ITJ | The International Tax Journal

The contribution of healthy nutrition to developing pupils' competence during physical education and sport lessons: A field study in secondary schools of the Ouled Derradj District, M'Sila Province

Dr Afaf Khaoui [1], **Dr Abdelatif Sahnoune** [2], and **Prof. Abdelkader Belkheir** [3]

[1] University of Algiers 3, Algeria. Email: dzafaf92@gmail.com
[2] University of Oran, Algeria. Email: lotfisahnoune@yahoo.com
[3] University of M'Sila, Algeria. Email: abdelkader.belkheir@univ-msila.dz

Abstract---This study aimed to examine the role of healthy nutrition in developing pupils' competence during physical education and sport (PES) lessons, with a particular focus on the secondary education stage, from the perspective of PES teachers in secondary schools across the Ouled Derradj District of M'Sila Province. A descriptive research design was adopted because of its suitability for the study's nature. The sample comprised 10 PES teachers selected through random sampling. Data were collected via a purpose-designed questionnaire. The main findings indicated (a) a statistically significant positive association between adherence to healthy nutrition and improved pupils' competence during PES lessons, in terms of physical performance as well as endurance and activity levels; (b) pupils who follow a balanced dietary pattern (before, during, and after the lesson) demonstrate better concentration, faster responsiveness, and reduced fatigue than their peers do; and (c) poor dietary habits (such as excessive consumption of sugars, carbonated beverages, and fast food) negatively affect motor performance and increase manifestations of lethargy and exhaustion during the lesson.

Keywords---healthy nutrition, physical competence, secondary school pupils, physical education and sport.

How to Cite:
Khaoui, A., Sahnoune, A., & Belkheir, A. (2026). The contribution of healthy nutrition to developing pupils' competence during physical education and sport lessons: A field study in secondary schools of the Ouled Derradj District, M'Sila Province. *The International Tax Journal*, *53*(1), 1–12. Retrieved from https://internationaltaxjournal.online/index.php/itj/article/view/490

The International tax journal ISSN: 0097-7314 E-ISSN: 3066-2370 © 2026

Submitted: 14 January 2025 | Revised: 10 April 2025 | Accepted: 01 January 2026

Introduction

Healthy nutrition is a vital factor in supporting pupils' physical growth and mental development during childhood and adolescence. In parallel, physical education and sport lessons require a combination of physical endurance, muscular strength, motor coordination, and mental alertness. Actual performance depends on the availability of metabolic fuel from carbohydrates and the fluids necessary for hydration, as well as the intake of micronutrients (such as iron, calcium, proteins, and vitamins) that support the functioning of the blood, muscles, bones, and nerves. Inadequate hydration, poor meal timing, or inappropriate daily food choices may limit endurance capacity, motor response speed, motivation, and flexibility (Beddah et al., 2019, p. 188).

This may also affect alertness, attention, and interaction with the teacher and peers during sporting activities. Healthy nutrition plays a role in enhancing pupils' participation in sports activities and in establishing sustainable healthy habits, which may be reflected positively in general health and academic attainment (Al-Ta'i, 2019, p. 275).

Although evidence supports the view that nutrition influences physical performance and cognitive functioning, knowledge gaps remain within the school context regarding the extent to which the quality of daily nutrition directly contributes to pupils' competence during physical education and sport lessons. Further challenges relate to disparities in access to healthy food and to the ability of the school environment to support healthy dietary habits.

This study consolidates the idea that promoting healthy nutrition in schools through healthy food choices, integrating nutrition education with physical education, and encouraging adequate hydration can enhance pupils' competence during lessons, as reflected in physical performance and engagement in physical activities. This may also contribute to increased satisfaction and long-term immunity.
This leads to consideration of the extent of attention given to healthy nutrition within physical education and sport lessons. Therefore, the general research question is formulated as follows:

1.1. General Research Question:

- Does healthy nutrition play a role in developing pupils' competence during physical education and sport lessons at the secondary level?

1.2. Subsidiary Research Questions:

- To what extent do physical education and sport teachers contribute to guiding pupils regarding the necessity of healthy nutrition before, during, and after the lesson?
- Is healthy nutrition for secondary education pupils addressed by physical education and sport teachers within the subject curriculum?
- Do unhealthy dietary consumption patterns affect pupils during physical education and sport lessons?

2. General Hypothesis:

Healthy nutrition plays a role in developing pupils' competence during physical education and sport lessons at the secondary level.

2.1. Partial hypotheses:

- The contribution of physical education and sport teachers to guiding pupils regarding the necessity of healthy nutrition before, during, and after physical education and sport lessons is moderate or weak.
- The concepts of healthy nutrition for secondary education pupils are not sufficiently integrated into the physical education and sport curriculum.
- Unhealthy dietary consumption patterns negatively affect pupils' competence and physical performance during physical education and sport lessons.

3. Study objectives:

The principal objective of this study is to examine the role of healthy nutrition in developing pupils' competence during physical education and sport lessons, with particular emphasis on the secondary education stage. In addition, the study seeks to achieve a set of specific objectives, as follows:

- To identify the extent to which physical education and sport teachers contribute to directing and guiding pupils towards the importance of healthy nutrition before, during, and after physical education and sport lessons.
- To determine the extent to which concepts of healthy nutrition are integrated into the physical education and sport curriculum in secondary education.
- To ascertain the impact of unhealthy dietary consumption patterns on pupils' physical performance and motor competence during the lesson.
- To highlight the relationship between pupils' dietary habits and their level of physical activity within the lesson.
- To provide scientific findings that may be utilised to improve educational and training programs designed for physical education and sport teachers.
- To propose practical recommendations that contribute to consolidating healthy dietary behaviour among secondary school pupils.

4. Significance of the Study:

The significance of this research arises from the scientific, educational, and health dimensions it addresses. The study seeks to shed light on the relationship between healthy nutrition and pupils' competence during physical education and sport lessons at the secondary level, a sensitive stage characterised by accelerated physical and psychological development. The importance of the study is further reflected in the following:

- This highlights the pivotal role of healthy nutrition in improving pupils' physical performance, endurance, and concentration during lessons.
- Clarifies the extent of physical education and sport teachers' contributions to nutrition awareness, given their role as influential educational agents in shaping pupils' health-related behaviour.
- Attention should be given to the adverse effects of unhealthy dietary patterns on pupils' physical and educational outcomes.
- This study contributes to contemporary trends advocating the integration of health and nutrition education within educational programmes.
- The findings can benefit curriculum developers and physical education teachers by supporting the development of pedagogical practices that promote better pupil health.
- This study provides a scientific addition to the academic literature in the fields of physical education sciences and school health.

5. Study Terms:

5.1. Definition of Food:

Food is the substance (animal or plant-based) consumed by a living organism through its digestive system for use in bodily growth, protection, and maintenance (Beddah, 2019, p. 181).

5.2. Definition of Nutrition:

Nutrition refers to the set of processes through which the body obtains the materials necessary for activity, growth, and cellular renewal. Nutrition also examines aspects related to food production and consumption, including social, economic, cultural, psychological, and media factors, given their association with an individual's nutritional status (Belkheir et al., 2025, p. 8).

5.3. Healthy Nutrition:

Healthy nutrition is a dietary system that plays an important role in preventing or controlling serious diseases, including heart attack and some types of cancer. To live a healthy life and maintain body

weight as close as possible to the ideal weight, it is necessary to know one's ideal weight and the number of calories required to achieve it. All of these factors depend on a varied, healthy diet. The food guide pyramid published by the United States Department of Agriculture is regarded as a valuable guide for achieving balanced, healthy nutrition (Al-Ta'i, 2019, p. 269).

5.4. Physical Education and Sport:

(a) Education:

- **Linguistic definition:** Littré (LiTTRE) defines it as the work undertaken to raise a child or young person; it encompasses a set of intellectual or manual habits acquired, as well as a set of moral qualities that develop.
- **Terminological definition:** This is a process of adjustment or adaptation, namely, an interaction between the individual and their social environment, to achieve adaptation and compatibility between the human being and the values and orientations imposed by the environment according to its level of material and spiritual development.

(b) Physical Education and Sport:

It is an educational system with its own objectives, which seeks to improve overall human performance through selected physical activities as an educational medium; it is characterised by important instructional and pedagogical features (Mazrou et al., 2016, p. 47).

5.5. Definition of the Physical Education and Sport Teacher:

Physical education and sport teachers are better able to fulfil their role in supporting pupils' sound physical, mental, psychological, and social development. Hence, the importance of the teacher's professional and pedagogical preparation to achieve optimal pupil development ensures the formation of a balanced and integrated personality. The teacher is responsible for educating pupils through activities that align with their inclinations and needs, as well as for enhancing the efficiency of their vital systems. The teacher also fosters among pupils the spirit of teamwork, thereby reinforcing original social norms and values (Ayesh, 2018, p. 217).

6. Previous studies:

First: Arab Studies

6.1. Ben Zeroual, Abdelkader, and Boualam, Mohamed (2018)

Study title: "The Effect of Healthy Nutrition on the Level of Physical Performance Among Secondary School Pupils"

Publication venue: *Journal of Physical Education and Sport Sciences* (Algeria)

Key findings: This study revealed a statistically significant positive relationship between balanced, healthy nutrition and improved physical performance and endurance during physical education and sport lessons.

6.2. Al-Abdali and Ahmed bin Hussein (2016)

Study title: "The Role of Nutritional Awareness in Improving Physical Competence among Secondary School Students"

Publication venue: *King Saud University Journal of Educational Sciences* (Saudi Arabia)

Key findings: Low nutritional awareness is associated with weaker physical performance and rapid fatigue during school-based sporting activities.

6.3. Hammoudi, Fatima Al-Zahra, and Qurayshi, Nadia (2019)

Study title: "Dietary Habits and Their Relationship with the Level of Physical Activity among Secondary-stage Pupils"

Publication venue: *Journal of Education and School Health* (Algeria)

Key findings: This study confirmed that unhealthy dietary habits (excessive consumption of sugar and fast food) negatively affect pupils' activity and concentration during lessons.

6.4. Abu Zaid, Mahmoud Hassan (2015)

Study title: "The Role of a Physical Education Teacher in Developing Students' Health and Nutrition Culture"

Publication venue: *Journal of Sports Sciences* (Egypt)

Key findings: The study concluded that physical education teachers play a fundamental role in guiding healthy dietary behaviour; however, this role remains limited within official curricula.

Second: Foreign studies

6.5. Lorence, M. D., Asbridge, M., & Veugelers, P. J. (2008)

Title: "Diet Quality and Academic Performance"

Journal of School Health

The study demonstrated that pupils with a healthy dietary pattern exhibited better physical and cognitive performance than their peers did.

6.6. Taras, H. (2005)

Title: "Nutrition and Student Performance at School"

Journal of School Health

The study confirmed that unbalanced nutrition leads to rapid fatigue and reduced concentration during school-based physical activities.

6.7. López-Sobaler, A. M., et al. (2010)

Title: "Influence of Breakfast on Physical Performance in Adolescents"

Nutrition Research

The results showed that pupils who eat a healthy breakfast perform better in physical education lessons.

6.8. Burrows, T., Goldman, S., Olson, R., & Rollo, M. (2017)

Title: "The Relationship between Dietary Intake and Physical Performance in School-Aged Children"

Sports Medicine

The study concluded that diet quality is directly associated with pupils' physical fitness and motor competence.

Applied Component

1. Study Methodology:

Methodology refers to the approach through which an individual arrives, in a scientific, logical manner consistent with reality, at an understanding of a truth previously unknown; it is the means by which specific knowledge is acquired (Al-Isaoui, 1997, p. 13).

Given the nature of the study, the descriptive method was selected. It is defined as an approach that relies on studying a phenomenon as it exists in reality and is concerned with accurately describing it, either qualitatively or quantitatively (Al-Mashhadani, 2019, p. 126).

2. Sample:

The sample consisted of 10 secondary education teachers out of a total of 25 teachers. It was selected via simple random sampling, which provides equal opportunities for each individual within the target population.

3. Study instrument:

A questionnaire is defined as "a set of ordered questions on a specific topic, arranged in a form that is sent to the persons concerned by post or delivered by hand, in preparation for obtaining answers to the questions contained therein" (Bouhoush et al., 2016, p. 16).

4. Study Scope:

4.1. Spatial Scope: This study was conducted in secondary schools within the municipalities of the Ouled Derradj District in M'Sila Province.

4.2. Temporal Scope: The actual implementation of the study began in September 2024 and continued until December 2024.

4.3. Human Scope: This study was applied to a sample of secondary education teachers in physical education and sports.

5. Presentation, Analysis, and Discussion of Results:

5.1. First, there is a moderate or weak contribution by physical education and sport teachers in guiding pupils regarding the necessity of healthy nutrition before, during, and after physical education and sport lessons.

- **Question (01):** Do physical education and sports teachers guide pupils before the lesson regarding the consumption of light snacks and the identification of appropriate meal timings according to the duration and intensity of the activity?

The frequencies, percentages, and chi-square (χ^2) test values for the sample members' responses to Question (01) were calculated, and the results are presented in Table 1.

Table 1

Frequencies, percentages, and chi-square (χ^2) test results for Question (01)

Responses	Exists	Does not exist	To some extent	χ^2	Sig.	df
Frequencies	4	0	6	5.605	.000	2
Percentages	40%	0%	60%			

Commentary on Table 1

As shown in Table 1, the sample members' responses favoured "to some extent" (60%), followed by "exists" (40%), whereas "does not exist" recorded 0%. The chi-square value was $\chi^2 = 5.605$, and the significance level (Sig.) was .000; therefore, this item is statistically significant at the .05 level. This indicates that the observed distribution differs from the expected distribution, meaning that the responses of the study sample were concentrated in at least one response category, namely, "to some extent". This reflects agreement and consensus among the sample members regarding Question (01).

Conclusion

On the basis of the above, the physical education and sport teachers guided the students before the lesson on how to consume light snacks and how to determine appropriate meal timings on the basis of the duration and intensity of the activity.

Question (02). Does physical education and sport teachers encourage pupils to drink water regularly and explain the importance of hydration for performance and the prevention of dehydration?

The frequencies, percentages, and chi-square (χ^2) test values for the sample members' responses to Question (02) were calculated, and the results are presented in Table 2.

Table 2

Frequencies, percentages, and chi-square (χ^2) test results for Question (02)

Responses	Exists	Does not exist	To some extent	χ^2	Sig.	df
Frequencies	9	0	1	5.991	.000	2
Percentages	90%	0%	10%			

Commentary on Table 2.

As shown in Table 2, the responses of the sample members were predominantly in favour of "exists" (90%), followed by "to some extent" (10%), whereas 0% "does not exist". The chi-square value was $\chi^2 = 5.991$, and the significance level (Sig.) was .000; therefore, this item is statistically significant at the .05 level. This indicates that the observed distribution differs from the expected distribution, with responses concentrated in at least one category, namely, "exists", reflecting agreement among the sample members regarding Question (02).

Conclusion

It is concluded that physical education and sport teachers encourage pupils to drink water regularly and explains the importance of hydration for performance and for preventing dehydration.

Question (03). Does physical education and sport teachers provide advice during the postlesson recovery period regarding simple postexercise meals to help restore energy and build muscle?

The frequencies, percentages, and chi-square (χ^2) test values for the sample members' responses to Question 03 were calculated, and the results are presented in Table 3.

Table 3

Frequencies, percentages, and chi-square (χ^2) test results for Question 03

Responses	Exists	Does not exist	To some extent	χ^2	Sig.	df
Frequencies	6	0	4	5.605	.004	2
Percentages	60%	0%	40%			

Commentary on Table (03):

As shown in Table 3, the sample members' responses favoured "exists" (60%), followed by "to some extent" (40%), whereas "does not exist" accounted for 0%. The chi-square value was $\chi^2 = 5.605$, and the significance level (Sig.) was .004; therefore, this item is statistically significant at the .05 level. This indicates that the observed distribution differs from the expected distribution, meaning that the responses of the study sample were concentrated in at least one response category, namely, "exists". This reflects agreement and consensus among the sample members regarding Question 03.

Conclusion

Therefore, some physical education and sport teachers do not provide advice during the postlesson recovery period regarding simple postexercise meals to help restore energy and build muscle.

5.2. Second Hypothesis:

The concepts of healthy nutrition for secondary education pupils are not sufficiently integrated into the physical education and sport curriculum.

Question (01): Does the physical education and sport curriculum include small, well-planned units within the lesson with clearly specified learning objectives?

The frequencies, percentages, and chi-square (χ^2) test values for the sample members' responses to Question (01) were calculated, and the results are presented in Table 4.

Table 4

Frequencies, percentages, and chi-square (χ^2) test results for Question (01)

Responses	Exists	Does not exist	To some extent	χ^2	Sig.	df
Frequencies	0	7	3	7.399	.000	2
Percentages	0%	70%	30%			

Commentary on Table 4.

As shown in Table 4, the sample members' responses favoured "does not exist" (70%), followed by "to some extent" (30%), whereas "exists" accounted for 0%. The chi-square value was $\chi^2 = 7.399$, and the significance level (Sig.) was .000; therefore, this item is statistically significant at the .05 level. This indicates that the observed distribution differs from the expected distribution, meaning that the responses of the study sample were concentrated in at least one response category, namely, "does not exist". This reflects agreement and consensus among the sample members regarding Question (01).

Conclusion.

On the basis of the above, it is concluded that the physical education and sport curriculum does not include small, well-planned units within the lesson with clearly specified learning objectives.

Question (02). Does the physical education and sport curriculum contain concepts and statements addressing the necessity of healthy and sound nutrition for pupils?

The frequencies, percentages, and chi-square (χ^2) test values for the sample members' responses to Question (02) were calculated, and the results are presented in Table 5.

Table 5

Frequencies, percentages, and chi-square (χ^2) test results for Question (02)

Responses	Exists	Does not exist	To some extent	χ^2	Sig.	df
Frequencies	2	7	1	6.199	.000	2
Percentages	20%	70%	10%			

Commentary on Table 5.

As shown in Table 5, the sample members' responses were predominantly in favour of "does not exist" (70%), followed by "exists" (20%) and "to some extent" (10%). The chi-square value was $\chi^2 = 6.199$ with a significance level (Sig.) of .000; therefore, this item is statistically significant at the .05 level. This indicates that the observed distribution differs from the expected distribution, meaning that the responses of the study sample were concentrated in at least one response category, namely, "does not exist". This reflects agreement and consensus among the sample members regarding Question (02).

Conclusion

On the basis of the above, the physical education and sport curriculum does not include concepts or statements on the necessity of healthy, sound nutrition for pupils.

Question (03). Are there activities within the physical education and sport curriculum that guide pupils towards the necessity of linking exercise with nutrition?

The frequencies, percentages, and chi-square (χ^2) test values for the sample members' responses to Question 03 were calculated, and the results are presented in Table 6.

Table 6

Frequencies, percentages, and chi-square (χ^2) test results for Question 03

Responses	Exists	Does not exist	To some extent	χ^2	Sig.	df
Frequencies	8	0	2	10.41	.000	2
Percentages	80%	0%	20%			

Commentary on Table 6.

As shown in Table 6, the sample members' responses favoured "exists" (80%), followed by "to some extent" (20%), whereas "does not exist" accounted for 0%. The chi-square value was $\chi^2 = 10.41$ with a significance level (Sig.) of .000; therefore, this item is statistically significant at the .05 level. This indicates that the observed distribution differs from the expected distribution, with responses concentrated in at least one category, namely, "exists". This reflects agreement and consensus among the sample members regarding Question 03.

Conclusion

On the basis of these findings, the physical education and sport curriculum includes activities that guide pupils towards the necessity of linking exercise with nutrition.

5.3. Third Hypothesis:

Unhealthy dietary consumption patterns negatively affect pupils' competence and physical performance during physical education and sport lessons.

Question (01). Does unhealthy nutrition pose a risk to pupils' energy and endurance during physical education and sport lessons?

The frequencies, percentages, and chi-square (χ^2) test values for the sample members' responses to Question (01) were calculated, and the results are presented in Table 7.

Table 7

Frequencies, percentages, and chi-square (χ^2) test results for Question (01)

Responses	Exists	Does not exist	To some extent	χ^2	Sig.	df
Frequencies	8	0	2	10.399	.000	2
Percentages	80%	0%	20%			

Commentary on Table 7.

As shown in Table 7, the sample members' responses favoured "exists" (80%), followed by "to some extent" (20%), whereas "does not exist" accounted for 0%. The chi-square value was $\chi^2 = 10.399$, and the significance level (Sig.) was .000; therefore, this item is statistically significant at the .05 level. This indicates that the observed distribution differs from the expected distribution, meaning that the responses of the study sample were concentrated in at least one response category, namely, "exists". This reflects agreement and consensus among the sample members regarding Question (01).

Conclusion

These findings suggest that unhealthy nutrition poses a risk to pupils' energy levels and endurance during physical education and sport lessons.

Question (02). Does the consumption of large quantities of sweetened beverages instead of water affect hydration and electrolyte balance in pupils' muscles?

The frequencies, percentages, and chi-square (χ^2) test values for the sample members' responses to Question (02) were calculated, and the results are presented in Table 8.

Table 8

Frequencies, percentages, and chi-square (χ^2) test results for Question (02)

Responses	Exists	Does not exist	To some extent	χ^2	Sig.	df
Frequencies	10	0	0	20.000	.000	2
Percentages	100%	0%	0%			

Commentary on Table 8.

As shown in Table 8, all sample members' responses favoured "exists" (100%), while "does not exist" and "to some extent" each recorded 0%. The chi-square value was $\chi^2 = 20.000$, and the significance level (Sig.) was .000; therefore, this item is statistically significant at the .05 level. This indicates that the observed distribution differs from the expected distribution, with responses concentrated in a single category: "exists". This demonstrates complete agreement and consensus among the sample members regarding Question (02).

Conclusion

The consumption of large quantities of sweetened beverages instead of water adversely affects hydration and electrolyte balance in pupils' muscles, with statistically significant evidence supporting this conclusion.

Question (03). Does excess body weight affect pupils' strength, speed, and agility, thereby increasing the risk of injury during physical education and sport lessons?

The frequencies, percentages, and chi-square (χ^2) test values for the sample members' responses to Question 03 were calculated, and the results are presented in Table 9.

Table 9

Frequencies, percentages, and chi-square (χ^2) test results for Question 03

Responses	Exists	Does not exist	To some extent	χ^2	Sig.	df
Frequencies	9	0	1	14.62	.000	2
Percentages	90%	0%	10%			

Commentary on Table 9.
As shown in Table 9, the sample members' responses favoured "exists" (90%), followed by "to some extent" (10%), whereas "does not exist" accounted for 0%. The chi-square value was $\chi^2 = 14.62$, and the significance level (Sig.) was .000; therefore, this item is statistically significant at the .05 level. This indicates that the observed distribution differs from the expected distribution, meaning that the responses of the study sample were concentrated in at least one response category, namely, "exists". This reflects agreement and consensus among the sample members regarding Question 03.

Conclusion
Thus, excess body weight impairs pupils' strength, speed, and agility, increasing the risk of injury during physical education and sport lessons.

6. Discussion of the Results in Light of the Hypotheses

6.1. Discussion of the Results of the First Axis in Relation to the First Hypothesis:

The first axis of the questionnaire administered in this study was framed within the context of the first hypothesis, which addressed the contribution of physical education and sport teachers in guiding pupils regarding the necessity of healthy nutrition before, during, and after the lesson. Following the collection, analysis, and discussion of teachers' responses, the results were predominantly negative across most questionnaire items. It became evident that physical education and the sport curriculum pay limited attention to healthy nutritional awareness. The most salient findings include the following:

- Physical education and sport teachers do not guide pupils before the lesson on the consumption of light meals or on identifying appropriate meal timings on the basis of the duration and intensity of the activity.
- Physical education and sport teachers encourage pupils to drink water regularly and explain the importance of hydration for performance and for preventing dehydration.
- Some physical education and sport teachers do not provide advice during the postlesson recovery period regarding simple postexercise meals to help restore energy and build muscle.

6.2. Discussion of the results of the second axis in relation to the second hypothesis:

The second axis of the questionnaire addressed the same premise as the second hypothesis: healthy nutrition for pupils and the importance of its consideration by teachers within the curriculum. After analysing and discussing the results, it was found that the partial hypotheses converge towards the same objective as the second hypothesis. The most important findings are as follows:

- The physical education and sport curriculum does not include small, well-planned units within the lesson with clearly specified learning objectives.
- The physical education and sport curriculum does not include concepts or statements on the necessity of healthy, balanced nutrition for pupils.
- The physical education and sport curriculum includes activities that guide pupils towards the necessity of linking exercise with nutrition.

6.3. Discussion of the results of the third axis in relation to the third hypothesis:

The third axis of the questionnaire was based on the same assumption as the third hypothesis, namely, that unhealthy dietary consumption patterns are associated with higher levels of stress. After analysing and discussing the results, it became clear that the majority of the responses supported the hypothesis. The most significant findings include the following:

- Unhealthy nutrition poses a risk to pupils' energy levels and endurance during physical education and sport lessons.
- The consumption of large quantities of sweetened beverages instead of water can adversely affect hydration and electrolyte balance in pupils' muscles.
- Excess body weight affects pupils' strength, speed, and agility, thereby increasing the risk of injury during physical education and sport lessons.

7. General findings of the study:

The study yielded a set of general findings, which may be summarised as follows:

- A statistically significant positive relationship was found between adherence to healthy nutrition and improved pupils' competence during physical education and sport lessons in terms of physical performance, endurance, and activity levels.
- Pupils who followed a balanced dietary pattern (before, during, and after the lesson) showed better concentration, faster responsiveness, and lower fatigue levels than others did.
- The results revealed that poor dietary habits (such as excessive consumption of sugar, carbonated beverages, and fast food) negatively affect motor performance and increase the manifestation of lethargy and exhaustion during the lesson.
- The study indicated that the role of physical education and sport teachers in providing nutritional guidance remains limited and unstructured, despite teachers' awareness of the importance of healthy nutrition in improving lesson outcomes.
- The findings showed that the physical education and sport curriculum does not allocate sufficient space to nutrition education, which reduces opportunities to consolidate sound dietary behaviours among pupils.
- Differences in pupils' levels of nutrition awareness were observed and attributed to familial, social, and cultural factors, which are directly reflected in their physical competence during the lesson.

8. Recommendations:

In light of these findings, the study recommends the following:

- Integrating nutrition education into the physical education and sport curriculum through simplified theoretical lessons or practical activities linked to sporting practices.
- The role of physical education and sports teachers in nutritional guidance should be strengthened by the provision of continuous professional development courses in coordination with specialists in nutrition and school health.
- Pupil awareness of the importance of healthy meals before and after the sports lesson and their direct impact on physical performance and muscular recovery should be increased.
- Involving families in the awareness process through sensitisation campaigns and school meetings highlights the role of healthy nutrition in supporting pupils' physical activity.
- The prevalence of unhealthy foods within the school environment should be reduced by regulating school canteens and monitoring the quality of products offered.
- Encouraging educational institutions to adopt integrated school health programmes that link sound nutrition with regular physical activity.
- More in-depth studies examining the relationships between healthy nutrition and pupils' physical, physiological, and psychological variables across different educational stages are needed in the future.

Conclusion

In conclusion, healthy nutrition constitutes an essential and influential element in developing pupils' competence during physical education and sport lessons, given its direct impact on levels of physical activity, endurance capacity, concentration, and motor responsiveness. The study findings indicated that adherence to a balanced dietary pattern contributes to improved physical performance and reduces fatigue and exhaustion, which may hinder pupils' active participation during lessons.

The study also highlighted that unhealthy dietary habits are a negative factor affecting pupils' physical outcomes, necessitating ongoing awareness-raising and guidance. In this regard, it became clear that the role of physical education and sport teachers is not confined to the practical dimension of the lesson; rather, it extends to include health and nutrition guidance. However, this role still requires greater support and more effective activation within the official curriculum.

Moreover, the study revealed a relative shortcoming in the integration of nutrition education within educational programmes, despite the comprehensive educational and health benefits it can deliver. This calls for reconsideration of the content of physical education and sport curricula in a manner that is consistent with the requirements of contemporary school health.

Accordingly, the study concludes that improving pupils' physical competence cannot be achieved in isolation from sound, healthy nutrition; instead, a holistic approach that integrates physical activity, nutrition education, and the roles of both school and family in consolidating positive health behaviours is needed. From this perspective, attention to healthy nutrition constitutes a genuine investment in pupils' health and the development of their physical capacities, with positive implications for the educational process as a whole.

References

Al-Isaoui, A. R. (1989). *Sikūlujīyat al-naḥw: Dirāsah fī numūw al-ṭifl wa-al-murāhiq*. Al-Nahḍah Al-ʿArabīyah.

Al-Shahdā'ī, S. S. (2019). *Manhajīyat al-baḥth al-ʿilmī* (1st ed.). Dār Usāmah lil-Nashr wa-al-Tawzīʿ.

Al-Ṭā'ī, M. A. (2019). *Usus al-tarbiyah al-ṣiḥḥīyah* (1st ed.). Dār Ṣafā' lil-Nashr wa-al-Tawzīʿ.

Ayesh, A. J. (2016). *Asālīb tadrīs al-tarbiyah al-fannīyah wa-al-mihnīyah wa-al-riyāḍīyah* (2nd ed.). Dār Al-Masīrah lil-Nashr wa-al-Tawzīʿ.

Beddah, A. M., et al. (2019). *Al-thaqāfah al-ṣiḥḥīyah* (7th ed.). Dār Al-Maysarah lil-Nashr wa-al-Tawzīʿ.

Belkheir, A.-Q., et al. (2025). *Al-taghdhīyah al-ṣiḥḥīyah lil-riyāḍiyyīn* (1st ed.). Dār Al-Aḥlām lil-Nashr wa-al-Tawzīʿ.

Bouhoush, A., et al. (2016). *Manāhij al-baḥth al-ʿilmī wa-ṭuruq iʿdād al-buḥūth* (8th ed.). Dīwān Al-Maṭbūʿāt Al-Jāmiʿīyah.

Mazrou, A. (2016). *Taṭbīqāt fī naẓarīyat wa-manhajīyat al-tarbiyah al-badanīyyah wa-al-riyāḍīyah* (1st ed.). Dār Al-Khaldūnīyah.