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Motor Competence, Perceived Competence and Physical and Sport Practice among Adolescents

Competencia motriz, percepción de competencia y práctica físico-deportiva en adolescentes

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Abstract

During the last few decades, research studies related to motor competence have shown a decline in the motor competence levels in adolescents. Stodden et al. presented a conceptual model that, amongst other variables, related motor competence and perceived motor competence with physical or sport practices. The objective of this study is to determine the relationship amongst the three variables. 970 students of both sexes, ages ranging from 12 to 16 years old, participated in this study. We measured the level of motor competence of the students with the SPORTCOMP battery and they filled-out the AMPET questionnaire that measures their achievement motivation. The results showed that the students in this study have a medium level of motor competence and perceived motor competence. At the same time, 60% of the students sampled practice physical and sport activity every week. As to the relationship amongst the variables, the results demonstrate that there are positive and significant differences amongst the three variables. Finally, it has been shown that adolescents who practice physical and sport activities more frequently, showed a higher mean level of motor competence and perceived motor competence.

Keywords

Motor competence; perceived motor competence; physical and sport activity.

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Resumen

En las últimas décadas, investigaciones relacionadas con la competencia motriz manifiestan un descenso de los niveles de competencia motriz en los adolescentes. Stodden y cols. presentaron un modelo conceptual que, entre otras variables, relacionaba la competencia motriz y la percepción de competencia motriz con la práctica físico-deportiva. El objetivo de este estudio es determinar la relación entre las tres variables. Participaron 970 adolescentes de ambos sexos, con edades comprendidas entre 12 a 16 años. Se ha medido el nivel de competencia motriz del alumnado mediante la batería SPORTCOMP y se les ha aplicado el cuestionario AMPET de medición de Motivación de logro. Los resultados muestran que el alumnado de este estudio presenta un nivel medio de competencia motriz y percepción de competencia motriz. A su vez, un 60% de la muestra realiza práctica físico-deportiva todas las semanas. En cuanto a las relaciones entre las variables, los datos muestran que existen diferencias positivas y significativas entre las tres variables. Finalmente, se ha comprobado que los adolescentes que realizan práctica físico-deportiva más frecuentemente muestran valores medios más altos de competencia motriz y percepción de competencia motriz.

Palabras clave

Competencia motriz; percepción de competencia motriz; práctica físico-deportiva.

Introduction

During the past few years, due to reports such as PISA, educational centers are giving great importance to the development and improvement of three areas been evaluated by them: reading, mathematics and natural sciences proficiency. However, despite warnings from the medical realm, calling attention to the alarming increase in sedentary lifestyle and obesity been suffered by this young collective group, the educational centers have not manifested concern for the development of motor competence. Motor competence implies that a person can adapt and adjust to the requirements of their environment to perform a good job. It is not only to learn and perform skills for abilities of a different nature, but also encompasses an aggregate of knowledge (that comprise knowing what, how, when and with whom to do) said jobs, used with the intention of facing the motor tasks they encounter (Ruiz, 1995).

Therefore, students will learn to be competent when they are able to interpret and select the precise resources to provide the answers to the demands of their environment in an efficient manner (Ruiz, 2004). Thus, making ours the definition given by Ruiz (1995), the motor competence is considered as a set of "knowledge, procedures, attitudes and feelings that intervene in the multiple interactions made in their environment and with others" (page

19). Within the last few decades, investigations related to motor competence (Katic, Pavic & Cavala, 2013; Lorson, Stodden, Langendorfer & Goodway, 2013; Ruiz, 2004) manifested a decrease of the motor competence in teenagers.

These low levels, worry professionals in the motor competence area, since motor competence not only adopts great relevance in the integral development of male and female teenagers, but also it is defined as a fundamental element when it is time to predict physical and sport activity, understanding that motor competence is a denominator for the desire to practice (Ruiz, 2010). In this sense, it is frequent that studies focused in the development of motor competence analyze the relationship with physical and sport activity (Khodaverdi, Bahram, Khalaji & Kazemnejad, 2013; Lopes, Rodrigues, Maia & Malina, 2011; Stodden et al., 2008). All these investigations agree in confirming that a positive and significant relationship exists between physical and sport activity and motor competence.

White (1959) already considered that competence was in itself a motivational element, since the need to want to demonstrate and to feel competent in a specific environment, is not derived from impulses or instincts, but from feelings and emotions. Harter (1978, 1982) expanded this concept and it defined it as a personal belief that each individual has over their ability in an environment with a specific achievement. In the motor or sports environment, perceived motor competence is defined, as the believe that each individual has over their capacity to resolve different motor situations (Arruza et al., 2011). In relation to physical and sport activity, Hellín, Moreno and Rodríguez (2006), indicated that a better perceived motor competence would correspond with a higher possibility of enjoying physical activity and reinforce accession and persistence to physical and sport activity. As to the relationship between perceived motor competence and motor competence, various investigations (Arruza et al., 2011; García-Canto, Pérez, Rodríguez & Moral, 2013; Hands, Rose, Parker & Larkin, 2010; Harter, 1978, 1982; Khodaverdi et al., 2013; McIntyre, Hands & Parker, 2010; Rigoli, Piek & Kane, 2011; Sporiš, Šiljeg, Morgan & Kevíc, 2011; Stodden et al., 2008; Vedul-Kjelsås, Sigmundsson, Stensdotter & Haga, 2012; Viholainen, Aro, Purtsi, Tolvanen & Cantell, 2013), have corroborated the relationship between two variables, demonstrating that the number of successes and failures accumulated during experiences lived in one environment, influence the foundation for perceived motor competence for each individual.

This way, the effective execution of motor tasks entails a positive self-valuation of their capacity. Conversely, bad practices lead to create low perceived motor competence.

Stodden et al. (2008) presented a conceptual model where they correlated these three variables. This model proposes that motor competence is one of the principal variables that influence commitment to physical and sport activity and it also interacts with variables such as perceived motor competence. These authors pose that perceived motor competence intervene in the relationship between motor competence and physical and sport activity.

This model was confirmed in a study carried out by Barnett, Morgan, van Beurden and Beard (2008), where they analyzed the influence that perceived motor competence exerted over the relationship between motor competence and physical and sport activity. They concluded that perceived motor competence plays a mediating roll between motor competence in children and physical activity in teenagers.After everything previously exposed and taking into account the disturbing situation concerning motor competence, knowledge of its levels and its relationship with psychological correlations, as well as perceived motor competence, adopted great importance, because it can be a determining factor in practicing physical and sport activity, and as a consequence, support healthy habits. For this reason, interests in this study have been centered in confirming if a relationship exists among the three variables (motor competence, physical and sport activity and perceived motor competence) and if the levels of motor competence and perceived motor competence vary as a function of the frequency of physical and sport activity.

Materials and method

Sample

In this study participated 970 subjects from 14 different Middle School centers belonging to three Historical Territories within the Autonomous Basque Autonomous Community. The sample was chosen by convenience, selecting those centers and teachers that were interested in participating in this project.

Design and variables for the investigation

The design for this study was of descriptive nature, correlational and multi-variable, "ex post facto".

The variables analyzed in this investigation were:

- Motor competence: understood as the ability to face a motor task.
- Perceived motor competence: understood as the conviction of each individual of their motor capability.
- Frequency of physical and sport activity: it was documented if they performed physical and sport activities outside their school schedule.

Instruments

The instruments used are described below:

a) Adaptation of the Battery of Motor Tasks Sportcomp of Ruiz, Graupera, García, Arruza, Palomo and Ramón, 2010 (Arruza, Irazusta & Urrutia-Gutierrez, 2011).

Sportcomp battery of motor tasks was developed by Ruiz et al. in 2010, to measure and analize the level of motor competence in teenages grades 1- 4 in Middle Schools. It consists of a group of 10 motor tasks. A factorial analysis confirmed that five out of the ten tasks were grouped in a single factor which was named "motor coordination and control" and the other five were grouped in another factor named "physical aptitude". This test was standardized with a Spain sample (N= 6.000) and measures the dimensions of their motor competence. The reliability of the instrument was established though correlations and regresion tests, during a two month period.

b) Spanish adaptation of the Achievement Motivation in Physical Education Test (AMPET) (Ruiz, Graupera, Gutiérrez & Nishida, 2004).

This questionaire was designed by Tamotsu Nishida to evaluate the achievement motivation for learning in physical education. Later on, Ruiz, Graupera, Gutiérrez and Nishida (2004), performed an adaptation of this questionaire to Spanish which consists of 37

items. In this study, a reduced "internal" version of the Spanish version of AMPET was used, which consists of 33 items.

The reliability analysis of this reduced version in Spanish revealed a reliability level of α = .81. The three factors in this scale showed the following coefficients of internal consistency: commitment and seriousness α = .81, perceived motor competence α = .92 and anxiety about failure and stressful situations α = .79.

The reliability of the internal version in Basque language showed an acceptable reliability level, with an α = .83. The internal consistency for each factor was α = .85 for the perceived motor competence, α = .68 for the commitment and seriousness and α = .77 for anxiety about failure and stressful situations.

c) Health Behavior in School-aged Children (HBSC) of Wold (1989).

The questionnaire used to measure the physical and sports practice, through which we asked if they performed physical and sport activities outside their school schedule, presented four possible answers: never, less than once a week, every week or every day.

Procedure

A previous selection of the centers was carried out by establishing telephone communication with the responsible parties and the physical education teachers for the centers, to explain to them the project objectives and procedures. To use the physical tests and the questionnaires, pertinent authorizations were obtained from the centers and later on, from the mothers and fathers. Afterwards, it was agreed-upon with the centers on a calendar and the dates in which to proceeded to obtain the data, where, while half the students filled out the questionnaire, the other half was performing the physical tests. Obtaining the data did not take more than two hours. To measure the motor competence variable, the tests performed and the tasks to carry out were as follows:

- Lateral jumps: to jump laterally over a non-slip plank, paralell to a horizontal bar, making the highest number of jumps possible in 15 seconds.

- 7 meters on one leg: to hop on one leg a seven meter distance in the least amount of time possible.
- 7 meters feet together: to hop with both feet together the 7 meter distance in the least amount of time possible.
- Displacement over supports: to travel a 3 meter distance over supports.
- Equilibrium: maintain equilibrium on one leg the maximum amount of time possible.
- Abdominals: to make the largest amount of sit-ups from a laying-down position during 30 seconds.
- Dinamometry: squeeze the dinamometer as hard as possible.
- Throw a medicinal balloon: to throw a medicinal balloon as far away as possible
- Flexibility: sit in front of a flexibility box and stretch as much as possible.
- Run up and back: to run a 9 meter distance, pick up a baton and return to the starting point, pick up another baton and cross the first pick up point in the least amount of time possible.

Once the test had finished, the values were typified for the ten test for Sportcomp. Those tests that were measured in time (7 meters on one leg, 7 meters with feet together, displacement over supports and run up and back) were multiplied by -1, since the valuation of these test are the inverse of the rest of the test, that is to say, the longer the time for these tests, the worst the punctuation received. After typifying the values, on one side, the five motor coordination tests were added, and on the other, the five physical condition tests were added. This way, the mean was obtained for the two blocks, obtaining two variables (coordinating capacity and conditional capacity) with positive values and two decimals, comprised between 33 and 66.

The categorization of motor competence was done placing three cut points for three equal groups, with a sample of 3.695 subjects from the Pyrenees Working Community (Aragón, Barcelona, Andorra and the Basque Autonomous Community) and in this manner, a

scale was established for the variable, which were named: high motor competence, medium motor competence and low motor competence. Two scales were used, one for girls and one for boys for each age group. In the case of perceived motor competence of the students, the values obtained were added in the items that represented perceived motor competence and later the values obtained were typified. For their categorization, the same was done as in the case of motor competence, cut points for three equal groups were created, with a sample of 3.695 subjects from the Pyrenees Working Community and this way, the scale for the variable was established. In this case, a single scale was used for both sexes and the different ages.

Data Analysis

For the statistical analysis, IBM® SPSS Statistics 20.0 software was used. A descriptive and frequency analysis was made for the three variables analyzed. On the other hand, the relationship amongst variables was determined through correlations, utilizing Pearson´s R and the comparison of means utilizing single factor ANOVA. The significance of the relationships was determined to be $p \leq .05$*.

Results

The mean value for the motor competence was 49.99 points (DT = 5.08), value that falls between 48 and 52 points, which corresponds to a medium level motor competence. Figure 1 shows the percentage of students that falls in each of these motor competence levels. The largest percentage of students is placed in the medium level of motor competence (37%), versus 33% in the low level of motor competence and 30% shown in the high level of motor competence.

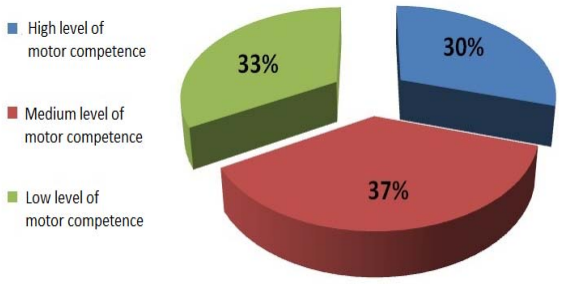

Figure 1. Sample distribution according to motor competence

As for the perceived motor competence, the mean value is 50 points *(DT* = 9.98). In this case, the mean value is set between 45.85 and 54.37 points, that is to say, in the mean level of motor competence.

Figure 2 shows the percentage of students in each of these levels according to their perceived motor competence. 36% of the sample presented a medium level of perceived motor competence and for low and high levels of perceived motor competence the values are equal (32% in both groups).

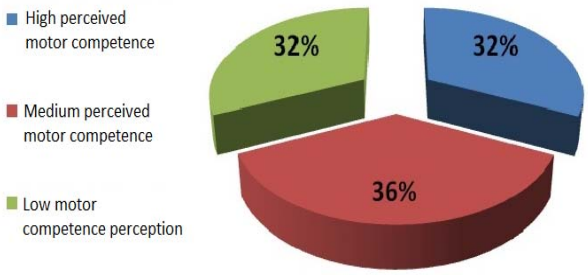

Figure 2. Descriptive analysis of perceived motor competence.

60% of the students performs some type of physical and sports practice weekly and 23% practice every day. The values are lower for those that perform physical and sport practice less than one time per week or never (8% and 9% respectively) (Figure 3).

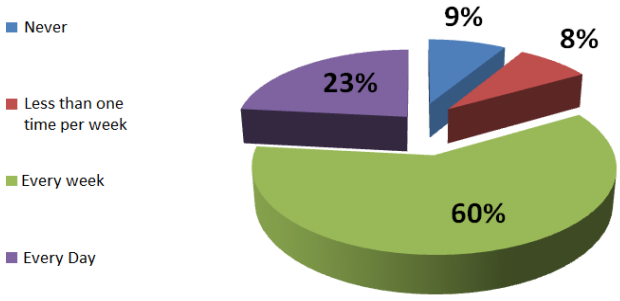

Figure 3. Descriptive analysis of the frequency of physical and sport practice.

The correlations performed demonstrate that the relation amongst the three variables are significant and positive. In the case of the relationship between motor competence and the frequency of physical exercise practice, the higher the competence, higher was the frequency of physical exercise practice and vice versa (r = .286, p < .01). In regards to motor competence and perceived motor competence, the higher the motor competence, the higher their perceived motor competence (r = .351; p < .01). Finally, the relationship between the frequency of exercise practice and perceived motor competence, the relationship is positive and significant, the higher the frequency of exercise practices, the higher the competence perception (r = .364; p < .01). Table 1 shows the differences of means of motor competence and perceived motor competence as a function of exercise practice frequency. As far as motor competence, it shows significant differences (p = .000) as a function of exercise practice frequency. The group that never performed physical and sport activity showed a difference of 3.7 points (p = .000) with those that practiced every week and of 5.39 (p = .000) with those that practice exercise every day. Those that perform physical and sport activity less than once per week, also demonstrated differences with the group that performs exercises every week (1.86 points; p = .000) and with the group that performs physical or sports activity every day (3.55 points; p = .000).

Table 1. Mean differences of motor competence and perceived motor competence as a function of the frequency of exercise practice.

		Motor competence			Perceived motor competence		
		N	*M*	*DT*	*N*	*M*	*DT*
Frequency of Exercise Practice	Never	83	46.37	4.83	73	41.70	8.71
	Less than once per week	80	48.21	4.36	77	45.90	8.55
	Every week	581	50.00	4.82	540	49.68	9.10
	Every day	226	51.76	5.21	209	54.71	8.69
	F (gl)		28.714			45.981	
	p		< .000			< .000	

As far as perceived motor competence, it shows significant differences between all the groups of exercise practice frequencies. So, those that never do physical and sport activity show a difference of 4.2 points (p = .021) with those that practice less than once per week. Those that perform physical and sport activity once per week show a difference of 3.78 (p = .000) with respect to those that practice every week. Finally, those that perform physical and sport activity every week show a difference of 5.03 (p = .000) with the group that practice exercises every day.

Discussion

Attending to the results previously displayed, it was observed that in motor competence as well as perceived motor competence, the students in this study showed medium levels for both variables. As to motor competence, the data does not agree with data obtained in other investigations (Ruiz, 2010; Katic et al., 2013; Lorson et al., 2013) that alert us of the low levels of motor competence shown by teenagers. However, in this study, the percentage of students that show low levels of motor competence is 33%, a very high percentage of students

which coincides with the data obtained for low levels of motor competence shown by teenagers. However, in this study, the percentage of students showing low level of motor competence is 33%, a very high percentage of students, and that coincides with the data obtained in other investigations previously sited. With respect to perceived motor competence, the data coincides with data exposed in an investigation performed by García, Rodríguez and Pérez (2013), in which they found that the majority of students showed a medium level of perceived motor competence. Nevertheless, just as the data obtained for motor competence, the percentage of students which perceives themselves as having low level of motor competence is still high (32%). If we relate this descriptive data with the correlation analysis, where it is shown that there is a positive and significant relationship between motor competence and perceived motor competence, makes sense that the percentage of teenagers that perceive themselves having a low level of competency is high, since the percentage of students that present a low level of motor competency is also high. In this sense, as a recapitulation of the data interpreted and following the tendencies of previous studies (Barnett

et al. 2008; García-Canto et al. 2013; Khodaverdi et al. 2013; Rigoli et al. 2011; Stodden et al. 2008; Urrutia-Gutierrez, 2014; Vedul-Kjelsås et al. 2012; Viholainen et al. 2013), a clear relationship can be established between the levels of motor competence presented by the students and the perception they have of their own abilities. The data obtained from the analysis of the physical and sport activity corroborated the thesis developed by other investigations (Khodaverdi et al. 2013; Lopes et al. 2011; Stodden et al. 2008; Wrotniak, Epstein, Dorn, Jones & Kondilis, 2006) in which it is affirmed that it exists a positive and significate relationship between physical and sport activity and motor competence. Delving deeper in this relationship, the level of motor competence demonstrated by the students as a function of their exercise practice frequency, the results are in accord with the data exposed by Wrotniak et al. (2006), who manifested that female and male teenagers with higher levels of motor competence were more active than those that showed a low level of motor competence. Previously, Ruiz (2010) showed that motor competence has an invigorating role over the desire to practice. However, Stodden et al. (2008) describes the relationship between motor competence and physical and sport activity as a reciprocal relationship. Likewise, the results of this investigation, in relation to the physical and sport activity and the perceived motor competence, coincide with the previous investigations performed by (Abarca, 2011; Barnett et al., 2008; Haugen, Ommundsen & Seiler, 2013; Inchley, Kirby & Currie, 2011; Khodaverdi et al., 2013; Moreno & Cervelló, 2005), affirming that there is positive and significate relationship between perceived motor competence and physical and sport activity. From the analysis of the levels of perceived motor competence in function of the frequency of practices, our data manifests that teenagers that perform physical and sport activity more frequently, show higher levels of perceived motor competence. These results are in accord with investigations performed by García et al. (2013) and Moreno and Cervelló (2005). We spotlight the work of Moreno and Cervelló (2005), where they ascertain that teenagers that practice sports more than three times per week obtain higher scores in the perceived motor competence scale.

Conclusions

The data collected with respect to motor competence and perceived motor competence, we can determine that 37% of the students presented a medium level of motor competence

and at the same time, 36% perceives themselves to have a medium level of motor competence. As far as the results related to the correlations, it has been verified that exists a positive and significate relation amongst the three variables analyzed. Finally, teenagers that carry out physical and sport activity more frequently have shown higher levels of motor competence and perceived motor competence.

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