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Cohesión grupal en estudiantes de educación física del primer ciclo de educación secundaria obligatoria

Group cohesion in students of physical education in the first cycle of compulsory secondary education

Coesão de grupo em estudantes de educação física do primeiro ciclo do ensino secundário obrigatório

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Resumen

La cohesión grupal ha sido considerada un factor importante en la formación y crecimiento de equipos de trabajo, así como una variable importante para diferentes grupos y diferentes tipos de procesos grupales. El objetivo de este proyecto es analizar las posibles diferencias de género, edad y nivel educativo respecto a la cohesión grupal en el área de Educación Física en el primer ciclo de Educación Secundaria Obligatoria. La muestra estuvo compuesta por 306 estudiantes

que respondieron tres preguntas sociodemográficas, además de nueve preguntas que componen el Cuestionario de Evaluación de Cohesión Grupal. Para el análisis estadístico se utilizó la prue-ba de Kolmogorov-Smirnov para establecer el supuesto de normalidad. Por lo tanto, se eligieron pruebas no paramétricas porque no se cumplía este supuesto. En consecuencia, se utilizó la prueba U de Mann-Whitney para examinar el sexo y la prueba de Kruskal-Wallis para analizar la edad y el nivel educativo. Luego se utilizó la prueba Rho de Spearman para analizar la asocia-ción entre los ítems y las variables sociodemográficas. La consistencia interna se evaluó median-te el alfa de Cronbach. Finalmente, se observaron diferencias estadísticas en algunos ítems del cuestionario respecto a la edad y el nivel educativo y, en menor medida, en una pregunta espe-cíficamente en relación al género. Dado que estas diferencias pueden deberse a factores diver-sos, quizás incluso puntuales, sería recomendable desarrollar futuras líneas de investigación que paliaran esta situación.

Palabras clave: cohesión grupal; educación Física; educación secundaria inferior; género; edad; nivel educacional.

Abstract

Group cohesion has been considered an important factor in the formation and growth of work teams, as well as an important variable for different groups and different types of group pro-cesses. The aim of this project is to analyze the possible differences in gender, age and educa-tional level with respect to group cohesion in the area of Physical Education in the first cycle of Compulsory Secondary Education. The sample consisted of 306 students who answered three sociodemographic questions in addition to nine questions comprising the Group Cohesion Eval-uation Questionnaire. For the statistical analysis, the Kolmogorov-Smirnov test was used to es-tablish the assumption of normality. Therefore, nonparametric tests were chosen because this as-sumption was not met. Consequently, the Mann-Whitney U test was used to examine gender and the Kruskal-Wallis test was used to analyze age and educational level. Spearman's Rho test was then used to analyze the association between the items and the sociodemographic variables. Internal consistency was assessed using Cronbach's alpha. Finally, statistical differences were observed in some items of the questionnaire with respect to age and educational level and, to a lesser extent, in one question specifically in relation to gender. Since these differences may be due to various factors, perhaps even punctual, it would be advisable to develop future lines of research to alleviate this situation.

Keywords: group cohesion; physical education; lower secondary education; gender; age; edu-cational level.

Resumo

A coesão grupal tem sido considerada um fator importante na formação e crescimento das equipes de trabalho, bem como uma variável importante para diferentes grupos e diferentes ti-pos de processos grupais. O objetivo deste projeto é analisar as possíveis diferenças de género, idade e nível de escolaridade relativamente à coesão grupal na área da Educação Física no primeiro ciclo do Ensino Secundário Obrigatório. A amostra foi composta por 306 alunos que responderam três questões sociodemográficas, além de nove questões que compõem o Questio-nário de Avaliação da Coesão Grupal. Para análise estatística foi utilizado o teste de Kolmogo-rov-Smirnov para estabelecer o pressuposto de normalidade. Portanto, foram escolhidos testes não paramétricos porque esse pressuposto não foi atendido. Nesse sentido, utilizou-se o teste U de Mann-Whitney para examinar o sexo e o teste de Kruskal-Wallis para analisar a idade e a es-colaridade. O teste Rho de Spearman foi então utilizado para analisar a associação entre os itens e as variáveis sociodemográficas. A consistência interna foi avaliada pelo alfa de Cronbach. Por fim, observaram-se diferenças estatísticas em alguns itens do questionário relativamente à idade e escolaridade e, em menor medida, numa questão especificamente relacionada com o género. Dado que estas diferenças podem dever-se a vários factores, talvez até específicos, seria acon-selhável desenvolver futuras linhas de investigação para atenuar esta situação.

Palavras-chave: coesão grupal; Educação Física; ensino secundário inferior; gênero; idade; Ní-vel educacional.

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Introducción

Currently, the Spanish Ministry of Education emphasizes as an evaluation criterion in the area of Physical Education (PE) the importance of physical activities (PA) being cooperative and co-llaborative (Real Decreto 217/2022, de 29 de marzo, por el que se establece la ordenación y las enseñanzas mínimas de la Educación Secundaria Obligatoria, 2022). Cooperative Learning (CL) in the field of PE has had an exponential development in study and interest throughout the first two decades of the 21st century (Martín & Jiménez, 2021). In this sense, in order to successful-ly adopt this work method, it is crucial to foster a collaborative environment in the classroom by educating students to cooperate. Lavega et al., 2014; (Ramos et al, 2024) Since CL has an im-pact on each and every component of the teaching-learning process (TLP), it is not only consid-ered a didactic technique or methodology, but also a way of understanding teaching and, by extension, learning (Alarcón Orozco et al., 2018). In turn, Collaborative Learning (CoL), is a collective process in which everyone contributes jointly to the completion of the task, i.e., it in-volves from the beginning the instructor and, in general, the entire educational context. (Roselli, 2016; Checa Esquiva & Bohórquez Gómez-Millán, 2020). In these aforementioned terms, the so-called Group Cohesion (GC) comes into place.

GC is the first component that a teacher should foster in his or her class (Fernandez-Rio et al., 2018) due to the fact that before students collaborate, it is essential to teach them to be together. (Iglesias Muñiz et al., 2017; González y otros, 2023) Carron, Brawley and Widmeyer's (Carron et al., 1998) definition of cohesion-as "A dynamic process that is reflected in the tendency of the group to stay and remain together for the achievement of its instrumental goals and/or for the satisfaction of the affective needs of the members"-is the most widely used in the literature (López Nadal & Frutos Salvia, 2011). Consequently, before the whole class is generally united, its members must join others in progression (pairs, trios, quartets...) (Á. Pérez Pueyo, 2007). In addition to preparing the group in terms of specific skills and abilities that allow them to face the new cooperative activities they are about to initiate, the main objective is to create a climate of trust in the classroom and foster a feeling of belonging (Fernandez-Rio et al., 2018). This creates a true classroom group experience without the risk of exclusion (A. Pérez Pueyo et al., 2012). Since exclusion based on lack of ability, achievement, or belief of incompetence-which often results in self-exclusion or dropping out-is removed from the educational equation, it is possible to focus on collective experiences of success. (Pérez-Pueyo, 2010; Rojo-Ramos y otros, 2024)

Although the activity has a competitive objective, the value in the PE classes lies in getting each partner to enjoy the experience (Á. Pérez Pueyo, 2016), and that collective aspects such as the formation of values are also prioritized. (Hernández y otros, 2024) In this sense, the organizational dynamics itself will produce the changes and combinations of the less like-minded members, and it will be they themselves who finally achieve the balance. (Á. Pérez Pueyo, 2016; Morales y otros, 2023). To achieve this, the teacher will use introductory activities, in which students learn each other's names or interesting events in each other's lives, icebreaker activities, in which direct contact is sought to help students overcome the distance that embarrassment causes to exist between them, trust activities, in which each student is challenged to complete complex tasks, and self-knowledge activities, in which they demonstrate to each other that they can trust each other (Fernández Río, 2017). But, instead of the teacher balancing groups by

gender, ability level, or ethnicity, they are initially organized according to their areas of affinity (Fernandez-Rio *et al*., 2018).

In reality, the teacher never creates the groups, but rather works with the results produced by the groupings created by the students to show them the effects they have on the growth of the practice and help them reflect on and understand the effects of their playing decisions, both good and bad. (Á. Pérez Pueyo, 2013; Mainer-Pardos y otros, 2024; Roso-Moliner y otros, 2024) However, among the challenges faced by teachers when implementing this model are the scarcity of material currently available on the promotion of CL and CoL in PE, the difficulty in controlling the group, low expectations, previous negative experiences, the lack of training to address this problem safely and successfully, and the lack of time due to the reduced presence of PE in the timetable (Martínez Benito & Sánchez Sánchez, 2020). These challenges are the reasons why these practices are something punctual or last for a short period of time (Fernandez-Rio *et al*., 2018).

Therefore, the aim of this paper is to carry out a descriptive analysis of GC in the subject of PE, analyzing the possible differences that exist in the first cycle of Compulsory Secondary Educa-tion (CSE) according to gender, age and educational level of the students

2. Materials and Methods

2.1. Participants

The sample consisted of 306 students belonging to the first cycle of CSE, comprising grades 1, 2 and 3. The participants were chosen using a non-probabilistic convenience sampling method (Salkind, 1999), as shown in Table 1

Table 1. Sociodemographic distribution of the sample (N = 306).

Varia-bles	Categories	N	%
Gender	Male	128	41.8
	Female	178	58.2
Educational level	First grade	145	47.4
	Second grade	138	45.1
	Third grade	23	7.5
Age	12 years	92	30.1
	13 years	172	56.2
	14 years	40	13.1
	15 years	2	0.7

N: number, %: percentage.

2.2. Instruments

For sociodemographic characterization, the questionnaire included three questions on gender, age and educational level of the students. In addition, the Group Cohesion Evaluation Ques-tionnaire (GCEQ) was used. This instrument consists of nine questions: 1: "We get along well together", 2: "We feel good about our team", 3: "We enjoy helping each other", 4: "We stick to-gether during the challenges", 5: "I feel like my group will keep me safe", 6: "We encourage each other in the challenges", 7: "I feel like I fit in my group", 8: "I want to work on more chal-lenges with my group", 9: "We help each other on the challenges" (Glass & Benshoff, 2002). In the questionnaire, each score obtained is based on a Likert scale (1-4) with the range being from 1 "Not at all like me/my group" to 4 "Exactly like me/my group" (Glass & Benshoff, 2002). The GCEQ was initially constructed with 16 items, based on relevant research and item types (Glass & Benshoff, 2002).

However, it was found that, given the age of the target audience, a smaller number of items would make it easier for participants to understand and complete the instru-ment (Glass & Benshoff, 2002).

2.3 Procedure

The e-mail addresses of the schools that teach CSE were chosen after consulting the database of public schools in Extremadura (Spain) maintained by the Department of Education and Em-ployment of the Regional Government of Extremadura. The PE teachers at each school re-ceived an e-mail explaining the objectives of the study, requesting parental consent and inviting them to participate. The parents of the PE students participating in the first cycle of CSE had to give their informed consent, and it was made clear to the educational centers that they consent-ed to participate in the study. In addition, they were told that they would make an appointment by e-mail so that a member of the research team could come to the educational center on the scheduled day to interview these students. Using a tablet owned by the research team, a mem-ber of the research team who visited the educational facility provided the students with access to the questionnaire URL. Before completing the instrument, the researcher read aloud each item, clarifying any ambiguities and ensuring that each item was understood. All data were col-lected and used anonymously following the ethical standards of the Declaration of Helsinki (1975). Each response to the survey took an average of five minutes. Data collection took place between September 2022 and December 2022.

2.4. Statistical Analysis

Version 23 of the IBM SPSS statistical program for MAC (Chicago, IL, USA) was used to process the data. First, the Kolmogorov-Smirnov test was used to examine the assumption of normality in the distribution of the data of the continuous variables. This assumption turned out to be false, so nonparametric statistical tests were used. Next, the Mann-Whitney U test, which examined the differences between questionnaire items and gender, and the Kruskal-Wallis test, to analyze age and educational level, were used. Subsequently, Spearman's Rho test was per-formed to observe the correlation between the mean of the items and the sociodemographic var-iables. Correlation coefficients were interpreted using the Mondragon-Barrera standards of 0.00 (no correlation), 0.01 to 0.10 (low correlation), 0.11 to 0.50 (medium correlation), 0.51 to 0.75 (substantial correlation), 0.76 to 0.90 (very high correlation) and 0.91 to 1.00 (perfect correla-tion) (Barrera, 2014). The reliability of each instrument was assessed using Cronbach's alpha. Nunnally and Bernstein's (Nunnally & Bernstein, 1994) reference ranges of 0.70 (poor), 0.71 to 0.90 (good) and > 0.91 (excellent) served as a guide to understand the reliability test results.

3. Results

Table 2 presents descriptive information for each question of the GCEQ based on the median value (Me) and the interquartile range (IQR) according to the gender of the students. It is ob-served that there are no significant differences according to gender at the general level, except for item 2 ($p < 0.05$).

Table 2. Descriptive analysis and variations of the questionnaire items according to gender.

		Gender		
Items	Total	Male	Fe-male	
	Me (IQR)	Me (IQR)	Me (IQR)	p
1	3 (1)	3 (1)	4 (1)	0.919
2	4 (1)	4 (1)	3 (1)	0.049*
3	4 (1)	4 (1)	4 (1)	0.832
4	3 (1)	3 (1)	3 (2)	0.732
5	3 (2)	3 (2)	3 (2)	0.348
6	3 (2)	3 (2)	3 (2)	0.877
7	4 (1)	4 (1)	4 (1)	0.145
8	4 (1)	4 (1)	4 (1)	0.402
9	3 (1)	3 (1)	3 (2)	0.487

Note: Me = median; IQR = interquartile range. Differences are significant at ** $p < 0.01$; * $p < 0.05$. Each score obtained in the dimensions is based on a Likert scale (1-4) with the range be-ing from 1 “Not at all like me/my group” to 4 “Exactly like me/my group”.

Table 3 shows the results for each question of the GCEQ based on the Me and the IQR accord-ing to the age of the students. It is observed that significant differences were found in ques-tions 4 with a significance value of $p < 0.05$ and in questions 5, 6 and 8 with one of $p < 0.01$ re-spectively.

Table 3. Descriptive analysis and variations of the questionnaire items according to age.

	Age				
Items	12 years	13 years	14 years	15 years	
	Me (IQR)	Me (IQR)	Me (IQR)	Me (IQR)	p
1	3 (1)	4 (1)	3 (1)	4 (0)	0.058
2	3 (1)	4 (1)	3.5 (1)	3 (0)	0.190
3	3 (1)	4 (1)	3.5 (1)	4 (0)	0.206
4	3 (1)	3 (1)	3 (1)	4 (0)	0.017*
5	3 (1)	3 (2)	3 (2)	3 (0)	0.006**
6	3 (2)	3 (2)	4 (1)	4 (0)	0.009**
7	4 (1)	4 (1)	3 (1)	4 (0)	0.297
8	3 (1)	4 (1)	4 (1)	4 (0)	0.002**
9	3 (1)	3.5 (2)	4 (1)	3 (0)	0.098

Note: Me = median; IQR = interquartile range. Differences are significant at ** $p < 0.01$; * $p < 0.05$. Each score obtained in the dimensions is based on a Likert scale (1-4) with the range be-ing from 1 “Not at all like me/my group” to 4 “Exactly like me/my group”.

Table 4 displays descriptively the information obtained for each question of the GCEQ based on the Me and the IQR according to the educational level of the students. Significant differ-ences were observed in items 3, 4, 5 and 6 with a significance of $p < 0.01$ and in item 8 with a significance of $p < 0.05$.

Table 4. Descriptive analysis and variations of the questionnaire items according to school grade.

Items	Educational level			
	1º grade	2º grade	3º grade	
	Me (IQR)	Me (IQR)	Me (IQR)	p
1	3 (1)	3 (1)	3 (1)	0.741
2	4 (1)	4 (1)	3 (1)	0.361
3	3 (1)	4 (1)	3 (1)	0.002**
4	3 (2)	4 (1)	3 (2)	0.000**
5	3 (2)	4 (2)	3 (2)	0.003**
6	3 (2)	4 (1)	3 (1)	0.001**
7	4 (1)	4 (1)	3 (1)	0.451
8	4 (1)	4 (1)	4 (1)	0.027*
9	3 (1)	4 (1)	3 (2)	0.116

Note: Me = median; IQR = interquartile range. Differences are significant at ** $p < 0.01$; * $p < 0.05$. Each score obtained in the dimensions is based on a Likert scale (1-4) with the range be-ing from 1 "Not at all like me/my group" to 4 "Exactly like me/my group".

Table 5 follows the correlations between the mean value of the GCEQ items and gender, age and educational level using Spearman's Rho test. It can be seen that the correlation is low for gender and medium for both age and educational level, with no significant differences for gen-der, but significant differences for age and educational level with a $p < 0.05$.

Table 5. Correlations between scores and sociodemographic variables.

Di-men-sions	Variables		
MItems	Gender (p)	Age (p)	Educa-tional level (p)
	-0.024 (0.673)	0.145 (0.011*)	0.156 (0.006**)

Note: MItems: mean of the items. Differences are significant at ** $p < 0.01$; * $p < 0.05$. Each score obtained on the dimensions is based on a Likert scale (1-4) with the range being from 1 "Not at all like me/my group" to 4 "Exactly like me/my group".

Finally, the reliability results of the GCEQ items were calculated from Cronbach's alpha, ob-taining a value of 0.927, considered excellent according to Nunnally and Berstein (Nunnally & Bernstein, 1994).

4. Discussion

This study arose from the need to know the possible differences that could be found in GC in students in the first cycle of CSE. To this end, the questions of the GCEQ instrument were ana-lyzed considering gender, age and educational level as factors that could influence the GC.

First, our project finds that gender seems to condition only in question 2 ("We feel good about our team"), in which girls found themselves less satisfied with their group than boys. This may be due to the fact that when performing PA boys generally leave girls aside (Gil-Madrona *et al*., 2017) and there is not good communication and participation between them (Bermejo Díaz *et al*., 2020), that when performing this sport practice girls prefer to do it individually (Castro-Sánchez *et al*., 2016) or that they consider it more important to be in shape than to execute it for competition (Martínez et al., 2017). It should also be noted that in a previous study males scored higher on ability and deceptive tactics while females scored higher on effort (Usán Su-pervía *et al*., 2017).

The general trend of a more competitive environment that prioritizes outperforming others,

which is very present in men's teams, may be to blame for these results (Lavega Burgués et al., 2012). In another study Møllerløkken et al. (Møllerløkken et al., 2017) found only statistically significant variations in the performance climate, with the men's outcome being higher, but a study by Cordo Cabal et al. pointed out that there were differences in the motivational climate and the perception of success in sport according to gender (Cordo Cabal et al., 2019). However, in general terms, the literature suggests that there are no significant differences in gender, as pointed out in a recent study by Mosqueda and coworkers (Mosqueda *et al*., 2022).

In addition, it was also found that the age of the participants in questions 4 ("We stick together during the challenges"), 5 ("I feel like my group will keep me safe"), 6 ("We encourage each other in the challenges") and 8 ("I want to work on more challenges with my group") may have contributed to GC. Next, educational level is also found to be a factor acting on GC, as seen in questions 3 ("We enjoy helping each other"), 4 ("We stick together during the challenges"), 5 ("I feel like my group will keep me safe"), 6 ("We encourage each other in the challenges") and 8 ("I want to work on more challenges with my group"). Consequently, these results indicate that age and educational level may have some correlation with the GCEQ items.

Younger participants felt that their teachers were creating a greater performance atmosphere than older participants, who felt that their teachers were creating a higher mastery climate (Møllerløkken et al., 2017). In other studies, it has been observed how in the 12-13-year-old group they are more motivated in PA than in other age groups (Muñoz González et al., 2019), this may be due to the fact that when students start CSE they are more satisfied in the area of PE (Muñoz González et al., 2019). In other words, these discrepancies can result from the sport's and PE's major transition from infant to adolescent stages, from a more playful to a more competitive atmosphere (Baena-Extremera & Granero-Gallegos, 2015). According to a research the results based on the age of the participants, the younger group focused more on image and skill development, while the older groups focused more on health (Marcos Pardo et al., 2011). This is why at these ages, the competitive spirit still prevails more than the cooperative spirit (López Guillén & Taveras Sandoval, 2022).

However, according to Gómez-López *et al*., adolescents between 12 and 18 years of age are the ones who abandon physical exercise the most, partly because they find it demotivating (Gómez-López et al., 2010), especially in the case of women (Caspersen et al., 2000).Later, with the years, students assume an active role, helping their peers when necessary to achieve a common goal and going beyond merely learning the material of a subject (García Martínez et al., 2020; Navarro Ardoy et al., 2020). One study found that exercise classes with more cohesive mem-bers also had a higher level of class adherence (Carron et al., 1996).

4.1. Limitations and future lines of research

As in other studies, this project also has a series of limitations. First, because only students in the first cycle of CSE were included in the sample, there are factors that could have influenced the results obtained, such as age, sociodemographic characteristics, and the students' school grade. Next, the participants were chosen by means of a non-probabilistic convenience sample, i.e., not randomly, therefore, caution should be exercised when presenting the results. Finally, it should be emphasized that there are few previous studies that analyze GC over a long period of time, it is generally one-off, and this means that not all relevant information about GC in the ar-ea of PE is obtained. On the other hand, it is considered that possible future lines of research would be to extend the sample to a national level, in all educational stages, over a longer period than has generally been done to obtain better results, and to analyze whether age and gender have an influence and, if so, to investigate the reasons for this. Consequently, it is essential to reach an agreement with other researchers in the different communities to collect all the neces-

sary data. Furthermore, it should not be forgotten that it is essential to train teachers in innovative and motivating methodologies for the proper promotion of GC and, therefore, in the TLP.

5. Conclusions

This research underlines that age and educational level influence GC in the subject of PE in the first cycle of CSE. Gender only did so in one question; therefore, it would be necessary to look for the reasons for this difference so that the GC is the same regardless of the gender of the students. It would be advisable to know their tastes, preferences and motivations, incorporating them into the educational methodologies and thus achieve a greater stimulus in the performance of PA at all educational levels, regardless of gender and age. In this sense, it is also important to achieve good GC so that students learn to help, cooperate and collaborate with their classmates, making learning more intrinsic and obtaining both healthy benefits (sports practice) and interpersonal benefits (better social relations) as soon as possible. On the other hand, to achieve all this, the role of the teachers is fundamental. Although they are more of a guide in the TLP, they must support their students and motivate them to achieve their group and personal goals. In addition, it is necessary to involve all governments, the entire educational community, including the students' families, in order to perceive more support and participation in the GC.

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Institutional Review Board Statement: The use of these data did not require approval from an accredited ethics committee, as they are not covered by data protection principles, i.e., they are non-identifiable, anonymous data collected through an anonymous survey for teachers. In addi-tion, based on Regulation (EU) 2016/679 of the European Parliament and of the Council on 27 April 2016 on the protection of individuals concerning the processing of personal data and on the free movement of such data (which entered into force on 25 May 2016 and has been com-pulsory since 25 May 2018), data protection principles do not need to be applied to anonymous information (i.e., information related to an identifiable natural person, nor to data of a subject that is not, or is no longer, identifiable). Consequently, the Regulation does not affect the pro-cessing of our information. Even for statistical or research purposes, its use does not require the approval of an accredited ethics committee.

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Conflicto de intereses

El o los autores declaran que la presente investigación y su redacción no responde a ningún conflicto de interés y que es un artículo inédito.

Contribución de los autores

Jorge Rojo-Ramos y Santiago Gómez-Paniagua: Investigación y aplicación del experimento.
Virginia Barragán Erazo y Carmen Galán-Arroyo: Redacción y estilo científico.