activity practitioners (Running in nature, swimming), and 15 of whom were not. They were chosen at random.

Study design

Three tests were administered to the research population to distinguish between practitioners (Running in nature, swimming), and non-practitioners in sports activities.

The research was conducted during March and April of 2024 and was divided into the following phases :

- Endurance Tests were carried out between March 26, 2024, and April 1, 2024.
- Strength test was place between April 5th, 2024, and April 10th, 2024.
- The Flexibility Test was administered from April 12 to April 17, 2024.

The tests

The following are some of the field tests included in the research:
endurance Test :

- Brixie 5min Test :

Purpose of the test: Measuring the efficiency of the circulatory and respiratory systems, and maximum oxygen consumption.

Test Description: The necessity of covering the largest possible distance during the test period 5min.

Method record grades: The total distance traveled during the test period is calculated.

Table 1. Suggested levels for Brixie 5min Test

Estimate	Result
excellent	1310 and above
middle	1165
weak	1020 and less

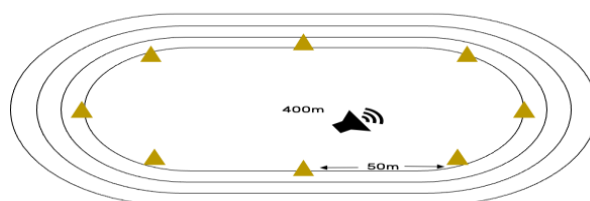


Figure 1. The Brixie 5min Test

Note. Source:(sportsulting, 2023).

Strength test

Medicine ball throw test :

Purpose of the test: Measurement of arm muscle strength.

Tools: 2kg medicine ball, measuring tape

Executing the test: The tester takes the starting position for the test behind the starting line, holding the ball with both hands; standing with his back to the measuring tape or throwing area, the tester swings his arms and throws the ball behind his back and to the farthest distance.

Method record grades: The distance is recorded to the nearest 5 cm, The tester is given three attempts, and the best one is counted.

Table 2. Suggested levels for the 2 kg medicine ball throw test

Estimate	Result
excellent	11,1 and above
middle	9,1
weak	7,1 and less



Figure 2. The 2 kg Medicine ball throw test

Note. Source:(mobilesport.ch,2012)

Flexibility Test

- Test of bending the torso forward and lower from standing

Purpose of the test: Measuring the elasticity of the spine on the horizontal axis.

Tools: Non-flexible ruler numbered from 0 to 50 cm perpendicular to the seat where the number 50 cm parallel to the surface of the ruler and the number 25 cm parallel to the lower edge of the seat, a wooden indicator moving on the surface of the ruler.

Performance specifications: The player stands above the seat with the feet bandaged with the toes fixed on the edge of the seat while keeping the knees straight, the player bends his torso forward and down so that the cursor pushes his fingertips as far as possible, to be fixed at the last distance he reaches for 2 seconds.

method record grades: Record the distance he achieved in the two attempts and calculate the greater distance in centimeters.

Table 3. Suggested levels for Test of bending the torso forward and lower from standing.

Estimate	Result
excellent	14,5 and above
middle	11,75
weak	9 and less



Figure 3. Test of bending the torso forward and lower from standing
Note. Source:(lepape-info, 2015).

Statistical analysis:

- The statistical analysis of the research was conducted using SPSS version 25.
- standard deviation (SD) and arithmetic mean.
- independent samples T test.
- The study deemed a significant threshold of $\alpha \leq 0.05$, corresponding to a 95% confidence interval.

Results

Table 4. Statistical analysis of the results for the Brixie 5min Test.

Endurance: Brixie 5min test	Practice variable	N	Mean	Std. Deviation	t	df	Significance level	Sig	Statistical estimate
	practitioners	15	1422,90	122,93	9,008	28	$\alpha \geq 0,05$	0,00	significant
	non- practitioners	15	1080,04	81,32					

According to the data in Table (4), the arithmetic mean of practitioners in sports physical activity in the endurance test (Brixie 5 minutes) was 1422.90 with a standard deviation of 122.93. This is higher than the arithmetic mean of non-practitioners, which was 1080.04 with a standard deviation of 81.32. then we examine the results of the subsequent test (T) to determine whether or not this difference is statistically significant. We observe from the table that the value of (T) computed at the degree of freedom (28) equals (9,008). Due to the variable of engaging in sports activity, the differences between practitioners and non-practitioners in terms of endurance are statistically significant and favor practitioners because the degree of moral probability (sig=0.00) is less than the level of significance (≥ 0.05).

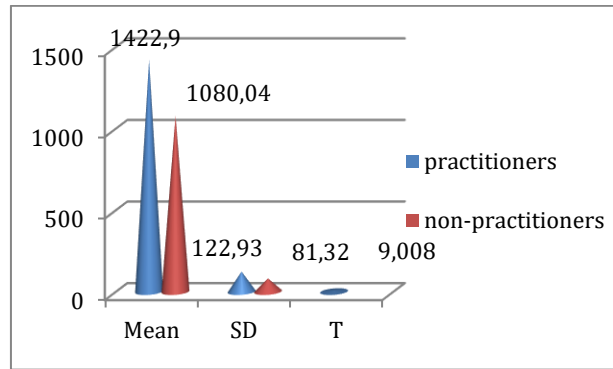


Figure 4. Graph of the mean and standard deviation of the Brixie 5min Test.

We observe from the results shown in Table (5) that the arithmetic mean for strength in the 2 kg medicine ball throw test was higher for who participated in sports physical activity (13.96) and had a standard deviation of 1,177 than the arithmetic mean for non-participants (9.84) and a standard deviation of 1,183). then we examine the results of the subsequent test (T) to determine whether or not this difference is statistically significant. We observe from the table that the value of (T) computed at the degree of freedom (28) equals (9,575). Given that the level of significance ($\geq 0,05$) is higher than the degree of moral probability ($\text{sig}=0,00$), The variable of engaging in healthy sports physical activity is responsible for the statistically significant strength differences between practitioners and non-practitioners, which favor practitioners.

Table 5. Statistical analysis of the results for 2 kg medicine ball throw test.

Strength: 2 kg medicine ball throw test	Practice variable	N	Mean	Std. Deviation	t	df	Significance level	Sig	Statistical estimate
	practitioners	15	13,96	1,177	9,575	28	$\alpha \geq 0,05$	0,00	significant
	non- practitioners	15	9,84	1,183					

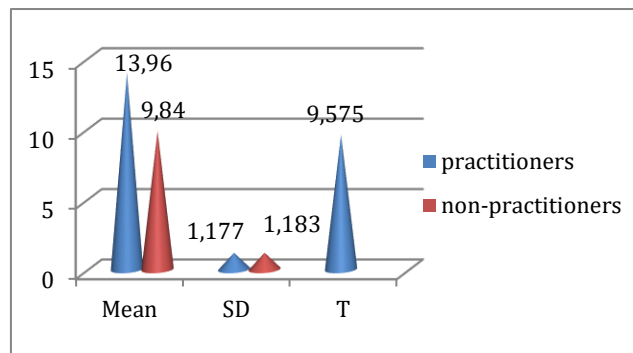


Figure 5. Graph of the mean and standard deviation of the 2 kg medicine ball throw test

In the test of bending the torso forward and lower from standing, the arithmetic mean of athletes' flexibility was found to be 14.11 with a standard deviation of 1,230. This is higher than the arithmetic mean for non-practitioners, which was 9.82 with a standard deviation of 1,488, as per the results shown in Table (6). In order to determine whether or not this difference is statistically significant, we read the results of the subsequent test (T) and see from the table that the value of (T) computed at the degree of freedom (28) equals (8,610). Because the degree of moral probability ($\text{sig}=0,00$) is less than the level of significance ($\geq 0,05$), the differences in flexibility between

practitioners and non-practitioners are statistically significant, favoring practitioners, and are ascribed to the variable of engaging in physical, healthy sports.

Table 6. Statistical analysis of the results for 2 kg medicine ball throw test.

Flexibility: Test of bending the torso forward and lower from standing	Practice variable	N	Mean	Std. Deviation	t	df	Significance level	Sig	Statistical estimate
	practitioners	15	14,11	1,230	8,610	28	$\alpha \geq 0,05$	0,00	significant
	non- practitioners	15	9,82	1,488					

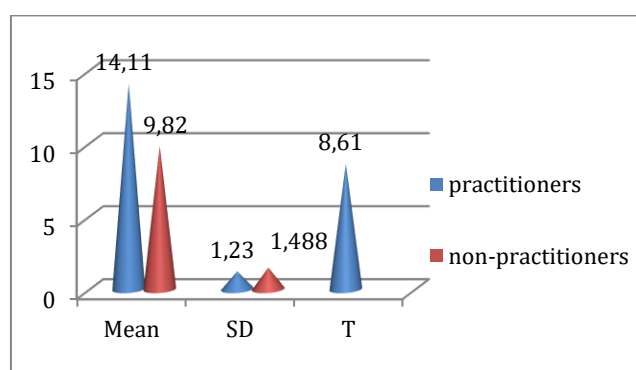


Figure 6. Graph of the mean and standard deviation of the Test of bending the torso forward-

Discussions

Since we discovered that there are statistically significant differences in the evaluation of the results of the applied tests between practitioners and non-practitioners of sports activities (strength test, cardiorespiratory endurance test, and flexibility test), it was in favor of practicing teachers. From here, we see that the results of the current study prove that participation in sports improves the physical health of practicing teachers, whether in physical education classes or during free time, due to the variable of practicing sports in its various types.

This study helps us understand how good sports practices affect the physical well-being of secondary school physical education instructors.

A number of tests were used to further analyze the study's findings, such as an endurance test (which measures the respiratory and circulatory systems' efficiency as well as maximum oxygen consumption), a strength test (which measures the strength of the arm muscles), and a flexibility test (which measures the spine's elasticity on the horizontal axis). Our study confirms earlier findings and advances understanding of the advantages of physical education instructors who regularly participate in healthy sports for their physical health.

Sports practice and fitness are strongly correlated, as seen by the fact that physical education instructors were found to be more active and healthy than their non-physical education counterparts. They also rated their health and attitudes about aging more favorably and felt more fit overall (Netz & Raviv, 2002). Physical activity benefits everyone, including physical education instructors, to improve mental and physical health. Increasing exercise capacity, lowering the risk of cardiovascular disease, and fostering general well-being, helps instructors stay in good health and successfully set an example of healthy behavior for their children (Gajendra, 2023).

Reduced resting heart rate, greater left ventricular muscle mass, and improved diastolic function are all signs that moderate exercise greatly increases cardiac fitness. These gains, which promote long-lasting behavioral shifts toward physical exercise, are especially noticeable in sedentary people (Pavlik et al., 2018). For people of all ages, regular exercise and increased cardiorespiratory fitness greatly improve metabolic and general health. As a crucial public health tactic for fostering well-being,

this practice can lessen the detrimental health impacts of obesity (Ortega, et al, 2018). To improve fitness, maintain a healthy body weight, and avoid chronic illnesses, regular physical exercise is crucial (Botilias & Stylios, 2022).

strength, balance, and aerobic endurance over the course of 36 weeks with planned sessions intended to increase total physical skills in order to improve functional fitness and gait characteristics in older persons (Ramalho, et al, 2017). Because physical fitness activities improve both mental and physical states, they have a considerable positive impact on quality of life. The importance of leisure sports in preventing disease and fostering interpersonal relationships is shown by the fact that gender, age, and disposable money are important determinants of involvement (Kunxia, et al, 2021).

Frequent endurance training improves cardiac structure and function in midlife and older women, reducing the risk of cardiovascular disease and mitigating the negative cardiovascular modifications linked to sedentary aging. It also significantly improves the cardiovascular system, as evidenced by increased $\dot{V}O_{2max}$ (Tokarski et al, 2023).

Respiratory health is positively associated with improved lung function, and push-ups require endurance and physical fitness, suggesting that exercise can enhance both endurance and muscle strength. (Liu, et al, 2024).

Frequent endurance training prevents the negative cardiovascular variations linked to not active old age and lowers the risk of cardiovascular disease. It also improves cardiac structure and function in midlife and older women and significantly improves respiratory health, as evidenced by increased $\dot{V}O_{2max}$ (Carrick et al, 2023).

With gains of 9.4% in grip strength and 14.4% in leg strength for adults and 6.2% and 28.9% for older people with arterial disease, respectively, the hybrid exercise-based heart rehabilitation programme enhanced muscular strength in both groups (Marzuca et al, 2022). Older persons can successfully increase their muscle strength through gymnasium activity, especially when they follow a gradual 8–12 week exercise programme. Significant improvements in muscular strength, physical fitness, and everyday activities were reported by participating, demonstrating the program's viability and beneficial effects on functioning capability (Starck et al, 2022). When compared with passively controls, exercising therapies had a greater impact on improving strength in the muscles in those with non-specific low back pain (Clael et al, 2021).

Activities that increase muscle strength, such as resistance training with weights or body weight, are crucial. Numerous health advantages are linked to them, including improved mental and cardiometabolic health outcomes and a decrease in all-cause mortality (Marino et al, 2022). Postmenopausal female muscular strength increased dramatically as a result of the muscular-strengthening workouts (Reis et al, 2022).

According to the research, 75% of the muscle mass in patients with tetraplegic spinal cord injuries showed stronger muscles at three and six months following a nurse-coached training intervention (Sheehy, 2010). In order to improve balance recovery and lower the number of fall-related injuries in older persons, progressive resistance training (PRT) is the accepted technique for increasing muscular strength and power. Putting PRT into practice can greatly reduce the hazards related to muscular weakness (Benichou & Lord, 2016).

To increase the flexibility of your muscles and joints, you must perform structured stretching activities. Frequent practice of flexibility helps players perform better in athletics and games by maintaining range of motion, building muscle power, and lowering the risk of sports injuries (Rahman & Islam, 2020). In order to reduce low back discomfort and enhance overall athletic performance by preserving muscle length and preventing injuries, Muscle, Energy Technique, or traditional spinal activities can successfully increase muscular and joint flexibility, especially in the hamstrings (Divya, 2011).

In people with cerebral palsy, exercise for cerebral palsy effectively improves hip and knee joint flexibility and strengthens the knee and trunk muscles, proving that an organized program of exercise can enhance both muscular and joint flexibility (Valadão et al., 2024). Adults' joint flexibility is considerably increased by eccentric exercising; a reasonably high impact is indicated by a pooled standardised mean difference of 0.54. The quality of the evidence ranged from poor to excellent, indicating that this kind for physical activity was beneficial in increasing flexibility (Diong et al, 2022).

Increased muscular flexibility improves joint range of motion, strengthens muscles, and lessens pain and stiffness. Activities that increase flexibility can enhance joint health, lower the chance of injury, and improve the performance of muscles overall (Huang, 2023). In order to improve the health of primary and secondary school teachers, physical exercise is essential. According to the study, instructors who engage in more physical exercise had better body image, self-efficacy, and general health (Gao et al, 2024).

Conclusion

Physical education teachers who engage in healthy sports physical activity during the school day or in their free time have good physical health, according to the study's findings. This is demonstrated by the comparison of their endurance test results to those of non-practicing teachers (Brixie 5-minute test). in the flexibility test (test of bending the torso forward and lower from standing) and strength test (test of throwing a 2 kg medicine ball),

based on all the information gathered and examined from the assessment of the tests. Consequently, the stress test yielded an arithmetic mean (1422.90) and a standard deviation (122.93) for practitioners. On the identical test, however, non-practicing academics received an arithmetic mean of 1080.04 and a standard deviation of 81.32. Practitioners received a standard deviation of 1,177 and an arithmetic mean of 13.96 for the strength test. In the same exam, the non-practicing academics received an arithmetic mean of 9.84 and a standard deviation of 1,183, whereas the practitioners' scores for the flexibility test showed an arithmetic mean of 14.11 and a standard deviation of 1,230. Conversely, non-practicing academics who took the same test received a standard deviation of 1,488 and an arithmetic mean of 9.82. Based on the data and findings, we can conclude that professors who participate in healthy sports and physical activity have better physical health than their colleagues who do not. This is because the professors who participated in sports activities performed better on tests than those who did not engage in any form of physical activity.

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