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Factors Affecting Nursing Students' Knowledge of Sports Injury Management

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A B S T R A C T

Knowledge about handling sports injuries is crucial for nursing students at Universitas Pendidikan Indonesia (UPI), who actively participate in various sports activities. This study analyzes the factors influencing students' knowledge in managing injuries. The influencing factors are categorized into internal factors—such as education, experience, age, and interest—and external factors, including mass media, socio-cultural influences, economic conditions, and environmental aspects. A cross-sectional research design was employed, involving 84 nursing students from UPI. Data were collected using a 90-item questionnaire, and analysis was conducted using the t-test. The results indicate that internal and external factors significantly influence students' knowledge of handling sports injuries, with a significance level of less than 0.05 ($p < 0.05$). This suggests that improvements in the internal and external factors correlated with enhanced knowledge among nursing students regarding sports injury management. These findings underscore the importance of enhancing both internal and external factors to improve nursing students' capabilities in sports injury management. Conversely, a decline in these factors corresponds with diminished knowledge levels. It is recommended that further research include a larger sample size to strengthen these findings.

1. Introduction

Injuries occur when forces acting on the body exceed its ability to cope with them, whether these forces arise suddenly or over a prolonged period [1]. Sports injuries encompass all injuries sustained during training, competition, or immediately following these activities [2]. Such injuries often result from negligence and a lack of awareness regarding prevention and treatment methods, which can lead to common injuries like bruises, muscle cramps, and bleeding. Many injuries worsen due to inadequate first aid responses, such as the improper use of saliva, inappropriate wound coverings, or premature massage following a sprain—all of which lack sterile conditions and do not adhere to established first aid protocols.

Unique loads placed on different body parts, can lead to unbalanced forces. Chronic injuries often arise from extended training in specific sports, knee injuries among high climbers and football players [3]. Additionally, the human body possesses anatomical and biomechanical weaknesses that can predispose individuals to injury [4]. and indifference during sports participation further exacerbate the risk of injuries [5], [6].

Despite the importance of injury management, there is limited research on the factors influencing nursing students' knowledge in this area, especially at Universitas Pendidikan Indonesia. This study employs a quantitative approach to evaluate students' knowledge of first aid for sports injuries. The research will measure variables including age, occupation, education, and knowledge levels, and categorize them as low, sufficient, or high.

According to the World Health Organization (WHO) report in 2022, sports injuries are defined as those occurring during participation in sports or physical activities, affecting both professional and amateur athletes [7]. Common types of sports injuries include bruises, dislocations, sprains, fractures, and muscle or ligament injuries. Sports such as football, basketball, hockey, and boxing are frequently associated with injuries [8]. WHO estimates that 30-50% of all injuries treated in emergency units are related to sports and physical activities. Many of these injuries can be prevented through effective programs that promote proper warm-up routines, appropriate equipment use, and correct technique [9], [10].

The 2022 Health Research Results indicate that 67% of injuries occur in individuals aged 5-25, with a higher prevalence in males (62%) compared to females (48%) [11]. Falls while exercising or participating in sports account for most injuries, with 42.2% categorized as strains and sprains, 14% as fractures, and 17% as wounds and bruises.

Understanding sports injuries is crucial for students and graduates pursuing careers as sports practitioners. Such knowledge enables them to provide timely and accurate first aid and to prevent injuries for themselves and others. This necessity underscores the rationale for this research, which aims to assess the knowledge of sports injury management among students [12].

Effective injury management is vital for athletes to recover and resume their activities. For those with musculoskeletal injuries, proper first aid can significantly influence recovery [13]. The RICE protocol (Rest, Ice, Compression, Elevation), established in 1978 by Dr. Gabe Mirkin, is widely endorsed for treating acute musculoskeletal injuries [14]. This protocol aims to expedite recovery and reduce inflammation. Enhancing knowledge regarding the prevention and treatment of sports injuries is essential. Increasing awareness among students can foster greater caution during physical activities, thereby minimizing injury risks [15].

Prior to conducting this research, preliminary observations were made among students from the Faculty of Sports and Health Education (FPOK) at Universitas Pendidikan Indonesia. A modified questionnaire was distributed via Google Forms to representatives from the Class of 2021 and 2022. Findings revealed that these students possessed limited knowledge about sports injuries relevant to their field. They lacked understanding regarding injury management in both personal and community contexts, as well as the importance of injury prevention [16]. Furthermore, many students were unaware of how to select a concentration that could enhance their expertise in identifying and managing injuries.

Over the past months, numerous students from the FPOK Nursing program have sustained sports-related injuries during training sessions. These incidents, compounded by insufficient knowledge of injury management, have led to extended recovery periods. This observation underscores the need to explore the extent of Nursing students' understanding of sports injury management and the factors that influence it. This study is framed within the context of these initial findings and aims to address gaps in knowledge and practice. The outcomes will be presented in the thesis titled "Factors That Influence Nursing Students' Knowledge of Handling Sports Injuries".

The structure of this article consists of four main sections. The first section provides an introduction that outlines the background and significance of the study. The second section describes the research methodology employed in this investigation. The third section presents the results obtained and includes a discussion of the findings in the context of existing literature. Finally, the fourth section concludes with a summary of the research outcomes and their implications.

2. Research Method

2.1. Research Design

Research design is a structured approach employed to address a problem within a study, aimed at achieving specific objectives [17]. This study utilizes a quantitative approach, employing multiple linear regression analysis due to the presence of multiple independent variables. In this framework, the influencing variables are termed Independent Variables (IVs), while the influenced variable is referred to as the Dependent Variable (DV) [18]. Specifically, this study examines two independent variables: Internal Factors (X1) and External Factors (X2). The dependent variable, which represents knowledge of handling sports injuries, is denoted as (Y). The research was conducted at Jl. Dr. Setiabudi No. 229, Isola, FPOK B, Sukasari District, Bandung City, West Java, from June 28 to July 2, 2024.

2.2. Population and Sample

The population for this study comprised nursing students from the cohorts of 2020 to 2023, totaling 328 individuals. The sample criteria included active students who were willing to participate as respondents. Accidental sampling was utilized, and the Slovin formula was applied with an error margin of 10%, resulting in a sample size of 84 students.

The survey was administered in a structured manner to ensure consistency and reliability. Participants were provided with detailed instructions, and the questionnaires were distributed physically and collected on-site. Follow-up questions were included to clarify ambiguous responses and gather comprehensive data. The questionnaire underwent validation beforehand to

ensure its reliability and appropriateness for assessing the study objectives.

To optimize the study, inclusion and exclusion criteria were established to determine the suitability of samples. The criteria were as follows:

Inclusion Criteria: Active students who met the eligibility requirements to participate.

Exclusion Criteria: Students who declined to participate.

Based on calculations using the Slovin formula, the estimated sample size was approximately 76.64. However, due to some questionnaires being damaged or not returned, the final sample size was adjusted to 84 participants.

2.3. Independent Variables

The independent variables include external and internal factors.

2.3.1. Internal Factors (X1)

Education: Education level significantly influences knowledge of sports injury management. Individuals with higher educational backgrounds or specialized training in sports science or health are more likely to understand injury mechanisms, prevention strategies, and effective management techniques [19]. This correlation emphasizes the role of formal education in developing an in-depth understanding of injury prevention and treatment.

Experience: Personal experience in sports or coaching enhances an individual's awareness of how injuries occur and the best ways to manage them. People who have experienced or dealt with sports injuries tend to have better practical knowledge of injury management and prevention [20].

Age: Age impacts knowledge of sports injury management, as older individuals often accumulate more practical experience and understanding over time. In contrast, younger people may access more up-to-date information through modern media or recent educational programs [21].

2.3.2. External Factors (X2)

Mass Media/Information: Mass Media/Information: Mass media, including the internet, television, and sports magazines, play a crucial role in disseminating knowledge about injury prevention and management. Access to these resources allows individuals to continually update their understanding of effective strategies [1].

Socio-Cultural Influences: Cultural and social norms shape how sports injuries are perceived and managed. In some cultures, the emphasis might be on pushing through the pain, while others prioritize medical treatment and rehabilitation. These cultural perspectives can influence how individuals approach injury management [5].

Economic Conditions: Economic status affects access to healthcare facilities and education on injury management. Those with higher economic standing are more likely to have access to professional coaches, sports physicians, or high-quality healthcare services, contributing to more comprehensive knowledge [3].

Environmental Aspects: The physical environment, such as the quality of sports facilities, also affects knowledge and awareness of injury management. A supportive environment, equipped with safe equipment and professional training, enhances opportunities for learning about injury prevention and management [4].

2.4. Dependent Variable

The dependent variable, as defined by Sugiyono [15], is influenced by the independent variables and pertains to knowledge of sports injury management (Y).

According to Rahman & Nasryah questioner, knowledge encompasses the ability to recall various aspects, including Causes of Injury, Types of Injuries, and Sports Injury Treatment Actions.The development of the questionnaire involved multiple stages. Initially, relevant literature was reviewed to identify key themes and constructs related to knowledge of sports injury management. Questions were chosen based on their relevance and alignment with the research objectives. The draft questionnaire was pilot-tested with a small sample to assess clarity and coherence. Feedback from this process was incorporated, and the final version was validated using statistical methods to confirm its reliability and validity

2.5. Data Analysis

The data in this study will be analyzed through several tests, including:

2.5.1. Descriptive Statistical Analysis

Descriptive statistics were utilized to compute mean, maximum, minimum, and standard deviation values. This analysis provides a concise summary of the data, facilitating the assessment of its distribution.

2.5.2. Normality Test

A normality test was conducted to ascertain whether the data followed a normal distribution, which is essential for subsequent statistical analyses.

2.5.3. Partial Hypothesis Test (t-test)

To evaluate the impact of each independent variable on the dependent variable individually, a partial correlation coefficient test (t-test) was performed. This involved comparing the calculated t-value with the t-table value at a significance level of 5% (degrees of freedom = n – 2).

2.5.4. Simultaneous Hypothesis Testing (Multiple Regression)

The F statistical test was employed to determine whether the independent variables (X1 and X2) collectively affect the dependent variable (Y). This analysis examines the overall influence of the independent variables on the dependent variable simultaneously.

3. Result and Discussion

Table 1. Characteristics Respondents

No	Characteristics	Frequency	(%)
	Gender		
1.	Man	6	7.1
	Woman	78	92.9
		84	100.0
	Force		
	2020	21	25.0
2.	2021	22	26.2
	2022	22	26.2
	2023	19	22.6
		84	100.0
3.	Experiented Sports Nursing Course	65	75.0

The data from Table 1 highlight the demographic and academic characteristics of the respondents. A total of 84 nursing students participated in the study, with 92.9% being female and only 7.1% male. The distribution of the respondents by academic cohort shows a relatively balanced representation, with the highest proportion from the 2021 and 2022 cohorts (26.2% each), followed closely by 2020 (25%) and 2023 (22.6%). Additionally, 75% of the respondents reported having experience with the Sports Nursing Course, indicating a foundational exposure to injury management.

3.1. Test Normality

Based on the table above, it shows that the value of *Asymp. Sig. (2-tailed)* is 0.051 , the value is > 0.05. So it can be concluded that the residual value is normally distributed or the normality test is met. In this study , in addition to using histogram graphs and P-plot graphs.

3.2. Correlation Test

Table 2. Correlation Test Results

		Internal Factors	External Factors	Knowledge Handling Injury
Internal Factors	Pearson Correlation	1.000	0.434	0.570
	Sig (2-tailed)		0.001	0.001
	N	84.000	84.000	84.000
External Factors	Pearson Correlation	0.434	1.000	0.502
	Sig (2-tailed)	0.001		0.001
	N	84.000	84.000	84.000
Knowledge of Injury Management	Pearson Correlation	0.570	0.502	1.000
	Sig (2-tailed)	0.001	0.001	
	N	84.000	84.000	84.000

Based on Table 2, the Pearson correlation for the Internal Factors variable is 0.570. When compared to the r_{table} value (n=84) of 0.215, the r_{count} (0.570) is greater than the r_{table} value (0.215), indicating a significant correlation between internal factors and nursing students' knowledge of injury management.

Similarly, for the External Factors variable, the Pearson correlation is 0.502. Again, comparing this value to the r_{table} value (n=84) of 0.215, the r_{count} (0.502) is greater than the r_{table} value (0.215), suggesting a significant correlation between external factors and nursing students' knowledge of injury management.

3.3. Hypothesis Test (t-test)

Table 3. Partial Hypothesis Test Results (t-test)

	Unstandardized Coefficients		Standardized Coefficients		
	B	Std.Error	Beta	t	Sig.
(Constant)	11.702	9.166		1,277	0.205
Internal Factors	0.420	0.092	0.434	4,559	0.001
External Factors	0.326	0.099	0.314	3.296	0.001

Based on Table 3, the t_{count} value is 4.559 and has a positive sign for the Internal Factor variable. If compared to with mark t_{table} (df =n-1, =84-1, =83) is 1.664 because the t_{count} value > t_{table} , namely 4.559 > 1.664 and the value significance is 0.000 < α (0.05) then Ha is accepted and H_0 rejected . Then Internal factors of students nursing has a positive and significant impact to knowledge student nursing about Handling injury sport.

Based on Table 3, the t_{count} value is 3.296 and has a positive sign for the External Factor variable. If compared to with mark t_{table} (df =n-1, =84-1, =83) is 1.664 because the t_{count} value > t_{table} , namely 3.296 > 1.664 and the value significance is 0.001 < α (0.05) then Ha is accepted and H_0 rejected . Then Factor external student nursing has a positive and significant impact to knowledge student nursing about Handling injury sport.

3.4. Simultaneous Hypothesis Test (Multiple Regression)

Table 4. Results of Simultaneous Hypothesis Test (F Test)

Model	Sum of Squares	df	Mean Square	F
Regression	2413.358	2	1,206.679	27,531
Residual	3550.246	81	43,830.000	
Total	5963.604	83		

Based the Table 4, The multiple regression analysis results in an F-value of 27.531, which is statistically significant ($p < 0.05$). This indicates that the combined effect of internal and external factors on students' knowledge of injury management is both positive and significant. The regression model accounts for a substantial proportion of variance in the dependent variable, confirming the importance of these factors in shaping nursing students' understanding of handling sports injuries.

3.5. Discussion

This discussion provides an in-depth analysis of the findings related to the influence of internal and external factors on nursing students' knowledge regarding sports injury management. The results clearly indicate that internal factors significantly impact students' knowledge; as these internal factors improve, so does their understanding and capability in managing sports injuries. Conversely, a decline in these internal factors leads to a decrease in knowledge, highlighting the dynamic nature of educational attainment and personal development.

3.5.1. Influence of Internal Factors

The findings of this study are consistent with the theoretical framework established. which identifies several internal factors that shape a person's knowledge. Key among these are:

1. Education: Education is foundational in personal and professional development. Higher educational attainment generally correlates with improved retention and comprehension of information. Students with more advanced education are typically better equipped to assimilate new knowledge, particularly in specialized fields like health and sports injury management [22]. This suggests that fostering educational opportunities can enhance nursing students' competence in managing injuries. Educational institutions should prioritize curricula that focus on injury prevention, management, and treatment, incorporating specialized modules on sports injuries. Providing advanced training opportunities and continuous professional development programs will help nursing students gain a deeper understanding of injury management and related health topics.
2. Experience: Experience, whether personal or observational, plays a crucial role in knowledge acquisition. Practical experiences allow students to apply theoretical knowledge in real-world settings, thereby deepening their understanding of sports injuries and management techniques. As Notoatmodjo [17] posits, age and experience contribute to cognitive maturity, enabling older or more experienced students to engage with complex concepts more effectively. Clinical practice and internships play a vital role in developing a comprehensive understanding of injury management. Nursing programs should strengthen opportunities for hands-on training, field placements, and simulation-based learning to enhance students' practical exposure to sports injuries. Furthermore, encouraging students to engage in sports or community health projects could build valuable experiential knowledge.
3. Interest: Interest in a subject significantly impacts knowledge acquisition. Students who are passionate about a particular area are more likely to seek out additional information and actively engage with the material, which enhances their understanding and retention of knowledge related to injury management, as emphasized by [23]. Furthermore, [23] supports this idea, indicating that personal factors, including interests, influence how well students absorb and apply knowledge. To promote deeper engagement, educators can foster students' interest in sports injury management by incorporating interactive teaching methods, such as case studies, workshops, and seminars with professionals in sports medicine. Allowing students to explore areas of personal interest within the curriculum can increase motivation and enhance learning outcomes.

These internal factors collectively suggest that enhancing educational resources, providing practical experiences, and fostering student interest can significantly improve nursing students' knowledge and skills in handling sports injuries.

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For example, the positive correlation between internal factors, such as experience and education, and sports injury management knowledge suggests that students with more experience or higher education tend to understand injury management better. This finding highlights the importance of prioritizing both educational opportunities and practical experiences to increase students' knowledge in this area.

3.5.2. Influence of External Factors

The research also highlights the significant impact of external factors on nursing students' knowledge. Improved external conditions correlate with enhanced knowledge, while adverse external factors negatively affect understanding. Key external influences include:

1. Mass Media and Information: Access to information through various media—such as television, online platforms, and printed materials—plays a vital role in shaping public understanding of health topics. With technological advancements, students now have unprecedented access to diverse sources of information, which can positively influence their knowledge of sports injury management. The more actively students engage with current and relevant information, the better equipped they are to apply this knowledge in practical scenarios. Institutions and educators can leverage mass media tools like online courses, educational platforms, and other multimedia resources to further enhance the knowledge base of nursing students in sports injury management.

2. Socio-Cultural Factors: Socio-cultural contexts also affect knowledge acquisition. Cultural norms and values shape how individuals perceive and prioritize learning about health and injury management. A supportive cultural environment that promotes health education will likely enhance students' knowledge levels. Cultural competence should be integrated into nursing education programs. Understanding socio-cultural differences in injury management and rehabilitation can ensure that nursing students are well-prepared to address the diverse needs of patients from various backgrounds
3. Economic Conditions: Economic status can significantly influence access to educational resources, training opportunities, and relevant experiences. Students from higher economic backgrounds may have better access to quality education and materials, facilitating greater knowledge acquisition [9]. Educational institutions should consider strategies to reduce the economic barriers to accessing high-quality resources for nursing students, such as providing scholarships or subsidized learning materials to ensure equitable opportunities for all students
4. Environmental Context: The physical and social environment in which students learn can either promote or hinder their educational experiences [8]. A conducive learning environment supports effective learning processes. Environments that encourage exploration, observation, and engagement with real-world issues will facilitate deeper understanding and practical application of knowledge regarding sports injuries. Universities and colleges can improve their physical infrastructure, such as creating simulated clinical environments, or encouraging off-campus clinical training where students can interact directly with patients and injuries in realistic settings

In summary, both internal and external factors significantly influence nursing students' knowledge about handling sports injuries. Enhancing education, providing practical experiences, fostering interest, and creating supportive external conditions can collectively improve students' competencies in this critical area. Future research should continue to explore these relationships, potentially expanding to larger samples and diverse educational contexts to further validate these findings.

4. Conclusion

Based on the conducted studies, it can be concluded that both internal and external factors significantly influence nursing students' knowledge about sports injury management, both independently and collectively. Specifically, when nursing students possess strong internal factors—such as motivation, self-efficacy, and personal interest—as well as favorable external factors—such as access to resources, supportive learning environments, and quality instruction—their knowledge of sports injury management improves significantly. Conversely, a decline in the quality of these internal and external factors correlates with a decrease in their knowledge.

These findings suggest that enhancing both internal and external factors is essential for improving nursing students' understanding of sports injury management. Therefore, educational institutions should focus on creating supportive environments and providing adequate resources while also fostering intrinsic motivation among students. Educational programs should integrate more hands-on experience with injury management techniques, and schools should leverage mass media for injury prevention education.

Further research is recommended to explore additional variables that may impact knowledge acquisition in this field, such as practical training experiences or mentorship programs. Investigating these areas could provide deeper insights into effective strategies for enhancing sports injury management knowledge among nursing students

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