Eunbin L. (2024) COMPARATIVE STUDY OF SPORTS-RELATED INJURY PREVENTION STRATEGIES ACROSS DIFFERENT DISCIPLINES.Revista Internacional de Medicina y Ciencias de la Actividad Física y el Deporte vol. 24 (96) pp. 103-119
DOI: https://doi.org/10.15366/rimcafd2024.96.007

ORIGINAL

COMPARATIVE STUDY OF SPORTS-RELATED INJURY PREVENTION STRATEGIES ACROSS DIFFERENT DISCIPLINES

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Recibido 06 de octubre de 2023 **Received** October 06, 2023
Aceptado 06 de puede de 2024 **Accepted** May 06, 2024

ABSTRACT

The goal of the research study is to compare various approaches of preventing sports-related injuries. Techniques for preventing injuries can be tailored to a specific activity or injury and often focus on modifiable risk factors such equipment, policy, and physical fitness. Exercise training include learning proper exercise techniques, such as recognizing the range of motion restrictions in each joint and avoiding joint postures that might endanger the anatomical components of the joint. Smart PLS software was utilized in the study, which relied on primary data analysis to measure the data. The outcomes included algorithm model, correlation coefficient, and descriptive statistics. The exercise related to forty which includes strength, the proprioceptive, neuromuscular training also that all essential for enhance the athletic performance and preventing injuries. The main objective of research is demonstrating comprehensive review related to ascertain quantity of systematic literature and meta-analysis which examined the influence of injury of sports prevention program on musculoskeletal injuries. The Research found a direct and significant link between sport-related prevention strategies across different disciplines. We predicted that the majority of papers would deal with sports injury prevention generally rather than preventative tactics for particular sports and concentrate on avoiding common sports-related knee injuries.

KEYWORDS: Comparative Study (CS), Sports-Related Injury Prevention Strategies (SRIPS)

1. INTRODUCTION

Over the last ten years, about 21% in sports participation in the United

States has increased by about 30 million young athletes enrolling in different sports disciplines (Plummer et al., 2019). This huge increase has been made possible due to the health sector making the importance of sports and physical activity available around the globe these days. Health experts say increased physical activity at any age can lead to better cardiovascular conditions, weight management, body composition, and enhanced leadership and teamwork skills (Mugele et al., 2018). However, with these benefits come the demerits as well because of the high chances and rates of sports injury among different sorts of accidents in the sports field. Even some statistical data show that during the young adolescent age, about 30% of the injuries in Western individuals come from sports-related accidents (Ross et al., 2021). Several risk factors can add up to these types of injuries, including longer durations of training, high-intensity training, high levels of competition, and constant workouts in different sports disciplines. All of these reasons add up to an immense increase in the injury risk factor for people enrolled in various sports disciplines worldwide. Studies are being conducted to reduce injury rates among individuals of different disciplines by studying the risk factors, anterior cruciate ligament injuries, and newly emerging recovery methods. Despite all of these efforts, there still has been an ongoing increase in sports-related injuries among young as well as professional athletes. To develop a functional program for injury prevention, a foregoing study still needs to be done so that people from different sports fields can be treated and trained to prevent injury according to their field of performance (Babí Lladós et al., 2018; Soomro et al., 2016).

Sports injuries have a huge impact on the performance and the dynamics of the team in which the sportsmen are performing. Sports professionals worldwide emphasize the bad impacts of sports injuries on their respective sports of interest. A survey conducted on a group of 72 athletes made clear that 77% of professionals think that sports injuries impact their overall performance on the team and, in turn, prohibit them from acting in the field. Moreover, 98% of professional trainers think that injury prevention strategies based on evidence should be added to the athletes' training routines so that they know how to double their field performance by reducing the chances of injury (Stephenson et al., 2021). Several injury preventions programs have been initiated to tackle the injuries specifically according to their types. For instance, FIFA 11+ and Sports metrics are renowned injury prevention programs designed to increase physical performance and enhance muscle movement by regulating neuromuscular control (Smyth et al., 2019). All of these efforts add up to reduce the risk of injuries and, if applied accurately, can have long-term beneficial and positive effects on the collective performance of athletes from different disciplines. However, these injury prevention programs still face serious challenges in terms of becoming functional. One of the biggest issues is convincing the coaches to implement injury prevention strategies into their regular training routines. Not only coaches but sometimes athletes also

resist implementing these strategies in their regular familiar pattern of training because they doubt its long-term benefits and sometimes the complexity of the strategies (Lutter et al., 2022). Also, the challenge arises in developing suitable and selective injury prevention strategies for the specific discipline so that formats and goals related to specific discipline can be aligned with the training. For instance, the FIFA 11+ injury prevention program was initially implemented in only 12% of the sessions and was later on shifted to 28% of the sessions according to the needs of disciplines (Leppänen et al., 2014; J. Xiao et al., 2023).

The specificity of injury prevention programs is the main reason for it to be beneficial for athletes. Coaches believe that specificity is the main element for better training adaptations by people in different fields, and therefore, specific injury prevenion programs can show better results than generic injury prevention strategies. For instance, sports like soccer require strategies like proper footwear, a safer surface for playing, strength training to mobilize their joints, and neuromuscular control to enhance proprioception. Similarly, sports like swimming may involve injuries like lower back pain and shoulder joint issues that can be resolved if the athletes are given proper training, like dryland training, to develop strength in the shoulders and muscles (Emery et al., 2015). Moreover, they can be trained to have proper stroke mechanics to reduce the strain on the shoulders. The tennis players are forced to learn about their swing mechanics and strength training to balance their rotator cuff muscles. They also can prevent injuries by regulating their body stretching to manage their range of upper body motion (Mendonça et al., 2022). Other than these sports, there are other strategies bound to specific disciplines.

For instance, gymnasts can face injury issues like wrist fractures and lower pain with dislocation of different bones and muscles. To prevent these injuries, they can be trained in techniques to reduce acute injuries. Also, there should be proper availability of mats and grips for the regulation of gymnastics without any chance of injury. Furthermore, runners can prevent their injuries by slowly increasing the load and intensity of the training to reduce issues like overload and muscle cramps (McBain et al., 2012; Ross et al., 2021).

2. Literature Review

Researchers reveal that various game injury anticipation programs intended to diminish intense and abuse wounds in competitors have been demonstrated viable. However, the parts of the projects, general or sports-explicit, that prompted these constructive outcomes are unclear. Regardless of not being familiar with the predominance of sports-explicit injury anticipation programs, mentors and competitors favor more specific programs as opposed to summed-up practice programs. The general and blended programs emphatically influence injury rates. Sports-explicit projects are not explored,

and in spite of wide conversation regarding the definition, no agreement has been reached(Mugele et al., 2018). Studies suggest that conduct and sociology speculations can improve endeavours to expand well-being and security ways of behaving, for example, the take-up and support of injury anticipation measures. In any case, the degree to which they have been utilized in sports injury examinations to date is obscure.

Almost certainly, future games injury avoidance endeavours might be upgraded and accomplish effective results in the event that expanded consideration is given to completely understanding the social determinants of wellbeing activities(McGlashan & Finch, 2010). Studies elaborate that Injury avoidance programs are an inborn piece of preparing for sporting and professional athletics. Giving execution-improving advantages notwithstanding injury avoidance might assist with changing mentors' and competitors' perspectives towards the execution of injury counteraction in their daily schedules. Different factors, for example, power, specialized execution and consistency, ought to be represented in ongoing examinations notwithstanding exercise methodology(Plummer et al., 2019). Scholars suggest that escalated sports support in youth and immaturity are laid-out reasons for intense and abusive injuries. Mediations and projects intended to forestall such wounds are significant in decreasing individual and cultural expenses related to treatment and recuperation. In like manner, they help to keep up with the accumulation of positive results from support, like cardiovascular wellbeing and expertise advancement(Soomro et al., 2016). Studies claim that counteraction of game wounds is critical to expanding the wellbeing and cultural advantages of a truly dynamic way of life.

To fortify the interpretation and execution of the accessible proof based on compelling preventive measures, a scope of possibly significant systems ought to be thought of. Concentrates on transcendently assessing the preventive impact of different preparation programs focused on at the 'pre-occasion' stage and the utilization of gear to stay away from injury in the 'occasion stage'. Concentrates explicitly pointed toward forestalling re-wounds were a minority and were, for the most part, connected with lower leg hyper-extends(Vriend et al., 2017). Researchers depict and assess injury avoidance mediations for pre-tip top competitors who contend in an Olympic or pro game. Of the seven activity intercessions, 4 showed a defensive impact, and 3 tracked down no huge impact, giving clashing proof.

Alert is educated because of the high gamble regarding predisposition, low mediation revealing, and negligible proof for execution arrangement in every one of the seven examinations. There is a requirement for quality examination plans affirming the clinical effect of existing injury counteraction intercessions for pre-world class competitors(Smyth et al., 2019). Scholars

explain that the point of this methodical survey was to evaluate the viability of activity-based injury avoidance programs in kid and juvenile games as a general rule and to consider various qualities of the objective gathering, injury counteraction program, and result factors. The outcomes give great proof and obviously show the advantageous impacts of activity-based injury avoidance programs in young people's sports, as they can bring about genuinely huge and basically pertinent injury decrease(Rössler et al., 2014).

This investigation demonstrated the way that specific intercessions can decrease the gamble of sports wounds. There are many restrictions in regard to the nature of the preliminaries, the relevancy of the outcomes, and the diversity of the review plans. Subsequently, the systems behind viable techniques and the most valuable components of preventive preparation programs should be explained(Leppänen et al., 2014). Scholars indicate that carrying ladies into the conversation of business-related wounds is viewed as a development; the outlining of ladies' game-related wounds has been seen with caution by pundits, who consider this to be a re-visitation of verifiable thoughts of ladies' feebleness.

The examination recommends that differentiations between these assortments of exploration come from contrasts in the social association of game & the more extensive writings on wellbeing and security(Theberge, 2012). Researchers examine the frequency paces of lower leg wounds by sex, sort of openness, and game. In all games, with the exception of young ladies' volleyball, paces of lower leg injury were higher in rivalry than by and by. Generally speaking, most lower leg wounds were determined as tendon injuries to have inadequate tears. Lower leg wounds most regularly made competitors miss under seven days of the movement, trailed by seven to twenty-one days of action misfortune and over twenty-two days of action misfortune. Games that consolidate bouncing in nearness to different players and quick shifts in the course while running are most frequently connected with lower leg wounds(Nelson et al., 2007).

Studies show that the number of patients who are more seasoned than sixty-five is expanding in created social orders. The effect is old enough on wounds, and their result has been legitimated in a few areas of traumatology. With expanding age, the gamble of a homegrown mishap expanded. The mishap system in older individuals was most often a fall or was not reproducible. So, a massive contrast b/w bunches with respect to corresponding wounds(Kloss et al., 2007). Scholar studies reveal that various examinations record the medical advantages of a genuinely dynamic way of life, yet generally, scarcely any report the perils of active work.

As a result of the prerequisite for actual wellness to finish their central

goal, the US military administrations have a personal stake in understanding the advantages and dangers of active work, including activity & games. Researchers evaluated the general frequency of wounds and the enormous extent that are brought about by exercise & games among military staff, a populace of solid, genuinely dynamic grown-ups. Counteraction procedures ought to zero in on running, powerlifting & ball(Hauret et al., 2015). Studies explain that lower leg wounds continue to be areas of strength for competitors in many games. The recurrence of lower leg wounds in sports is vital.

The games, which include the lower appendages, ordinarily will make wounds around the lower leg and drive lower leg insecurity; accordingly, repeats are extremely normal. Besides, strength assumes a significant part in forestalling lower leg injury for a competitor. Researchers inferred that water and land-based practices are valuable for working on the steadiness and scope of movement and subsequently for forestalling lower leg wounds(Abadi et al., 2018). The reason for this review was to examine the pervasiveness of juvenile actual work-related wounds in-game exercises, relaxation time active work and education-related active work. This study determines a troubling ascent in injury commonness lately.

According to the general wellbeing stance, there is a critical need to put resources into wound counteraction to invert this pattern(Räisänen et al., 2018). Researchers predict that further developing information with respect to wounds supported by female artists is significant in comprehending wound probability more readily. The research purpose is to dissect dance wounds & body regions by age in partnership with young pediatric artists introducing to female games. Wounds to youthful pediatric artists here partner was, for the most part, ordered as abuse & contrasted by the age bunch and the body region.

Expanded data in regard to moving wounds can assist with directing future wound anticipation endeavo(Stracciolini et al., 2015). Scholar studies reveal that the goal of assessing the degrees of games wound uneasiness b/w battle competitors as per their separate methods. In any case, tremendous contrasts were seen in the sub-aspects of encountering torment, experiencing dissatisfaction, and losing social help. Furthermore, measurably huge varieties were tracked down in the general games wound uneasiness levels comparable to identity, frequency of incapacity, instructive foundation, length of association in games, & the method of game.

All in all, it tends to be expressed that as the game's age increments between battle competitors, their degrees of game wound uneasiness will generally heighten(Madak et al.). Scholars reveal that the strategies and utilization of actual training in schools at the necessary stage both in China and Japan, it is trusted that their disparities can be explained, and a few ideas to be

given will be valuable for the two nations so that the two of them can gain from one another and have a better approach to advance its own actual instruction in the schools at the mandatory stage (Chunyan & Donghao, 2023). Researchers present a preventive system for limiting games-related wounds among understudies signed up for Iranian schools. The subjective exploration system utilizing the grounded hypothesis strategy was utilized.

The discoveries showed that a few logical elements assumed a part as causal variables in the issue, involving negative weather patterns, understudies' absence of inspiration, educators' absence of energy for instructing, non-normalized contests, mental and mental hardships, over-stressing rivalry in interactivity, instructor understudy proportion imbalance, the shortfall of actual training teacher, and study hall limit(Salemi et al., 2023). Researchers suggest that game wounds address a huge general wellbeing concern, and their commonness is on the ascent because of the developing worldwide populace and expanded cooperation in novice and pro athletics. Studies uncovered that the knee was the most often harmed body locale between patients looking for care at the game's medication facility for outer muscle wounds.

Ligament wounds were the prevalent sort of wound noticed(Benli, 2023). Scholars want to improve the presentation of clinical pictures to highlight extraction and movement wound expectations. This coordinated methodology plans to accomplish exact distinguishing proof of oddities in clinical pictures, especially connected with muscle or bone harm. Researchers assess the viability of our strategy on four clinical picture datasets explicitly relating to skeletal and muscle wounds(D. Xiao et al., 2023). Researchers conducted the points of the review, which were the assessment of stress-related impacts (exhausting versus non-difficult game) in animating or lessening impacts on ligament volume in the lower leg joint & the assessment of the picture nature of an attractive reverberation picture (X-ray) gadget.

This review explains no massive distinction in the hyaline articular ligament in the upper lower leg joint between the superior presentation arduous competitor, elite execution non-exhausting competitor, & nonathlete gatherings(Gorzolla et al., 2023). Research studies reveal that movement catches innovation assumes a pivotal part in improving competitors' abilities, procedures, and systems by giving nitty gritty criticism on movement information. Scholars describe a complete overview that is directed toward directing specialists in choosing the most reasonable movement catch innovation for sports science examinations. Movement catches innovation offers various benefits and applications in the field of games, empowering the examination of competitors' specialized exhibition, preparing viability, serious evaluation, & games medication-related data(Suo et al., 2024). Scholars elaborate that practice is critical for keeping up with actual wellbeing in

contemporary society. Be that as it may, ill-advised stances and developments during activity can bring about game wounds, highlighting the meaning of skeletal movement examination. By giving smart and compelling wellness direction and game recovery support, researchers accept progressions in this field will bring a better and more logical game insight to game fans(Zhu et al., 2024). Scholars claim that the combination of sensor innovation and mechanized examination in wearable gadgets denotes a huge headway in games science, planning to proactively forestall wounds and improve competitor execution. Researchers investigation features the groundbreaking effect of sensor-upgraded wearables and computerized examination in hoisting the guidelines of wound anticipation and execution improvement in games(Kovoor et al., 2024). Scholars concentrating on discoveries showed that young men's football, young ladies' soccer, and young men's wrestling had the most noteworthy wound rates, with young men's games generally speaking having greater wound rates than young ladies' games. Hyper-extends & blackouts were the most widely recognized analysis. Barely any wounds require a medical procedure(Pizzarro et al., 2024).

3. Theoretical Framework

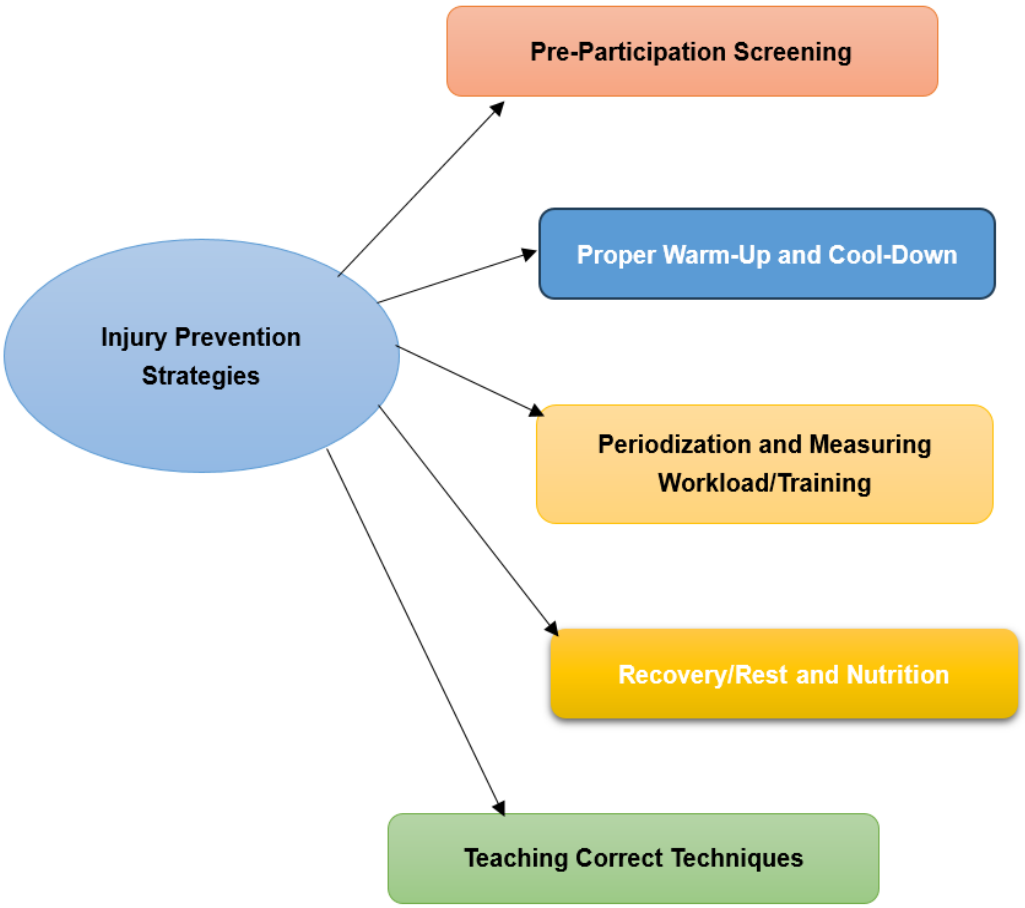

Figure 1: Theoretical Framework

Youngsters who practice sports activities can develop functional, psychosomatic and communal advantages. Using sports activities, youngsters are able to improve their health, self-confidence, and social life and reduce the risk of depression. Unfortunately, irrespective of these benefits, sports activities are also linked with different types of injuries, and these circumstances have increased day by day in recent years amongst youngsters. It was demonstrated that in the United States, 3.5 million youngsters get treatment for sports injuries, and these have aged less than 15 years (Figure 1).

Moreover, an estimated 2/3rd of these sports injuries need medical care in emergency units (Prieto-González et al., 2021). It was verified that the African continent comprises roughly about 23 million sports injury cases. Studies have demonstrated that the total number of sports injury cases in United States health care management costs two billion dollars. It was observed in recent years that high sports injury cases are linked to soccer activity. The ratio of more injuries might happen due to the more extreme and specialized practice at an early age in soccer games. To reduce sports injuries, there is a need for some strategies to lessen the cost of treatment and load of health care management (Watson et al., 2019). When the number of injuries decreases, it automatically increases the lifespan participation and reconstruction of interest in sports in youth. This will also improve their social life, which is inked with continuous sports practice. There are many chances for youngsters to abandon sports activities for many reasons, including intrapersonal, interpersonal, and restrictions issues. According to some studies, the rate of sports dropout is different among various age groups.

For instance, 70 -80 % of the dropout rate is among the 15-year-old age group. The dropout rate of sports activity is high among middle-aged youth. The higher number of sports injuries is the major reason for its dropout (Habelt et al., 2011). The reduction of sports injuries increases the focus on the application of different strategies to reduce them and maintain youngster's health. The safety of sports activities requires continuous investigation of sports injury patterns and pervasiveness. Several inconsistencies in injury accident ratios come from the targeted populace, country, study of sports and their type, different age groups and levels of competition (Theadom et al., 2020). Therefore, more studies are required to gain more knowledge about sports injuries and their prevention. Many studies are presently related to sports injuries from different countries, but there is restricted knowledge in the case of Spain. Most of the sports injuries focused on specific types of sports such as basketball, skateboarding, martial arts, etc. (Martínez-de-Quel-Pérez et al., 2019).It is crucial to know the epidemiology and pattern of sport-related injuries.

Additionally, it is also important to know which sports activity has the highest number of sports injuries, having common injuries, under which

circumstances injuries exist, which gender agonizes more injuries, either male or female and if expert sportspersons get more injuries as compared to incompetent sportspersons. Moreover, the other main element is to demonstrate the effect of various risk factors associated with injuries, for example, a load of training, sports methodology, gender, age, Body Mass Index (BMI), sports practice hours, equipment and services used, using any injury prevention activity, diet, stress and physical activities. This knowledge is required to know about the cost and level of sports injuries. This will also improve the safety of athletes and create more strategies to reduce these injuries (Caldemeyer et al., 2020; Pascual et al., 2008).

4. Smart PLS Algorithm

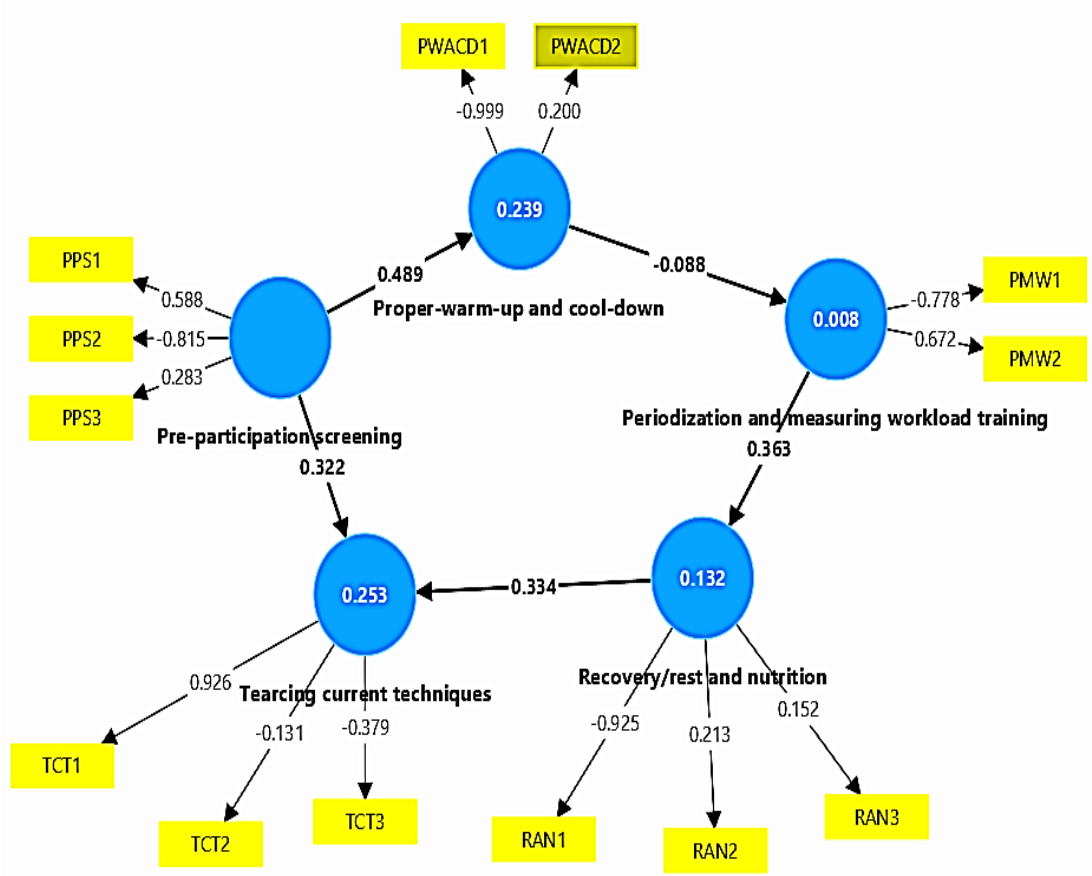

Figure 2: Smart PLS Algorithm

The above model of figure 2 represents the smart PLS Algorithm model between sport-related injury prevention strategies. The pre-participation screening shows that 0.588, 0.815, and 0.283 were positive, with significant values of 58%, 81%, and 28%. The proper warm-up and cool-down showed 48% positive links with others. The periodization and measuring workload training show a 36% positive link with recovery rest and nutrition. The current teaching techniques show 92%, 13%, and 37% significant value between them.

5. Descriptive statistic

Table 1: Result of Descriptive statistic

NAME	NO.	MEAN	MEDIAN	SCALE MIN	SCALE MAX	STANDARD DEVIATION	EXCESS KURTOSIS	SKEWNESS	CRAMÉR-VON MISES P VALUE
PPS1	1	1.673	2.000	1.000	4.000	0.711	0.920	0.936	0.000
PPS2	2	1.592	2.000	1.000	3.000	0.531	-1.135	0.039	0.000
PPS3	3	1.469	1.000	1.000	3.000	0.575	-0.329	0.788	0.000
PWACD1	4	1.429	1.000	1.000	3.000	0.535	-0.671	0.709	0.000
PWACD2	5	1.449	1.000	1.000	3.000	0.574	-0.181	0.876	0.000
PMW1	6	1.612	2.000	1.000	3.000	0.565	-0.758	0.239	0.000
PMW2	7	1.327	1.000	1.000	3.000	0.511	0.505	1.231	0.000
RAN1	8	1.531	1.000	1.000	3.000	0.610	-0.404	0.716	0.000
RAN2	9	1.653	2.000	1.000	3.000	0.624	-0.613	0.426	0.000
RAN3	10	1.551	2.000	1.000	3.000	0.537	-1.139	0.198	0.000
TCT1	11	1.449	1.000	1.000	3.000	0.537	-0.806	0.618	0.000
TCT2	12	1.612	2.000	1.000	3.000	0.565	-0.758	0.239	0.000
TCT3	13	1.633	2.000	1.000	3.000	0.523	-1.052	-0.120	0.000
TCT4	14	1.408	1.000	1.000	2.000	0.491	-1.932	0.386	0.000
TCT5	15	1.286	1.000	1.000	2.000	0.452	-1.088	0.979	0.000

The previously mentioned outcome in table 1 illustrates the standard deviation and significant value between the mean, median, minimum, and maximum rates as well as the descriptive statistical analysis result reflecting them. The mean values for PPS1,2, and 3 are 1.673, 1.592, and 1.469, respectively, indicating a positive average value for the mean. The percentage of standard deviation that deviates from mean values is 71%, 53%, and 57%. Overall, there are three different rates: 1.000 for the least, 3.000 for the highest, and 2.000 for the median. According to PWACD1,2, there is a 57% departure from the mean, a 53% standard deviation rate, and a mean value of 1.429 and 1.449. The overall significance level is 0.000, indicating that there is a significant difference between them of 100%. The mean values of 1.531, 1.653, and 1.551 are represented by the

RAN1, 2, and 3, indicating a positive average rate. The values of the standard deviation are 61% and 62%, correspondingly. Additionally, 52%, 49%, and 45% of the TCT1, 2, 3, 4, and 5 show deviations from the mean. The averages are 1.286 and 1.408. They are all regarded as positive average rates.

6. Correlation coefficient analysis

Table 2: Result of Correlation coefficient analysis

	PPS1	PPS2	PPS3	PWACD1	PWACD2	PMW1	PMW2	RAN1	RAN2	RAN3	TCT1	TCT2	TCT3	TCT4	TCT5
PPS1	1.0	0.	0.	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PPS2	-0.137	1.	0.	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.	0.0	0.0	0.0	0.0
PPS3	-0.224	-0.108	1.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
PWACD1	-0.169	0.472	-0.190	1.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
PWACD2	-0.241	-0.135	0.289	-0.162	1.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
PMW1	-0.010	0.153	0.246	-0.058	-0.093	1.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
PMW2	0.237	0.190	-0.035	0.085	0.196	-0.056	1.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
RAN1	-0.165	-0.024	-0.070	0.116	0.077	0.242	-0.229	1.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
RAN2	-0.117	0.188	-0.001	0.323	0.264	-0.092	0.035	-0.160	1.000	0.000	0.000	0.000	0.000	0.000	0.000
RAN3	0.097	-0.356	-0.243	-0.112	-0.074	-0.103	0.014	0.229	-0.039	1.000	0.000	0.000	0.000	0.000	0.000
TCT1	0.331	-0.145	0.177	-0.244	-0.058	-0.099	-0.088	-0.291	0.039	0.133	1.000	0.000	0.000	0.000	0.000
TCT2	-0.163	-0.051	-0.068	0.077	-0.093	-0.023	-0.198	0.183	0.081	0.099	0.103	1.000	0.000	0.000	0.000
TCT3	-0.213	0.121	0.234	0.344	0.074	-0.068	-0.086	0.035	0.172	-0.224	-0.140	-0.206	1.000	0.000	0.000
TCT4	-0.027	0.169	0.044	0.033	-0.071	-0.092	-0.043	-0.042	-0.071	-0.156	0.234	-0.092	-0.131	1.000	0.000
TCT5	0.163	-0.279	0.112	-0.254	0.135	-0.046	0.038	-0.032	0.134	0.108	-0.024	-0.286	0.185	-0.066	1.000

The above result of table 2 describes that the correlation coefficient overall result shows that positive and negative correlation between them. It is crucial to consider the programs that work to prevent and reduce sports injuries in youngsters. These programs adopted different strategies, such as the implementation of various preventive procedures, the production of several fitness constituents, and the alteration of sports methodologies and lifestyle ways.

For instance, ankle injuries are considered the second most common sports injury after knee injuries. Ankle injury is most common in various sports activities such as basketball, rugby, volleyball and handball. Ankle injury comprises 15% of all types of injuries from sports activities. In the most popular sport globally, which is known to be soccer, athletes suffer from various types of injuries such as fractures, wrenches, bruises and strains, and the most common place of these injuries is the ankle area (Al Attar et al., 2022). It was studied that ankle injury history inked with a high risk of joint bone instability, less physical activity and osteoarthritis. Individuals agonized by ankle injury have three times more chance in future to again suffer from an ankle injury. It was demonstrated that in a usual soccer game of 28 athletes,' there might be an average of seven ankle injuries per period. It was verified that each ankle injury requires almost 15 days of rest to recover. Various studies have confirmed that balance training is an efficient method of reducing ankle injuries, maintaining ankle balance, increasing performance, and preventing lower limb injuries. Taking 18 training sessions of 20 minutes each reduced the risk of an ankle injury (Al Attar & Alshehri, 2019).

7. Conclusion

In conclusion, with the rise in youth involvement in sports, there has been a massive rise in sports injuries as well, and these can be reduced only by initiating a proper injury prevention program with strategies that are selective and suitable for specific sports. Further research also needs to be done so that the coaches and trainers can be engaged in implementing these strategies into their daily routines without having doubts about their long-term effects. The overall research concluded that there is a significant and positive relationship between them. With these implementations, the positive rise in sports participation can be made possible with the maximized involvement of young athletes in sports along with their high-quality performance with the teams. Sports-related traumatic brain injuries (SR-TBI) comprise 20% of all types of sports injuries. A concussion is a mild form of TBI that is usually a more common brain injury among athletes. Some individuals experience mild symptoms, and some experience chronic symptoms of TBI or Concussion. Both these types comprise headaches, cognitive complications, stress, faintness, insomnia and tiredness. Many individuals also face long-term cognitive disorders and many other health problems. In sports like rugby and football, players experience more brain injuries as compared to other sports activities. Moreover, more brain injuries are experienced by females in match play as compared to training. Different training programs and strategies must be followed to prevent brain injuries. In a recent study, it was concluded that neuromuscular training (NMT) with or without the summation of interferences like tapping and bracing helps in the reduction of ankle injuries in most of the sports populace. In the past, there was limited knowledge about the training programs for the reduction of ankle injuries in females, but in this research, it was demonstrated that NMT training

improves and reduces ankle injuries in females. As females suffer more from ankle injuries as compared to males, so they need more safety regarding this injury. There were many types of research available to support that NMT training affected males, but this research demonstrated that this training is also beneficial for females.

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