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Sports injuries in primary school physical education classes

An analytical study of incidence patterns and risk factors

A field study in Laghouat primary schools

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Abstract: This study aims to identify the most common sports injuries among primary school students during physical education and sports classes, which constitute a health challenge in primary schools where they may affect children's participation in physical activities and their motor development.

The study used the descriptive analytical method on a sample of 50 physical education and sports teachers in primary education in Laghouat Province, Algeria, for the 2024/2025 academic year, randomly selected. A questionnaire was used as the main tool to collect data on the most common types of injuries and associated risk factors.

The results showed that minor injuries represent 80–90% of total injuries, followed by moderate injuries (8%). The factors most associated with the occurrence of sports injuries were inadequate playing spaces and courts, insufficient warm-up, high number of students per group, and inappropriate sports equipment and materials.

Based on these results, the study recommends the necessity of implementing an appropriate warm-up program for students in the preparatory phase of the class, with the need to prepare appropriate and safe playing spaces and surfaces for physical and sports activities, provide suitable sports means and equipment, and reduce the number of students in each group per class to ensure adequate space for their safe movement.

Keywords: Sports injuries, Physical education, Primary level, Risk factors, Prevention, School safety, Primary pupils.

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and Research Problem

Physical education is an essential component of the modern educational system, aimed at enhancing students' physical and psychological health and developing their motor skills. It also contributes to their physical, mental, and social preparation. However, participation in sports activities during physical education classes may expose students to various injuries of differing severity. Therefore, it is necessary to study these common injuries to analyze their causes and identify effective ways to reduce them.

Preventing such injuries requires a thorough understanding of the nature of the activities and the associated risk factors, such as inadequate warm-up, unsafe playing environments, or improper exercise techniques. Research shows that the most common injuries include bruises, sprains, muscle strains, and, occasionally, fractures. The severity of such injuries depends on the type of activity, adherence to safety procedures, and the quality of instructor supervision.

Early childhood is characterized by increased physical activity, which makes children more vulnerable to injuries that may affect their self-confidence and future participation in physical activities. Therefore, monitoring and analyzing these injuries is vital for developing educational strategies that ensure students' safety.

Moreover, injury reduction is a shared responsibility among teachers, parents, school administrators, and health specialists. This can be achieved by raising awareness of safety measures and providing a secure sports environment. The present analytical study aims to review the most prevalent injuries among primary school students during physical education classes, with an emphasis on their causes, consequences, and possible preventive measures, based on expert opinions and real data analysis.

Physical education holds a pivotal place within school curricula, focused on improving physical fitness and developing children's motor skills from an early age. Through diverse activities, students build endurance, balance, and improve their mental and social well-being. Regular engagement in sports also contributes to preventing lifestyle-related diseases such as obesity and cardiovascular problems. This importance is especially pronounced in the primary stage, where students are in a critical phase of physical and motor development.

According to Nash, physical education involves activities engaging large muscle groups. Butcher regards it as an integral part of general education designed to prepare individuals physically, psychologically, and socially through selected sports activities. Nixon views it as the segment of general education focused on vigorous activities that engage the muscular system and foster associated learning experiences (El Chahat, 2007, p. 30).



Despite its benefits, sports activities pose risks, especially for children who may lack experience and essential skills, with injuries ranging from minor bruises and sprains to serious fractures and acute muscle injuries. Studies confirm that primary school pupils are more susceptible to sports injuries due to factors such as limited motor control, insufficient supervision, inadequate equipment, and overcrowded classes.

Given the significant impact of these injuries, a thorough analytical study is essential to identify common injuries and their causes, develop preventive strategies, and raise awareness among teachers and parents regarding adherence to safety guidelines.

2. Research Questions

1. What are the most common sports injuries among primary school pupils during physical education classes?
2. What are the factors that contribute to the occurrence of these injuries?

2.1 Research Hypotheses

1. The most frequent injuries during primary school physical education classes are of mild, moderate, and severe severity.
2. The factors contributing to these injuries include inadequate warm-up, the use of inappropriate sports equipment, and large class sizes.
3. The incidence of injuries can be reduced through awareness and training programs for teachers and students focusing on safety in physical education.

2.2 Rationale for the Study

- Personal interest and scientific ambition to contribute to this evolving field.
- The need to shed light on the most prevalent sports injuries among primary school students during physical education.
- Scarcity of specialized local research on this subject.
- The intention to enrich academic resources for future postgraduate research.
- The suitability of the problem for a combined theoretical and empirical approach.
- Identifying common injuries facilitates design of targeted prevention programs.
- Understanding root causes aids development of effective intervention strategies.
- Preventing injuries that could adversely affect normal childhood growth and development.
- Establishment of appropriate safety standards for school sports activities.
- Necessity for a reliable local database documenting student injuries.
- Easing the burden on healthcare systems through early injury prevention.
- Raising awareness among families and the community regarding children's safety in schools.



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2.3 Significance of the Study

- Identifies the most common sports injuries, their types, and causes, enabling development of effective prevention strategies.
- Assists in educating teachers on safe training methodologies and adapting curricula appropriately for age groups.
- Promotes a culture of responsible sports participation and injury prevention among students.
- Equips physical education professionals with data necessary for devising safer, more effective training interventions.
- Provides data and statistics useful as a reference for broader school health and sports-related research.
- Encourages continued scholarly inquiry into sports injuries within school environments.

2.4 Objectives of the Study

- Analyze and describe the most common sports injuries encountered during physical education classes among primary students to develop effective prevention strategies and ensure a safe learning environment.
- Rank injuries by frequency and severity.
- Classify injuries according to anatomical location (upper limbs, lower limbs, trunk, head/neck).
- Identify contributing risk factors.
- Determine the age groups most susceptible to injuries (6–8 years and 9–11 years).
- Enhance the culture of safety within the school community.
- Propose practical recommendations aimed at reducing injuries and improving safety during physical education classes.

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5. STUDY TERMINOLOGY

5.1 Sports Injuries

- ***Conceptual Definition:***



An injury is defined as a sudden or severe disruption of the normal function of the athlete's tissues or organs caused by an external force, often leading to physiological changes (e.g., bruising, swelling, skin discoloration) and anatomical alterations restricting muscular or joint movement. (Adapted from Mahmoud Hamdi, 2008, p. 31)

- ***Operational Definition:***

Physical harm sustained by students during curricular physical activities, including muscle tears, sprains, bruises, and minor fractures that interfere with class continuation or require first aid intervention.

5.2 Primary School Students

- ***Conceptual Definition:***

Children at this stage exhibit relative emotional and behavioral stability, increasing responsibility, adaptability, and eagerness to learn about themselves and their environment. Entering primary school marks a critical separation from the home environment and the beginning of social participation requiring respect and cooperation. (Rateb, 1999, p. 94).

- ***Operational Definition:***

Children aged 6 to 12, enrolled in grades 1 through 5 in primary schools, receiving basic education according to official curricula.

5.3 Physical Education Class

- ***Conceptual Definition:***

An integrated element of general education relying on experiential learning through diverse physical activities to impart knowledge, motor skills, social integration, and holistic development. (El-Aroui, 2019, p. 81)

- ***Operational Definition:***

A curricular component aimed at teaching motor skills and engaging students in sports activities to improve physical fitness, coordination, health awareness, and social interaction.

6. SIMILAR STUDIES

Scientific research is considered a chain of interconnected aspects, where the researcher must draw upon all previous research and studies that have addressed the same phenomenon under investigation. Previous studies encompass all research, theses, and university dissertations that have dealt with the same phenomenon. Through our review of some theses and studies related to or sharing certain aspects with our current topic, we highlight the most prominent points mentioned therein:

6.1 First Section: Related Studies

First Study

Study by Anwar Waheed Salman and Asaad Kadhim Al-Khafaji (2024) titled "Study of the Most Important Sports Injuries Among Students of Physical



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Education and Sports Sciences at Al-Qasim Green University," published in the Journal of Integration in Social and Sports Sciences Research (Volume 08, Issue 01, June 2024). The study aimed to identify the most common injuries among physical education students. It adopted a descriptive methodology, with a sample of 300 male and female students, using a questionnaire as the data collection tool, and analyzed data through frequencies and percentages. Results: The most common injuries (muscle strains, tears, back pain); the least common (eye injuries, dislocations, wounds, fractures, sprains, scratches, bruises or contusions).

Second Study

Study by Mahmoud Musa Al-Nuaimat (2024) titled "Common Sports Injuries Among Team Sports Players at Al-Hussein Bin Talal University in Jordan," published in the Journal of Sports Science Applications (Issue 120, Part 02, June 2024). The study aimed to identify the most common sports injuries among team sports players. It adopted a descriptive methodology, with a sample of 69 players, using a questionnaire, and analyzed data through frequencies and percentages. Results: The most common injuries are fractures (especially in the wrist joint); the main cause: inadequate warm-up.

Third Study

Study by Munayer Salem Nasser Al-Rashidi and Mishal Fahad Muhammad Al-Thuwaini (2023) titled "Analytical Study of Common Sports Injuries in the Field and Track Competitions Course for Students of the Physical Education and Sports Department in the State of Kuwait," published in the Scientific Journal of Sports Sciences and Arts (Volume 75, Issue 03, October 2023). The study aimed to identify the most common injuries among students enrolled in the course. It adopted a descriptive methodology, with a sample of 120 male and female students, using a questionnaire, and analyzed data through frequencies and percentages. Results: The most common injuries (muscle cramps, ligament tears, muscle tears, sprains); most vulnerable sites (thigh, leg, ankle, knee joint, shoulder joint); causes: inadequate warm-up, overtraining, continuing training during injury.

Fourth Study

Study by Mahi Manal (2021-2022) titled "Analytical Study of Common Sports Injuries in Physical Education and Sports Classes from the Perspective of Teachers and Students," Master's thesis from the Institute of Physical Education and Sports, Abdelhamid Ibn Badis University, Mostaganem. The study aimed to identify types of injuries, most vulnerable body areas and organs, analyze direct and indirect causes, and determine if morphological variables (height, weight, gender, age) relate to injuries. It adopted a descriptive methodology, with a sample of 104 physical education teachers in the secondary stage in Mostaganem Province, using a questionnaire, and analyzed data with the chi-square test.



Results: Most common injuries (joint injuries); most vulnerable organs (arm, ankle); main cause: neglecting the warm-up period.

Fifth Study

Study by Boukratam Belkacem, Madani Muhammad, and Khaloul Ghania (2021) titled "Analytical Study of Sports Injuries Among Football Players in Amateur Clubs in Ain Defla Province," published in the Professional Journal of Sports Sciences and Human and Social Sciences (Volume 08, Issue 03, 2021). The study aimed to identify the most important sports injuries among football players. It adopted a descriptive methodology, with a sample of 48 senior football players in regional and honor divisions in Ain Defla Province, using a questionnaire, and analyzed data with the chi-square test. Results: Sports injuries vary among amateur club players in Ain Defla Province between muscular, bony, and joint injuries.

Sixth Study

Study by Musab Samir Muhammad Rashid and others (2020) titled "Diagnosis of the Most Common Sports Injuries and Their Causes Among Students of the College of Physical Education at An-Najah National University," published in the Journal of Sports Creativity (Volume 11, Issue 02 Supplement, 2020). The study aimed to identify the most common types of injuries, body sites, and causes. It adopted a descriptive methodology, with a sample of 475 students, using a questionnaire, and analyzed data with the chi-square test. Results: Most common injury (muscle strain); most vulnerable anatomical sites (metacarpals of the hand, followed by knee joint); highest injury rate in physical preparation course; causes: poor weather conditions, lack of warm-up.

Seventh Study

Study by Chalouche Moataz Billah and Khamer Amir (2018-2019) titled "Analytical Study of Common Sports Injuries and Their Causes in Judo," Master's thesis from the Department of Sciences and Techniques of Physical and Sports Activities, Mohamed Seddik Ben Yahia University, Jijel. The study aimed to identify common injuries in judo and their causes. It adopted a descriptive methodology, with a sample of 30 senior wrestlers from Jijel Province, using a questionnaire, and analyzed data with the chi-square test. Results: Common injuries in judo are joint injuries; causes: non-scientific physical preparation, poor warm-up.

Eighth Study

Study by Ben Taleb Zakaria and Boudouaya Houari (2014-2015) titled "The Most Common Injuries in Physical Education and Sports Classes, Their Causes, and How Secondary and Middle School Teachers Deal with Them," Master's thesis from the Institute of Physical Education and Sports, Abdelhamid Ibn Badis University, Mostaganem. The study aimed to reveal how physical education



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teachers deal with common injuries in middle and secondary stages and their causes. It adopted a descriptive methodology, with a sample of 60 teachers (30 from middle school, 30 from high school) in Naama Province, using a questionnaire, and analyzed data with the chi-square test. Results: Deficiency in teachers' handling of sports injuries; diverse injuries (mainly wounds and sprains); causes: poor warming, poor field surface.

Ninth Study

Study by Boukhras Abdelrahman and Dahmani Al-Amir Abdelkader (2014-2015) titled "Common Sports Injuries That Students Are Exposed to During the Sports Baccalaureate Exam," Master's thesis from the Institute of Physical Education and Sports, Abdelhamid Ibn Badis University, Mostaganem. The study aimed to identify types of injuries during the physical education exam, exposed areas, and causes from supervisors' perspective. It adopted a descriptive methodology, with a sample of 30 physical education teachers from high schools in Tiaret and Mascara, using a questionnaire, and analyzed data with the chi-square test. Results: Injuries (cramps, sprains, scratches); most exposed areas (ankle, hand, thigh); causes: irregular practice, short warm-up period, performance errors.

6.2 Second Section: Commentary on Related Studies

Previous studies have helped form a comprehensive view of the topic through their research methods and results, facilitating the formulation of the problem and research questions. They primarily focus on sports injuries, their types, causes, and most vulnerable anatomical sites, representing important scientific efforts to understand injuries in various environments (universities, schools, sports clubs) and diverse groups (students, team players, football players, etc.). Below is a comprehensive commentary from several angles:

6.2.1 Scientific Commentary on Previous Studies

The review of previous literature in sports injuries shows scientific richness and diversity in methodologies and results, enhancing our understanding of these injuries and associated risk factors, particularly in primary physical education classes.

-Diversity in Injury Patterns: Studies show diversity across age groups and activities. For example, Salman and Al-Khafaji (2024) highlighted muscle strains and tears (consistent with modern evidence: 21.2% of injuries in team sports are muscular). Supported by Al-Rashidi and Al-Thuwaini (2023) focusing on cramps and ligament tears.

-Variation in Anatomical Regions: Varies by activity; e.g., wrist in Al-Nuaimat (2024), thigh and ankle in Al-Rashidi (2023). Supported by global studies (hand fractures: 28.3%; lower limbs: 56.6% in children).

-Causative Factors: Inadequate warm-up is key (in studies by Al-Nuaimat 2024, Al-Rashidi 2023, Manal 2021-2022), scientifically supported by the role of warm-up in increasing flexibility. Poor field surface (Zakaria and Houari 2014-2015) accounts for 24.8% of injuries due to inadequate preparation.

-Theoretical Foundation: Provides useful classifications (e.g., muscular/bony/joint in Belkacem 2021), aligning with international classifications.

These studies provide a strong scientific basis, showing pattern diversity and causative factors, highlighting preventive measures like adequate warm-up and environmental improvement. The current research (focusing on primary stage) fills a clear research gap, offering practical insights for child safety, with high credibility due to alignment with global trends.

6.3 Overlaps and Repetitions Between Studies

- All relied on descriptive methodology and questionnaires.
- Most focused on common injuries (muscle strains, tears, fractures, sprains).
- Repetition in results (prevalence of muscle strains, sprains, back pain).

6.4 Differences Between Studies

- **Target Group:** Universities (first, sixth), clubs (fifth), schools (fourth, eighth).
- **Activity Type:** Specific (judo in seventh, football in fifth) or general.
- **Causes:** Poor warm-up (second, seventh), overtraining or weather (sixth).

6.5 Positive Points in the Studies

- Focus on prevention (importance of good warm-up, avoiding overtraining).
- Diversity of samples (students, players, pupils) for a comprehensive picture.
- Use of accurate statistics (frequencies, percentages, chi-square).

6.6 Negative Points or Critical Notes

- Overreliance on questionnaires (may lead to inaccuracy due to memory bias).
- Absence of experimental or field studies (limits practical recommendations).
- Lack of methodological diversity (all descriptive, no experimental).
- Lack of focus on solutions (deficiency in integrated preventive programs).

In conclusion, these studies reflect significant interest in sports injuries in educational and sports environments. However, repetition in methodologies and lack of practical solutions highlight the need for more diverse and effective research methods. Addressing these weaknesses will enhance their contributions to improving health and safety in sports.



APPLIED ASPECT

7.Exploratory Study

The exploratory study is considered one of the most important research procedures conducted by the researcher to avoid errors, challenges, or obstacles during the main experiment. It represents a mini version of the main experiment, aiming either to uncover certain scientific facts, or to trial the work process in order to identify impediments and drawbacks that may be encountered in the implementation of the main study. It can also serve to train some of the assisting staff. Al-Abadi (2015, p.128) indicated that the exploratory study involves testing some choices and measurements on samples that are usually not part of the original research sample, provided that they are of the same level and age. Alternatively, some members of the main sample may be isolated to apply the exploratory experiment, provided that they do not return to the original sample, to prevent their familiarization with the tests, which could bias the results (Al-Abadi, 2015, p.128).

To apply scientific research methods and to obtain accurate and reliable results, we conducted the exploratory study on some physical education teachers in primary education in the municipality of Qasr El-Hirane, Laghouat province. The study was conducted in two stages:

- Identifying obstacles and difficulties that may arise in applying the main study.
- Understanding the various conditions surrounding the study.
- Determining shortcomings in the procedures for implementing the questionnaire.
- Estimating the time required for the study.

8.Research Methodology

Choosing the research methodology is a fundamental step in scientific research, as it determines how data and information pertaining to the subject will be collected. The choice of method is closely tied to the research problem and topic; the nature of the subject dictates the most suitable approach. For our research topic (“An Analytical Study of the Most Common Sport Injuries During Primary Physical Education Classes”), which addresses a phenomenon related to the educational field through physical activities, with the aim of analyzing common sports injuries among students, identifying their causes, influential factors, and proposing measures to minimize them, the **descriptive method** is deemed most appropriate.

The descriptive approach is defined as the study of reality or the phenomenon as it exists, with the research focusing on accurately describing it to reach conclusions that contribute to development and change—using quantitative or

qualitative approaches with tools such as questionnaires and interviews. (Al-Omrani, 2012, p.103) Furthermore, it seeks accurate and detailed knowledge of the elements of a given issue or phenomenon, aiming at a better and more precise understanding or to formulate future policies and procedures. (Al-Mahmoudi, 2019, p.46)

8.1 Independent Variable

The independent variable is that which the researcher assumes to be the cause, or one of the causes, for a certain effect; its study may reveal its influence on another variable. (Boudaoud & Atta Allah, 2009, p.139)

In this study, the **independent variable** is the physical education classes, regarded as the factor influencing the occurrence of sports injuries.

8.2 Dependent Variable

The dependent variable is the one that changes as a result of the influence of the independent variable, or the outcome whose relationship to the independent factor is being explored. (Boudaoud & Atta Allah, 2009, p.141)

Here, the **dependent variable** is the most common sports injuries—the results being analyzed and studied.

8.3 Temporal Domain

The temporal domain refers to the time span covered by the research, such as years, months, or other temporal units. (Al-Mahmoudi, 2019, p.106) In our study, the timeline includes:

- **Initial observation period:** Early December 2024 to end of December 2024.
- **Exploratory study:** Conducted in two stages.
- **Second stage:** From mid-April 2025 to end of April 2025.
- **Applied phase:** Beginning April 2025 to mid-May 2025.

8.4 Sample Definition

A sample is a subset of the original research population, representing it with its shared characteristics, enabling the researcher to study the phenomenon without examining the entire population, especially when that would be impractical or resource-intensive. (Noufal & Abu Awad, 2010, p.232; El-Basiony, 2013, p.309; Mahjoub, 2005, p.149).



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Variable	Type	Number	%	Total
Gender	Male	46	92%	50
Gender	Female	4	8%	50
Years of Teaching PE	<1 year	10	20%	50
Years of Teaching PE	1-2 years	40	80%	50
Years of Teaching PE	>3 years	0	0%	50
Academic Qualification	License	19	38%	50
Academic Qualification	Master	31	62%	50
Academic Qualification	Doctorate	0	0%	50
Academic Qualification	Other	0	0%	50
Students per Group	<20	2	4%	50
Students per Group	20-30	17	34%	50
Students per Group	30-40	25	50%	50
Students per Group	>40	6	12%	50
First Aid Training	Yes	50	100%	50
First Aid Training	No	0	0%	50

8.5 Sample Characteristics Discussion

• **Gender:** The sample is predominantly male (92%), reflecting that most physical education teachers in Algerian schools are men, likely due to the practical, physical demands of the subject and prevailing cultural norms.

• **Years of Experience:** Most participants are recently hired teachers with less than two years of experience (80%), which may be attributed to recent recruitment waves after years of limited employment opportunities in the physical education sector.

• **Academic Qualification:** The majority hold a Master's degree (62%), indicating an advanced academic level which may positively influence teaching quality.

• **Class Size:** Most groups consist of 30–40 students (50%), and 62% of groups exceed 30 students, signaling overcrowded classrooms, which can negatively affect teaching quality and safety.

• **First Aid Training:** All participants (100%) have received first aid training, reflecting heightened awareness and preparedness to handle sports-related accidents, possibly due to curriculum requirements or institutional training programs.

Research Tools



The researcher utilized several means, including scientific references (books, articles, journals, conferences, previous studies, and the Internet) to gain familiarity with the subject before proceeding with the fieldwork.

9. Questionnaire Instrument

The questionnaire covered several axes targeting different aspects of the studied phenomenon, including:

- The relationship between type of sport and injuries (activities causing most injuries, and influence of surfaces/equipment).
- Administrative and organizational procedures (availability of injury records, first aid tools, parental notification, and suggested preventive measures).

To ensure the tool's validity and reliability, principles of test standardization were followed.

9.1 Reliability

Table2 : Questionnaire Reliability

Section	Sample Size	Reliability Coefficient
Factors causing sports injuries	15	0.92
Preventive measures	15	0.93
Most common sports injuries	15	0.73
Relationship between type of sport/injuries	15	0.80
Administrative/organizational procedures	15	0.71
Overall questionnaire	15	0.83

Reliability coefficients indicate that the instrument as a whole enjoys strong consistency and reliability, especially in key focus areas.

9.2 Content Validity and Expert Review

The questionnaire's draft was reviewed by the academic supervisor and three faculty experts specializing in physical education, who provided constructive feedback regarding clarity and relevance. Based on their recommendations, some items were revised for the final version, ensuring linguistic clarity and internal consistency for accurate and comprehensive data collection.



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9.3 Construct Validity (Internal Consistency)

Table 3 : Questionnaire Construct Validity

Section	Reliability	Construct Validity
Factors causing sports injuries	0.92	0.95
Preventive measures	0.93	0.96
Most common sports injuries	0.73	0.85
Relationship sport/injuries	0.80	0.89
Administrative/organizational procedures	0.71	0.84
Overall questionnaire	0.83	0.91

The high construct validity values confirm that the questionnaire accurately measures the intended constructs and is suitable for drawing valid research conclusions.

10. Presentation and Analysis of First Axis Results:

10.1 First Axis: Factors Causing Sports Injuries

Statement 01: Insufficient warm-up before engaging in physical and sports activities increases the likelihood of injury.

Table 04: represents the analysis of sample responses regarding statement (01) of the first axis.

Response	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Total
Frequency	40	10	00	00	00	50
Percentage	80%	20%	00%	00%	00%	100%

The analysis of the table demonstrates an almost unanimous consensus among the sample participants regarding the validity of the statement. Specifically, 80% of teachers strongly agreed and 20% agreed, with no neutral or opposing responses recorded. This indicates a high level of awareness among teachers about the critical role of warm-up in preventing sports injuries. Warm-up is recognized as a necessary step in preparing the muscular and nervous systems for physical activity, enhancing muscle flexibility and blood circulation, and thereby reducing the risk of muscular and joint injuries. The complete agreement among teachers highlights their understanding of evidence-based injury prevention strategies and their commitment to implementing safe physical education practices.

First Axis: Factors Causing Sports Injuries

Statement 03: High student numbers per group increase injury occurrence opportunities.

Table 05: presents the analysis of sample responses to statement (03) of the first axis.

Response	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Total
Frequency	37	13	0	0	0	50
Percentage	74%	26%	0%	0%	0%	100%

Analysis of Table 06 reveals an almost unanimous consensus among participants, with 74% strongly agreeing and 26% agreeing that student density in groups is a significant factor in increasing the likelihood of injuries during physical education classes or activities. No neutral or opposing responses were recorded. These findings highlight that overcrowded classes make individual supervision challenging for teachers and raise the risk of student collisions or contact.

The results underscore the importance of maintaining balanced group sizes to ensure safety and the achievement of learning objectives under effective organizational conditions. Large class sizes present teachers with difficulties in monitoring each student's movements, which can lead to improper technique and a higher risk of accidents. Overcrowded environments also increase the chance of unintentional collisions, especially during high-movement activities.

This unanimous agreement reflects educators' practical experience managing large groups and their recognition that appropriate class sizes are crucial for both safety and educational effectiveness.

First Axis: Factors Causing Sports Injuries

Statement 05: Lack of muscular coordination among students contributes to injury occurrence.

Table 06: presents the analysis of sample responses to statement (05) of the first axis.

Response	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Total
Frequency	30	20	0	0	0	50
Percentage	60%	40%	0%	0%	0%	100%

Analysis of Table 08 reveals an almost unanimous consensus among participants, with 60% strongly agreeing and 40% agreeing that muscular coordination is a fundamental factor in proper motor performance and injury prevention during physical activity. No neutral or opposing responses were



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recorded. These results indicate a solid understanding among educators of the risks associated with poor muscular coordination, such as imprecise or abrupt movements that increase injury likelihood.

The findings emphasize the need to prioritize the development of fundamental motor skills—especially muscular coordination—in educational and training programs to enhance performance and reduce injury risks among students. Inadequate neuromuscular coordination results in decreased precision and control, leading to delayed reactions, improper force application, poor balance, and difficulty adapting movements to dynamic conditions.

This unanimous agreement highlights educators' recognition that developing coordination goes beyond skill acquisition; it is essential for effective injury prevention. Properly coordinated movement distributes physical forces across muscle groups and joints, minimizing localized stress and lowering the risk of both overuse and acute injuries during physical activity.

First Axis: Factors Causing Sports Injuries

Statement 07: Insufficient playing spaces increase injury probability.

Table7: presents the analysis of sample responses to statement (07) of the first axis.

Response	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Total
Frequency	44	6	0	0	0	50
Percentage	88%	12%	0%	0%	0%	100%

Analysis of Table 10 shows an almost unanimous consensus among participants, with 88% strongly agreeing and 12% agreeing that the spatial environment has a major impact on student safety during physical activity. No neutral or opposing responses were recorded. These results indicate a high level of awareness among educators that confined or inadequate spaces increase the risk of crowding, unintended contact, and injury.

The findings highlight the critical need for sufficient and appropriately sized sports facilities that match the number of participants and are managed effectively to avoid overcrowding. Inadequate space forces students into close proximity, elevating risks of collisions, improper technique execution, limited reaction time, and intensified competition for equipment and movement area.

Moreover, spatial limitations compromise the quality of instruction, as teachers face difficulties in supervising and intervening effectively. Insufficient space also prevents the arrangement of proper safety zones around equipment and activity stations, which are vital for accident prevention during both skill practice and transitions.

This overwhelming agreement among educators underscores their professional understanding that proper facility planning is essential—not merely for comfort,

but for ensuring a safe environment that supports effective learning and skill acquisition in physical education.

12. Presentation and Analysis of Second Axis Results:

Second Axis: Preventive Measures to Reduce Injuries

This axis centers on the evaluation of various preventive strategies and measures designed to reduce sports injuries during physical education classes. The analysis aims to determine the most effective prevention methods as perceived by physical education teachers, drawing on their expertise and familiarity with injury prevention protocols in educational contexts.

The preventive measures axis covers several key dimensions: proper preparation routines, the use of appropriate safety equipment, educational programs to raise awareness, environmental modifications, and systematic risk reduction approaches. Gaining insight into teachers' perspectives on these strategies is essential for developing comprehensive injury prevention plans that can be successfully integrated into primary school physical education programs.

Second Axis: Preventive Measures to Reduce Injuries

Statement 11: Allocating sufficient time for warm-up reduces injury probability.

Table 8: presents the analysis of sample responses to statement (11) of the second axis.

Response	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Total
Frequency	43	7	0	0	0	50
Percentage	86%	14%	0%	0%	0%	100%

Analysis of Table 14 reveals an almost unanimous consensus among participants, with 86% strongly agreeing and 14% agreeing on the importance of warm-up as an effective injury prevention measure. No neutral or opposing responses were recorded. These results indicate strong recognition among educators that warm-up is crucial for preparing the muscular and nervous systems, enhancing flexibility, and improving circulation, thereby reducing the risk of muscle strains and movement-related injuries.

The findings emphasize the necessity of systematically incorporating adequate warm-up time in every sports class or exercise session, tailored to the type and intensity of activity. This consensus demonstrates that educators view warm-up not just as a routine, but as a scientifically-backed strategy for injury prevention.

Adequate warm-up enables essential physiological adaptations, such as gradual increases in body temperature, improved muscle blood flow, enhanced neural activation, greater joint mobility, and mental readiness for physical exertion. When insufficient time is dedicated to warm-up, these adaptive benefits are limited, increasing the risk of acute injuries.



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Overall, the strong agreement among educators underscores an evidence-based understanding that warm-up duration should be proportionate to activity demands and participant needs, supporting the use of structured protocols that prioritize safety and injury prevention through thorough preparation.

Second Axis: Preventive Measures to Reduce Injuries

Statement 12: Training in correct sports movement techniques contributes to sports injury prevention.

Second Axis: Preventive Measures to Reduce Injuries

Statement 15: Organizing awareness programs for students about safety in physical education and sports classes reduces injuries.

Table 9: presents the analysis of sample responses to statement (15) of the second axis.

Response	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Total
Frequency	11	39	0	0	0	50
Percentage	22%	78%	0%	0%	0%	100%

Analysis of Table 18 reveals near-unanimous agreement among participants regarding the importance of safety awareness in promoting a safety culture among students. With 22% strongly agreeing and 78% agreeing, and no neutral or opposing responses, educators clearly recognize that educating students about risks and prevention strategies effectively reduces unsafe behaviors during physical education classes.

The results underscore the necessity of systematically integrating preventive education into school programs—through dedicated sessions or supplementary activities—to enhance students’ awareness, encourage adherence to safety protocols, and ultimately lower injury rates. Educators view safety awareness initiatives as foundational to comprehensive injury prevention, serving multiple roles: imparting knowledge about hazards, developing safe movement skills and emergency responses, fostering responsibility for collective safety, and cultivating consistent safety-minded behaviors.

Effective programs address key areas including understanding activity-specific risks, environmental and equipment safety, situational awareness, decision-making under pressure, and communication skills for reporting hazards. Successful implementation depends on curriculum integration, age-appropriate content, interactive teaching, ongoing practical reinforcement, and regular assessment to ensure lasting comprehension.

This strong consensus highlights educators’ professional conviction that safety education should not be merely informational, but transformative, instilling lifelong safety consciousness that extends well beyond the school environment.

Second Axis: Preventive Measures to Reduce Injuries



Statement 16: Training teachers in first aid is necessary for dealing with injuries.

Table 10: presents the analysis of sample responses to statement (16) of the second axis.

Response	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Total
Frequency	45	5	0	0	0	50
Percentage	90%	10%	0%	0%	0%	100%

Analysis of Table 19 reveals near-unanimous agreement among participants regarding the importance of first aid competency for teachers in physical education settings. With 90% strongly agreeing and 10% agreeing—no neutral or opposing responses recorded—there is clear recognition that first aid skills are crucial given the higher risk of sudden injuries during physical activities.

These findings confirm that prompt and effective teacher intervention can reduce injury complications and provide psychological reassurance to both students and parents. As a result, integrating regular first aid training into teacher qualification programs is considered essential for enhancing school safety.

The consensus underscores that first aid proficiency is a fundamental aspect of comprehensive injury management in educational environments. Effective training equips teachers with immediate response abilities, professional confidence, legal and ethical preparedness, and helps uphold institutional safety standards. Training should cover both theoretical knowledge and practical skills, including recognition and management of common sports injuries, proper assessment and stabilization techniques, effective communication protocols with emergency services and families, and thorough incident documentation.

The high agreement rate indicates that educators view first aid training as an indispensable requirement—not an optional enhancement—for safe program delivery. This supports the implementation of mandatory, regularly updated certification programs that address sport-specific injuries, child-specific care, and realistic emergency simulations relevant to physical education.

Importantly, the psychological security provided by first aid-competent teachers contributes significantly to the overall safety culture of the physical education program and increases parental trust in school health and safety measures.

Second Axis: Preventive Measures to Reduce Injuries

Statement 19: Encouraging adequate fluid intake helps avoid injuries.

Table 11: presents the analysis of sample responses to statement (19) of the second axis.

Response	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Total
Frequency	19	31	0	0	0	50



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Percentage	38%	62%	0%	0%	0%	100%
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Analysis of Table 22 reveals near-unanimous agreement among participants regarding the importance of hydration during physical activity, with 38% strongly agreeing and 62% agreeing; no neutral or opposing responses were recorded. These results indicate a high level of health awareness among educators about the critical role of hydration in preventing injuries. Proper hydration is essential for sustaining muscle function, preventing cramps and fatigue, and maintaining concentration—all factors that reduce the risk of injury.

The findings underscore the necessity of integrating hydration guidelines into physical education classes, including educating students on the importance of regular water intake, scheduling hydration breaks—particularly during hot weather or strenuous activities—and monitoring for signs of dehydration. Educators' unanimous recognition reflects an advanced understanding that hydration supports injury prevention by preserving electrolyte balance, thermoregulation, cognitive function, and cardiovascular efficiency.

Dehydration increases injury risk through mechanisms such as muscle fatigue, impaired joint lubrication, reduced blood flow, and diminished mental alertness. While all educators acknowledge hydration's importance, the variation between “strongly agree” and “agree” highlights differing levels of emphasis on formal hydration protocols.

The results support the implementation of structured hydration education and management in physical education, including pre-activity preparation, frequent in-session breaks, post-activity rehydration, and vigilance for dehydration risk factors. Overall, maintaining proper hydration is recognized as fundamental to ensuring safe, effective physical performance and minimizing injury risk in school sports settings.

12. Presentation and Analysis of Third Axis Results:

Third Axis: Most Common Sports Injuries

Statement 01: What are the most common types of mild injuries occurring during physical education classes?

Table 12: presents the analysis of sample responses to statement (01) of the third axis.

Responses	Frequency	Percentage
Scratches and superficial wounds	39	78%
Simple bruises	7	14%
Simple muscle cramps	4	8%

Analysis of Table 24 indicates that the most prevalent mild injuries during physical education and sports classes are scratches and superficial wounds,



reported by 78% of sample participants, followed by simple bruises (14%) and minor muscle cramps (8%). These findings highlight that most injuries are superficial in nature, primarily resulting from direct contact with the ground, equipment, or other students during physical activities.

The predominance of skin abrasions underscores the importance of implementing safety measures such as ensuring appropriate protective clothing, maintaining and improving playing field surfaces, and closely supervising student behavior. Although classified as mild, these injuries can still disrupt continued participation in physical activity and, if not managed properly, may lead to complications such as infection or reluctance to engage in future activities.

The data suggest that environmental factors and external contacts are the primary sources of injury, rather than internal biomechanical issues. Therefore, preventive strategies should focus on surface safety, the use of protective equipment, and regular inspection of sports facilities and equipment, rather than on complex biomechanical corrections.

Overall, these findings emphasize the need for targeted injury prevention efforts that address the specific risks associated with primary school physical education environments, ensuring a safer and more supportive setting for active student participation.

Third Axis: Most Common Sports Injuries

Statement 02: What are the most common types of moderate injuries occurring during physical education classes?

Table 13: presents the analysis of sample responses to statement (02) of the third axis.

Responses	Frequency	Percentage
Joint sprains	28	54%
Simple muscle tears	8	16%
Nosebleeds	14	28%

Analysis of Table 25 reveals that the most common types of moderate injuries during physical education and sports classes are joint sprains (54%), followed by nosebleeds (28%) and simple muscle tears (16%). These findings indicate that activities involving jumping, rapid deceleration, and frequent direction changes place considerable stress on students' joints, making sprains the most prevalent moderate injury. Joint sprains typically result when ligaments are overstretched during dynamic movements or accidental contact, underscoring the need for proper technique and enhanced joint stability through targeted neuromuscular training.

The notable occurrence of nosebleeds suggests that direct impacts, often from collisions with other students or equipment, are a frequent risk during group



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physical activities. This highlights the importance of spatial awareness and proactive supervision to minimize contact-related injuries.

The lower incidence of simple muscle tears compared to joint injuries suggests that while muscular strain is a concern, ligamentous injuries are more common in this age group, possibly due to the greater vulnerability of developing joint structures or effective, though not comprehensive, warm-up routines.

These findings emphasize the necessity of comprehensive injury prevention programs in physical education that focus on improving proprioception and joint stability, implementing measures to manage contact and reduce collisions, and refining preparation routines to adequately protect both muscles and joints. Overall, a multifaceted approach addressing these risk factors is essential to reduce the occurrence of moderate injuries in primary school physical education settings.

Third Axis: Most Common Sports Injuries

Statement 04: Which body parts are most commonly injured during physical education classes?

Table 14: presents the analysis of sample responses to statement (04) of the third axis.

Responses	Frequency	Percentage
Knee	0	0%
Ankle	33	66%
Wrist	14	28%
Fingers	4	8%
Head	0	0%

Analysis of Table 27 reveals that the ankle is the most commonly injured body part during primary school physical education classes, accounting for 66% of injuries, followed by the wrist (28%), and fingers (8%). No injuries were reported to the knee or head. This distribution reflects the biomechanical demands of typical school activities, where running, jumping, and sudden changes in direction place significant stress on the ankle—leading to a high incidence of sprains, particularly inversion injuries resulting from rapid deceleration, cutting movements, or uneven surfaces. The data suggest that students may lack ankle stability, proprioceptive control, or proper footwear, increasing their vulnerability.

Wrist injuries occur primarily as a result of students instinctively using their hands to break falls, placing considerable strain on the wrists during impact. Finger injuries are less common, typically resulting from ball-handling, equipment use, or contact during group activities, but can still affect fine motor skills and daily functioning.



The absence of knee and head injuries is noteworthy and may indicate that current safety protocols, activity selection, and student biomechanics are effective in protecting these areas in the primary school context.

These findings highlight the importance of targeted injury prevention strategies, such as:

- Training students in proper movement and landing techniques,
- Implementing ankle strengthening and proprioceptive exercises,
- Ensuring appropriate and well-fitted footwear,
- Teaching safe fall techniques to reduce wrist and finger injuries.

Overall, focused prevention efforts addressing ankle stability, safe movement patterns, and hand protection during falls can significantly reduce the most common injuries observed in primary school physical education settings.

Third Axis: Most Common Sports Injuries

Statement 07: Which age group is most susceptible to injuries during physical education classes in primary education?

Table 15: presents the analysis of sample responses to statement (07) of the third axis.

Responses	Frequency	Percentage
6-8 years	27	54%
9-10 years	14	28%
11-12 years	9	18%

Analysis of Table 30 indicates that the youngest age group (6–8 years) is the most susceptible to injuries during primary school physical education and sports classes, accounting for 54% of cases. This is followed by the 9–10-year-old group at 28%, and the 11–12-year-olds at 18%. These findings reflect a well-established educational reality: younger children are more prone to injury due to underdeveloped balance, motor coordination, and limited awareness of movement risks. Their ability to control strength and speed is not yet fully mature, further increasing injury likelihood.

Developmental factors contributing to this vulnerability among 6–8-year-olds include immature proprioceptive and neuromuscular systems, limited spatial awareness, lower cognitive capacity for risk assessment, short attention spans, and an inclination to attempt movements beyond their current abilities. As children age, their neuromuscular control, reaction times, risk perception, and strength improve, leading to a progressive decrease in injury rates in the older groups.

The predominance of injuries in the youngest age group underscores the urgent need for age-appropriate instructional strategies. These should include simplified, developmentally suitable activities, increased supervision, modified equipment and environments to minimize hazards, and structured skill-building programs that prioritize safety alongside motor learning.



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Ultimately, the inverse relationship between age and injury risk highlights the importance of differentiated safety protocols that offer greater protection and support for younger students, while providing appropriate challenges as children mature and their motor competencies increase.

13. Presentation and Analysis of Fourth Axis Results:

Fourth Axis: Relationship Between Type of Sports Activity and Injuries

Statement 08: What are the physical and sports activities most associated with injury occurrence?

Table 16: presents the analysis of sample responses to statement (08) of the fourth axis.

Responses	Frequency	Percentage
Running and chasing games	23	46%
Team games	27	54%
Gymnastics and floor exercises	0	0%
Track and field	0	0%

Analysis of Table 31 reveals that team games are the activities most strongly associated with injury occurrence during physical education classes, accounting for 54% of reported injuries, followed by running and chasing games at 46%. No injuries were recorded in gymnastics, floor exercises, or track and field activities.

These findings indicate that team games, with their frequent physical contact and potential for collisions, present the highest injury risk in primary school settings—a pattern consistent with data from earlier analyses, notably where 76% of injuries occurred during team game phases. Team games involve dynamic and unpredictable movement patterns, direct competition, player-to-player contact, and complex spatial interactions, all of which increase the likelihood of accidents, especially among young students with developing coordination skills.

Running and chasing games, though seemingly simpler, also pose substantial risk due to high speeds, sudden changes in direction, unstructured play, and crowded participation spaces, which can easily result in falls and collisions.

The absence of injuries in gymnastics, floor exercises, and track and field is noteworthy. This may reflect controlled and supervised environments, individualized participation, gradual skill development, or possibly lower exposure in the studied curriculum.

Overall, the injury pattern underscores that activities involving group dynamics, physical contact, or unpredictable environments carry a higher risk, while well-structured and individually paced activities are associated with better safety outcomes.



The results highlight the need for targeted risk management strategies:

- Enhanced supervision and clear preventive rules during team games and chasing activities,
- Adapted rules and equipment to minimize collision risks,
- Progressive transitions from individual to group activities to build safe participation skills,
- Environmental modifications to create safer play spaces.

These measures aim to reduce injury incidence while preserving the educational and developmental value of active participation in school sports.

Fourth Axis: Relationship Between Type of Sports Activity and Injuries

Statement 11: What are the sports equipment most responsible for causing injuries?

Table 17: presents the analysis of sample responses to statement (11) of the fourth axis.

Responses	Frequency	Percentage
Balls	7	14%
Sports apparatus (posts and barriers)	24	48%
Cones	3	6%
Rings	16	32%

Analysis of Table 34 shows that fixed sports apparatus such as posts and barriers are identified as the leading cause of injuries during physical education classes (48% of responses), followed by rings (32%), balls (14%), and cones (6%). These results highlight that rigid, elevated, or fixed equipment poses the greatest risk to students, particularly if not sufficiently protected, properly maintained, or supervised.

The predominance of injuries from posts and barriers points to the significant collision and impact hazards these structures create—especially during dynamic movements when visibility is limited or spatial awareness is reduced. Specific risks include direct impact injuries, lacerations from sharp edges, entanglement, and trauma from improper navigation around or over equipment.

Rings, commonly used in gymnastics, represent the second highest injury source. They present dangers related to falls from height due to grip loss, swing-related collisions, excessive strain on the upper limbs, and possible head or neck injuries during unsuccessful dismounts.

In contrast, balls and cones, which are generally softer, more portable, and present fewer protruding or rigid surfaces, account for considerably fewer injuries.



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However, ball-related incidents remain notable—typically resulting from impact trauma, collisions while chasing balls, or tripping over misplaced balls.

This injury distribution underscores the correlation between equipment rigidity, elevation, and injury potential: fixed, hard, and elevated structures consistently carry higher risk than mobile, soft-surface apparatus.

The practical implications are clear:

- Prioritize regular and thorough inspection of all fixed and rigid equipment, ensuring structural integrity and installation of protective padding.
- Modify positioning of hazardous apparatus to minimize collision potential during active play.
- Enhance direct supervision whenever high-risk apparatus are used, and ensure activities are age-appropriate.
- Maintain systematic schedules for equipment maintenance and communicate safety rules clearly to students.

Overall, these findings emphasize that effective injury prevention in physical education requires a strong focus on managing and mitigating risks associated with fixed, hard, and elevated equipment, without overlooking the proper use and supervision of all types of sports apparatus.

14. Presentation and Analysis of Fifth Axis Results:

Fifth Axis: Administrative and Organizational Procedures

Statement 13: What is the extent of availability of records for documenting sports injuries in your school?

Table 18: presents the analysis of sample responses to statement (13) of the fifth axis.

Responses	Frequency	Percentage
Fully available and organized	28	56%
Available but insufficiently organized	18	36%
Available in limited form	4	8%
Not available	0	0%

Analysis of Table 36 reveals that a majority of participants (56%) report the availability of complete and organized records for documenting sports injuries, while 36% indicate such records are available but insufficiently organized, and 8% describe them as limited in form. No respondents stated that documentation is entirely unavailable. This distribution reflects broad awareness of the importance of injury documentation, while highlighting a need to improve the organization and standardization of records to maximize their effectiveness for prevention, treatment, and educational or medical follow-up.



The majority's confirmation of comprehensive record-keeping (56%) is encouraging, indicating that many primary schools recognize the value of systematic injury tracking as a cornerstone of effective safety management and the development of evidence-based prevention strategies. However, the significant proportion citing organizational shortcomings (36%) points to challenges in implementation that could undermine the usefulness of injury records for identifying patterns, evaluating prevention efforts, and informing policy decisions.

Universal documentation in at least some form (100% availability) demonstrates widespread acknowledgement among educators of its essential roles—including legal protection, medical continuity, targeted prevention, institutional accountability, and communication with families and healthcare providers. Barriers to optimal organization may stem from inconsistent protocols, lack of staff training, limited administrative resources, technological constraints, or insufficient time for thorough record-keeping.

Overall, these findings underscore the need to enhance documentation systems through standardized reporting forms, staff training, adoption of digital record-keeping solutions, regular audits, and seamless integration with broader school health management practices. The total absence of settings without any documentation highlights that injury reporting is a recognized priority, supporting improvement and optimization of existing systems rather than the need for entirely new implementations.

Fifth Axis: Administrative and Organizational Procedures

Statement 15: What are the first aid resources available in the school?

Table 19: presents the analysis of sample responses to statement (15) of the fifth axis.

Responses	Frequency	Percentage
Complete first aid kit	2	4%
Basic first aid kit	28	56%
No first aid resources	20	40%

Analysis of Table 38 uncovers a significant deficiency in first aid resources within schools. While 56% of respondents report the presence of only basic first aid kits—likely inadequate for managing moderate or severe injuries—an alarming 40% indicate that their schools have no first aid resources whatsoever. Only 4% of participants report complete first aid kits on site, emphasizing a widespread lack of comprehensive emergency preparedness in educational settings.

This concerning distribution points to a critical gap in schools' ability to respond effectively to injuries, particularly in light of previous findings highlighting



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frequent moderate to severe injuries (such as bone fractures) during physical education activities. The absence or inadequacy of first aid resources delays essential care, increases the risk of negative outcomes, heightens institutional liability, and causes distress for both staff and students.

The contrast between almost universal parental notification of injuries (as observed in prior analysis) and the lack of proper first aid resources underscores a troubling disconnect between communication practices and actual emergency response capability.

Underlying factors may include insufficient budget allocations, lack of awareness of minimum requirements, absence of legally mandated preparedness standards, inadequate staff training, and competing operational priorities.

To address this urgent safety issue, immediate steps should be taken to:

- Equip all schools with comprehensive first aid kits appropriate for managing a full range of injuries,
- Establish and enforce mandatory minimum standards for emergency medical resources,
- Provide systematic staff training on first aid administration and kit maintenance,
- Conduct regular audits of first aid resource adequacy and readiness,
- Integrate emergency preparedness into the broader framework of school safety protocols.

Taken together, these findings strongly advocate for substantial, systematic investment in first aid infrastructure and staff training to ensure schools are capable of delivering timely, competent care when injuries occur during physical education and sports activities.

Fifth Axis: Administrative and Organizational Procedures

Statement 16: From your perspective, what are the most effective measures for preventing sports injuries?

Table 20: presents the analysis of sample responses to statement (16) of the fifth axis.

Responses	Frequency	Percentage
Improving warm-up programs	0	0%
Developing sports facility infrastructure	20	40%
Reducing student numbers per group	24	48%
Providing safe sports equipment	6	12%
Training teachers in first aid	0	0%
Educating students about safety procedures	0	0%



Analysis of Table 39 shows that the prevention measures most strongly supported by participants are reducing the number of students per group (48%) and developing sports facility infrastructure (40%). This demonstrates the educational field's strong recognition of the impact of organizational and environmental factors on injury prevention during physical education classes.

In contrast, measures such as improving warm-up programs, providing safe sports equipment, training teachers in first aid, and educating students about safety procedures received negligible or no support. This lack of prioritization suggests either limited awareness of the importance of these aspects, or insufficient integration into daily practice.

The emphasis on class size reduction as the top priority reveals a sophisticated understanding among educators that overcrowding compromises safety on multiple levels. Smaller group sizes allow for better individual supervision, immediate intervention, reduced collision risks, more equitable equipment distribution, and greater capacity for teachers to monitor and manage hazards.

Similarly, the high priority placed on infrastructure development reflects practical acknowledgment that environmental conditions are fundamental to injury prevention, reinforcing earlier findings that poor facility quality is universally seen as a contributor to injuries.

However, the absence of support for behavioral and educational interventions—such as warm-up improvements, first aid training, and safety education—presents a striking paradox. This contradicts both established injury prevention research and prior findings from this study emphasizing the role of warm-up, equipment safety, and professional training in reducing injuries. It may indicate that current practices in these areas are perceived as sufficient, or reflect a limited appreciation of their impact compared to structural solutions.

The comparatively low prioritization of safe equipment provision (12%)—despite evidence that equipment is a leading cause of injuries—further suggests a disconnect between recognized injury risks and action priorities.

These results highlight a concerning trend toward favoring structural solutions while undervaluing essential behavioral and educational measures. Comprehensive injury prevention requires integrating environmental, organizational, and instructional strategies. The findings underscore the need for ongoing professional development, systematic evaluation of existing programs, and a balanced, multi-faceted approach to injury prevention in physical education settings.

15.DISCUSSIN OF RESULTS:

15.1.Discussion of the First Hypothesis Results

The statistical analysis of data on the most prevalent sports injuries among primary school pupils during physical education lessons reveals a distinctive injury profile: minor injuries are predominantly scratches and superficial wounds,



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moderate injuries most commonly involve joint sprains, and severe injuries are mainly bone fractures. This distribution suggests that the physical activities undertaken in class expose children to particular injury mechanisms—especially in the absence of effective preventive strategies or adequate shock-absorbing surfaces.

This heightened vulnerability can largely be attributed to developmental characteristics typical of this age group, such as impulsive movement patterns and limited motor control, which heighten the risk of falls and direct impact with the ground or equipment—especially when protective clothing or suitable footwear is lacking. Joint sprains, as the predominant moderate injury, are frequently associated with insufficient warm-up or sudden, unanticipated movements (e.g., abrupt stops and jumps) that place excessive stress on muscles and joints. On the other hand, bone fractures—representing the most severe injuries—most often occur as a result of high-impact falls or significant collisions during group activities, particularly when supervisory oversight is inadequate or proper movement techniques are not observed.

Collectively, these findings underscore the critical need to provide a safe and well-equipped physical education environment, enhance awareness and application of injury prevention methods, and adapt activities to align with children's physical and cognitive capacities. These observations are in line with previous research (e.g., Mahi, 2022; Ben Taleb & Boudouaia, 2015), which also identified high rates of articular injuries and wounds in school contexts, thereby corroborating the hypothesis.

15.2. Discussion of the Second Hypothesis Results

Further analysis into the primary causes of sports injuries highlights three significant risk factors: inadequate warm-up routines, the use of inappropriate sports equipment, and elevated student-to-group ratios. The data reflect a strong consensus that insufficient warm-up before participation subjects muscles and joints to abrupt stress, increasing susceptibility to sprains and muscle tears—this is particularly notable among pupils with lower fitness levels.

Additionally, the use of ill-adapted equipment (such as oversized balls or unsuitable weights) places disproportionate strain on the musculoskeletal system. Simultaneously, overcrowded classes hinder effective supervision and reduce movement space, leading to diminished performance quality and an increased likelihood of collisions and falls arising from uncoordinated group movement.

These risk factors, and their impact on injury incidence, have been substantiated in previous studies (Naemat, 2024; Boukheiras & Dahmani, 2015; Ben Taleb & Boudouaia, 2015), which similarly identified poor warm-up practices and inappropriate equipment as leading contributors to sports injuries. Taken together, these findings lend strong support to the second hypothesis.

15.3. Discussion of the Third Hypothesis Results



The data analysis emphasizes the crucial role of a comprehensive set of preventive measures in minimizing injury rates among pupils. Notable measures include: ensuring effective warm-up, using suitable equipment, implementing structured injury prevention education, training teachers in first aid, and maintaining regular facility inspections.

A proper warm-up effectively prepares muscles, tendons, and joints for physical activity, thereby reducing the incidence of muscle strains and acute fatigue. Technical skill training promotes safer, more efficient movement patterns and reduces uneven stress on joints. The use of appropriate protective equipment—such as helmets, guards, and activity-specific footwear—offers substantial defense against impacts and slips.

In parallel, the integration of educational programs that teach safety protocols and foster both mental and physical readiness cultivates a culture of prevention among students. Teacher preparedness, particularly in injury response, is also pivotal in minimizing complications and fostering a safe and engaging learning environment. Furthermore, hydration and the systematic maintenance of equipment and playing areas are vital to mitigate the risks presented by defective or worn-out resources.

Collectively, these strategies constitute an integrated injury prevention framework supportive of student safety and high-quality physical education practice. The findings concur with prior research (Chekkouri, 2014; Al-Rashidi & Al-Thuwaini, 2023), affirming that both teacher competence and field suitability significantly decrease injury rates. This demonstrates that the consistent implementation of such measures is fundamental for preventing injuries in physical education, advancing one of the central objectives of health education in schools, and thereby confirming the hypothesis.

15.4. General Conclusion

In light of the results obtained and supporting evidence from previous studies, there is a clear need to enhance the motor learning environment in primary schools to reduce the incidence of sports injuries among pupils. The foremost priority is to upgrade school sports surfaces with safe, shock-absorbing materials, thereby minimizing the risk of falls and related injuries. Ensuring adequate sports spaces and reducing class sizes further promotes safe movement and significantly lowers the likelihood of collisions.

At the same time, schools should provide high-quality, age-appropriate sports equipment and mandate structured warm-up sessions before all activities to properly prepare students' muscles and joints, thus reducing the risk of musculoskeletal injuries. The effectiveness of these efforts is strengthened by implementing student awareness programs focused on safety fundamentals, such



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as secure falling techniques and avoidance of hazardous contact during play, alongside strategic organization of activities into small groups to limit overcrowding.

Regular health screenings are recommended to verify students' physical readiness for sports participation. Involving medical professionals and sports medicine specialists in planning activities and advising teachers on injury management and prevention is also crucial. Parental involvement is vital; regular awareness sessions should be organized to promote their understanding of physical education's benefits and their supportive role in ensuring safe participation. Finally, encouraging extracurricular sports activities further develops students' motor skills, balance, and self-confidence, which not only fosters their overall development but also contributes to greater injury prevention within the school environment.

16.RECOMMENDATIONS:

Based on the findings from data analysis and previous studies, the following recommendations are proposed to minimize sports injury rates and enhance the motor learning environment for primary school pupils:

1. Upgrade school sports surfaces using safe, shock-absorbing materials to decrease the risk of falls and related injuries.
2. Ensure adequate sports areas and lower the number of pupils per group to facilitate safer movement and reduce collisions.
3. Provide high-quality, age-appropriate sports equipment designed to meet safety standards.
4. Mandate regular, structured warm-up sessions before any physical activity to prepare muscles and joints and lower injury risk.
5. Implement student safety education programs covering fundamental safety rules, including safe falling techniques and the avoidance of hazardous contact during play.
6. Organize sports activities through clear strategies such as dividing students into small groups to minimize overcrowding and random contact.
7. Conduct regular health screenings to assess pupils' physical readiness for participation in sports activities.
8. Involve medical professionals and sports medicine experts in designing injury prevention plans and guiding teachers on best practices.
9. Hold awareness sessions for parents to emphasize the importance of safe physical activity and ways to support their children in injury-free sports participation.



10. Encourage physical activity outside of school to improve motor skills, balance, and self-confidence, ultimately decreasing injury risk during school sports.

17.CONCLUSION:

In light of the findings, it is clear that the issue of sports injuries during physical education lessons at the primary level is of considerable importance due to its direct impact on student safety and the overall quality of the educational process in the sports context. The theoretical framework highlighted that sports injuries are a widespread phenomenon in educational settings, with their type and severity varying according to children's physiological characteristics, the nature of the activities performed, the quality of infrastructure, and the teachers' competence in implementing appropriate preventive measures.

Physical education plays a vital role in developing students' motor and health capacities; however, the absence of optimal conditions may expose children to injuries that could hinder their ongoing participation in physical activity. Practically, the results revealed that wounds, scratches, joint sprains, and bone fractures—particularly affecting the ankle and arm—were the most common injuries, a finding mainly attributable to uncoordinated movement, poor motor control, and insufficient warm-up prior to exercise.

Moreover, the study identified key organizational factors that exacerbate injury risk, such as classroom overcrowding, poorly planned sports activities, inadequate ongoing teacher training in injury prevention, and insufficiently equipped or unsuitable sports grounds.

These results underscore the necessity for decisive preventive measures, including enhancing the quality of sports infrastructure, equipping facilities with effective safety measures, offering continuous training programs for teachers in prevention and first aid, and reducing class sizes to ensure better management of physical education sessions. Additionally, activities should be thoughtfully designed to match the age-specific characteristics of students and to minimize injury risks.

Ultimately, creating a safe and effective educational and sports environment demands the collective effort of all stakeholders—school administrators, teachers, parents, and relevant authorities—to guarantee safe practice conditions, bolster students' physical and psychological health, and encourage sustainable engagement in physical and sporting activities.



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