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Original article

Oculo-pedic coordination contents in ball conduction for juvenile female soccer. Validation by specialists

Contenidos de coordinación óculo-pédica en conducción del balón para fútbol femenino juvenil. Validación por especialistas

Conteúdos da coordenação óculo-pédica no manejo de bolas para o futebol feminino júnior. Validação por especialistas

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ABSTRACT

The oculo-pedic coordination refers to movements made with the visual coordination with the foot, a useful motor element for various sports and especially for establishing work strategies in soccer players of various teaching-educational categories. The objective of this research is to theoretically validate, through specialists, a physical exercises proposal that enhance the oculo-pedic coordination in the ball conduction technique for female youth soccer players. This is a descriptive-correlational research of qualitative order. Thirty specialists are selected, divided into three levels of professional competencies, to whom a questionnaire is applied to evaluate three pre-proposal indicators, which validate an idea of coordination training (relevance, complexity, priority), plus a questionnaire that will evaluate an indicator (effectiveness) after designing the intervention proposal with 30 specialized physical exercises. As results, there are no significant differences in three indicators (complexity: $p=0.850$; priority: $p=0.075$; effectiveness: $p=0.419$) out of four possible indicators (relevance: $p=0.014$) by level of specialists, and there is consensus in the ratings issued. The pre-proposal



indicators presented a qualitative evaluation between fair to very good and the evaluator indicator of the proposal obtained an overall qualitative rating of Agreed. It is evident, in general, the consensus criterion of several specialists with diverse competences, qualifying quantitatively and qualitatively, in a positive way, the quality of the pre-proposal and the proposal.

Keywords: Youth category; Women's soccer; Oculo-pedic coordination; Ball conduction.

RESUMEN

La coordinación óculo-pédica se refiere a movimientos realizados con la coordinación visual con el pie, elemento motriz de utilidad para diversos deportes y, en especial, para establecer estrategias de trabajo en futbolistas de diversas categorías de formación. Esta investigación tiene como objetivo validar teóricamente mediante especialistas una propuesta de ejercicios físicos que potencien la coordinación óculo-pédica, en la técnica de conducción del balón para futbolistas juveniles del género femenino. Esta investigación es de tipo descriptiva-correlacional, de orden cualitativa. Se seleccionan a 30 especialistas, divididos en tres niveles de competencias profesionales, a los cuales se les aplica un cuestionario para evaluar tres indicadores prepropuesta, que validan una idea de entrenamiento coordinativo (pertinencia, complejidad, prioridad), más un cuestionario que evaluará un indicador (efectividad) luego de diseñada la propuesta de intervención con 30 ejercicios físicos especializados. Como resultados, se plantea que no se evidencian diferencias significativas en tres indicadores (complejidad: $p=0.850$; prioridad: $p=0.075$; efectividad: $p=0.419$) de cuatro posibles (pertinencia: $p=0.014$) por nivel de especialistas, existiendo consenso en las calificaciones emitidas. Los indicadores prepropuesta presentaron una evaluación cualitativa entre regular a muy bien y el indicador evaluador de la propuesta obtiene una calificación cualitativa general *De acuerdo*. Se evidencia, en sentido general, el criterio consensado de varios especialistas con competencias diversas, calificando cuantitativa y cualitativamente, de forma positiva, la calidad de la prepropuesta y la propuesta.

Palabras clave: Categoría juvenil; Fútbol femenino; Coordinación óculo-pédica; Conducción del balón.

RESUMO

A coordenação óculo-pédica refere-se a movimentos feitos com a coordenação visual com o pé, um elemento motor útil para vários desportos e, especialmente, para estabelecer estratégias de trabalho em jogadores de futebol de várias categorias de treino. O objetivo desta investigação é validar teoricamente através de especialistas uma proposta de exercícios físicos que potenciem a coordenação óculo-pédica, na técnica de condução de bola para jovens jogadoras de futebol feminino. Esta é uma investigação descritivo-correlacional e qualitativa. São selecionados trinta especialistas, divididos em três níveis de competências profissionais, aos quais é aplicado um questionário para avaliar três indicadores de pré-proposta, que validam uma ideia de formação de coordenação (pertinência, complexidade, prioridade), mais um questionário que avaliará um indicador (eficácia) após a concepção da proposta de intervenção com 30 exercícios físicos especializados. Como resultados, afirma-se que não são evidenciadas diferenças significativas em três indicadores (complexidade: $p=0,850$; prioridade: $p=0,075$; eficácia: $p=0,419$) de quatro possíveis (pertinência: $p=0,014$) por nível de especialistas, consenso existente nas qualificações emitidas. Os indicadores de pré-proposta apresentaram uma avaliação qualitativa entre regular a muito bom e o indicador do



avaliador da proposta obtém uma qualificação qualitativa geral *Acordado*. É evidente, num sentido geral, o critério consensual de vários especialistas com diversas competências, qualificando quantitativa e qualitativamente, de forma positiva, a qualidade da pré-proposta e da proposta.

Palavras-chave: Categoria jovem; Futebol feminino; Coordenação óculo-pédica; Manejo da bola.

INTRODUCTION

Soccer is a sport that has enjoyed great popularity in Ecuador and has spread in recent years in the female sphere; therefore, nationally, strategies have been designed to promote it and increase the number of participants as can be exemplified in *Perlaza (2014)*. Over the years, the possibility of women practicing and playing this sport has become known. Social classes have been determinant in the struggle of women to consider their rights, including the right to practice sports without gender distinctions. In this sense, the inclusion of women's sports has shown the need to adapt the different contents of sports preparation, according to a specific gender, taking into account various aspects such as physiological, biochemical and socio-cultural, to cite some relevant ones.

Conditional capacities such as strength, endurance and speed have been for decades a priority in sports training planning in general; (*Bompa & Buzzichelli, 2017; Morales & González, 2015*) and specifically, in soccer; (*Yépez & Ramírez, 2019; Rojas, Natali, López Montalvo, Vallejo Rojas, & Chávez Cevallos, 2019*) however, with time and facing an increasingly competitive scenario, researchers broadened their horizon towards other capacities intimately related to the nervous system. These qualities, known today as coordinative capacities, allow the athlete to perform the movements with precision, economy and efficiency, (*Bigoni, et al., 2017*) perfecting sports performance in a more comprehensive way.

Coordination in soccer is used as a determining capacity and is closely related to the technical-tactical component, (*Abdullah, et al., 2017*). As it is known, when playing soccer, the athlete needs to apply a great variety of actions or game movements, which implies that, the greater the number of sport gestures, the greater the required coordination development; therefore, the better their chances of quickly learning new skills and solving game situations with speed and efficiency (*Jukic, et al., 2019; Joo & Seo, 2016*). Taking into account the above definitions, the authors can indicate that the coordinative capacities allow the soccer player to perform a great variety of movements with precision, a saving of energy and with great efficiency; likewise, the coordinative capacities are the engine to learn the technical fundamentals, as stated by *Solana & Muñoz (2011)* and for this, various training and control strategies are established (*González, Córdova, Madrigal, & Pérez, 2019*).

Within the dissimilar technical-tactical situations that occur in soccer, linked to the coordination capacity, the oculo-pedic coordination involves the exercise of controlled and deliberate movements that require a lot of precision, with adjustments of visual information and limb motricity (*Alberto, 2016; Álvarez, Buendía, & Curiel, 2004*). Such eye-foot coordination is required especially in tasks where the eyes, hands, feet and fingers are used simultaneously; eye-foot coordination is the same as eye-hand coordination, but in this case the executions will be made with the foot as a key element of displacements, ball conduction, jumping over obstacles, among others. For *Suárez*



and Parrado (2016), eye-foot coordination is used to perform executions with the feet, giving as main access of information the vision: for example, jumping obstacles, guiding the ball, moving, where the sight will always be active when performing such movements (Suárez Correa & Parrado Orduz, 2016).

On the other hand, technique as a fundamental component of sports training, being characterized as a set of basic and sport-specific skills, involves enhancing various conditioning skills that aim to solve various situations within the game. One of the basic soccer techniques is ball conduction, (Carbo, Vélez, Cañizares, & Echeverría, 2019; Schreiner, 2002; Buschmann, Pabst, & Bussmann, 2002) understood as rolling and advancing the ball, using any part of the foot and on the field of play, maneuvering to advance with the ball at the feet. In other words, it is the action of dominating and moving with the ball at ground level, through a succession of touches with any part of the foot.

Under the concept of recreational sport, there is an erroneous knowledge. The only thing that matters in the child is that he/she learns to play soccer; on many occasions, practices are directed empirically, without scientific basis and, on other occasions, sports preparation contents are prioritized to the detriment of other components that usually, in the medium or long term, are essential for the achievement of high sports performance, such as the different coordination capabilities, which at the same time have various mechanisms of integral optimization, (Calero., 2018) as would be the case of the development of the oculo-pedic coordination.

For the specific case of Ecuador, it is necessary to highlight the importance of taking into account the proposals of intervention on the training of the oculo-pedic coordination, in the sense that the training of children and young soccer players has a point of strengthening in the initiation stage. On the other hand, there is the need to have a guide for the national trainer, orienting physical qualities and the best training methods to efficiently fulfill the researched field of action. The main concern for the realization of this research is based on the observable experience, on the part of the authors, of the preparation of female soccer players between 16 and 18 years of age at the Terranova School in Quito. This situation has motivated the interest in researching and proposing alternative solutions to contribute to the improvement of the application of the technical fundamentals of soccer, especially in relation to ball conduction.

Therefore, a first step would be to validate theoretically, by means of specialists, a proposal of physical exercises that, as contents of the sport preparation, would enhance the oculo-pedic coordination in the ball conduction technique for juvenile female soccer players, being this the purpose of the present research.

MATERIAL AND METHODS

The present research is of a descriptive-correlational type, of qualitative order, with 30 selected specialists, under a non-probabilistic intentional sampling, who respond to an evaluation questionnaire. The specialists were divided into three independent groups by level of knowledge, related to soccer training, delimiting their assumptions of inclusion for the present research, based on the following characteristics:

1. Specialist level 1: Masters in sports training or related (fourth level), with research experience in soccer.



2. Specialists level 2: Graduates in Physical Culture and Sports or related with experience in soccer (third level), both genders (as a soccer player and/or graduation specialty).
3. Specialist level 3: Coach without a higher degree, with extensive practical experience in soccer of both genders (as a former professional soccer player, technical director, etc.).

The specialists evaluated the proposal theoretically, based on an idea presented by the authors. The specialists made judgments before designing this intervention proposal, which will consist of 30 specialized exercises to improve the oculo-pedic coordination, in order to improve the ball conduction technique. The evaluation qualifies the content of the sports preparation in three pre-proposal indicators, described as follows:

1. Pertinence: related to the opportunity, adequacy, convenience that comes to purpose, relevant, appropriate or congruent with that which will solve the problem; in this case, a coordination training program for female youth soccer.
2. Complexity: related to the quality inherent to the appropriate level, to the sport category studied (youth, female).
3. Priority: related to the need for implementation of such contents of the coordinative preparation in a classical model of sports training.

The scores given by the specialists will have five Likert scale type items or levels, arranged as a field research method on the theoretical opinion of a subject on a given topic. The levels are described below:

- 1 point: deficient.
- 2 points: fair.
- 3 points: good.
- 4 points: very good.
- 5 points: excellent.

Additionally, another post-proposal indicator of the quality of the intervention physical exercises is evaluated. This indicator was evaluated once the intervention proposal was designed, with the 30 physical exercises that will make up the content of the sports preparation, that is, the specialists had a methodological document that basically described each content of the athlete's preparation. The indicator and its characterization will be:

1. Effectiveness: Inherent property of the proposal, based on the fulfillment of the objective pursued (the coordination of oculo-pedic coordination in ball conduction).

In the case of the aforementioned indicator, the Likert scale will change the qualitative values that will characterize the indicator; these would be:

- 1 point: strongly disagree.
- 2 points: disagree.



- 3 points: neither agree nor disagree.
- 4 points: agree.
- 5 points: strongly agree.

To compare the evaluations issued by the specialists, the Kruskal-Wallis H ($p \leq 0.05$) 6omp be applied for k independent 6ompete since there is no normal distribution of the data, as determined by the Shapiro-Wilks test.

RESULTS AND DISCUSSION

Table 1 shows the evaluations issued by each specialist, according to the level at which the indicators described in the material and methods section were classified (Table 1).

Table 1. – Evaluations issued by specialists, according to their level for each indicator

No	Pertinence			Complexity			Priority			Effectiveness		
	Level 1	Level 2	Level 3	Level 1	Level 2	Level 3	Level 1	Level 2	Level 3	Level 1	Level 2	Level 3
1	4	2	4	4	4	4	3	2	3	4	4	3
2	4	3	4	4	3	3	3	3	3	4	3	4
3	3	2	3	4	3	4	4	3	3	4	5	4
4	4	4	4	3	4	4	3	3	3	3	4	4
5	3	2	3	4	4	4	3	3	4	4	3	4
6	2	3	5	4	4	4	2	3	3	5	4	5
7	5	4	5	5	5	4	4	2	3	4	4	5
8	4	2	4	4	4	4	3	3	4	3	4	4
9	4	2	3	4	4	4	3	1	3	4	4	4
10	3	2	3	4	4	4	3	3	3	4	4	5
\bar{x}	3,6	2,6	3,8	4,0	3,9	3,9	3,1	2,6	3,2	3,9	3,9	4,2

6ompete case of "Relevance" (Table 1), coaches without qualification, in higher education, evidenced the highest score as average (level 3: 4 points; very 6omp), followed by specialists with fourth level or master's degree in sports coaching or related (level 1: 3.6 points; between 6omp-very 6omp) and the specialists with bachelor's degree (Level 2: 2.6 points; between fair-good), being significantly different, according to the Kruskal-Wallis H-test ($p=0.014$; Table 2), differences are indicated in the average ranges (PR) of the specialists' 6ompeten according to their level, when considering the relevance of the proposal to improve indicators of the oculo-pedic coordination in female soccer players of the youth category.

Such differences in 6ompeten could be justified given the pre-experimental situation in which the proposal was indicated, of which only coaches with greater practical experience and academic scientific level (being performance athletes and/or sports coaches in soccer, with considerable 6ompetencias from the scientific point of view, level 3 (PR: 19.40) and level 1 (PR:17.90), were able to deduce some level related to the indicator "Pertinence", which, in turn, is related to the results of social effects that the process generates, as stated by López (2012).



In the case of the "Complexity" indicator, the differences in the three groups of specialists, who qualify the intervention proposal, did not present significance ($p=0.850$), which shows a similar criterion between independent groups that obtained, in all cases, a minimum qualitative qualification between good and very good (level 1: 4 points; level 2: 3.9 points; level 3: 3.9 points), an extremely positive aspect in favor of the possible contents of the preparation, applied to ball handling, taking into account the physical capacity of coordination. Complexity as an indicator has been taken as a synonym of affordability, one of the most important pedagogical principles (Alburquerque, 2009). Theoretically, the specialists conceived that the juvenile female level, to which the coordination contents to be designed would be applied, in practice, would be perfectly adequate to the teaching-educational level, which the female soccer players should present, indicating the relevance of the same.

For the case of the "Priority" indicator, which is related to the need for its practical implementation, as part of sports training, the mean scores were lower than the indicator explained above, having a qualitative rating ranging from fair to good (level 1: 3.1 points; level 2: 2.6 points; level 3: 3.2 points) respectively, there are no significant differences ($p=0.075$); therefore, there is consensus among the different specialists evaluated.

However, among the determinant capacities in soccer, there are the coordinative ones, closely linked to the technical-tactical direction, with emphasis on the competitive or seasonal period, specified in authors such as Bigoni, *et al.*, (2017), and Abdullah, *et al.*, (2017).

For the "Effectiveness" indicator, the only one studied after designing the intervention proposal, with 30 exercises of oculopedic coordination, could be evaluated satisfactorily by the different specialists, given that theoretically the different specialists considered that the proposal, without being implemented, could have a qualitative effectiveness of a medium scale, between "Neither agree nor disagree" (level 1: 3.9 points; level 2: 3.9 points) and "Agree" (level 3: 4.2 points), there were no significant differences ($p=0.419$) in the criteria issued by all the specialists, regardless of their level. 419) in the criteria issued by all specialists, regardless of their level. The theoretical effectiveness given to the intervention proposal, in its final design, evidences the possibility of fulfilling the objective of the sport preparation content, designed to improve, from practice, the coordination of ball conduction in female youth soccer players (Tabla 2) y (Tabla 3).



Table 2. - Statistics and average ranges for each indicator. Kruskal-Wallis H test

	Ranges		
	Groups	N	Average-range
Pertinence	Level1	10	17,90
	Level2	10	9,20
	Level3	10	19,40
	Total	30	
Complexity	Level1	10	16,40
	Level2	10	15,00
	Level3	10	15,10
	Total	30	
Priority	Level1	10	16,85
	Level2	10	11,55
	Level3	10	18,10
	Total	30	
Effectiveness	Level1	10	14,25
	Level2	10	14,25
	Level3	10	18,00
	Total	30	

Table 3. - Test statistics^{a,b}

	Pertinence	Complexity	Priority	Effectiveness
H de Kruskal-Wallis	8,592	,324	5,176	1,740
gl	2	2	2	2
Asymptotic sig.	,014	,850	,075	,419

Caption: ^aKruskal Wallis test; ^bGrouping variable: Groups

Table 2 shows the different correlations obtained with the Kruskal-Wallis H test, where it was previously specified that there were no significant differences, except in the "Pertinence" indicator ($p=0.014$), which shows an adequate level of agreement between the criteria issued by the specialists at different levels. However, as a relevant fact, it is worth noting that the highest average ranges in the evaluation were obtained by level 3 specialists (Relevance: 19.40; Priority: 18.10; Effectiveness: 18.00), except in the "Complexity" indicator, where the Level 1 specialist obtained the highest score (PR: 16.40; Effectiveness: 18.00).



It is curious that practical experience as an athlete and as a coach allows a more complete vision to be obtained than subjects who lack these requirements. In part, this could explain why level 3 specialists (without a higher degree) qualify in a better way everything related to specific components of the process of sports training management, as is the case of coordination work in youth categories.

The literature consulted evidences that the player's attention should be divided between the ball and the offensive defense, (Bigoni, *et al.*, 2017). The more time is devoted to the improvement of ball conduction, in terms of variations in speeds and directions, the easier it will be to perform the sport technique.

Another aspect to take into account is related to the characteristics proposed for the training of ball conduction in soccer, emphasizing the importance of ball control, keeping the ball close to the foot that makes contact. The player's attention while carrying the ball and, of course, trying not to have the ball personally over long distances, which determines the need to distribute it as a team to maintain control, (Buschmann, Pabst, & Bussmann, 2002; Carbo, Vélez, Cañizares, & Echeverría, 2019; Schreiner, 2002; Solana & Muñoz, 2011), aspects that should be taken into account when designing specific content for sports preparation, following the fundamental assumptions of optimized training (Calero., 2018).

Once the proposal has been theoretically validated in its initial elaboration phase, it is recommended to implement it in praxis, in a youth team of the female gender, validating the proposal at a higher scientific-practical level, assessing the scope and limitations as part of a sports training model.

CONCLUSIONS

In conclusion, it is stated that, in general, the consensus criteria of several specialists with diverse competences, where the quality of the pre-proposal is described and qualified in a positive way in the three indicators provided for this purpose, once the intervention proposal is designed, which includes 30 specialized exercises of oculo-pedic coordination, the qualification of the specialists in the indicator "Effectiveness" was medium-high, which shows the need to implement in praxis, similar proposals of coordination training in female youth soccer players.

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Conflict of interests:

The authors declare not to have any interest conflicts.

Authors' contribution:

Sofía Carolina Carchipulla Enríquez: Conception of the idea, literature search and review, instrument making, Instrument application, compilation of information resulting from the instruments applied, statistic análisis, preparation of tables, graphs and images, database preparation, general advice on the topic addressed, drafting of the original (first version), review and final version of the article, article correction, authorship coordinator, translation of terms or information obtained, review of the application of the applied bibliographic standard.



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