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The importance of the preparatory phase in developing secondary students' health awareness in Physical Education classes - A field study in selected high schools of Laghouat

أهمية المرحلة التحضيرية في تنمية الوعي الصحي لدى تلاميذ المرحلة الثانوية في حصص التربية البدنية "دراسة ميدانية في ثانويات مختارة بولاية الأغواط"

Yacine Bencherif
Laboratory of Cognitive Dimensions and Applied Perceptions in Sports Training Sciences through Multiple Approaches (Algeria), y.bencherif@lagh-univ.dz

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ABSTRACT:

The study investigates how secondary school PE teachers consider physiological, psychological, and educational factors in preventing sports injuries. Results show limited focus on age and physical preparation, but effective communication through health guidance. Safety and verbal motivation are prioritized, while student participation in health research is weak. Teachers demonstrate practical competence yet need to strengthen educational and preventive aspects for better health awareness and safer practice.

Keywords: Physical and sports education, sports injuries, school health awareness, health and preventive guidance, secondary education.

الملخص:

تتناول الدراسة مدى مراعاة أساتذة التربية البدنية في المرحلة الثانوية للأبعاد الفسيولوجية والنفسية والتربوية في عملهم، خاصة في الوقاية من الإصابات الرياضية. أظهرت النتائج ضعف الاهتمام بعوامل العمر والإعداد البدني، مقابل فاعلية أكبر للتواصل المباشر والتعليمات الصحية، خصوصا مع التلاميذ ذوي الحالات الخاصة. كما ركزت الممارسات التربوية على السلامة والتحفيز اللفظي، مع ضعف في إدماج المعرفة الصحية أو مشاركة التلاميذ في البحوث. خلصت الدراسة إلى فعالية تطبيقية للأساتذة، مع الحاجة لتعزيز الجوانب التربوية والوقائية لترسيخ الوعي الصحي وتحقيق ممارسة بدنية آمنة.

كلمات مفتاحية: التربية البدنية والرياضية؛ الإصابات الرياضية؛ الوعي الصحي المدرسي؛ التوجيه الصحي والوقائي؛ مرحلة التعليم الثانوي.

1- Introduction:

Physical Education (PE) is a core component of the educational system and a branch of general education aimed at balanced physical and mental development of students (Ministry of National Education, 2006). This is achieved through motor activity specific to the field, embodied in physical and sports activities as cultural and social supports. PE is among the most capable programs of serving societal goals, which is reflected in the attainment of its objectives at the secondary level.

In this context, understanding growth characteristics and student needs is critical, since secondary students are in adolescence at a transitional stage between childhood and adulthood requiring cautious and methodical handling (Hoda M. Qenawi, 1992). D. Rogers characterizes adolescence as a period of bodily growth and a social phenomenon marked by profound psychological

- Corresponding author: Yacine Bencherif
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changes; S. Hall describes it as a stage of storms and stress, associated with psychological challenges and physiological disturbances that disrupt motor behavior, increase glandular secretions (including adrenal), accelerate neuromuscular growth, and compromise precision and balance due to uneven growth (S. Djalal, 1982).

Accordingly, this stage requires teachers capable of safeguarding students' security, in line with Algeria's legal framework: Ordinance 76-81 of 23 October 1976 on PE, and Law 13-05 of 23 July 2013, whose articles 14–15 define PE as a subject developing psychomotor, mental, and social conduct through movement and body control; PE is compulsory at all levels of national education and vocational training, with programs and modalities set by regulations, Al-Khouli believes that practicing physical activity and sports in general, and physical education in particular, leads to improved muscle fitness, joint flexibility, and increased bone density, thus reducing the likelihood of fractures (Amin Anwar Al-Khouli, p. 123). This is the approach upon which our research problem is based, as it studies the impact of a stage in the preparatory physical education lesson on developing health awareness among students.

The link between PE and health is stronger than ever: PE promotes healthier lives while health must be safeguarded during practice and performance pursuits, which requires adequate physical preparation; fitness underpins motor performance by enhancing muscular energy sources, enabling mechanical energy production, effort tolerance, and injury prevention.

All sport activity entails some injury risk due to natural conditions (e.g, playing surface) or external factors such as insufficient warm-up; warm-up prepares students physiologically and psychologically, and attire-especially footwear-plays a preventive role. Lifestyle factors add to this risk, such as tobacco use among some male senior students, associated with lower cardiovascular and respiratory indices; nicotine increases heart rate and stimulates respiratory and vomiting centers, with additional adverse effects on performance and health. Sleep deprivation on the eve of competition negatively affects the nervous system, reducing concentration and increasing errors; psychological preparation helps mitigate injuries in this age group.

Therefore, PE teachers should possess solid health literacy grounded in sport medicine and physiology, and transfer it to students during the preparatory phase to educate and prevent sports injuries.

2- General objective of the study:

2-1- General question:

How can secondary PE teachers effectively reduce sports injuries through the preparatory phase while accounting for adolescent's characteristics and needs?

2-1-1- Sub-questions

- Does the teacher's knowledge base in health prevention and sport medicine help reduce injuries during PE classes?
- Do the teacher's communication mechanisms enable simplification and transfer of knowledge to students so as to lower injury occurrence?

- Do students' health literacy and adherence to the teacher's guidance during the preparatory phase reduce injury rates?

2-2- General hypothesis

The preparatory phase in PE plays an important role in reducing injuries through preventive guidance and by enhancing students' health awareness.

2-2-1- Specific hypotheses

- The teacher's knowledge base in health prevention and sport medicine contributes to lowering injuries during class.
- Effective communication mechanisms enable knowledge simplification and transfer, thereby reducing injuries.
- Students' health literacy and compliance with guidance during the preparatory phase help reduce injury incidence.

2-3- Significance

The significance of preventing sports injuries among secondary students lies in the scarcity of Arabic-particularly Algerian-literature and in the potential negative impacts of injuries on health and performance; this study addresses teachers' cognitive dimensions in health and prevention, injury types, causes, first aid, and risk reduction strategies, as well as administrative and legal procedures to be followed in case of a sports accident within the national regulatory framework.

2-4- Objectives:

- Determine the role of PE teachers in prevention and primary care of accidents and injuries, aligned with applicable regulations.
- Investigate causes of injuries from the perspective of teachers and injured students, leveraging literature on PE injury incidence in secondary schools.
- Assess teachers' knowledge base in sport medicine and injury prevention.
- Describe teacher-student communication channels and methods for simplifying preventive information.
- Inventory administrative and legal procedures when injuries occur during class within the national framework.
- Identify common injury patterns in PE and their reference rates in the literature.
- Contribute to the local scientific knowledge base in this field.

2-5- Rationale for topic selection

Like other subjects, PE contributes to holistic development through motor activity; vital systems require adequate exercise for maintenance and health. As secondary students are tomorrow's adults, special attention to PE at this stage is warranted to build a strong, aware, and balanced generation physically, psychologically, cognitively, and socially; hence this field study on preventive

approaches, lowering injury rates, first aid methods, and the impacts on injured students, within a clear regulatory and referential framework.

3- Procedural definition of the concepts mentioned in the

3-1- Conceptual definition:

Multiple definitions coexist. Samia M. Khalil frames them as damage to body tissues from external or internal agents causing anatomical and physiological alterations at the injury site and disrupting tissue function) Samia M. (2005, Haya Raphael views injury as a harmful change to one or more tissues accompanied by physio–chemical–psychological responses to high internal or external forces (Namroud, 2017).

Operational definition: An unforeseen harmful alteration occurring during sport participation, producing anatomical–physiological damage and pain that limits performance.

3-2- Definition of "injury":

Conceptually, an effect on a tissue or tissue set due to external or internal stressors that disrupt function; determinants are commonly grouped as extrinsic, intrinsic, and internal (Mohamed Hassan Allawi, 1998). Triggers often involve sudden, high-intensity mechanical, technical, or chemo-physiological factors.

Researcher's operational definition: An unforeseen harmful event due to natural or external factors occurring during sport activity.

3-3-Definition of secondary education:

Per UNESCO/ISCED, the middle stage of general education following lower/middle education and preceding higher education, typically three years in duration for ages roughly 15–18, aligning with mid-adolescence

3-4- Definition of education:

Etymologically tied to growth and cultivation; conceptually, a process of adaptation and adjustment through individual–environment interaction to internalize societal values and attitudes in line with material and spiritual development levels.

3-5- Definition of Physical Education and Sport (PES):

A set of curricular physical and sport practices forming part of general education, structured as class sessions, intramural, and extramural sport, providing experiences and skills that foster social adaptation (M. A. El-Basyouni; F. Yassine, 1992). It targets psychomotor, affective, social, and cognitive outcomes, complementing body and mind (Az-Zoubaï; Al-Ghannam, 1974).

Operational definition: A complementary component of general education, PES uses selected, supervised activities to prepare learners for robust physical, cognitive, and social development.

3-6- Definition of the preparatory phase:

The initial segment of the session covering organizational–pedagogical setup (attendance, attire, equipment) and goal briefing, plus warm-up, which prepares cardiovascular, neuromuscular, and psychomotor systems for session demands.

Operational definition Operational definition: stage preceding the main and final parts, ensuring physical and cognitive preparation and injury prevention, while allowing for the assimilation of the teacher's advice.

Explanatory note: despite its importance for the health of secondary school populations, applied studies in Arab/local contexts are limited, although international literature documents the epidemiology, patterns and management of school and inter-school injuries.

4- Previous and related studies:

Prior literature is a methodological cornerstone for any rigorous research: it identifies knowledge gaps and informs questions, methods, and procedures, especially on topics intersecting injuries, the preparatory phase, and health awareness during PE lessons at the secondary level. Contemporary evidence indicates that embedding comprehensive or neuromuscular injury prevention warmups during the preparatory phase reduces youth injury rates by about 36% across 15 cluster RCTs, with compliance emerging as a key moderator explaining between study heterogeneity—underscoring the centrality of the preparatory phase for school-based prevention.

4-1- Boudawoud A. (1996):

A study at the University of Algiers' Institute of PE reported recurrent cuts, sprains, fractures, and abrasions, with injuries clustered at the foot, knee, leg, elbow, thigh, forearm, and wrist, and higher incidence in football, judo, gymnastics, handball, basketball, and athletics; proposed causes included rough play, execution errors, brief warm ups, low fitness, and lack of protective gear—consistent with modern evidence emphasizing structured warm ups and appropriate facilities.(Boudawoud A, 1996)

4-2- Bougoufa M. (2022):

A school-based study (Chlef; 360 students, 90 teachers, 12 physicians) highlighted collisions/direct contact, poor flooring, and insufficient warm ups as contributors to injuries; recommendations included adhering to teacher guidance, ensuring safety conditions, improving floors/equipment, and performing adequate warm ups—aligned with aggregated evidence on the effectiveness of preventive warm ups in schools. (Bougoufa M, 2022)

4-3- Issa Mouhoubi (2021):

A descriptive study (≈200 participants) among secondary students found frequent cuts, abrasions, sprains, and cramps, with ankle, thigh, and knee most affected; running events—particularly middle distance-showed higher rates; cited factors included short warm ups, poor surfaces, technique errors, and psychological aspects; these converge with meta-analytic inferences linking neuromuscular warm ups and adherence with lower injury rates. (Issa Mouhoubi ,2021)

4-4- Hizem A. & Saoudi Dj (2023):

A survey in middle schools (Sétif) indicated that PE classes foster healthy thinking/behaviors, awareness of body systems, and psychosocial support, reinforcing the preparatory phase as an educational window for prevention. (Hizem A. & Saoudi Dj, 2023)

4-5- Aïcha Alla & Tarek Trar (2019):

In 300 youths, PE programs predicted health promotion across multiple domains, with no sex differences but differences by age and educational level-supporting targeted, contextualized preparatory interventions. (Aïcha Alla & Tarek Trar, 2019)

4-6- Hizem A. & Saoudi Dj. (2023):

A correlational study (middle school, M'sila) found no overall significant association between health awareness and attitude except for "stress/risk experience," with negative correlations among females and positive ones among males on specific dimensions—justifying gender sensitive psycho behavioral components within the preparatory phase. (Hizem A. & Saoudi Dj,2023)

4-7- Mohamed et al. (2017, Assiut, Egypt):

A descriptive field study (n≈656) in sports/military schools assessed trainers' knowledge/practices and students' knowledge regarding injury safety and first aid; more than half the trainers demonstrated good knowledge and adequate practice, whereas roughly half the students showed knowledge deficits; the study recommended continuous trainer education and improved safety equipment—consistent with the need for certified training in school settings.(Mohamed and al 2017)

4-8- Alharthy N. et al. (2024, Saudi Arabia):

A national survey of 535 primary teachers found 64.3% reporting at least one monthly injury, 67.72% perceiving first aid kits as accessible, and 95.89% reporting familiarity with first aid, with social media as the primary knowledge source (57.94%); logistic regression linked male sex and monthly injury frequency with more negative attitudes, whereas ⩾10 years' experience related to more positive attitudes, underscoring the need for certified training to enhance emergency management quality in schools.

In sum, three converging strands emerge: (1) systematic descriptions of injury patterns, locations, and contributory factors within lessons, highlighting insufficient warm ups, poor flooring, and execution errors; (2) confirmation that structured PE and the preparatory phase consolidate health behaviors and awareness, reducing injury rates via preventive warm up protocols strengthened by compliance; (3) variability in the health awareness–attitude link by sex, age, and educational level, calling for targeted, preparatory, school based interventions.(Alharthy N. et al,2024)

Commentary on the studies

The collective body of local and Arab studies has primarily focused on cataloging the types, rates, and common causes of injuries-such as falls, collisions, technique errors, and inadequate warm-up-with recurring patterns including muscle strains, sprains, abrasions, and

fractures. This literature has provided a knowledge base for estimating the magnitude and seriousness of the phenomenon and has guided curriculum design and data-collection tools. However, a shortcoming has been the limited analysis of the preparatory phase as a preventive mechanism linking health awareness with instructional practice within the lesson; prevailing approaches have largely remained post hoc and descriptive. The present research contributes a preventive, proactive treatment by integrating health and educational dimensions and by centering the preparatory phase as an entry point for consolidating health awareness among secondary-school students in Laghouat high schools.

5- The methodological procedures used in the study:

5-1- Definition of the descriptive approach:

The descriptive approach holds a central position in educational research because many published studies rely on non-experimental designs to portray phenomena accurately without

manipulating variables. It aims to depict events and conditions as they are, gather facts and observations, specify their circumstances, and establish their current status. Contemporary methodological taxonomies include surveys, case studies, developmental/longitudinal descriptions, and, in some classifications, correlational and causal comparative inquiries under the descriptive umbrella. Accordingly, the descriptive approach was adopted for its fitness to the present study's aims. (methods and applications descriptive research in education,2024)

Study variables

- Independent variable: the preparatory phase.
- Dependent variable: health awareness.

5-2- Study population:

The target population comprises secondary level PE teachers in the wilaya of Laghouat (N = 184), with a practical constraint reflected in a pilot sample of 20 teachers to check instrument suitability.

5-3- Research sample:

Following population delineation, a representative sample was selected in line with descriptive study requirements. A sample is a subset drawn from the target population that faithfully represents it. Given the difficulty of reaching all members, simple random sampling was used by distributing questionnaires randomly to secondary level teachers across several Laghouat high schools (n = 20). The questionnaire served as the main data collection tool.

The items were clear and easy to comprehend. Psychometric qualities were verified: objectivity, and acceptable levels of validity and reliability.

5-4- Study fields:

- Spatial field: questionnaires were distributed to teachers in 10 high schools in Laghouat (n = 20).
- Temporal field: theoretical component from 14 to 31 January 2024; applied component from 18 February to 7 March 2024.

5-5- Pilot study:

A pilot study (n = 20) was conducted to verify acceptability and comprehension of items, and to refine wording prior to the main administration.

5-6- Research instruments

- Questionnaire definition: a widely used educational research tool consisting of items designed to collect information about the focal phenomenon; it is time and cost efficient and enables large scale data capture concurrently, albeit with limited face to face interaction and immediate verification of response veracity.
- Instrument validity: validity is fundamental and reflects the extent to which the tool measures what it purports to measure. Face/content validity was examined by a panel of expert reviewers (faculty/specialists), and minor adjustments were implemented accordingly.
- Instrument reliability: reliability denotes measurement consistency over time and similar conditions. Test–retest was performed one week apart with 6 teachers (identical morning

conditions), and internal consistency was estimated via Cronbach's alpha, which reached 0.779 for 29 items-indicative of acceptable to good internal consistency for educational instruments, with ⩾0.70 commonly cited as an acceptable threshold.

- Reliability summary: number of items = 29; Cronbach's alpha = 0.779 (above the 0.70 reference threshold widely used in education).

Table 1. Shows a very strong degree of stability for the questionnaire with a value greater than 0.6, namely 0.779.

Number of Items	Cronbach's Alpha
29	0.779

6- Statistical processing:

6-1- Statistical Treatment:

9-1-1- Definition of the Chi-Square Test (χ^2):

The Chi-square test is a commonly used probability distribution that ranks second only to the t-distribution in terms of widespread applications. It is used to compare observed frequencies with expected frequencies.

6-1-2- Characteristics of the Chi-Square Distribution (χ^2):

The distribution depends fully on degrees of freedom; the larger the degrees of freedom, the less skewed and more symmetric the distribution becomes.

6-1-3- Application of the Chi-Square Test (χ^2):

This test allows comparison of various results obtained from the questionnaire administered to the teachers by contrasting observed frequencies (O) with expected frequencies (E). It is calculated as:

x^2= computed chi-square value

O_i= observed frequency

E_i= expected frequency

$E_i = \frac{N}{k}$,

where:

N = sample size

k = number of categories

7- Presentation and Analysis of the Questionnaire Results

7-1- Presentation and analysis of the first axis (the cognitive dimension):

7-1-1- First Hypothesis:

The knowledge background of the physical education teacher in health prevention and sports medicine contributes to reducing and preventing sports injuries during physical education sessions.

7-1-1-1- First Statement:

"Considering the physiological and psychological foundations of the age group before planning sessions and selecting exercises."

Purpose of the statement:

To investigate to what extent physical education teachers, take into account the physiological and psychological bases related to the developmental stage when preparing lessons and designing activities.

Statistical Results:

Table 2. shows the extent of teachers' awareness regarding the physiological and psychological foundations of the age group. Source: Yacine BENCHERIF,2024.

Responses	Frequencies	χ^2 Calculated	χ^2 Tabulated	Significance level	Degrees of freedom
Strongly agree	10	03.70	06.70	0.15	02
Agree	07				
Disagree	00				
Total	20				

Analysis: Table (02) shows the absence of statistically significant differences at the significance level (0.15) with two degrees of freedom. The calculated χ^2 value (3.70) is lower than the tabulated value (6.70). This indicates that physical education teachers do consider the physiological and psychological aspects of the age group, but only to a relative extent.

Conclusion: It is concluded that secondary school physical education teachers relatively consider the physiological and psychological characteristics of the age group when preparing lessons and selecting appropriate exercises, reflecting a moderate awareness of these principles.

7-1-1-2- Second Statement:

Text of the statement:

"Explaining the importance of warm-up and the correct methods of preparing the body before engaging in physical effort or physical activity to students."

Purpose of the statement:

To investigate the extent to which teachers emphasize the importance of warm-up and explain the appropriate methods for body preparation.

Statistical Results

Table 3. shows the importance of clarifying the warm-up process and the appropriate methods of body preparation. Source: Yacine BENCHERIF,2024.

Responses	Frequencies	χ^2 Calculated	χ^2 Tabulated	Significance level	Degrees of freedom
Strongly agree	14	3.20	06.70	0.07	01
Agree	06				
Disagree	00				
Total	20				

Analysis of results: Table (03) indicates the absence of statistically significant differences at the significance level (0.07) with one degree of freedom. Since the calculated χ^2 (3.20) is lower than the tabulated value (6.70), this suggests that physical education teachers do explain the warm-up process and proper ways of body preparation, but only to a relative extent.

Conclusion: Table (03) demonstrates that secondary school physical education teachers place only relative emphasis on explaining the significance of warm-up routines and proper body

preparation before engaging in physical activity, which acts as a fundamental preventive strategy to lower the incidence of sudden injuries among students. However, this awareness appears to be moderate and highlights the need for further health education and professional development for teachers. This observation aligns closely with findings by Boudawoud (1996) and Bougoufa (2022), who established brief or poorly managed warm-ups, coupled with low fitness levels and technique errors, are significant contributors to injury in physical education classes, especially when protective measures and suitable facilities are lacking. Recent meta-analytic evidence strengthens this conclusion, showing that implementing structured comprehensive or neuromuscular warm-up programs can reduce adolescent injury rates by up to 36%, provided teachers and students adhere strictly to the recommended procedures.

7-2- Presentation and Analysis of Results for the Second Axis (Communicative Dimension)

7-2-1- Second Hypothesis:

The communication mechanisms utilized by physical education teachers help to simplify and convey their knowledge background to students, which contributes to reducing sports injuries.

7-2-1-1- First Statement:

"You feel there is responsive engagement from students of various levels with your explanation of health guidelines."

Purpose of the statement:

To assess the degree to which students comprehend health guidelines through teachers' explanations.

Statistical Results

Table 4. demonstrates the students' comprehension of health guidelines through teachers' explanations. Source: Yacine BENCHERIF,2024.

Responses	Frequencies	χ^2 Calculated	χ^2 Tabulated	Significance level	Degrees of freedom
Strongly agree	08	7.90	06.70	0.01	02
Agree	11				
Disagree	01				
Total	20				

Analysis of Results

Table 04 shows the presence of a statistically significant difference at the significance level (0.01) and two degrees of freedom, as the calculated χ^2 value (7.90) is higher than the tabulated value (6.70). This suggests a high level of student comprehension regarding health guidelines communicated by teachers.

Conclusion

It is evident from Table 04 that secondary school students practicing physical education activities have a high level of understanding of health guidelines owing to the quality of teachers' explanations, which enhances injury prevention.

7-2-1-2- Second Statement:

"A correct explanation of the motor skill by the teacher to students reduces incorrect performance and thus helps prevent injuries."

Purpose of the statement:

To assess the extent to which the teacher correctly explains the motor skill to students.

Statistical Results

Table 5. shows the extent of the teacher's correct explanation of the motor skill to students. Source: Yacine BENCHERIF,2024.

Responses	Frequencies	χ^2 Calculated	χ^2 Tabulated	Significance level	Degrees of freedom
Strongly agree	12	09.70	06.70	0.01	02
Agree	07				
Disagree	01				
Total	20				

Analysis of Results: Table 05 reveals a statistically significant difference at the 0.01 significance level with two degrees of freedom, as the calculated χ^2 value (9.10) exceeds the tabulated value (6.70). This indicates that teachers clearly explain the session's objective and address proper postures, which relatively contributes to reducing contact and roughness, thereby preventing injuries.

Conclusion: It can be concluded from Table (05) that secondary school physical education teachers provide clear explanations of lesson objectives and effectively discuss proper motor postures, thereby encouraging students to avoid rough contacts and risky behaviors that could lead to injuries. The statistically significant results regarding the communicative dimension emphasize that clear and skillful explanations enhance student engagement and elevate their preventive awareness, reducing the risk of sports injuries. This finding aligns with Mohamed et al. (2017), who demonstrated that trainers' knowledge and pedagogical competence play a critical role in improving student safety practices and fostering a preventive culture within schools. Supporting this area through ongoing professional development programs focused on effective communication and motivational teaching strategies is essential to sustain and boost injury prevention efforts.

7-3- Presentation and Analysis of Results for the Third Axis (Educational Dimension)

7-3-1- Third Hypothesis:

The knowledge and acquisitions gained by students in the field of health culture play an important role in their attention to teachers' advice and instructions during the preparatory phase, contributing to the reduction and prevention of sports injuries.

7-3-1-1- First Statement:

"A health awareness, even if minimal, is formed among students through attention and explanation during the preparatory phase of the physical education session."

Purpose of the statement:

To assess the degree of health awareness formation among students through explanation during the preparatory phase.

Statistical Results

Table 6. shows the degree of health awareness formed among students through explanation during the preparatory phase. Source: Yacine BENCHERIF,2024.

Responses	Frequencies	χ^2 Calculated	χ^2 Tabulated	Significance level	Degrees of freedom
Strongly agree	04	12.40	06.70	0.02	02
Agree	14				
Disagree	02				
Total	20				

Analysis of Results: Table 06 indicates a statistically significant difference at the significance level (0.002) and two degrees of freedom, as the calculated χ^2 value (12.40) exceeds the tabulated value (6.70). This demonstrates that a strong health awareness is formed among students as a result of the precise explanations given by the teacher during the preparatory phase.

Conclusion: It is concluded that secondary school physical education students develop a high degree of health awareness through the clear and thorough explanations provided by teachers during the preparatory phase, which promotes the prevention of sports injuries.

"Safety and security factors are considered in programming activities, exercises, and selecting appropriate equipment and fields for safe practice."

7-3-1-2- Second Statement:

"Safety and security factors are considered in programming activities, exercises, and selecting appropriate equipment and fields for safe practice."

Purpose of the statement:

To evaluate the extent to which teachers consider safety factors when programming sports activities.

Statistical Results

Table 7. shows the extent of teachers' consideration of safety factors in programming activities. Source: Yacine BENCHERIF,2024.

Responses	Frequencies	χ^2 Calculated	χ^2 Tabulated	Significance level	Degrees of freedom
Strongly agree	18	12.90	06.70	0.00	01
Agree	02				
Disagree	00				
Total	20				

Analysis of Results: Table 07 indicates a statistically significant difference at the significance level (0.00) and one degree of freedom, with the calculated χ^2 value (12.90) exceeding the tabulated value (6.70). This demonstrates that teachers highly consider safety factors when programming activities, exercises, and choosing appropriate equipment and fields.

Conclusion: It can be concluded from the results that secondary school physical education teachers place great importance on safety factors when programming activities, selecting equipment, and choosing sports fields, with the aim of protecting students and preventing sports injuries. These findings are supported by recent studies underscoring the role of physical education lessons in fostering strong health awareness and preventive behaviors among students. Research by Hizem & Saoudi (2023) and Aïcha Alla & Tarek Trar (2019) demonstrated that PE classes effectively

consolidate preventive health behaviors and promote a culture of health within school settings. Such evidence highlights the importance of strengthening educational programs and focusing on the pedagogical dimension to reduce injury risks and support healthy lifestyles among youth.

8- Discussion and Interpretation of Results

8-1- Discussion of the first hypothesis results:

The background of physical education teachers in health prevention, sports medicine, and physiology significantly contributes to reducing and preventing sports injuries during physical education classes. The analysis of the first axis (cognitive dimension) data confirmed that this scientific expertise helps to limit the occurrence of injuries, as supported by the chi-square test (χ^2). Moreover, teachers' ability to clearly explain the causes of injuries to students during the preparatory phase contributed to minimizing potential risks. Previous literature highlights the importance of scientifically and practically qualifying physical education teachers to enhance student safety and reduce injuries within the school environment. This aspect is considered a fundamental pillar to ensure the quality of sports education and the safety of practitioners.

8-2- Discussion of the second hypothesis results:

The communication mechanisms of PE teachers facilitate the simplification and delivery of knowledge, thereby limiting injury occurrence. Findings from the second axis (communicational dimension) revealed strong student responsiveness due to the clarity of health-related instructions. This was further confirmed by the chi-square test (χ^2). Therefore, the second hypothesis is relatively validated.

3-8- Discussion of the third hypothesis results:

Students' health-related knowledge and awareness enhance their responsiveness to teachers' advice during the preparatory stage, which reduces sports injuries. The pedagogical axis highlighted a strong level of health awareness among students, confirmed by the chi-square test (χ^2). Teachers emphasized the importance of instilling values such as fair play while using motivational expressions linking health and safety. Consequently, this hypothesis is strongly validated.

8-4- Discussion of the general hypothesis results:

The preparatory stage of PE lessons plays a decisive role in reducing sports injuries. This stage enables teachers to deliver health-prevention knowledge clearly, monitor attendance, explain objectives, and enhance students' awareness. Considering the validation of the three previous hypotheses, the general hypothesis is strongly supported.

8-5- General conclusion:

PE practice across life stages is vital in both educational and competitive contexts. Results showed that injury prevention is significantly linked to teachers' practices, with major causes being insufficient warm-up time, poor playing surfaces, and inadequate preparatory durations.

The findings highlight that:

- Physiological and psychological considerations are only relatively accounted for across teachers.

- Communication is very effective in individual guidance but less so in collective injury-prevention awareness.
- Safety and verbal motivation are emphasized, but students' involvement in research-based health projects remains limited

9- Recommendations:

- Physiological/psychological aspect: implement structured warm-up programs according to age and provide continuous training for teachers.
- Communication aspect: strengthen awareness-raising during the preparatory stage using audiovisual tools and increase individualized guidance.
- Pedagogical aspect: involve students in small-scale research, connect PE content to other health-related topics, and prioritize safety through school-wide preventive programs.

10- Conclusion:

Based on what has been presented and analyzed, it is clear that secondary school physical education teachers play a fundamental role in promoting health and preventing sports injuries within the school environment. The results showed that their practices relatively take into account the physiological and psychological characteristics of the students, relying on warm-up and gradual progression in exercises, although this is not consistently applied among all teachers. The communicative dimension emerged as a strong factor, especially regarding direct explanations and individual guidance for students with specific health conditions, while the utilization of the preparatory phase and general risk warnings remain less effective. Regarding the educational dimension, there was significant attention to safety, security, and verbal motivation, whereas a relative weakness appeared in engaging students in cultural research linking sports with health.

Accordingly, it can be said that the current performance of physical education teachers is primarily practical and applied, with relative shortcomings in educational and research aspects. This calls for directing efforts toward developing more comprehensive practices that combine applied aspects with health awareness dimensions, contributing to forming an integrated awareness among students and ensuring the safe practice of sports activities.

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