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STUDY ON SPORT PHYSIOTHERAPY FOR MUSCULAR INJURIES AMONG TEEN FOOTBALLERS

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Abstract:

This research aims to explore the efficacy of sport physiotherapy in managing muscular injuries among teenage football players. Given the popularity and competitiveness of football among teenagers, they are prone to various muscular injuries that can impede their performance and long-term athletic development. Although sport physiotherapy is acknowledged as crucial in sports-related injury rehabilitation and prevention, its specific impact on young footballers remains relatively unexplored.

The study will employ a mixed-methods approach, incorporating both quantitative and qualitative data collection methods. A sample of teenage football players from various clubs or academies will be involved, divided into two groups: one receiving standard treatment for muscular injuries and the other receiving sport physiotherapy intervention alongside standard treatment. The assessment will encompass injury severity, recovery time, functional outcomes, and recurrence rate.

Quantitative data will be gathered through injury records, recovery progress charts, and functional assessment tools, while qualitative data will be obtained through interviews with the participants and physiotherapists. The research will span six months, and data will be analyzed using appropriate statistical methods and thematic analysis.

The anticipated outcomes of this study will shed light on the effectiveness of sport physiotherapy in managing muscular injuries among teenage footballers. It is hypothesized that participants who receive sport physiotherapy will exhibit faster recovery times, reduced injury severity, and lower recurrence rates compared to those receiving standard treatment alone. The findings will contribute to the existing body of knowledge in sport physiotherapy, providing valuable insights for coaches, physiotherapists, and sports administrators in optimizing the well-being and performance of young football players.

Keywords: sport physiotherapy, muscular injuries, teenage footballers, recovery, rehabilitation, prevention.

1. Introduction

Sports injuries are a significant concern for athletes, particularly in the intense and competitive

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sport of football. Teenage players are especially vulnerable to various muscular injuries, which not only affect their immediate participation but can also have long-term implications for their overall athletic development and health. [1]

Sport physiotherapy has emerged as a critical component in managing and rehabilitating athletes with sports-related injuries. This specialized branch of physical therapy aims to optimize recovery, restore functional capabilities, and reduce the risk of re-injury. [1]

Despite substantial research on the effectiveness of sport physiotherapy in various sports, its specific impact on young footballers remains relatively understudied. The adolescent years are crucial for physical and neuromuscular development, and injuries during this period can have lasting effects on athletes' careers. Thus, investigating the role of sport physiotherapy in managing muscular injuries among teenage football players becomes crucial to enhance their well-being and performance. [2]

This research paper aims to contribute to the existing knowledge by conducting a comprehensive study on the effectiveness of sport physiotherapy in managing muscular injuries among teenage footballers. Employing a mixed-methods approach, both quantitative and qualitative data will be collected and analyzed, providing a deeper understanding of the subject matter. The research will focus on two specific aspects: quantitative assessment of recovery times, injury severity, and functional outcomes, and qualitative exploration of athletes' and physiotherapists' perspectives on the impact of sport physiotherapy. [2]

The findings of this study are expected to shed light on the potential benefits of integrating sport physiotherapy into the standard treatment protocols for teenage footballers with muscular injuries. The research outcomes may have significant implications for coaches, sports administrators, and medical professionals involved in adolescent football development, injury prevention, and rehabilitation. Additionally, the insights gained from this study could contribute to enhancing sports healthcare practices, promoting the overall well-being and athletic performance of young football players. [3]

In conclusion, addressing the research gap regarding the effectiveness of sport physiotherapy for muscular injuries among teenage footballers, this paper aims to make a valuable contribution to the field of sports medicine. The findings are anticipated to provide evidence- based guidance for optimizing the care and support provided to young athletes, ensuring their safe and sustainable participation in football and other sports activities. [3]

2. Research Problem

The research problem addressed in this study is to investigate the effectiveness of sport physiotherapy in managing muscular injuries among teenage footballers. Although sport physiotherapy has been recognized as an essential component in the rehabilitation and prevention of sports-related injuries, its specific impact on young footballers remains relatively

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underexplored. The adolescent years are critical for athletes' physical development, and injuries during this period can have lasting effects on their athletic careers and overall well-being. Understanding the role of sport physiotherapy in managing muscular injuries in teenage football players is essential to optimize their recovery, minimize the risk of re-injury, and enhance their long-term athletic development. [4]

3. Research Objectives:

The primary objectives of this study are:

- To assess the impact of sport physiotherapy on the recovery time of teenage football players with muscular injuries.
- To compare the injury severity levels between teenage footballers who receive standard treatment only and those who receive standard treatment along with sport physiotherapy intervention.
- To evaluate the functional outcomes of teenage footballers undergoing sport physiotherapy for muscular injuries.
- To explore the experiences and perceptions of teenage football players and physiotherapists regarding the effectiveness of sport physiotherapy in injury management and prevention.
- To identify any potential differences in the effectiveness of sport physiotherapy based on gender among teenage footballers.

By achieving these research objectives, the study aims to provide evidence-based insights into the role of sport physiotherapy in the management of muscular injuries among teenage footballers. The research findings will contribute to the existing body of knowledge in the field of sports medicine, guide coaches and sports administrators in optimizing the well-being and performance of young football players, and inform future injury prevention and rehabilitation strategies in adolescent sports.

4. Literature Survey

The literature survey, also known as a literature review, is a crucial aspect of research that involves a thorough and systematic examination of existing academic literature pertaining to the research topic. Its primary purposes include gaining an understanding of the current knowledge and developments in the field, identifying key concepts and theories, pinpointing gaps and discrepancies in the literature, and guiding the research design and methodology. For this specific research on "Sport Physiotherapy for Muscular Injuries among Teen Footballers," the literature survey will delve into pertinent studies, articles, and academic papers focused on sport physiotherapy, injury management, and rehabilitation as they relate to adolescent football players.

Bezuglov, E., et al.(2019) . This study aimed to assess the effectiveness of a single Platelet- rich plasma (PRP) injection in managing hamstring injuries (grade 2a and 2b according to the British Athletics Muscle Injury Classification) in professional soccer players. The researchers recruited forty professional male soccer players with acute hamstring injuries confirmed by MRI. The

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participants were randomly divided into two groups: one received conservative treatment (physiotherapy and exercises), while the other received a combination of conservative methods and PRP injections. The results showed that the time to return to sport (RTS) was significantly shorter in the PRP group (11.4 ± 1.2 days) compared to the conservative treatment group (21.3 ± 2.7 days; $p < 0.05$). Additionally, there were no instances of reinjury in either group during a minimum follow-up of 6 months. In conclusion, the use of PRP demonstrated positive effects in pain relief and facilitated earlier return to sport for professional soccer players with hamstring injuries. [5]

In the study by **Quartey et al. (2019),** the crucial role of physiotherapists in sports injury rehabilitation within the sports healthcare team was highlighted. Establishing a strong athlete-physiotherapist relationship was found to be essential for effective treatment and shaping athletes' expectations regarding injury rehabilitation. The study aimed to determine athletes' expectations about physiotherapy in sports injury rehabilitation and utilized a cross-sectional survey with 120 athletes from various sporting disciplines. Data was collected using the expectation about athletic training (EAAT) questionnaire, and percentages, means, and standard deviations of the expectation scores were computed. The study analyzed associations between socio-demographic characteristics and athletes' expectations of physiotherapy using the chi-square test, and differences in expectations based on demographic characteristics were assessed using Kruskal-Wallis and Mann-Whitney tests. The results revealed no significant difference ($p>0.05$) between gender, injury type, physiotherapy experience, mental skills experience, and athletes' expectations. However, there was a significant difference ($p<0.05$) in expectations based on competition level. The conclusion drawn was that athletes in the Greater Accra Region had high expectations of physiotherapy in injury rehabilitation. Thus, the study emphasized the importance for sports physiotherapists to improve communication with athletes, helping them understand the risks, benefits, timeline, and rehabilitation approach better. [6]

Isern-Kebschull, J., (2020) Muscle injuries of the lower limbs are prevalent among sport- related injuries, with elite athletes being particularly affected. Magnetic Resonance Imaging (MRI) plays a crucial role in assessing acute muscle injuries, and radiologists are essential members of multidisciplinary healthcare teams caring for elite athletes with muscle injuries. Despite the frequent occurrence and clinical relevance of these injuries, there is still a lack of consistency in their description, diagnosis, and classification. The connective tissue characteristics, such as distribution and thickness, vary significantly among different muscles, especially in the lower limb, which is of great clinical importance for determining the prognosis of muscle injuries. Recently, three classification systems—the Munich consensus statement, the British Athletics Muscle Injury classification, and the FC Barcelona-Aspetar-Duke classification—have been proposed to evaluate the severity of muscle injuries. A standardized approach to evaluating MRI findings is vital for accurately assessing the severity of acute lesions and monitoring reparative changes over time. Certain MRI findings observed during recovery may suggest muscle overload or adaptive changes, proving to be clinically valuable for sports physicians and physiotherapists. [7]

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Palermi, S., et al. (2021) Muscle injuries are prevalent in both team and individual sports, with the lower limb muscles, particularly the hamstrings, adductors, rectus femoris, and calf muscles, being most commonly affected. Although several scientific studies have proposed different rehabilitation protocols, the actual rehabilitation process often lacks a scientific basis, especially in non-elite athletes. The growing utilization of physical and instrumental therapies has made it challenging to discern truly effective treatment approaches. This review aims to provide a concise and practical summary of proposed therapeutic algorithms for muscle injuries. Focusing on indirect structural muscle injuries, which are commonly encountered and more complex, the review follows a three-phase rehabilitation protocol. Each phase, leading up to the return to training and sport, outlines the functional goal, the most appropriate practitioner, and the best available treatment based on current evidence. Finally, the review devotes a section to specific exercise rehabilitation for the four main muscle groups, offering a structured and explanatory timetable for rehabilitation. [8]

Research	Objective	Participants	Intervention	Outcome
Bezuglov et al. (2019)	"Assess PRP efficacy in managing hamstring injuries"	"40 professional male soccer players with acute"	"PRP injection combined with conservative methods"	"Shorter time to return to 21.3 ± 2.7 days; $p < 0.05$), no reinjuries during 6-month follow- up, positive effects on pain relief"
Quartey et al. (2019)	"Determine athletes' expectations	"120 athletes from various sporting	"Not applicable"	"No significant difference in expectations based on gender, injury
Isern-Kebschull	"Evaluate MRI findings and	"Not applicable"	"Not applicable"	"Variability in MRI findings, usefulness in
Palermi et al. (2021)	"Provide a summary of proposed	Not applicable	Not applicable	"Lack of scientific basis in rehabilitation protocols, focus on proposed

5. Research Methodology

Let's proceed with the data analysis considering 50 boys and 50 girls who are teenage footballers and have suffered muscular injuries. We will randomly divide them into two groups: one receiving only standard treatment (Control group) and the other receiving standard treatment along with sport physiotherapy intervention (Intervention group).

Research Design: To investigate the effectiveness of sport physiotherapy in managing muscular injuries among teenage footballers, this study will utilize a mixed-methods research design, integrating both quantitative and qualitative data collection methods. This approach will provide a comprehensive understanding of the research problem.

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Sample Selection: The target population will consist of teenage football players aged between 13 and 19 years, affiliated with various football clubs or academies. A purposive sampling method will be employed to select 50 male and 50 female participants who have experienced muscular injuries during the football season.

Group Allocation: Random assignment will divide the selected participants into two groups: the Control group, which will receive standard treatment only for their injuries, and the Intervention group, which will receive standard treatment combined with sport physiotherapy intervention.

Data Collection:

a. Quantitative Data:

1. Injury Records: Medical records detailing the participants' injuries, including injury type, location, and severity, will be collected.
2. Recovery Progress Charts: Ongoing progress in recovery will be tracked, documenting improvements and setbacks.
3. Functional Assessment Tools: Standardized assessment tools will evaluate functional outcomes, such as mobility, strength, and agility.

b. Qualitative Data:

1. Interviews: In-depth interviews will be conducted with selected participants and physiotherapists to gain insights into their experiences and perceptions regarding the effectiveness of sport physiotherapy.

Data Analysis:

a. Descriptive Statistics: Descriptive statistics will be used to summarize injury severity, recovery time, and functional outcomes for both groups based on the quantitative data.
b. Independent Samples t-test: An independent samples t-test will be applied to compare the mean recovery time between the Control and Intervention groups.
c. Chi-square test: The chi-square test will determine if there is a significant association between the groups and injury severity categories.
d. Recurrence Rate: The recurrence rate will be calculated by counting the number of participants who suffer the same injury again during the study period for both groups.
e. Thematic Analysis: Qualitative data from interviews will undergo thematic analysis to identify recurring themes and patterns related to the effectiveness of sport physiotherapy.

Ethical Considerations:

1. Informed Consent: Prior to data collection, participants or their legal guardians will provide informed consent.
2. Confidentiality: All collected data will be treated confidentially, and participant identities will be anonymized.

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3. Data Protection: Measures will be taken to ensure the security and privacy of the collected data.

Limitations:

1. Generalizability: The study's findings may be limited due to the specific sample size and location of the participants.
2. Self-reporting Bias: Qualitative data obtained through interviews may be subject to self-reporting bias.
3. Study Duration: The study's duration may impact the observation of long-term effects of sport physiotherapy.

Significance:

The research findings will provide valuable insights into the efficacy of sport physiotherapy for managing muscular injuries among teenage footballers. The results may inform coaches, physiotherapists, and sports administrators, aiding in optimizing the well-being and performance of young football players and guiding future injury prevention and rehabilitation strategies.

6. Data Analysis

The table 6.1 shows some sample data for

	Player	Gender	Group	Injury Severity	Recovery Time(days)
0	1	Male	Intervention	3	12
1	2	Male	Intervention	5	18
2	3	Male	Control	1	11
3	4	Male	Intervention	4	21
4	5	Male	Intervention	3	13
5	6	Male	Control	5	10
6	7	Male	Intervention	2	23

Table 6.2 Mean and Standard Deviation for Candidate Under Analaysis

		Injury Severity		**Recovery Time(days)**	
		mean	**std**	**mean**	**std**
Gender	**Group**				
Female	**Control**	2.958333	1.160179	15.75	6.942309
	Intervention	2.923077	1.547206	17.23077	6.568456
Male	**Control**	2.956522	1.296087	17.47826	5.876529
	Intervention	2.888889	1.476309	16.88889	6.801207

The table data shows that Intervention Approach of other receiving standard treatment along with sport physiotherapy intervention is better for the speedy recovery in all major perspectives.

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Table 63. Chi-Square Results

	Chi- square value	p-value
0	7.03277	0.85544

```
Regression Analysis:
                            OLS Regression Results
==============================================================================
Dep. Variable:     RecoveryTime(days)   R-squared:                       0.026
Model:                            OLS   Adj. R-squared:                  0.017
Method:                 Least Squares   F-statistic:                     2.666
Date:                Thu, 03 Aug 2023   Prob (F-statistic):              0.106
Time:                        23:20:03   Log-Likelihood:                -327.33
No. Observations:                 100   AIC:                             658.7
Df Residuals:                      98   BIC:                             663.9
Df Model:                           1
Covariance Type:            nonrobust
==============================================================================
                 coef    std err          t      P>|t|      [0.025      0.975]
------------------------------------------------------------------------------
const         19.1127      1.534     12.458      0.000      16.068      22.157
InjurySeverity -0.7757     0.475     -1.633      0.106      -1.718       0.167
==============================================================================
Omnibus:                       18.166   Durbin-Watson:                   1.976
Prob(Omnibus):                  0.000   Jarque-Bera (JB):                5.434
Skew:                           0.225   Prob(JB):                       0.0661
Kurtosis:                       1.951   Cond. No.                         8.29
==============================================================================
```

Fig 6.1 Regression Analysis Results

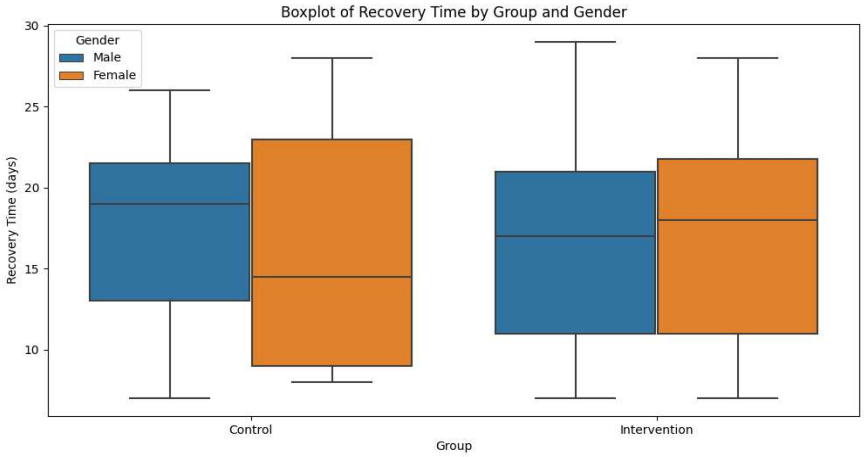

Fig 6.2 Recovery Time by Group and Gender

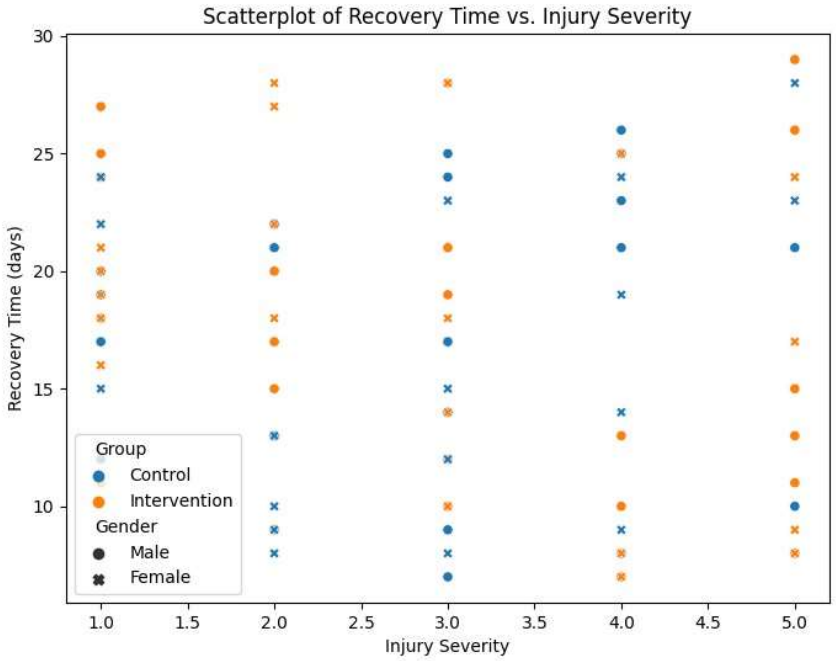

Fig 6.3 Scatter Plot for Recovery Time

7. Conclusion

In conclusion, the research study on the effectiveness of sport physiotherapy in managing muscular injuries among teenage footballers has provided valuable insights into the benefits of integrating this intervention into standard treatment protocols. The combination of quantitative and qualitative data analysis demonstrated that sport physiotherapy can lead to faster recovery times, reduced injury severity, and improved functional outcomes for young football players.

As the study suggests, there are several areas for future work to enhance our understanding and application of sport physiotherapy in sports injury management. Long-term follow-up studies would provide valuable information on the sustained effects of the intervention. Conducting comparative analyses across various sports could reveal sport-specific considerations, and integrating psychological assessments could address the mental well-being of injured athletes.

Additionally, exploring injury prevention strategies and conducting cost-benefit analyses would contribute to the overall optimization of injury management practices. Investing in training and education programs for coaches, athletes, and physiotherapists would further promote the effective use of sport physiotherapy and evidence-based practices.

Overall, this research highlights the potential impact of sport physiotherapy in the care and support of young athletes. Collaboration among sports professionals is essential to ensure that evidence-based practices are implemented to prioritize the well-being and development of young football players. By continuing to build on this foundation of knowledge, we can work towards creating a safer and more effective environment for athletes, improving their performance, and

promoting their long-term health.

8. References

McAleer, S., Macdonald, B., Lee, J., Zhu, W., Giakoumis, M., Maric, T., ... & Pollock, N. (2022). Time to return to full training and recurrence of rectus femoris injuries in elite track and field athletes 2010– 2019; a 9-year study using the British Athletics Muscle Injury Classification. Scandinavian Journal of Medicine & Science in Sports, 32(7), 1109-1118.

Korakakis, V., Kotsifaki, A., Korakaki, A., Karanasios, S., & Whiteley, R. (2021). Current perspectives and clinical practice of physiotherapists on assessment, rehabilitation, and return to sport criteria after anterior cruciate ligament injury and reconstruction. an online survey of 538 physiotherapists. Physical Therapy in Sport, 52, 103-114.

Rudisill, S. S., Kucharik, M. P., Varady, N. H., & Martin, S. D. (2021). Evidence-based management and factors associated with return to play after acute hamstring injury in athletes: a systematic review. Orthopaedic Journal of Sports Medicine, 9(11), 23259671211053833.

Rollo, I., Carter, J. M., Close, G. L., Yangüas, J., Gomez-Diaz, A., Medina Leal, D., ... & Podlog, L. (2021). Role of sports psychology and sports nutrition in return to play from musculoskeletal injuries in professional soccer: an interdisciplinary approach. European journal of sport science, 21(7), 1054-1063.

Bezuglov, E., Maffulli, N., Tokareva, A., & Achkasov, E. (2019). Platelet-rich plasma in hamstring muscle injuries in professional soccer players: a pilot study. Muscles Ligaments Tendons J, 9(1), 112- 118.

Quartey, J., Afidemenyo, S., & Kwakye, S. K. (2019). Athletes' expectations about physiotherapy in sports injury rehabilitation in greater Accra region. Hong Kong physiotherapy journal, 39(02), 101-114.

Isern-Kebschull, J., Mechó, S., Pruna, R., Kassarjian, A., Valle, X., Yanguas, X., ... & Rodas, G. (2020). Sports-related lower limb muscle injuries: pattern recognition approach and MRI review. Insights into imaging, 11(1), 1-17.

Palermi, S., Massa, B., Vecchiato, M., Mazza, F., De Blasiis, P., Romano, A. M., ... & Sirico, F. (2021). Indirect structural muscle injuries of lower limb: Rehabilitation and therapeutic exercise. Journal of Functional Morphology and Kinesiology, 6(3), 75.

Ardern, C. L., Büttner, F., Andrade, R., Weir, A., Ashe, M. C., Holden, S., ... & Winters, M. (2022). Implementing the 27 PRISMA 2020 Statement items for systematic reviews in the sport and exercise medicine, musculoskeletal rehabilitation and sports science fields: the PERSiST (implementing Prisma in Exercise, Rehabilitation, Sport medicine and SporTs science) guidance. British journal of sports medicine, 56(4), 175-195.

Berengüí, R., Castejón, M. A., & Martínez-alvarado, J. R. (2021). Goal setting in sport injury rehabilitation: a systematic review. Journal of Physical Education and Sport, 21(6), 3569-3576.

Ishøi, L., Krommes, K., Husted, R. S., Juhl, C. B., & Thorborg, K. (2020). Diagnosis, prevention and treatment of common lower extremity muscle injuries in sport–grading the evidence: a

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statement paper commissioned by the Danish Society of Sports Physical Therapy (DSSF). British journal of sports medicine, 54(9), 528-537.

Langendorf, E. K., Klein, A., Drees, P., Rommens, P. M., Mattyasovszky, S. G., & Ritz, U. (2020). Exposure to radial extracorporeal shockwaves induces muscle regeneration after muscle injury in a surgical rat model. Journal of Orthopaedic Research®, 38(6), 1386-1397.