

Alarcón R and Castillo D. (2024) TRENDS AND CHALLENGES IN IMPLEMENTING SPORTS MEDICINE PRACTICES IN CHILEAN ATHLETIC TRAINING. Revista Internacional de Medicina y Ciencias de la Actividad Física y el Deporte vol. 24 (94) pp. 340-355.
DOI: <https://doi.org/10.15366/rimcafd2024.94.022>

ORIGINAL

TRENDS AND CHALLENGES IN IMPLEMENTING SPORTS MEDICINE PRACTICES IN CHILEAN ATHLETIC TRAINING

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Recibido 23 de abril de 2023 **Received** April 23, 2023

Aceptado 28 de Noviembre de 2023 **Accepted** November 28, 2023

ABSTRACT

The aim of the research is to determine the trends and challenges related to sports medicine practices in Chilean athletic training. This research examines the state of sports medicine practices in the field of athletic training in Chile, taking a close expression at both international trends and regionally-specific issues. To determine the research, smart PLS software was used and generated informative results, including descriptive statistics and correlation coefficient analysis, which also explains the smart PLS Algorithm model between them. Global trends include the integration of cutting-edge technologies, customized training programs, and an all-encompassing, interdisciplinary approach; however, for successful implementation in Chile, issues including scarce resources, educational disparities, cultural influences, infrastructure needs, and legal considerations must be resolved. The overall research found that direct and significant implementation of sports medicine practices in Chilean athletic training. The study highlights how crucial it is to comprehend and overcome these obstacles to maximize athlete performance and well-being. Sports medicine practices in Chile can progress by practitioners and stakeholders recognizing and adjusting to the distinct features of the nation's sports ecosystem.

KEYWORDS: Trends and Challenges (T&C); Implementing Sports Medicine Practices (ISMP); Chilean Athletic Training (CAT)

1. INTRODUCTION

The scope of advanced science and technology is not only confined to

fields of medicine, industry, communication, transportation, and health care but also includes marvelous advancements in the field of sports medicine. The term sports medicine is quite different from the medical field of health because, in sports medicine, there is a prominent focus on aspects related to sports. In the past few years, there was no concept of sports medicine in Chile, but with Chileans' advancement and adoption of technology, there has been a great focus on sports medicine. The term sports medicine can be explained in these words "the study of all aspects related to sports such as sports nutrition, physical health, injury assessment, injury prevention, measures, sport psychology, and others". This field also got much importance because of the use of technology in it. The main focus of this field is to enhance athletes' performance by improving their physical and mental health (Vancini et al., 2021). As we know, athletes in Chile are more prone to injury than common people. Therefore, there should be more care for athletes relevant to health. The first and foremost focus of sports medicine is to adopt such measures that can prevent the risk of injury. For example, wearable sensors, which can provide useful health information, are mostly used in Chile and the whole world. Athletes use wearable blood pressure sensors to analyze blood pressure in a very short time and thus can prevent any possible effect of high blood pressure (Gupta, Morgan, & Gilchrist, 2017).

There is also a trend of using such watches by athletes which can sense heart rate, temperature, pulse, hydration level, and other such factors. Not only this but some wearable technologies are also used that have no inflammatory and relaxing-inducing effects in the body of athletes. One of the important factors for improved performance of athletes is the level of practice done by athletes. Sports medicine not only focuses on medicines related to injury but is also related to the use of such medicines, which can reduce the fatigue level of athletes after practice. Physicians recommend such physical therapies that can prevent fatigue and injury and can also treat injury in a short time after an incident of injury. For example, in the case of Football players, knee and ankle joints are used more, so such exercises are suggested to make such joints more flexible and strong for better performance (Knapik et al., 2003). A very important aspect of sports medicine is related to sports nutrition. This aspect has gotten little attention from Chilean athletes in recent years, but in the present time, it has become an aspect of considerable concern. Because the performance and health of any athlete are related to the level and type of nutrition taken by athletes in Chile. Now, there is a trend of taking suggestions from experts about sports nutrition. The need for sports nutrition varies depending upon the type of sport (Adib, BASHA, TUFARHA, BARAKAT, & CAPAPÉ, 2021). For example, in cricket, there is a need for such food that can increase the strength of muscles, capacity to run swiftly, and other such perspectives. Nutrition is quite important for athletes, and it should be properly balanced for an effective level of performance (Sallis et al., 2016). But gaining knowledge about sports nutrition, there is an emerging trend of using plant-

based foods, mostly in Chile, because plant-based food is better for athletes than animal-based food. The reason is that plant-based food is easily digestible and has natural, non-inflammatory substances, which can help athletes in case of injury. Sports medicine has also brought a new aspect to light, which is the mental health of athletes. In past years, there were more concerns related to physical health but less focus on the mental health of athletes (Martínez de Ojeda, Puente-Maxera, & Méndez-Giménez, 2021; Wilke et al., 2022).

We learned with the help of sports medicine that maintaining mental health is mandatory for improving athletes' performance. The mental health of athletes is studied under sport psychology. This sports psychology is mainly aimed at improving mental health and infusing a sense of tolerance and endurance in athletes because an athlete must have the mental endurance to bear the effects of any failure during competition (García-Hermoso et al., 2020). If an athlete is undergoing depression, stress, anxiety, or any other mental health issues, he /she will not be able to perform well during competition. To maintain the mental health of athletes, there is an increasing trend of providing training sessions to athletes, which help them learn the ability to process the feeling of grief after failure. This increasing trend of providing importance to the mental health of athletes is true evidence of the extensive benefits of sports medicine for athletes in Chile (Aguilar, Fang, Laubenbacher, & Murrugarra, 2020; Costa et al., 2021).

We cannot deny that sports medicine has gotten much attention in Chilean society in recent years, but there are some challenges to implementing sport medicine for athletes' training. The first and foremost challenge is that this sports medicine is not easily accessible to all athletes in Chile (Ding et al., 2019). This kind of awareness and such training is not available in rural areas of Chile, which is an obstacle to implementing sports medicine in athletes. The second challenge is that it uses automated technology in a few aspects, which shows that there is a risk of machine error or computer error in analyzing athletes' mental and physical health. Thirdly, using sports medicine as common practice in athletes' training is quite costly because of technology use, so there is less chance of using it in all areas of Chile (Thomas et al., 2007; West et al., 2021). Moreover, it is using technology extensively, creating a society with more dependence upon technology and machinery but less use of human intelligence and judgment. Moreover, the next challenge is that masses of the population in Chile feel reluctant to trust technology in every field of life, which is a challenge for implementing sports medicine practices in Chilean Athletic Training. If all these challenges are coped with effectively, sports medicine will be an effective step for optimizing the performance of athletes in Chile (Yorgey, 2016).

2. Research Objective

The main objective of this study is to understand the importance of sports

medicine for athletes training in Chile. This study has also effectively explained the trends and challenges for properly implementing sports medicine practices in Chilean Athletic Training.

The research determines that Trends and challenges in implementing sports medicine practices in Chilean Athletic Training. The research study is divided into five research chapters. The first section represents the introduction and includes the objective of the research. The second portion represents the literature review, and the third section describes those methods of analysis, including tools and techniques related to variables. the fourth portion describes the result and its descriptions. The last portion summarizes overall research and presents some recommendations and future research related to variables.

3. Literature Review

Researchers claim that PA-related exercises are promoted in the Chilean population by developing appropriate policies. The PA-based policies are implemented in Chilean states in collaboration with political groups. The collaboration provides more opportunities to promote PA in Chile. also, the Chilean report card related to youth physical activity from the year 2018 predicts that various countries around the globe, including Chile, are developing PA-based policies to promote PA(Aguilar-Farias et al., 2020).studies reveal that sedentary behavior is one of the main causes of mental health problems in young children. Various interventions have been developed to assess the effect of sedentary behavior and lack of PA on youth's mental health (Andermo et al., 2020).studies elaborate that a lot of sports athletes face ACL injury conditions. PKB is used in the sports medical field to treat this injury condition. The use of PKB helps protect athletes' knees from injury reoccurrence risks.

In American football, PKB is used for athletes' protection (Blecha, Nuelle, Smith, Stannard, & Ma, 2021).Studies explain that technological advancement has resulted in the use of VR and AR in health care and other sectors. The use of VR and AR technology is mostly made for rehabilitation. For assessing the PA-associated rehabilitation process, VR technology is used in PA-related programs (Denche-Zamorano et al., 2023).studies reveal that ACL is one of the structural parts of the human body. the injury related to ACL is identified through various technological tools and methodologies. the athletes facing the ACL-related injury are provided with rehabilitation therapy along with medications. also, various other sports-based medical techniques and rehabilitation therapy are used for treating the ACL (Deniz & Dündar, 2023).studies explain that in the south of America, Chile state is located.in Chile, the sports industry is advancing at an exponential rate.

The reason behind the Chile sport industry's advancement is the digitalization process. The digitalization of Chile's sports industry has improved

sports-related practices in America. Many youths are actively participating in sports due to advancements in the sports industry. Sports industry digitalization has improved the PA-related practices of people (Duclos-Bastías, Hepp, Arias, Giakoni-Ramírez, & Calderon, 2023). Studies of scholars determine that Physical activity is beneficial for health as it reduces the chances of disease in people.

Older people receive long-term PA-based interventions to improve their overall health. elderly people getting PA-based interventions are less likely to develop serious health problems (Garcia-Hermoso et al., 2020). Studies explain that the sociology of sports is understandable through the help of the social sciences approach. Society-related sports problems and tasks become understandable using the approach of sports sociology (Giulianotti & Thiel, 2023). studies suggest that school students undergo changes in their body mass and physical health during their growing period.

The behavioral changes the school students undergo disturb their health. in Chile, the young generation is facing a lot of behavioral problems. These problems include sedentary behavior, lack of physical activity, obesity issue as well as mental health problems. all these problems makes students health poor (Godoy-Cumillaf et al., 2023). Studies highlights that cardiovascular fitness determines the physical health status of a person.

In Chilean schools, the students are provided with HIIT to improve the adolescent CRF (Lubans et al., 2021). studies predict that an athlete's physical appearance is enough to determine his diet and the level of physical training he performs daily. Observational studies reveal that an athlete's physique determines his PA-based training efficiency. by determining an athlete's body composition proper diet plan is provided to him (Lukaski & Raymond-Pope, 2021). Studies explain that athletes getting endurance training exhibit fluctuations in their heartbeat; when the heartbeat of the endurance training athletes is noted through the heartbeat monitoring system, then results show heart rate variability. Heart rate variability determines an athlete's psychological health and cardiac functioning.

The heartbeat varies differently during the pre and post-endurance training sessions. By using advanced technological tools, athletes' heartbeat variability can be easily predicted (Lundstrom, Foreman, & Biltz, 2023). studies predict that sports medicine and sports psychology concepts are used to determine the characteristics of elite athletes. These characteristics include the highest performing ability in the sports field, a success rate, well-experienced, and competitive spirit. all these characteristics make ordinary athletes elite (McKay et al., 2021). studies state that the decline in the physical health of children has been noted in Brazil. The decrease in the youth's ability to perform PA-based tasks is because of a decline in youth health conditions due to certain

health problems. providing youth with sports medicine that includes PA-based intervention programs and PA-based therapies helps in indulging the students in PA and reduces the risk of health problems (Nevill, Duncan, Gaya, & Mello, 2023). Studies predict that a sports-related medical approach is used for assessing the impact of swimming sports on athletes. swimming is overall a great sport as it improves athletic physical health but swimming also results in some health problems.

The health problems swimmers face include body pain, oxidative stress, and heartbeat variability problems (ÖZKADI et al., 2022). studies elaborate that to predict the role of teachers in PE researchers make the use of pedagogical approach. By providing students with PE, they can learn more about the importance of physical activity in their daily life. The Chilean education system has introduced the PE program in their educational institutes to provide knowledge related to PA to their students (Peña-Troncoso, Toro-Arévalo, Vega-Ramírez, Gallardo-Fuentes, & Pazos-Couto, 2023).

Also, various sports-education-related programs are provided at the university level to develop professional sports athletes. By educating sports students about the new trends in sports, their performance in the sports field improves (Ramírez-Montoya, Andrade-Vargas, Rivera-Rogel, & Portuguez-Castro, 2021). Studies of scholars provide explanations regarding the harmful effect of lack of PA on people's health. people who are physically inactive develop certain serious diseases.

The American College of sports medicine has developed various policies and programs to educate sports athletes and physicians about the importance of PA. physicians belonging to the field of sports emidine provide counselling to the athletes about the importance and need of exercise in their lives. exercise is regarded a sport medicine that solves athletes health related problems (Thompson et al., 2020). scholars predicts that professional coaches provide strength based contemporary exercises to soccer athletes to enhance their molecular strength (Weldon et al., 2021). furthermore, the straining load is monitored by using a technology-based monitoring system to minimize the injury risk. also, athlete sports-related tasks are effectively managed through the training-associated monitoring system (West et al., 2021).

4. Methodology of Research

The research study determines Trends and challenges in implementing sports medicine practices in Chilean Athletic Training. The research is based on the primary data analysis to determine the data used in research questions related to the sports medicine practices in the Chilean Athletic Training. For measuring, the research used smart PLS software and generated informative results, including descriptive statistical analysis and the correlation coefficient,

which also explains the smart PLS Algorithm model between them.

4.1 Sports Medicine Trends

1. Technology Integration: Utilizing cutting-edge technology to track athletes' performance and recuperation, such as wearables, biomechanics analysis, and telemedicine. 2. Individualized Training Plans: Creating training plans specific to each athlete while considering their genetics, biomechanics, and injury history. 3. Preventive medicine: Stressing methods to reduce injury risk via appropriate exercise, diet, and relaxation. 4. Interdisciplinary Approach: Working together to provide a complete approach to athlete well-being with a range of healthcare specialists, including as physiotherapists, psychologists, and nutritionists. 5. Mental Health Awareness: Including mental health support services and acknowledging mental health's role in sports success.

4.2 challenges in Sports Medicine

1. Limited Resources: Finding facilities, equipment, and skilled sports medicine specialists may take work. 2. Education and Awareness: Make sure that the sports community, coaches, and players understand the value of sports medicine and preventative measures. 3. Cultural Aspects: Considering how cultural perspectives on injuries, care, and prophylactics may affect the adoption and use of sports medical procedures. 4. Infrastructure Development: To enable efficient injury care, there is a requirement for sufficient sports medicine facilities, rehabilitation centers, and equipment. 5. Regulatory Framework: Creating and implementing rules to guarantee the caliber of services provided by sports medicine practitioners and the credentials of those working in the field.

4.3 Principal and Goals of Sports Medicine

There are many trends in implementing sports medicine practices in Chilean athletic training. The use of technology in sports medicine is becoming increasingly prevalent, with tools such as variable devices and virtual reality to enhance athletic care and performance. Collaboration among professionals from different fields is becoming more common in sports medicine. There is a growing emphasis on injury prevention in sports medicine, with a focus on identifying risk factors and implementing the strategy to minimize the occurrence of injuries.

Sports medicine encloses a wide range of disciplines and practices aimed at promoting the health and performance of athletes. The primary goal of sports medicine is to stop sports-related injuries through education, training, and carrying out injury prevention programs. This includes identifying risk factors for injuries and developing strategies to reduce them. Sports medicine professionals are trained to diagnose and treat sports-related injuries, including

bone and muscle injuries, concussions, and overworked injuries. They utilize various diagnostic tools and techniques to judge and manage these conditions. An important aspect of sports medicine is the rehabilitation of injured athletes.

This involves developing personalized rehabilitation programs to help athletes recover from injuries, regain strength and mobility, and safely return to sports. Sports medicine professionals work to optimize athletic performance through techniques such as strength and conditioning programs, nutrition counseling, and sports psychology. They stay updated on the latest developments in sports science and apply evidence-based practices in their work.

This often involves a multi-disciplinary approach, bringing together professionals from various fields such as orthopedics, physical therapy, nutrition, psychology, and exercise physiology to provide comprehensive care for athletes; at hearing these principles and goals, sports medicine professionals attempt to promote the health and performance of athletes across all level of competition in Chile.

4.4 Importance of Sports Medicine

Sports medicine plays an important role in optimizing athletic performance and preventing injuries in athletes, sports medicine professionals work with athletes to identify and address potential injury risks. They can guide proper training techniques, equipment selection, and injury prevention strategies to help athletes avoid injuries. In any event of an injury, sports medicine professionals can provide early precautions to help athletes recover more quickly and safely.

This can include physical therapy, rehabilitation, and other treatments to help athletes get back to their sport as soon as possible. Sports medicine professionals can help athletes optimize their performance by guiding nutrition, hydration, and other factors that can impact performance. They can also help athletes develop training plans customized to their needs and goals. Sports medicine is essential for optimizing athletic performance and preventing injuries in athletes. Working with sports medicine professionals, athletes can stay healthy, recover more quickly from injuries, and perform their best.

4.5 Challenges in Implementing Sports Medicine

Sports medicine professionals in Chilean athletic training phase several challenges and obstacles that can impact their ability to provide optimal care for athletes. The Obstacles faced by professionals in Chilean athletic training may differ. Sports medicine professionals in Chile may need more access to resources such as equipment, facilities, and funding. This can make it difficult to provide the best possible care for athletes. Athletes and coaches need more.

The general public may lack awareness about the importance of sports medicine and injury prevention. This can make it difficult for sports medicine professionals to promote their services and educate others about proper training and injury prevention benefits. Cultural barriers may sometimes make it difficult for sports medicine professionals to care for athletes. For example, some athletes may hesitate to seek medical attention due to cultural beliefs or stigmas surrounding injury and infection.

Cultural attitudes and beliefs about sports and healthcare can present barriers to effective athletic training. This may include cultural norms around injury management, rehabilitation practices, and the role of healthcare professionals in sports. Medicine professionals in Chilli may need more access to education and training opportunities, which can impact their ability to stay up to date with the latest research and techniques in the field. Access to specialized education and training programs in sports medicine and athletic training may help the development of qualified professionals in the field. This can impact the quality of care provided to athletes and the advancement of sports medicine in Chile. There may be a lack of regulation and oversight in the sports medicine field in Chile, making it difficult to ensure that all professionals provide high-quality care.

4.6 Smart PLS Algorithm Model

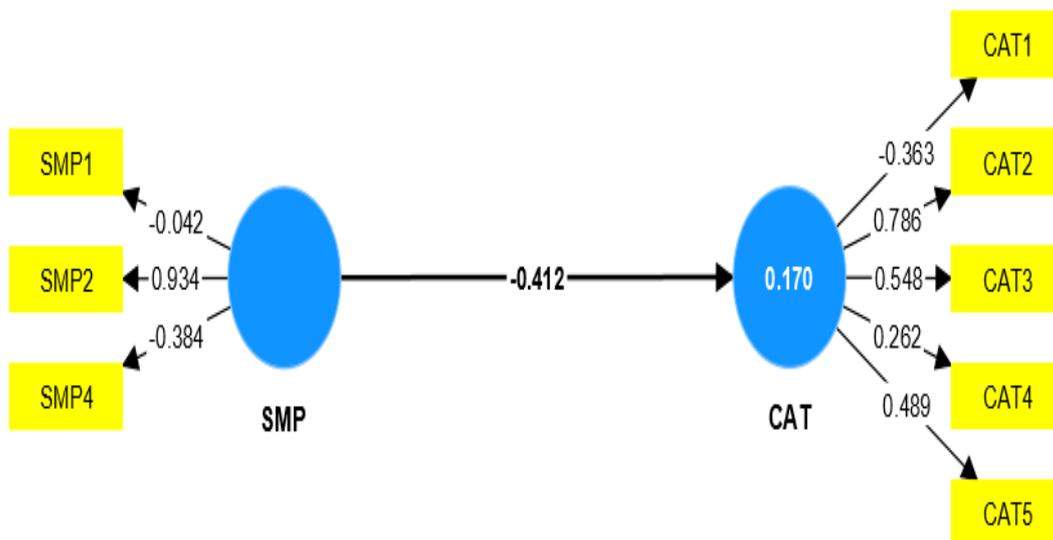


Figure 1

The above result describes the smart PLS Algorithm model in between sports medicine practices and athletic training. The SMP shows that -0.042, 0.934, and 0.384 show a significant rate of sports medicine practices. Similarly, the CAT shows that 0.363, 0.786, 0.548, 0.262 also that 0.489 these are shows that 78%, 26%, 48% positive rates between them. the SMP shows negative link with CAT its rate is -0.412 but its 41% significantly between them.

4.7 Descriptive Statistic

Table 1

NAME	NO.	MEAN	MEDIAN	SCALE MIN	SCALE MAX	STANDARD DEVIATION	EXCESS KURTOSIS	SKEWNESS	CRAMÉR-VON MISES P VALUE
SMP1	0	1.449	1.000	1.000	3.000	0.537	-0.806	0.618	0.000
SMP2	1	1.469	1.000	1.000	3.000	0.538	-0.915	0.530	0.000
SMP3	2	1.367	1.000	1.000	2.000	0.482	-1.751	0.568	0.000
SMP4	3	1.408	1.000	1.000	3.000	0.531	-0.509	0.803	0.000
SMP5	4	1.449	1.000	1.000	2.000	0.497	-2.040	0.212	0.000
SMP6	5	1.510	1.000	1.000	3.000	0.539	-1.068	0.361	0.000
CAT1	6	1.510	1.000	1.000	3.000	0.539	-1.068	0.361	0.000
CAT2	7	1.490	1.000	1.000	3.000	0.576	-0.453	0.703	0.000
CAT3	8	1.612	2.000	1.000	3.000	0.565	-0.758	0.239	0.000
CAT4	9	1.490	1.000	1.000	3.000	0.539	-1.002	0.445	0.000
CAT5	10	1.469	1.000	1.000	3.000	0.575	-0.329	0.788	0.000
CAT6	11	1.367	1.000	1.000	2.000	0.482	-1.751	0.568	0.000
CAT7	12	1.571	2.000	1.000	3.000	0.571	-0.734	0.387	0.000
CAT8	13	1.347	1.000	1.000	3.000	0.517	0.185	1.114	0.000

The above result represent that descriptive statistical analysis result shows that mean values, median rate, standard deviation, skewness values also that present probability values of each indicator included dependent and independent variables. the overall minimum value is 1.000 the maximum value is 3.000 also that median rate is 1.000 respectively of each indicator.

The SMP1,2,3,4,5,6 these are all consider as independent variable according to the result its mean values are 1.449, 1.469, 1.367, 1.408, 1.449 also that 1.510 these values shows that positive average value of mean. The standard deviation rates are 53%, 48%, 49%, respectively deviate from mean. Similarly, the CAT is dependent variable according to the result its

mean values are 1.510, 1.490, 1.612, 1.490, 1.347 these are all shows that positive average value of mean. The standard deviation rates of each indicator are 56%, 53%, 48%, 51%, also that 57% deviate from mean. The overall probability value is 0.000 shows that 100% significantly level between them.

4.8 Correlation Coefficient

Table 2

	SMP1	SMP2	SMP3	SMP4	SMP5	SMP6	CAT1	CAT2	CAT3	CAT4	CAT5	CAT6	CAT7	CAT8
CAT1	-0.227	0.019	0.143	-0.228	-0.017	-0.193	1.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
CAT2	-0.051	-0.347	0.087	0.147	0.087	-0.148	-0.082	1.000	0.000	0.000	0.000	0.000	0.000	0.000
CAT3	-0.099	-0.207	-0.226	0.051	-0.252	0.114	-0.155	0.082	1.000	0.000	0.000	0.000	0.000	0.000
CAT4	0.016	-0.089	0.250	-0.057	0.017	0.264	-0.228	0.148	0.021	1.000	0.000	0.000	0.000	0.000
CAT5	0.111	-0.184	0.041	-0.026	0.191	0.017	-0.114	0.107	0.246	-0.017	1.000	0.000	0.000	0.000
CAT6	-0.085	0.122	-0.142	-0.187	0.163	0.064	-0.093	0.161	0.298	0.014	0.041	1.000	0.000	0.000
CAT7	-0.038	0.256	-0.021	-0.029	0.031	0.312	-0.019	-0.230	-0.135	0.019	-0.009	-0.169	1.000	0.000
CAT8	0.027	0.001	0.226	0.227	-0.050	0.024	-0.049	0.320	0.181	0.196	-0.067	0.226	-0.118	1.000
SMP1	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	0.000
SMP2	0.048	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
SMP3	0.072	0.279	1.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SMP4	0.216	-0.028	0.371	1.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SMP5	0.009	0.204	0.504	0.156	1.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SMP6	0.196	-0.122	-0.250	-0.015	-0.093	1.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

The above result describes that correlation coefficient analysis of sport medicine practices in the Chilean athletic training. Overall result shows some positive and some negative correlation between dependent and independent variables. Sports medicine practices in Chilean athletic training involve the solution of comprehensive medical, bone, and muscle care for athletes, active individuals, and diverse populations.

Sports medicine physicians in Chile have typically completed an ACGME-accredited primary residency in family medicine, pediatrics, emergency medicine, or physical medicine and rehabilitation, followed by an ACGME-accredited fellowship in sports medicine. They are trained to address the unique medical and performance needs of athletes of all ages and abilities, aiming to provide equitable care to their patients.

The key principles and goals of sports medicine in Chilean athletic training include the demand for comprehensive development policies to integrate youth into sports, addressing the lack of resources and organizational structure, and the centralized nature of sports leading to equality and geographical exclusion. Emphasize the need for correct policies to level opportunities and highlight the importance of social protection, higher education, infrastructure, talent requirement, and continuous training. This needs evidence-based policies for sports development in Chile.

5. Conclusion

In conclusion, it is possible that both global trends and particular difficulties unique to the Chilean environment have an impact on the application of sports medicine techniques in athletic training. A comprehensive, multidisciplinary approach, customised training plans, and embracing technology innovations are important developments that can improve athlete performance and well-being. The research determines that trends and its challenges related to the sports medicine practices in the Chilean athletic training. For measuring the research used smart PLS software and generate result included descriptive statistic, correlation coefficient and smart PLS Algorithm model between them. However, in order to guarantee the successful integration of sports medicine procedures, issues including scarce resources, the requirement for education and awareness, cultural aspects, infrastructure development, and regulatory concerns must be addressed.

Through adept handling of these obstacles and utilization of developing patterns, the sports medicine community in Chile may make a substantial impact on the well-being and achievements of athletes within the nation. It's critical to keep up with the rapidly changing field of sports medicine and modify plans of action to suit the particular requirements of the Chilean sports community. Updated with Trends and overcoming challenges in sports medicine practices in Chilean athletic training is of significance importance. Overall research concluded that significant link between them. By staying updated with the latest trends and best practices in sports medicine, professionals can provide more effective and evidence-based care to athletes. this includes implementing advanced injury prevention strategies, utilizing rehabilitation techniques, and optimizing performance in many programs.

Implementing and understanding the latest trends in sports science and medicine can help athletic trainers and sports medicine professionals optimize athlete performance. This includes advancement in strength and conditioning, nutrition, recovery techniques, and sports physiology to help athletes reach their full potential.

5.1 Recommendations and Future Research

There are some suggestions based on the patterns and difficulties found while integrating sports medicine techniques into Chilean athletic training:

- 1) Set aside funds for the construction of sports medical facilities, the purchase of cutting-edge equipment, and the education of skilled personnel. This involves making sure that people have access to tools and equipment for rehabilitation that support preventative efforts.
- 2) Develop thorough education and awareness campaigns aimed at athletes, coaches, and the general public. Stress the value of training properly, taking preventative measures, and the contribution of sports medicine to improving performance and lowering injury rates.
- 3) To help sports medicine practitioners better understand and handle cultural issues impacting attitudes towards injuries, treatment, and preventative measures, offer cultural sensitivity training. Develop tactics that take into account the cultural background of Chilean sportsmen.
- 4) Promote cooperation between different medical specialists, such as physiotherapists, psychologists, and nutritionists. Create comprehensive programs that focus on the emotional and physical health of athletes.
- 5) Give top priority to the establishment of clinics and rehabilitation facilities for sports medicine in order to guarantee that athletes have access to top-notch treatment. This entails collaborating with governmental agencies and athletic associations to obtain financing and assistance.
- 6) Ensure that sports medical practices are subject to stricter rules. In order to preserve the quality of service, make sure practitioners fulfil certain requirements, follow moral guidelines, and participate in continuing professional development.
- 7) Promote and aid in research projects related to sports medicine. Encourage an innovative culture to investigate new tools and techniques that might improve athlete performance and care.
- 8) To keep sports medicine practitioners up to date on the most recent developments in the field, provide programs for their further education and professional growth. This may aid in the ongoing development of procedures and processes.
- 9) To determine the efficacy of sports medicine procedures, put in place a strong monitoring and evaluation system. Review injury rates, recovery rates, and athlete performance on a regular basis to make data-driven changes and enhancements.
- 10) Work together to match sports medical practices to the unique requirements and objectives of various sports, both nationally and locally. This partnership has the potential to improve athletes' overall support network. These guidelines are intended to direct those involved in Chilean athletic training towards the efficient application of sports medicine techniques, promoting an environment that priorities the health and performance of athletes.

Reference

- Adib, S., BASHA, N. A., TUFAHHA, A., BARAKAT, I., & CAPAPÉ, C. (2021). First substantiated record of leopard whiplay, *Himantura leoparda* (Myliobatoidei: Dasyatidae) from the Syrian coast (Eastern Mediterranean Sea). *FishTaxa*, 19, 5-8.
- Aguilar-Farias, N., Miranda-Marquez, S., Martino-Fuentealba, P., Sadarangani, K. P., Chandia-Poblete, D., Mella-Garcia, C., . . . Delgado-Floody, P. (2020). 2018 Chilean physical activity report card for children and adolescents: Full report and international comparisons. *Journal of Physical Activity and Health*, 17(8), 807-815.
- Aguilar, B., Fang, P., Laubenbacher, R., & Murrugarra, D. (2020). A near-optimal control method for stochastic boolean networks. *Letters in Biomathematics*, 7(1), 67. doi:10.30707/LiB7.1.1647875326.011975
- Andermo, S., Hallgren, M., Nguyen, T.-T.-D., Jonsson, S., Petersen, S., Friberg, M., . . . Elinder, L. S. (2020). School-related physical activity interventions and mental health among children: a systematic review and meta-analysis. *Sports Medicine-Open*, 6(1), 1-27.
- Blecha, K., Nuelle, C. W., Smith, P. A., Stannard, J. P., & Ma, R. (2021). Efficacy of prophylactic knee bracing in sports. *The Journal of Knee Surgery*, 35(03), 242-248.
- Costa, J., Depra, P., Abiko, R., Weber, V., Fernandes, D., Zavalla, S., & Borges, P. (2021). THE EFFECT OF BREATH STANDARDS BY STROKES IN CRAWL SWIMMING. *Revista Internacional de Medicina y Ciencias de la Actividad Física y del Deporte*, 21(82), 223-234.
- Denche-Zamorano, A., Rodriguez-Redondo, Y., Barrios-Fernandez, S., Mendoza-Muñoz, M., Castillo-Paredes, A., Rojo-Ramos, J., . . . Adsuar, J. C. (2023). Rehabilitation is the main topic in virtual and augmented reality and physical activity research: A bibliometric analysis. *Sensors*, 23(6), 2987.
- Deniz, İ., & Dündar, A. (2023). Publication trends and global productivity about the anterior cruciate ligament: a bibliometric analysis between 1980-2021. *Journal of Health Sciences and Medicine*, 6(2), 228-237.
- Ding, D., Varela, A. R., Bauman, A. E., Ekelund, U., Lee, I.-M., Heath, G., . . . Pratt, M. (2019). Towards better evidence-informed global action: lessons learnt from the Lancet series and recent developments in physical activity and public health. *British journal of sports medicine*.
- Duclos-Bastías, D., Hepp, K., Arias, D. Á., Giakoni-Ramírez, F., & Calderon, P. L. (2023). Digitization in Services of the Emerging Chilean Sport Industry. *Sport Management in the Ibero-American World: Product and Service Innovations*.
- Garcia-Hermoso, A., Ramirez-Velez, R., Saez de Asteasu, M. L., Martinez-Velilla, N., Zambom-Ferraresi, F., Valenzuela, P. L., . . . Izquierdo, M. (2020). Safety and effectiveness of long-term exercise interventions in older adults: a systematic review and meta-analysis of randomized

- controlled trials. *Sports Medicine*, 50, 1095-1106.
- Giulianotti, R., & Thiel, A. (2023). New horizons in the sociology of sport. *Frontiers in Sports and Active Living*, 4, 1060622.
- Godoy-Cumillaf, A., Fuentes-Merino, P., Fariás-Valenzuela, C., Duclos-Bastías, D., Giakoni-Ramírez, F., Bruneau-Chávez, J., & Merellano-Navarro, E. (2023). The association between sedentary behavior, physical activity, and physical fitness with body mass index and sleep time in Chilean girls and boys: A cross-sectional study. *Children*, 10(6), 981.
- Gupta, L., Morgan, K., & Gilchrist, S. (2017). Does elite sport degrade sleep quality? A systematic review. *Sports Medicine*, 47, 1317-1333.
- Knapik, J. J., Hauret, K. G., Arnold, S., Canham-Chervak, M., Mansfield, A., Hoedebecke, E., & McMillian, D. (2003). Injury and fitness outcomes during implementation of physical readiness training. *International journal of sports medicine*, 24(05), 372-381.
- Lubans, D. R., Smith, J. J., Eather, N., Leahy, A. A., Morgan, P. J., Lonsdale, C., . . . Holliday, E. G. (2021). Time-efficient intervention to improve older adolescents' cardiorespiratory fitness: findings from the 'Burn 2 Learn' cluster randomised controlled trial. *British journal of sports medicine*, 55(13), 751-758.
- Lukaski, H., & Raymond-Pope, C. J. (2021). New frontiers of body composition in sport. *International journal of sports medicine*, 42(07), 588-601.
- Lundstrom, C. J., Foreman, N. A., & Biltz, G. (2023). Practices and applications of heart rate variability monitoring in endurance athletes. *International journal of sports medicine*, 44(01), 9-19.
- Martínez de Ojeda, D., Puente-Maxera, F., & Méndez-Giménez, A. (2021). MOTIVATIONAL AND SOCIAL EFFECTS OF A MULTIANNUAL SPORT EDUCATION PROGRAM. *Revista Internacional de Medicina y Ciencias de la Actividad Física y del Deporte*, 21(81).
- McKay, A. K., Stellingwerff, T., Smith, E. S., Martin, D. T., Mujika, I., Goosey-Tolfrey, V. L., . . . Burke, L. M. (2021). Defining training and performance caliber: a participant classification framework. *International journal of sports physiology and performance*, 17(2), 317-331.
- Nevill, A. M., Duncan, M. J., Gaya, A., & Mello, J. B. (2023). Secular trends in the physical fitness of Brazilian youth: Evidence that fitness is declining for the majority but not for a fit minority. *Scandinavian Journal of Medicine & Science in Sports*, 33(10), 2079-2089.
- ÖZKADI, T., DEMİR, E., YILDIRIM, T., ÇAĞLAR, E. Ç., ALAGÖZ, İ., & AYDOĞDU, G. (2022). Bibliometric analysis of swimming publications in sports science: a medical perspective. *Hitit Medical Journal*, 4(2), 39-48.
- Peña-Troncoso, S., Toro-Arévalo, S., Vega-Ramírez, J., Gallardo-Fuentes, F., & Pazos-Couto, J. M. (2023). A Look at the Interconnection of Dimensions of Knowledge in Physical Education Teacher Training in Chile. *International Journal of Environmental Research and Public Health*, 20(4), 3249.

- Ramírez-Montoya, M. S., Andrade-Vargas, L., Rivera-Rogel, D., & Portuguez-Castro, M. (2021). Trends for the future of education programs for professional development. *Sustainability*, 13(13), 7244.
- Sallis, J. F., Bull, F., Guthold, R., Heath, G. W., Inoue, S., Kelly, P., . . . Hallal, P. C. (2016). Progress in physical activity over the Olympic quadrennium. *The lancet*, 388(10051), 1325-1336.
- Thomas, R. J., King, M., Lui, K., Oldridge, N., Piña, I. L., Spertus, J., . . . Grady, K. L. (2007). AACVPR/ACC/AHA 2007 performance measures on cardiac rehabilitation for referral to and delivery of cardiac rehabilitation/secondary prevention services: endorsed by the American college of chest physicians, American college of sports medicine, American physical therapy association, Canadian association of cardiac rehabilitation, European association for cardiovascular prevention and rehabilitation, inter-American heart foundation, national association of clinical nurse specialists, preventive cardiovascular nurses association, and the society of thoracic surgeons. *Journal of the American college of Cardiology*, 50(14), 1400-1433.
- Thompson, W. R., Sallis, R., Joy, E., Jaworski, C. A., Stuhr, R. M., & Trilk, J. L. (2020). Exercise is medicine. *American journal of lifestyle medicine*, 14(5), 511-523.
- Vancini, R. L., Andrade, M. S., Viana, R. B., Nikolaidis, P. T., Knechtle, B., Campanharo, C. R., . . . de Lira, C. A. (2021). Physical exercise and COVID-19 pandemic in PubMed: Two months of dynamics and one year of original scientific production. *Sports medicine and health science*, 3(2), 80-92.
- Weldon, A., Duncan, M. J., Turner, A., Sampaio, J., Noon, M., Wong, D., & Lai, V. W. (2021). Contemporary practices of strength and conditioning coaches in professional soccer. *Biology of Sport*, 38(3), 377-390.
- West, S. W., Clubb, J., Torres-Ronda, L., Howells, D., Leng, E., Vescovi, J. D., . . . Windt, J. (2021). More than a metric: how training load is used in elite sport for athlete management. *International journal of sports medicine*, 42(04), 300-306.
- Wilke, J., Mohr, L., Yuki, G., Bhundoo, A. K., Jiménez-Pavón, D., Laiño, F., . . . Ortega-Gómez, S. (2022). Train at home, but not alone: a randomised controlled multicentre trial assessing the effects of live-streamed tele-exercise during COVID-19-related lockdowns. *British journal of sports medicine*, 56(12), 667-675.
- Yorgey, M. (2016). *Requirements for sports medicine professionals in Central and South America*. Indiana State University,