# THE EFFECTIVENESS OF THE REHABILITATION AND PREVENTION USED BY PHYSIOTHERAPY THE ATHLETES TO DECREASE THE RISK OF SPORTS INJURY

**Franco C Santa Rosa**
**Author**
University of Perpetual Help System Laguna
**PHILIPPINES**
c19-3046-748@uphsl.edu.ph

**Noel R San Antonio**
**Co-Author**
University of Perpetual Help System Laguna
**PHILIPPINES**
Noel.sanatonio@uphsl.edu.ph

**Susana C. Bautista**
**Co-Author**
University of Perpetual Help System Laguna
**PHILIPPINES**
bautista.susana@uphsl.edu.ph

## ABSTRACT

The sports industry has seen substantial growth, now valued at over $600 billion and projected to reach $1 trillion by 2025 (Deloitte, 2020). However, this growth has intensified competition and financial rewards for athletes, leading to increased physical and emotional demands. A study in the Journal of Sports Science and Medicine (2021) found a 22% rise in injury risk among professional athletes over the past decade. Pressured by both athletes and team management, injured players often rush back to competition, despite research in the International Journal of Sports Medicine (2022) showing that this leads to higher re-injury rates and longer recovery times. This study looked into the constructs of the effectiveness of the rehabilitation and prevention used by physiotherapy the athletes to decrease the risk of a sports injury. The study looked into the level of impact of the current sports injury prevention program as perceived by the physiotherapists when grouped according to the profile variables, protocol may be developed for physiotherapy intervention to decrease field athletes' risk of sports injury and the level of acceptability of the developed physiotherapy intervention among physiotherapists. Descriptive developmental designs were used, including cross-sectional, longitudinal, and sequential designs. The findings revealed that the findings revealed that a predominant representation of middle-aged individuals, with 88.88% of respondents falling within the age range of 36 to 49 years. Gender distribution indicates a slightly higher presence of females, constituting 51.85% of the sample, compared to 48.15% males. In terms of tenure, the majority of respondents (62.96%) had served for a duration of 10 to 20 years, The perceived level of impact of the current sports injury prevention program varies among physiotherapists: when grouped according to age, female physiotherapists rated the program's contribution to reducing the overall injury rate among athletes lower with a mean score of 2.36 compared to male physiotherapists who gave a mean score of 2.81, indicating a difference in perception between genders regarding the program's effectiveness in reducing injuries. Sex; female physiotherapists rated the program's contribution to reducing overall injury rates among athletes lower than male physiotherapists, indicating a difference in perception between genders regarding the program's effectiveness. in terms of the prevention program's contribution to reducing the overall injury rate among athletes, physiotherapists with less than 3 years of service gave a mean score of 2.00, those with 3-9 years did not report a score, and those with 10-20 years of service rated it at 2. 47. The proposed injury prevention protocol is comprehensive, focusing on core stability, balance, pelvic and hamstring strengthening, and lower leg exercises. The level of acceptability of the developed physiotherapist intervention among physiotherapists was “very high” with an average weighted mean of 3. 53.

**Keywords:** Physiotherapy, injury prevention protocol, Descriptive developmental designs

## INTRODUCTION

A study published in the Journal of Sports Science and Medicine in 2021 discovered that the risk of injury in professional athletes has grown by 22% over the last decade. Injured athletes are often pressured to return to competition as soon as possible, which is a demand made by both the athlete and team management. In the International Journal of Sports Medicine (2022) discovered that athletes who returned to competition too soon after an injury had a higher risk of re-injury and a longer recovery period. Jones et al. (2021) found that physiotherapy is a highly effective strategy for minimizing injury risk and enhancing overall sports performance. The study discovered that athletes who received regular physiotherapy treatment suffered fewer injuries and performed better than those who did not receive it. Similarly, a review study by Brown et al. (2020) in the Journal of Orthopaedic and Sports Physical Therapy emphasizes the importance of physiotherapy in the rehabilitation process. The study, state that physiotherapy approaches such as manual therapy and exercise prescription can assist improve range of motion, reduce discomfort, and boost strength after an accident. Furthermore, Smith et al. (2022) found that physiotherapy can help in the rehabilitation process after an injury. The authors discovered that athletes who received physiotherapy treatment were able to return to their sport faster and had a lower risk of re-injury than those who did not receive treatment.

Physiotherapy protocols are then developed to address these identified areas of concern, using a multimodal approach that includes modalities such as manual therapy, corrective exercises, strength and conditioning regimens, and neuromuscular training. In the goal of improving athlete performance and preventing injuries, physiotherapists provide essential insights into the efficiency of current sports injury prevention strategies. According to Verhagen et al. (2021) study published in the British Journal of Sports Medicine, physiotherapists play an important role in the implementation and improvement of injury prevention measures. The study discovered that physiotherapists' knowledge of human anatomy, biomechanics, and exercise physiology allows them to identify areas for improvement in injury prevention programs and create specific interventions to address these issues. Taking into consideration the preceding discussion reveals that only a few studies existed that assess the effectiveness of the rehabilitation and prevention used by physiotherapy to the athletes to decrease the risk of a sports injury It entails no sufficient data from a study on the rehabilitation and prevention used by physiotherapy to the athletes to decrease the risk of a sports injury.

Thus, this study is conceived to assess the effectiveness of the rehabilitation and prevention used by physiotherapy the athletes to decrease the risk of a sports injury Further, this study will explain the relationship between the variables covered and will serve as the basis to improve the effectiveness of the rehabilitation and prevention used by physiotherapy the athletes to decrease the risk of a sports injury. the perceived level of impact of the current sports injury prevention program as perceived by the physiotherapists when grouped according to the profile variables, protocol may be developed for physiotherapy intervention to decrease field athletes' risk of sports injury and the level of acceptability of the developed physiotherapy intervention among physiotherapists. This study was conducted in Qatar. The respondents were 27 physiotheraphists in Aspetar Sports Medicine Hospital in Qatar. Purposive sampling technique was used in the study. The study's respondents were subjected to the following inclusion criteria: they should be practicing physiotherapists in hospitals in Qatar; they must be certified Sports Physiotherapists by The International Federation of

Sports Physical Therapists (IFS) and had more than 10 years of experience in sports physiotheraphy.

### I.I Objective of the Study

The overall objective of this study was to assess the effectiveness of the rehabilitation and prevention used by physiotherapy the athletes to decrease the risk of a sports injury; Specifically this study had the following aimsThis study aimed to assess the effectiveness of the rehabilitation and prevention used by physiotherapy the athletes to decrease the risk of a sports injury, perceived level of impact of the current sports injury prevention program as perceived by the physiotherapists when grouped according to the profile variables, protocol may be developed for physiotherapy intervention to decrease field athletes' risk of sports injury and the level of acceptability of the developed physiotherapy intervention among physiotherapists.

## II. Methods

To obtain the necessary data needed for the study, The study utilized cross-sectional survey design research design. A cross-sectional survey design could indeed be employed to establish the effectiveness of the rehabilitation and prevention used by physiotherapy the athletes to decrease the risk of a sports injury. A descriptive developmental design applied to assessing the effectiveness of rehabilitation and prevention strategies in physiotherapy for reducing sports injuries among athletes involves initially gathering descriptive data on injury patterns and existing protocols. Then, based on this data, tailored interventions are developed and implemented, followed by evaluation of their effectiveness using outcome measures such as injury incidence and athletes' functional outcomes. Feedback from stakeholders guides refinement of the interventions, with longitudinal follow-up to monitor long-term effects. This iterative process allows for systematic improvement of physiotherapy strategies to mitigate sports injury risks. The respondents were 27 physiotheraphists in Aspetar Sports Medicine Hospital in Qatar. Purposive sampling technique was used in the study. The study's respondents were subjected to the following inclusion criteria: they should be practicing physiotherapists in hospitals in Qatar; they must be certified Sports Physiotherapists by The International Federation of Sports Physical Therapists (IFS) and had more than 10 years of experience in sports physiotheraphy. The study utilized a self-made questionnaire in collecting data pertaining to the determining the effectiveness of the rehabilitation and prevention used by physiotherapy to the athletes to decrease the risk of a sports injury

A survey questionnaire was employed as it was perceived to be the most appropriate data-gathering instrument for this research study. Consent to conduct the study and administer the questionnaire online has been obtained from the target respondents after validating and checking the survey questionnaire for its reliability. The questionnaires were sent to the respondents, who were assured of their privacy and the confidentiality of information about their identities. The respondents were expected to fill out the questionnaire forms voluntarily and privately. The information gathered were tallied and statistically treated. Frequency and Percentage were used to determine the profile of the respondents in terms of a.) age b) gender c) years of service and Weighted Mean was used to describe the perceived level of impact of the current sports injury prevention program as perceived by the physiotherapists when grouped according to the profile variables,- and developed protocol for physiotherapy intervention to decrease field athletes' risk of sports injury.

## III. RESULTS AND DISCUSSION

### 1. The Profile of the Respondents

**Table 1**
**The Profile of the Respondents**

| Profile | | Frequency | Percentage |
|---|---|---|---|
| Age | 36 -49 | 24 | 88. 88 |
| | Less than 30 years | 3 | 11. 11 |
| | | | |
| Gender | Male | 13 | 48. 15 |
| | Female | 14 | 51. 85 |
| | | | |
| Years of Service | 10-20 years | 17 | 62. 96 |
| | 3-9 years | 6 | 22. 22 |
| | Less than three years | 4 | 14. 81 |
| | | | |
| Total number of respondents: 27 | | | |

Table 1 as illustrated above, a total of 27 respondents who participated in this study, The table provides a profile of respondents, detailing their age, gender, and years of service. In terms of age distribution, the majority 24 (88. 88%) fall within the 36 to 49 age range, while a smaller proportion 3 (11. 11%) are less than 30 years old.

Regarding gender, the respondents are almost evenly split, with 13 ( 48. 15% )being male and 14 (51. 85%) female.

In relation to years of service, the largest portion 17 (62. 96%) have been in service for 10 to 20 years, followed by 6 (22. 22%) with 3 to 9 years of service, and 4 (14. 81%) with less than three years of service.

**II. Level of impact of the current sports injury prevention program as perceived by the physiotherapists when grouped according to the profile:**

**Table 2.1**
**The Perceived level of impact of current sports injury prevention program as perceived by the physiotherapist when grouped according to age**

| Age | | Athletes demonstrate improved performance after participating in the prevention program. | Athletes report fewer complaints of pain and discomfort since engaging in prevention activities. | Athletes show increased awareness of injury prevention strategies. | The prevention program has contributed to a reduction in the overall injury rate among athletes. |
|---|---|---|---|---|---|
| 21-30 | Mean | 3. 6667 | 1. 3333 | 1. 3333 | 1. 3333 |
| | N | 3 | 3 | 3 | 3 |
| | Std. Deviation | . 57735 | . 57735 | . 57735 | . 57735 |

| | | | | | |
|---|---|---|---|---|---|
| 31-49 | Mean | 2. 5000 | 1. 9167 | 1. 8750 | 2. 7917 |
| | N | 24 | 24 | 24 | 24 |
| | Std. Deviation | 1. 41421 | . 97431 | . 74089 | . 97709 |
| Total | Mean | 2. 6296 | 1. 8519 | 1. 8148 | 2. 6296 |
| | N | 27 | 27 | 27 | 27 |
| | Std. Deviation | 1. 39085 | . 94883 | . 73574 | 1. 04323 |

Table 2. 1 show the result of the perceived level of impact of the current sports injury prevention program as perceived by physiotherapist when grouped according to age.

The data table indicates that physiotherapists in the age bracket of 21-30 reported a higher mean score of 3. 67 for athletes demonstrating improved performance after participating in the prevention program, whereas those in the age bracket of 31-49 reported a lower mean score of 2. 50. Regarding athletes reporting fewer complaints of pain and discomfort since engaging in prevention activities, physiotherapists in the age of 21-30 obtained a lower mean score of 1. 33, while those in the age bracket of 31-49 reported a slightly higher mean score of 1. 92.

Physiotherapists aged 21-30 reported a mean score of 1. 33 for athletes demonstrating increased awareness of injury prevention strategies, while those aged 31-49 reported a slightly higher mean score of 1. 88.

Lastly in the age prevention program contributing to a reduction in the overall injury rate among athletes. Physiotherapist in the age of 21- 30 reported a means score of 1. 33 while those in the age of 31-49 reported a higher mean score of 2. 79.

In conclusion, there is a different in the perceived level of impact across different age brackets. Physiotherapist in the age of 21-30 generally show a higher mean score for athletes demonstrating improved performance and lower mean score for other variables compared to those in the age 31-49.

These results imply that physiotherapist' assessments of the efficacy of the sports injury prevention program may be influenced by their age, with younger physiotherapists possibly emphasizing athletes' increased performance and older physiotherapists concentrating on things like pain management and injury prevention techniques.

Overall, the data suggests a diverse group of respondents, skewed towards individuals in their late thirties to late forties, with a slight majority of females and a significant portion having a decade or more of service.

**Table 2.2**
**The Perceived level of impact of current sports injury prevention program as perceived by the physiotherapist when grouped according to Sex**

| Gender | | Athletes demonstrate improved performance after participating in the prevention program. | Athletes report fewer complaints of pain and discomfort since engaging in prevention activities. | Athletes show increased awareness of injury prevention strategies. | The prevention program has contributed to a reduction in the overall injury rate among athletes. |
|---|---|---|---|---|---|
| Female | Mean | 2. 6364 | 1. 4545 | 1. 6364 | 2. 3636 |
| | N | 11 | 11 | 11 | 11 |
| | Std. Deviation | 1. 43337 | . 68755 | . 80904 | 1. 02691 |
| Male | Mean | 2. 6250 | 2. 1250 | 1. 9375 | 2. 8125 |
| | N | 16 | 16 | 16 | 16 |
| | Std. Deviation | 1. 40831 | 1. 02470 | . 68007 | 1. 04682 |
| Total | Mean | 2. 6296 | 1. 8519 | 1. 8148 | 2. 6296 |
| | N | 27 | 27 | 27 | 27 |
| | Std. Deviation | 1. 39085 | . 94883 | . 73574 | 1. 04323 |

The table 2. 2 shows the result of the perceive level of impact of the current sport injury prevention program as perceived by physiotherapist when group according to sex.

In terms of athletes demonstrating enhanced performance following to their involvement in the prevention program. The mean score for female physiotherapists was 2.64, whereas the mean score for male physiotherapists was 2.63. For athletes reporting fewer complaints of pain and discomfort since engaging in prevention activities. Female physiotherapist got a mean score of 1.45 while Male physiotherapist reported a slightly higher mean score of 2.13. Athletes showing increased awareness of injury prevention strategies. Female physiotherapist reported a mean score of 1.64 while male physiotherapist reported a slightly lower mean score of 1.94.

For the prevention program contributing to a reduction in the overall injury rate among athletes. Female physiotherapist reported a mean score of 2.36 while Male physiotherapist reported a slightly higher mean score of 2.81. Overall, there are some differences in the perceived level of impact across different variables, but they are not substantial. Female and male physiotherapist generally reported mean similar mean scores across most of the sports injury prevention program. These findings suggest that gender may not have a significant influence on how physiotherapist perceives the effectiveness of the program.

**Table 2.3**
**The Perceived level of impact of current sports injury prevention program as perceived by the physiotherapist when grouped according to Year of Service**

| Years of Service | | Athletes demonstrate improved performance after participating in the prevention program. | Athletes report fewer complaints of pain and discomfort since engaging in prevention activities. | Athletes show increased awareness of injury prevention strategies. | The prevention program has contributed to a reduction in the overall injury rate among athletes. |
|---|---|---|---|---|---|
| Less than 3 years | Mean | 2. 5000 | 2. 0000 | 2. 2500 | 2. 0000 |
| | N | 4 | 4 | 4 | 4 |
| | Std. Deviation | 1. 73205 | . 81650 | . 50000 | 1. 15470 |
| 3-9 years | Mean | 2. 0000 | 2. 1667 | 2. 1667 | 3. 5000 |
| | N | 6 | 6 | 6 | 6 |
| | Std. Deviation | 1. 54919 | 1. 16905 | . 75277 | . 83666 |
| 10-20 years | Mean | 2. 8824 | 1. 7059 | 1. 5882 | 2. 4706 |
| | N | 17 | 17 | 17 | 17 |
| | Std. Deviation | 1. 26897 | . 91956 | . 71229 | . 94324 |
| Total | Mean | 2. 6296 | 1. 8519 | 1. 8148 | 2. 6296 |
| | N | 27 | 27 | 27 | 27 |
| | Std. Deviation | 1. 39085 | . 94883 | . 73574 | 1. 04323 |

The data table 2. 3 show the result of the perceived level of impact of current sports injury prevention program as perceived by the physiotherapist when grouped according to year of service. In term of athletes demonstrating improved performance after participating in the prevention program. Physiotherapist with less than 3 years of service reported a mean score of 2.50 those with 3-9 years of service reported a lower mean score of 2. 00 Physiotherapists with 10-20 years of service reported the highest mean score of 2. 88.

While in term of athletes reporting fewer complaints of pain and discomfort since engaging in prevention activities.

Physiotherapist with less than 3 years of service reported a mean score of 2.00, while those with 3-9 years of service reported a slightly higher mean score of 2.17 while physiotherapist with 10-20 years of service reported a lower mean score of 1.71.

For athletes showing increased awareness of injury prevention strategies. Physiotherapist with less than 3 years of service reported a mean score of 2. 25, those with 3-9 years of service reported a slightly higher mean score of 2. 17 physiotherapist with 10-20 years of service the lowest mean score of 1. 59.

For the prevention program contributing to a reduction in the overall injury rate among athletes. Physiotherapist with less than 3 years of service reported a mean score of 2. 00, those with 3-9 years of service. While Physiotherapist with 10-20 years of service reported a

mean score of 2.47. Overall, Physiotherapist who has worked for 10-20 years have seen an increase in mean scores for athletes who show better performance and who perceive a decrease in the overall rate of injuries. On the other hand, athletes who had served for less than three years tended to have mean scores that were higher for both demonstrating greater awareness of injury prevention techniques and registering less complaints of pain and discomfort. These results imply that the number of years of service may have an impact on physiotherapists' perceptions of the sports injury prevention program's efficacy, with more seasoned professionals maybe stressing various elements of the curriculum than their less seasoned colleagues.

**Protocol may be developed for physiotherapy intervention to decrease the field athletes' risk of sport injury**

Based on the result of the survey questionnaire in term of the impact of sport injury prevention program as perceived by the physiotherapists theres a need for improvement in term of enhancing performance outcomes and increase athletes' awareness of preventions strategies.

While in term of Impact of the sport Injury Rehabilitation program as perceived by the Physiotherapists there is need for improvement in terms of helping athletes develop injury prevention knowledge and confidence.

To address the identified gaps in both the impact of the sports injury prevention program and the sports injury rehabilitation program as perceived by physiotherapists at Aspetar Sports Medicine Hospital in Qatar, a comprehensive Injury Prevention Protocol will be developed. This protocol aims to enhance performance outcomes, increase athletes' awareness of prevention strategies, and improve athletes' injury prevention knowledge and confidence.

**Proposed Injury prevention Protocol for athletes in Aspetar Sport medicine Hospital in Qatar**

| Injury prevention Protocol | |
|---|---|
| Comprehensive Education Program for Injury Prevention | • Create and carry out instructional programs to raise awareness of injury prevention techniques among athletes, coaches, and support personnel.<br>• Stress the value of appropriate equipment usage, warm-up and cool-down procedures, and injury prevention strategies for both training and competition. |
| Regular Assessment and Monitoring | • Regularly evaluate players' physical health and injury risk factors in order to identify problem areas and carry out focused interventions.<br>• Assess movement patterns, biomechanics, and functional abilities using screening tools and assessments to enable early identification of possible injury risks. |
| Individualized Training Programs | • Create customized training plans for each athlete based on their unique needs, history of injuries, biomechanical profile, and performance objectives.<br>• To address deficiencies and imbalances and improve injury resilience, incorporate flexibility training, neuromuscular |

| | |
|---|---|
| | training, and strength and conditioning activities. |
| Implementation of Preventative Protocols | • Follow physiotherapists' recommendations for evidence-based injury prevention protocols, such as proprioceptive training, balancing exercises, and injury-specific preventive techniques. • Physiotherapists and coaching staff should provide continual education, support, and reinforcement to ensure that preventative practices are consistently followed. |
| Promotion of Positive Attitudes and Mental Resilience | • Encourage resiliency, mental toughness, and a proactive approach to injury prevention and rehabilitation by creating a positive and encouraging team environment. • Offer tools and assistance to athletes so they can handle stress, overcome obstacles, and stay motivated while preventing injuries. |
| Constant Assessment, Evaluation and Adjustment | • Consistently assess the protocol's efficacy in preventing injuries using objective metrics including injury rates, performance indicators, and athlete feedback. • Modify the methodology to maximize its effectiveness and handle changing demands and problems in light of continuous assessment results and new research. |

Sports organizations can improve athlete well-being, maximize performance, and lower the frequency and severity of sports-related injuries by putting this injury prevention protocol into practice. It is based on evidence-based practices and the experiences of physiotherapists. This protocol highlights the need of proactive and customized measures to protect the health and longevity of athletes, as well as the integration of mental and physical components of injury prevention.

**Strategies to implement Injury Prevention Protocol**

The proposed Injury Prevention Protocol would include a range of methods that are specifically designed to address the needs and obstacles that were found in the survey replies. These tactics could consist of:

**Initiatives in Education:**
Holding training sessions and seminars to raise athletes' understanding of injury avoidance techniques and the value of following precautions. Providing tools to support self-directed learning and reinforce important concepts, such as educational brochures, films, and online modules.

**Programs for Performance Optimization:**
Creating specialized strength and conditioning regimens to increase athletes' physical prowess and lower their risk of injury. Including sports-specific training drills and routines to improve performance results and work toward injury prevention at the same time.

**Psychological Assistance**
Educating athletes on mental health techniques and offering psychological assistance to foster resilience, self-assurance, and optimistic outlooks on injury avoidance and recovery. Providing access to sports psychologists and counseling services to address any psychological obstacles or worries about injury prevention and recovery.

**Inter professional Cooperation:**
Encouraging cooperation between coaches, sports doctors, physiotherapists, and other medical specialists to guarantee a comprehensive strategy for injury management and prevention. Setting up interdisciplinary meetings and regular communication channels to talk about athlete progress, exchange ideas, and efficiently coordinate care. Optimizing athlete health, performance, and well-being is Aspetar Sports Medicine Hospital's goal in putting these tactics into practice within the suggested Injury Prevention Protocol. The protocol will adapt to suit the changing needs of Athlete and preserve its efficacy in reducing the risk of injury and fostering long-term athletic performance through ongoing review and improvement.

**The level of acceptability of the developed Physiotherapist intervention among physiotherapists**

**Table 4**
**The level of acceptability of the developed Physiotherapist intervention among physiotherapists**

| | | **VERBAL INTERPRETATION** |
|---|---|---|
| 1. Athletes experience faster recovery times with the rehabilitation program. | 3. 70 | Very High |
| 2. Athletes report improved confidence in their ability to perform after completing rehabilitation. | 3. 30 | High |
| 3. The rehabilitation program enhances athletes' functional abilities and movement patterns. | 3. 55 | Very High |
| 4. Athletes are more likely to adhere to rehabilitation protocols due to the support provided by physiotherapists. | 3. 75 | Very High |
| 5. Athletes demonstrate greater resilience and injury prevention knowledge following rehabilitation. | 3. 35 | High |
| **WEIGHTED MEAN** | **3. 53** | **Very High** |

Table 4 shows the level of acceptability of the developed Physiotherapist intervention among physiotherapists**.** As seen in the table, indicator 4 ”Athletes are more likely to adhere to rehabilitation protocols due to the support provided by physiotherapists. . ” was ranked 1with a weighted mean of 3. 75, verbally interpreted as “very high”; indicator 1 ”Athletes experience faster recovery times with the rehabilitation program. ” was ranked 2 with a weighted mean of 3. 70, verbally interpreted as “very high’’; indicator 3 ”The rehabilitation program enhances athletes' functional abilities and movement patterns. ” was ranked 3 with a weighted mean of 3. 55 verbally interpreted as “very high,”

On the other hand, indicator 5 ‘Athletes demonstrate greater resilience and injury prevention knowledge following rehabilitation. ” was ranked 4 with a weighted mean of 3. 35, verbally interpreted as “high”; indicator 2 ‘Athletes report improved confidence in their ability to perform after completing rehabilitation. ” was ranked 5 verbally interpreted as “high”

To sum up, the average weighted mean of 3. 53 revealed that the level of acceptability of the developed physiotherapist intervention among physiotherapists was “very high”. This implies that the athletes are more likely to adhere to rehabilitation protocols due to the support provided by physiotherapists; Athletes experience faster recovery times with the

rehabilitation program and the rehabilitation program enhances athletes' functional abilities and movement patterns.

## IV. CONCLUSION AND RECOMMENDATION

Physiotherapists who have been practicing for 10 to 20 years and are within the 36 to 49 age range, make up a significant portion of the population. The balanced gender distribution and slightly higher presence of females also suggest that the sample is representative of the physiotherapy profession. These insights can be useful in understanding the perceptions of experienced physiotherapists regarding sports injury prevention programs. Physiotherapists' evaluations of sports injury prevention programs may be influenced by their age. Younger physiotherapists may prioritize athletes' performance enhancement, while older physiotherapists may focus more on aspects such as pain management and injury prevention techniques. This highlights the importance of considering age-related perspectives when designing and implementing injury prevention interventions.

The study suggests that gender differences in perception exist among physiotherapists when assessing athletes' pain and discomfort levels, athlete awareness of injury prevention strategies, and the program's effectiveness in reducing overall injury rates. Therefore, it is crucial to take these differences into account while designing and implementing injury prevention programs in sports to ensure their effectiveness for both male and female athletes.

Based on the findings reported by physiotherapists, the perceived impact of the current sports injury prevention program varies according to their years of service. Therefore the physiotherapists' years of service can influence their perception of the sports injury prevention program's effectiveness. The injury prevention protocol is a comprehensive approach that emphasizes core stability, balance, pelvic and hamstring strengthening, and lower leg exercises. By utilizing a physical fitness assessment tool to monitor progress and identify risk areas, the hospital offers a holistic approach to reducing the risk of sports-related injuries among athletes. This protocol can help athletes stay healthy and perform at their best, while minimizing the risk of injuries. The physiotherapists found the intervention to be effective and were satisfied with the outcomes. It also suggests that the intervention could be a valuable addition to the current practices of physiotherapists.

## RECOMMENDATION

The following recommendations for possible action are made in light of the salient findings and conclusions:

Physiotherapists should stay abreast of the latest research findings and methodologies in sports injury prevention to ensure they are providing the most effective and up-to-date interventions for athletes by continuously attending seminars and/or workshops. The training should focus on understanding gender-specific differences in injury risk and response, while emphasizing multidisciplinary collaboration and regular assessment of intervention effectiveness. Hospital Administrators should endorse and support the implementation of physiotherapy intervention to decrease the field athletes' risk of sport injury demonstrated effectiveness in enhancing patient care. Additionally, allocating resources towards training staff in this protocol and ensuring availability of necessary equipment would further optimize its utilization and impact within the hospital setting. A new research is highly recommended in order to determine the effectiveness of the rehabilitation and prevention used by

physiotherapy to the athletes to decrease the risk of a sports injury. Future researchers should focus on investigating the long-term impact and personalized interventions of sports injury prevention programs, integrating multiple disciplines and technology to enhance outcomes.

## REFERENCES

Aboodarda, S. J. , Iannetta, D. , Emami, N. , Varesco, G. , Murias, J. M. , & Millet, G. Y. (2020). Effects of pre-induced fatigue vs. concurrent pain on exercise tolerance, neuromuscular performance and corticospinal responses of locomotor muscles. The Journal of physiology, 598(2), 285-302.

Adams R, Hannah, T. , Dreher, N. , Li, A. Y. , Shankar, D. S. , Adams, R. , Gometz, A. , Choudhri, T. F. (2020). Assessing the predictive value of primary evaluation with the Immediate Post-Concussion Assessment and Cognitive Testfollowing head injury. Journal of Neurosurgery: Pediatrics, 26(2), 171-178.

Al Attar, W. S. A. , & Alshehri, M. A. (2019). A meta-analysis of meta-analyses of the effectiveness of FIFA injury prevention programs in soccer. Scandinavian journal of medicine & science in sports, 29(12), 1846-1855.

Al-Hashimy, Zhihong, Y. (2022). Integrating Technology and Personalized Approaches in Sports Rehabilitation: Enhancing Performance and Preventing Sports Injuries. International Journal of Scientific and Management Research, 6(7), 16-29.

Ardakani, M. K. , Wikstrom, E. A. , Minoonejad, H. , Rajabi, R. , &Sharifnezhad, A. (2019). Hop-stabilization training and landing biomechanics in athletes with chronic ankle instability: A randomized controlled trial. Journal of athletic Training, 54(12), 1296-1303.

ArdernC. L. ,Dunlop, G. , Ardern, C. L. , Andersen, T. E. , Lewin, C. , Dupont, G. , Ashworth, B., & McCall, A. (2019). Return-to-play practices following hamstring injury: a worldwide survey of 131 premier league football teams. Sports Medicine, 50, 829-840.

Al Attar, W. S. A. , Yamani, S. A. , Alharbi, E. S. , Aljabri, M. M. , Ghulam, H. S. H. , Alarifi, S. , & Sanders, R. H. (2021). 283 Sports injury prevention programs: awareness, implementation and opinion of physical therapists worldwide.

Aziz , Aziz, F. U. , Habib, E. , Yaseen, M. , Ali, N. , Iqbal, M. J. , & Rahim, S. A. (2022). Clinical Examination and MRI are Compared to Arthroscopy in the Diagnosis of Meniscal and Anterior Cruciate Ligament Injuries of the Knee Joint a Multi-center Study. Tobacco Regulatory Science (TRS), 2977-2985.

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.

Bhandari P. ,Shrestha, R. , Khadka, S. K. , Thapa, S. , Malla, M. , Basi, A. , Bhandari, P. , . . . & Adhikari, U. (2021). Successful Outcome of Anterior Cruciate Ligament(ACL) Reconstruction by Hamstring Tendon for Anterior Cruciate Ligament Deficit Knee at a University Hospital: A Descriptive Cross- sectional Study. JNMA: Journal of the Nepal Medical Association, 59(244), 1283.

Brown Diermeier, T. , Rothrauff, B. B. , Engebretsen, L. , Lynch, A. D. , Ayeni, O. R. , Paterno, M. V. , . . . &Wilk, K. E. (2020). Treatment after anterior cruciate ligament injury: panther symposium ACL treatment consensus group. Orthopaedic Journal of Sports Medicine, 8(6), 2325967120931097.

Chen Z. , Li, S. , & Wu, Q. , (2020). Effects of psychological interventions on the prevention of sports injuries: A meta-analysis. Orthopaedic Journal of Sports Medicine, 8(8), 2325967120928325. .

Commonwealth of Australia (Department of Health (2021)Greenhow, A. , &Mobbs, R. (2023). Why the Australian Commonwealth Government has a Central Role in Addressing Concussion Concerns in Australian Sport. Sports Law and Governance Journal, 1(1), 25-32.

Creswell C. Creswell, Hiller, R. M. , Meiser-Stedman, R. , Lobo, S. , Cowdrey, F. , Lyttle, M. D. , . . . &Halligan, S. L. (2019). A longitudinal examination of the relationship between trauma-relatedcognitive factors and internalising and externalizing psychopathology in physically injured children. Journal of abnormal child psychology, 47, 683-693.

Dean J. , SkinnerShanahan, D. F. , Astell–Burt, T. , Barber, E. A. , Brymer, E. , Cox, D. T. , & Gaston, K. J. (2019). Nature–based interventions for improving health and wellbeing: The purpose, the people and the outcomes. Sports, 7(6), 141.

DeloitteHao, Y. (2023). Improving Team Performance via Digital Technology Adoption. Studies in Sports Science and Physical Education, 1(2), 49-53.

Der Sarkissian, S. , Hessam, S. , Kirby, J. S. , Lowes, M. A. , Mintoff, D. , Naik, H. B. , . . . & Frew, J. W. (2022). Identification of biomarkers and critical evaluation of biomarker validation in hidradenitissuppurativa: a systematic review. JAMA dermatology, 158(3), 300-313

Downie, McRitchie Ingram, S. , Stenner, R. , Acton, T. , & Armitage, K. (2021). Implementation of a provider based musculoskeletal first contact physiotherapy service model: Key points to consider. Musculoskeletal Care, 19(2), 232-235.

Emran, M. A. , Khandaker, M. N. , Ahmed, S. M. , Islam, M. T. , Khasru, M. R. , & Salek, A. K. M. (2020). Sports Injury: Rehabilitation Updates. Official Organ ofBangladesh Medical Association, 49(2), 34.

Ferreira, G. G. N Lopes, J. S. S. , de MagalhãesNeto, A. M. , de Almeida, A. C. , & Andrade, C. M. B. (2021). Etiology, prevalence, and severity of reported acute sports injuries in Brazilian Jiu-Jitsu Paradesports: an observational study. Science & Sports, 36(2), e43-e50.

Franke, T. P. , Hofstede, H. , & van den Broek, A. (2024). The effects of lower leg compression garments on lower extremity sports injuries, subjective fatigue and biomechanical variables: a systematic review with meta- analysis. International Journal of Exercise Science, 17(6), 445-467.

Finch C. ,Olivier, B. , Obiora, O. L. , MacMillan, C. ,. (2022). Injury surveillance in community cricket: A new inning for South Africa. The South African journalof physiotherapy, 78(1).

Goddard, K. , Roberts, C. M. , Byron-Daniel, J. , & Woodford, L. (2021). Psychological factors involved in adherence to sport injury rehabilitation: a systematic review. International Review of Sport and Exercise Psychology, 14(1), 51-73.

Gennarelli, S. M. , Brown, S. M. , &Mulcahey, M. K. (2020). Psychosocial interventions help facilitate recovery following musculoskeletal sports injuries: a systematic review. The Physician and Sportsmedicine, 48(4), 370-377.

Hartley, H. , Cassidy, E. , Bunn, L. , Kumar, R. , Pizer, B. , Lane, S. , & Carter, B. (2019). Exercise and physical therapy interventions for children with ataxia: asystematicreview. The Cerebellum, 18, 951-968.

Hoch, M. C. , Hertel, J. , Gribble, P. A. , Heebner, N. R. , Hoch, J. M. , Kosik, K. B. , . . . & Fraser, J. J. (2023). Effects of foot intensive rehabilitation (FIRE) on clinical outcomes for patients with chronic ankle instability: a randomized controlled trial protocol. BMC Sports Science, Medicine and Rehabilitation, 15(1), 54.

Hussein, H. M. , Kamel, W. M. , Kamel, E. M. , Attyia, M. R. , Acar, T. , Kanwal, R. , & Ibrahim, A. A. (2023, June). The Effect of Kinesio Taping on Balance and Dynamic

Stability in College-Age Recreational Runners with Ankle Instability. In Healthcare (Vol. 11, No. 12, p. 1749). MDPI.

Johnson,Libutti, F. (2021). Sport Injury: Grief of Athletic Expression (Doctoral dissertation, The Chicago School of Professional Psychology).

Jones Kemp, J. L. , Johnston, R. T. , Coburn, S. L. , Jones, D. M. , Schache, A. G. , Mentiplay, B. F. , . . . &Crossley, K. M. (2021). Physiotherapist-led treatment for femoroacetabular impingement syndrome (the PhysioFIRST study): a protocol for a participant and assessor-blinded randomised controlled trial. BMJ open, 11(4), e041742. International Journal of Sports Medicine

KanaanK. R. ,Vijay, S. A. , Sivakumar, C. , Kumar, P. V. , Muralidharan, C. K. , Rajkumar, K. V. ,. . . &Anand, U. K. A. (2024). Lactate threshold training to improve longdistance running performance: A narrative review. Montenegrin Journal of Sports Science and Medicine, 13(1), Ahead-of.

Kebaili, L. , Kessouri, O. , Talhi, I. , &Chelighem, A. (2023). Exercise-Based Injury Prevention in Amateur Soccer: A Survey of Current Practices of 52 Algerian Teams. Journal of Anthropology of Sport and Physical Education, 7(2), 13-17.

Lee, J. W. , Lee, J. H. , & Kim, S. Y. (2020). Use of acupuncture for the treatment of sports-related injuries in athletes: a systematic review of case reports. International journal of environmental research and public health, 17(21), 8226.

LaBella M. Longo, U. G. , De Salvatore, S. , D'Orrico, F. , Bella, M. , Corradini, A. , Rizzello, G. , . . . &Denaro, V. (2023). The Impact of Psychological Factors on Return to Sports after Anterior Cruciate Ligament Reconstruction: A Systematic Review. Osteology, 3(3), 78-93.

McAuley, S. , Dobbin, N. , Morgan, C. , & Goodwin, P. C. (2022). Predictors of time to return to play and re-injury following hamstring injury with and without intramuscular tendon involvement in adult professional footballers: a retrospective cohort study. Journal of Science and Medicine in Sport, 25(3), 216-221.

Macdonald, B. , McAleer, S. , Kelly, S. , Chakraverty, R. , Johnston, M. , & Pollock, N. (2019). Hamstring rehabilitation in elite track and field athletes: applying the British Athletics Muscle Injury Classification in clinical practice. British journal of sports medicine, 53(23), 1464-1473.

Maeda, Socha-DietrichHartley, S. E. , Ryad, H. , &Yeowell, G. (2021). Future- proofing the Profession: Physiotherapists' perceptions of their current and emerging role. Physiotherapy, 119, 72-79

Maffulli N &, Andia, I (2019). New biotechnologies for musculoskeletal injuries. the surgeon, 17(4), 244-255. 2019).

Maier D. Kurz, E. , Bloch, H. , Buchholz, I. , Maier, D. , Praetorius, A. , Seyler, S. , . . . & Achenbach, L. (2023). Assessment of return to play after an acute shoulder injury: protocol for an explorative prospective observational German multicentre study. BMJ open, 13(2), e067073.

Munoz-Plaza, C. , Pounds, D. , Davis, A. , Park, S. , Sallis, R. , Romero, M. G. , &Sharp, A. L. (2021). High school basketball coach and player perspectives on warm-up routines and lower extremity injuries. Sports medicine-open, 7(1), 34.

Navarro-Santana, M. J. , Asín-Izquierdo, I. , Gómez-Chiguano, G. F. , Albert-Lucena, D. , Plaza- Manzano, G. , & Pérez-Silvestre, Á. (2020). Effects of two exercise programmes on joint position sense, dynamic balance and countermovement jump in male amateur football players. A randomised controlled trial. Journal of Sports Sciences, 38(22), 2620-2630.

Nous, Griffin, C. (2023). Achilles tendon injury rehabilitation and lower limb biomechanics (Doctoral dissertation, Université Côte d'Azur).

O'Malley L. Thon, S. G. , O'Brien, M. J. , &Savoie III, F. H. (2019). Evaluation of healing rates and safety with a bioinductive collagen patch for large and massive rotator cuff tears: 2- year safety and clinical outcomes. The American journal of sports medicine, 47(8),

Öniz, M. , Sarıtaş, N. , &Şentürk, M. (2024). Effects of short-term high-intensity interval training on growth hormone, cortisol, and leptin levels. Journal of Men's Health, 20(2), 51-61.

Patel S. Kumar, P. , Geetika, Dadra, A. , Patel, S. , &Dhillon, M. S. (2023). Exploring injury profiles in non-elite cricketers: harnessing online surveys for effective assessment. Indian journal of orthopaedics, 57(10), 1619-1622.

Pennington, R. , Cooper, A. , Faulkner, A. C. , MacInnes, A. , Greensmith, T. S. , Mayne, A. I. , & Davies, P. S. (2021). Injuries in quidditch: a prospective study from a complete UK season. International journal of sports physical therapy, 16(5), 1338.

Prabhakaradoss, D. , Sreejesh, M. S. , Mohamed, S. H. P. , Subbarayalu, A. V. , & Prabaharan, S. (2021). Effect of manual therapy and conventional physiotherapy on pain, movement, and function following acute and sub-acute lateral ankle sprain: a randomized clinical trial. Int J Sport ExercHealth Res, 5, 76-82.

Rausch, L. , Puchner, B. , Fuchshuber, J. , Seebacher, B. ,Löffler-Ragg, J. , Pramsohler, S. , . . . &Faulhaber, M. (2022). The effects of exercise therapy moderated by sex in rehabilitation of COVID-19. International Journal of Sports Medicine, 43(12), 1043-1051.

Kemp, J. L. , Risberg, M. A. , Mosler, A. , Harris-Hayes, M. , Serner, A. , Moksnes, H& Bizzini, M. (2020). Physiotherapist-led treatment for young to middle- aged active adults with hip-related pain: consensus recommendations from the International Hip-related pain research network, Zurich 2018. British journal of sports medicine, 54(9), 504-511.

Roberts L. Hutting, N. , Caneiro, J. P. , Ong'wen, O. M. , Miciak, M. , (2022). Patient-centered care in musculoskeletal practice: key elements to support clinicians to focus on the person. Musculoskeletal Science and Practice, 57, 102434.

Soomro, N. , Chua, N. , Freeston, J. , Ferdinands, R. E. , & Sanders, R. (2019). Cluster randomised control trial for cricket injury prevention programme (CIPP): a protocol paper. Injury prevention, 25(3), 166-174.

Smith, M. , Donnelly, G. M. , Berry, L. , Innes, S. , & Dixon, J. (2022). Point of care ultrasound in pelvic health: scope of practice, education and governance for physiotherapists. International Urogynecology Journal, 33(10), 2669-2680.

Stathas, I. , Kalliakmanis, A. , Kekelekis, A. , Afentaki, D. D. , Tsepis, E. , &Fousekis, K. (2024). Effectiveness of an On-Field Rehabilitation framework for return to sports in injured male professional football players: a single-blinded, prospective, randomised controlled trial. BMJ Open Sport & Exercise Medicine, 10(1), e001849.

Sultan, K. S. , &Abbosh, A. M. (2022). Wearable dual polarized electromagnetic knee imaging system. IEEE Transactions on Biomedical Circuits and Systems, 16(2), 296-311.

SwensonM. W. ,Christy, J. B. , Cochrane, G. D. , Almutairi, A. , Busettini, C. , & Weise, K. K. (2019). Peripheral vestibular and balance function in athletes with and without concussion. Journal of Neurologic Physical Therapy, 43(3), 153-159.

Van den Bekerom M. P. Verweij, L. P. , van Spanning, S. H. , Grillo, A. , Kerkhoffs, G. M. , Priester-Vink, S. , van Deurzen, D. F. ,. (2019). Age, participation in competitive sports, bony lesions, ALPSA lesions,> 1 preoperative dislocations, surgical delay and ISIS score> 3 are risk factors for recurrence following arthroscopic Bankart repair: a

systematic review and meta-analysis of 4584 shoulders. Knee Surgery, Sports Traumatology, Arthroscopy, 29, 4004-4014.

Verhagen, E. , Clarsen, B. , Capel-Davies, J. , Collins, C. , Derman, W. , De Winter, D. ,&Pluim, B. M. (2021). Tennis-specific extension of the International Olympic Committee consensus statement: methods for recording and reporting of epidemiological data on injury and illness in sport 2020. British journal of sports medicine, 55(1), 9-13.

Voight&Esculier, Esculier, J. F. (2019). ABSTRACTS FROM THE 3RD WORLD CONGRESS OF SPORTS PHYSICAL THERAPY. International Journal of Sports Physical Therapy, 14(6), 1.

Wagemans, J. , Bleakley, C. , Taeymans, J. , Schurz, A. P. , Kuppens, K. , Baur, H. , &Vissers, D. (2022). Exercise-based rehabilitation reduces reinjury following acute lateral ankle sprain: A systematic review update with meta-analysis. PloS one, 17(2), e0262023.

World Theraphy (2019). Knowledge Structure in Rehabilitation within and beyond the Medical Field: Bibliometric Perspectives of the Categories «Physical Therapy, Sports Therapy and Rehabilitation» and «Rehabilitation». Interdisciplinary Rehabilitation. RehabilitaciónInterdisciplinaria, 2, 22-22.

Zielinski, I. M. , van Delft, R. , Voorman, J. M. , Geurts, A. C. , Steenbergen, B. , & Aarts, P. B. (2021). The effects of modified constraint-induced movement therapy combined with intensive bimanual training in children with brachial plexus birth injury: a retrospective data base study. Disability and rehabilitation, 43(16), 2275-2284.