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## *An Adjusting Strategy for Beach Soccer Practice*

*[Estrategia pedagógica para la adaptación al fútbol playa]*

*[Estratégia de adaptação ao futebol de Praia]*

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### **ABSTRACT**

**Introduction:** High-performance beach soccer practice demands enormous energy consumption due to the context where the game takes place. Therefore, designing and implementing a set of exercises for player adjustments to these conditions is critical for the scientific community

**Aim:** To assess the pertinence of a pedagogic strategy for athlete adjustment to beach soccer.



**Materials and methods:** Various theoretical, empirical, and statistical methods were used, in accordance with the transversal design assumed in the research.

**Results:** The results of the study were validated through the application of statistical techniques, confirming the pertinence of the proposal.

**Conclusion:** The suitability of the proposal was demonstrated since the pedagogic strategy for adjusting to the beach soccer settings is a social need for the present-day Ecuadorian sport.

**Keywords:** adjustment, strategy, beach soccer, sports education

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## **RESUMEN**

**Introducción:** la práctica deportiva de alto rendimiento en el fútbol sobre arena le demanda al organismo humano un gasto importante de energía. Producto de las condiciones contextuales donde se realiza el gesto deportivo. Es por ello que concretar ejercicios en función de la adaptación de los jugadores a la arena es un tema de importancia para la comunidad científica.

**Objetivo:** valorar la pertinencia de una estrategia pedagógica para la adaptación al fútbol playa.

**Materiales y métodos:** durante la investigación se utilizaron métodos teóricos empíricos y estadísticos en correspondencia a las características de diseño transversal asumido en la investigación.

**Resultados:** los resultados obtenidos en el estudio presentan un alto nivel de validez, pues así fue corroborado con la aplicación de las técnicas estadísticas. Además, esto conllevó a identificar el nivel de pertinencia de la propuesta presentada.

**Conclusiones:** quedó evidenciada la necesidad y actualidad de la investigación presentada pues la estrategia pedagógica para la adaptación al fútbol playa en una necesidad social para el deporte ecuatoriano en la actualidad.

**Palabras clave:** adaptación, estrategia, fútbol sobre arena, pedagogía deportiva

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## RESUMO

**Introdução:** a prática do esporte de alto rendimento no futebol de areia exige um importante gasto de energia do organismo humano. Isso é resultado das condições contextuais em que o gesto esportivo é realizado. Por isso, é importante para a comunidade científica especificar exercícios baseados na adaptação dos jogadores à areia.

**Objetivo:** avaliar a relevância de uma estratégia pedagógica para a adaptação ao futebol de praia.

**Materiais e métodos:** durante a pesquisa, foram utilizados métodos teóricos, empíricos e estatísticos, de acordo com as características do desenho transversal assumido na pesquisa.

**Resultados:** os resultados obtidos no estudo apresentam um alto nível de validade, pois foram corroborados pela aplicação de técnicas estatísticas. Além disso, isso levou à identificação do nível de relevância da proposta apresentada.

**Conclusões:** evidenciou-se a necessidade e a relevância da pesquisa apresentada, pois a estratégia pedagógica para a adaptação ao futebol de areia é uma necessidade social do esporte equatoriano na atualidade.

**Palavras-chave:** adaptação, estratégia, futebol de areia, pedagogia do esporte, pedagogia esportiva

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## INTRODUCTION

Today's sports training demands more from athletes. It responds to the tight international sports calendar in several disciplines. Soccer is also part of this scenario. Most soccer clubs compete internationally all over the year.

Hence, this issue should be addressed with a scientific perspective, especially in the different soccer variants derived from traditional soccer. They create a higher demand from the body, due to the structural and contextual conditions the athletes must face.



Factors like the changes in the rules, natural settings, and the limited number of participants, just to mention some examples, are part of the above.

Therefore, this study will deal with one of the variants of traditional soccer, which is being taken up by several countries, beach soccer, or sand soccer. This is a relatively recent soccer variant since it goes back to the 1990s. In 2005, beach soccer was managed and organized by the Fédération Internationale de Football Association (FIFA), spreading it to at least 170 of the 207 national associations, thus becoming a high-performance sport. Escobar & Lacerda, (2010, pp-11).

One of the main features of this sport is the sand floor, which facilitates aerial movements and demands greater skills from the players (Fazolo *et al.*, 2005, pp-24), which confers more excitement to the activity, due to the gracious acrobatic movements that make it a high-impact sport, and naturally, popular. Consequently, players must master various skills and dexterity for proper handling of different tactical situations posed during the matches.

Conceição, (2012, pp-4) considered that beach soccer is synonymous with spectacle, emotion, and goals. According to FIFA's statistics, the world championships held so far showed an average of eight goals per game. It creates a high level of fighting, attracting the interest of fans and the media.

The previous arguments demonstrate the need for assessing the main requirements of the sport and the field where it takes place, which coincides with Rada *et al.* (2019; Acuña, and Acuña, (2018); Dellacasa, Meucci, and Poeta, (2019). Therefore, some physiological elements should be mastered in detail by the athletes, coaches, and directors.

Moreover, Da Silva, Balogh, Márton, (2021); Valladares, Ayala, (2022); Aquino *et al.* (2022), considered that beach soccer is a team sport that demands major physical adjustment from the players due to the features of the sport and the field it takes place.



In that sense, it is a high-intensity intermittent variant that requires high energy consumption, and a strong anaerobic system, above 90 % of the maximum cardiac rate.

Álvarez-Medina *et al.* (2002, pp-54) noted that thanks to the high physical demand the aspects described by Fazolo *et al.* (2005) should be taken into consideration. They emphasized on muscle strength and playing on the sand, which raise the intensity of the sports gestures. Consequently, physical training should be performed depending on the type of activity, sports content, the rules, and the surface of the game.

Castellano & Casamichana, (2010), and Zapardiel, (2018) explained that soccer being played on sand limits player actions since they cannot run at such high intensities as in other soccer variants; it is a game surface that does not permit very quick movements, like the ones performed on other surface types. This scenario requires adjustments through proper pedagogic strategies implemented by coaches.

Another important aspect is that sandy floors absorb the impact during runs, making movements more difficult, shorter, and slower, which has been validated by Escobar *et al.* (2011). Besides, the lack of stability and less resistance from the sand create an overload on the ankles, causing greater efforts when thrusting, with greater flexion movements in the hips and knees (Escobar *et al.*, 2011). It is another important element for pedagogic-based training of this variant

Furthermore, Castellano and Casamichana (2010, pp-14) measured the cardiac frequency (CF) of amateur Spanish beach soccer players and found that most times it was around 59.3%. Players showed a frequency >90% above the maximum value (FCmax). In that sense, beach soccer is an intermittent, high-intensity sport that requires high energy consumption from the anaerobic system, considered a very important source of energy during matches, with over 90% intensity (FCmax).

Accordingly, new pedagogic ways must be designed with a scientific perspective, based on the biol



gical law of adjusting to sports training in Ecuador. These elements justify the need for coherent articulation of the pedagogic contents essentially based on athlete adjustment to the sport.

A diagnostic was performed on beach soccer teams in Ecuador using theoretical and empirical methods, as described by Caballero, Smarandache & Leyva, (2019); Moreno, García (2022); Góngora, Ávila Ramírez, & Coll (2023); De Ávila, Garcés & Espinoza (2023); Zaldívar, Ramirez, Gordo & La Rosa (2023). It revealed the following problem: How to help improve beach soccer player adjustment?

The aim of this paper was to assess the pertinence of a pedagogic strategy for athlete adjustment to beach soccer.

## *MATERIALS AND METHODS*

This study relied on non-experimental descriptive transversal research since this type of study permits the articulation of qualitative and quantitative techniques. Figure 1 shows the logic followed for the development of this type of design. Hence, the research methods and techniques have been validated by research methodology.

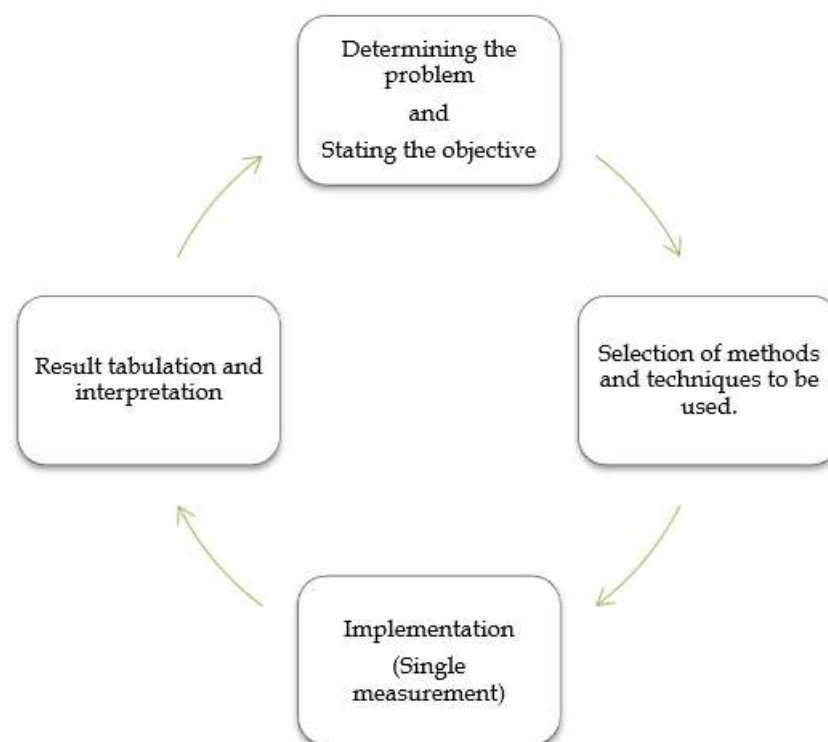
The population of the research consisted of 15 professionals with over 20 years of experience in the area of physical culture or applied sciences, soccer coaches with a master's degree (5), medical doctors (2), physiology teachers in the Sports Training Bachelor degree (3), and doctors with a Ph.D. in Physical Culture (5). The average age was 47.6 years. The selection was randomized via email.

Upon finishing the study, a meeting was held to explain the purpose of the investigation and they were asked to elucidate their doubts. Then the subjects were asked to sign a written consent based on the ethical principles for experimenting with humans, according to the Helsinki Declaration.



The theoretical methods used were analytical-synthetic and inductive deductive, which facilitated the work with the bibliography throughout the research. The empirical studies were surveys and measurements for data tabulation. A Likert-type scale was used to evaluate the pertinence of the strategy with the professionals selected for the study, with four levels: Excellent (5), Good (4), Average (3), and Bad (2).

Descriptive statistics, particularly the analysis of absolute and relative frequencies, was the statistical-mathematical method used. Inferential statistics (Pearson correlation) was used as well, with SPSS 20 (Windows) (Figure 1).



*Fig. 1. - Rationale for the transversal research*





## RESULTS AND DISCUSSION

The pedagogic strategy design was initially described by Flores & Castillejo, (2022), and Márquez, Rangel & Govea (2022), who took the pedagogic strategy as a stage-based system, interrelated actions that contribute to the improvement of some of the contents of pedagogy. In that case, it is oriented to the pedagogic process in beach soccer player training. The latter was derived from guiding theories that organize and direct the introduction of new content as part of the project presented in this research.

Table 1 summarizes the pedagogic strategy designed, with essential stages and actions for the fulfillment of the objective declared. Based on the exchanges with professionals, a set of significant assumptions are shown.

**Table 1.** *A summary of all the stages and actions of the educational strategy presented in the research*

Number	Stages	Actions
1	Diagnostic	Selection of instruments for application Training of the staff in charge of the application Instrument application Results tabulation Analysis of the potentialities and weaknesses derived
2	Planning	Selection of physical exercises Planning Content dosage Design of a training session-based system for implementation with the beach soccer team.
3	Implementation	Means and material resources management Design of a training session schedule Training sessions
4	Evaluation and adjustment	Selection of indicators Professional assessment  Design of an adjustment plan and session recovery



The implementation of the pedagogic strategy relies on the following methodological guidelines, which are closely related to the laws and principles of the theory that support the strategy.

- A periodic renovation of the exercises
- Progressive increase of execution difficulty grade
- Utilization of auxiliary means that correspond to the context of the game.
- Consideration of the climate characteristics when training

Below, are examples of some exercises and games in the pedagogic strategy for adjustments of beach soccer players.

Exercise 1. Pass and control on the sand.

Objective: To improve pass accuracy and the capacity to control the ball on the sand.

Instructions:

Make pairs and sit on the sand facing your partner.

One of you will pass the ball and the other will receive it.

The pass must be done with accuracy, trying to keep the ball off the sand.

The receiver must control the ball and kick it back following the same routine, off the sand.

Alternate roles after a preset number of passes (for instance, 10 passes each).

Note: As improvements are made, the distance between the players can be increased, or make more complicated passes, such as head passes or volleys.

Exercise 2. Running and fast shooting

Objective: To improve reaction speed and shooting accuracy.



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Instructions:

Place a cone or mark on the sand as a starting line, and place another cone approximately 15 m away, resembling the goal.

Begin at the start line and run to the goal line when the signal is made.

On the way, a partner will throw the ball to you.

You must control the ball quickly and shoot the door as fast as you can after receiving it.

Your partner will be the goalkeeper who will try to stop the ball from entering the goal.

Repeat it several times and change roles.

Note: You may set a time limit for the shooting, adding more pressure and encouraging quick decision-making.

This section refers to two important moments of the study. The first shows the results from the survey of the professionals selected in the sample. Meanwhile, in the second moment, they are discussed.

Moment 1. Presentation of the results

For a better explanation of this moment, the results from the three questions in the survey were discussed.

*Table 2 - Results of the analysis of the first question in the survey*

Question 1	Excellent (5)	Good (4)	Average (3)	Bad (2)
Assessment of the structure of the pedagogic strategy for beach soccer adjustments.	12 (80%)	2 (13.3%)	1 (6.7%)	-



Upon the assessment of the results from question 1, the table shows that 12 (80 %) said that the structure of the strategy was Excellent and corresponded to the ones consulted by the subjects in the scientific literature, whereas 2 (13.3 %) manifested it was Good. The lowest categories in the Likert scale showed 1 subject (6.7 %) who said that it was Average, and none said it was Bad. The results demonstrate the pertinence of the structure of the strategy designed (Table 3).

*Table 3 - Results of the analysis of the second question in the survey*

Question 2	Excellent (5)	Good (4)	Average (3)	Bad (2)
What's your assessment of the exercises for adjustment to sandy surfaces included in the pedagogic strategy?	13 (86.8%)	1 (6.6%)	1 (6.6%)	-

The results of this question are similar to the previous question. Overall, 13 subjects (86.8%) considered that the exercises for adjustments to sand in the strategy were Excellent, and corresponded to the characteristics, energy and aerobic requirements, and the rules of beach soccer. Meanwhile, only 1 subject (6.6 %) considered that they were Good, and another one said it was Average. None of the subjects considered the lowest category of the scale, which denotes the pertinence of the exercises in the strategy.

*Table 4 - Results of the analysis of the third question in the survey*

Question 3	Excellent (5)	Good (4)	Average (3)	Bad (2)
What's your assessment of the methodological recommendations for the implementation of the pedagogic strategy for adjustments in beach soccer?	13 (86.8%)	2 (13.2%)	-	-

The results of the third question in the survey are shown in Table 4. As in the questions below, 13 subjects selected the highest category in the scale (86.8 %) said it was Excellent. Whereas the other 2 (13.2 %) said it was Good. None of the subjects considered the lowest category of the scale. These results evidence the pertinence of the methodological recommendations presented.



A correlation study was done to confirm the validity of the results, with the coinciding relationships of three variables. Table 5 shows the correlation matrix of the variables selected that corresponded to the contents of the three questions in the survey. Accordingly, values were given to the scale.

And the data were processed using SPSS 20, for Windows. Hence, all the correlation coefficients in all the possible variable pairs were calculated. The statistical analysis relied on the Pearson test, with significant results  $r$ , ( $p < 0.005$ ). It proves that the significance level of this research, demonstrating the high level of internal validity of the research (Table 5).

**Table 5 - Results of the Pearson Correlation test**

		Structure	Exercises	Recommendations
<b>Structure</b>	Pearson correlation	1	.901**	.844**
	Sig. (two-sided)	-	0.00	0.00
	N	15	15	15
<b>Exercises</b>	Pearson correlation	.901**	1	.941**
	Sig. (two-sided)	0.00	-	0.00
	N	15	15	15
<b>Recommendations</b>	Pearson correlation	.844**	.941**	1
	Sig. (two-sided)	0.00	0.00	-
	N	15	15	15

**\*\*.** The significant correlation was significant, at 0.01 (two-sided).

Source: SPSS 20, for Windows.

In beach soccer, the surface is made of leveled and rock-free sand, preventing players from getting injured. The international requirements regulate the quality of sand (very thin grains covering a 40 cm deep layer). The sand must be sieved to meet the sport's requirements; the surface must not be rough or contain pebbles or other dangerous elements. Though it cannot be so thin that it causes dust. The elements in the rules were considered for the selection and application of the exercises of the strategy suggested in this research.

Moreover, Escobar *et al.* (2012) recommended the analysis of variables like anaerobic potency. The results of the study confirmed the predominant anaerobic character of the sport. This is another aspect taken into consideration for the strategy since it depends on



the proper characterization of beach soccer, which permits an adequate selection of exercises to promote player adjustment to this new scenario.

Another element considered for structuring the strategy is constant observation of player performance on the sand. The marked reduction of the intensity of the game might cause fatigue in the players, which was demonstrated by Leite & Barreira, (2014).

In beach soccer, competitions include consecutive matches, which demands significant energy consumption. Accordingly, the sports calendar should be studied to make an adequate selection of exercises for adjustment to the characteristics of beach sand.

Below, are a group of theoretical assumptions from the subjects in the survey, which were included in the strategy. They were arranged into two essential cores dealing with the laws of beach soccer and its principles.

#### *Theoretical core 1. Laws*

The pedagogic strategy takes into consideration the Law of biological adaptation, as a suitable means that links biological sciences to sports training in general, and beach soccer, in particular, which is expressed when an adapting body reaches a balance between the activity performed and the technical gesture of the sport practiced.

The principal law of sports enhancements is the fundamental law of acquiring sports mastery (PFMD). Verjoshanski, (2002) said it reveals that an increase in sports mastery depends, above all, on an increase in the athlete's motor potential and their ability to use that potential in training sessions and competition. These aspects have a relevant role in this particular case. It responds to two essential aspects: the characteristics of the game and the competition system used in this sport.

#### *Theoretical core 2. Principles*

The following principles are assumed in this paper, as described by Verjoshanski, (2002), The principle of regulated alternative of the different elements of training.



It corresponds to the real possibilities of each beach soccer player and the training stage they are in. Besides, it is more important to adjust training to the characteristics of beach soccer, its rules, times, and field size.

-The principle of specific and unspecific reaction versus the load stimulus, which is assumed for the sport's dynamism and intensity. It involves the necessary training with a focus on the players' reactions in every situation of the game.

The principle of conscious and active character of learners guided by their teachers. The player's cognitive side takes place through active pedagogic engagement. The athletes are asked to address contradictory situations so that they reflect on what they do once they have determined the outer stimuli that lead to these problems.

## *CONCLUSIONS*

The bibliographic review revealed that research done on the pedagogic process associated with training beach soccer players' adaptations has methodological flaws, which demand a new tool for improvements.

The pedagogic strategy poses a systemic relationship between stages and actions, which is materialized through a set of exercises to enhance skills and abilities related to player adjustments to beach soccer conditions.

The results collected upon surveying the professionals in the study sample evidenced the pertinence regarding the strategy for adjusting to the beach soccer conditions following its implementation in the Ecuadorian sports context.



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***Conflict of interest statement:***

The authors declare having no competing interests.

***Author contribution statement:***

The authors have participated in the redaction of the manuscript and the documentary review.



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