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# Eating Habits and Lifestyles in Schoolchildren from Granada (Spain). A Pilot Study

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**Abstract:** The creation of healthy habits and lifestyles is fundamental in the educational field and for acquiring adequate health levels that will prevail in adulthood. The aim of this study was to determine the characteristics and correlations between the level of practice of physical activity, adherence to the Mediterranean diet (MD), body mass index (BMI) and problematic use of videogames and self-concept of primary education students. This non-experimental, cross-sectional study is composed of a sample of 577 students aged 10–12 years ( $11.1 \pm 0.638$ ). Subjects were evaluated using the Mediterranean Diet Adherence questionnaire (KIDMED), Self-Concept Form-5 (AF-5), Experiences Related to Videogames (QERV) and anthropometric measurements were taken following the guidelines of the International Society for the Advancement of Kinanthropometry. Most students have been found to be of normal weight, although one in five has problems with being overweight or experiencing obesity. Likewise, half of them need to improve their adherence to the Mediterranean diet, while they do not have a problematic use of videogames, although one tenth of them in these early ages offer severe problems and it is highlighted that students offer an adequate self-concept. It is also noted that BMI correlates positively with problematic videogame use and social self-concept. Greater addiction to videogames is associated with poorer academic performance, low levels of physical activity and poor adherence to the Mediterranean diet. Finally, it should be noted that the continued practice of physical-sports activity favors emotional competence and academic performance.

**Keywords:** Self-concept; Mediterranean diet; videogames; children; healthy habits

## 1. Introduction

Over the past few years, there has continued to be an alarming increase in the rate of overweight or obese children and young people [1,2]. In Spain, according to the National Institute of Statistics [3], more than 20% of young students aged between 10 and 14 are obese or overweight. Possible factors associated with being overweight and obese include eating habits, lack of physical activity, not having breakfast, having television, computers and videogames, sleeping less than the recommended number of hours, as well as the economic, social and educational characteristics of parents [4–6].

The prevalence of this problem is related both to the increase in chronic diseases such as hypertension, diabetes mellitus, cardiovascular diseases, dyslipemias or cancer [7], as well as to reduced social competence, behavioral problems that will extend into adult life and low self-esteem [8]. Self-concept and self-esteem appear to be keys to predicting depressive symptoms in youth and adults, and low self-concept and self-esteem are shown to predict high levels of stress, depression and eating

disorders [9]. Current literature suggests that being obese and overweight for students is related to low body shape perception, poor self-esteem, low levels of confidence, as well as having little interest in physical-sports activities [10].

At the beginning of adolescence, physical, neurological and psychological changes are experienced differently depending on gender. It highlights that while girls assess their bodies in relation to body image concerns, boys do so in terms of physical fitness [11]. Therefore, children's concern is based on achieving greater muscle mass, while girls associate ideal beauty with thinness, which is sometimes associated with unhealthy values [12].

It should be noted that the evolutionary development of self-concept in middle childhood is characterized by positive self-descriptions, skills are overestimated, and one has a thought of everything or nothing (characterized by positive self-descriptions, skills are overestimated, and one has a general thought) [13]. There are cognitive processes that allow them to relate distinguished concepts, these subjects lack the capacity to generate a global concept of their talent as a person, which is evaluated by the rest of equals, although such judgments are not assimilated [14].

Thus, as physical exercise has a more positive effect on those with a low level of self-concept, in addition, subjects with high levels of activity are more likely to improve cognitive functioning [15]. Studies affirm that practicing sports and physical activities helps to gain skills through learning and thus acquire new skills that help to strengthen these self-concepts, although it should not be forgotten that students should do exercise that they find fun, to achieve the loss of some fear [16].

Similarly, physical activity is most important to prevent diseases such as cardiovascular pathologies, reduction of body fat index and pain associated with sedentary lifestyles such as the abusive use of new technologies [17]. In addition, there is a direct association between the systematic practice of physical activity and the improvement of competence, a high self-concept, satisfaction with one's own life and increased vitality [18]. In fact, these premises indicate that students give value to their bodies, accept them with their limitations and increase physical-healthy practices [19]. Many of the habits acquired at this stage will be repeated during the rest of adult life, which justifies the importance of studying and implementing healthy habits at school age [20,21].

The aim of the study is to determine the characteristics and correlations between levels of physical activity, adherence to the MD, BMI and problematic use of videogames and self-concept of primary school students.

## 2. Materials and Methods

### 2.1. Design and Participants

A non-experimental, ex post facto study was carried out with a single measurement in a single group and of a descriptive character in schoolchildren of the Primary Education stage in Granada (Spain). The sample consisted of 577 students, with a representation by sex of 56.9% (n = 328) boys and 43.1% (n = 249) girls and aged between 10 and 12 years ( $11.1 \pm 0.638$ ). This sample agreed to participate by receiving informed written consent from their parents or legal guardians. At the same time, it can be affirmed that it is fully representative of the of primary education students of the city of Granada in 2017 with a master error of 0.05 when using stratified random sampling techniques.

### 2.2. Instruments

Adherence to the Mediterranean Diet (MD) was evaluated using the Mediterranean Diet Quality Index (KIDMED), a questionnaire developed by Serra-Majem et al. [22] for use with children and young adults. This test has 16 items of the dichotomous type with an affirmative or negative response, which refer to patterns associated with the Mediterranean model. Four of the items have a negative connotation (−1) if answered yes (e.g., industrial bakery breakfast?), while the remaining twelve are rated positively (+1) if answered positively (e.g., do you eat fresh or cooked vegetables more than once a day?). After the summation, a score is obtained that oscillates between −4 and +12 points, which

categorizes a better or worse pattern of adherence to the MD (Low from  $-4$  to  $0$ ; Medium = from  $1$  to  $6$ ; High = from  $7$  to  $12$ ). For the correlational study, the total score of the sum of all the items is used.

Self-concept Form-5 Questionnaire (AF-5). This scale was elaborated by García et al. [23] which is based on the model of Shavelson et al. [24]. This test consists of 30 items that are evaluated using a Likert scale with 5 options (1 = Never; 5 = Always). In this instrument, self-concept has a multidimensional perspective that is grouped into five dimensions as follows: academic self-concept (AS) (items 1, 6, 11, 16, 21 and 26), social self-concept (SS) (items 2, 7, 12, 17, 22 and 27), emotional self-concept (ES) (items 3, 8, 13, 18, 23 and 28), family self-concept (FS) (items 4, 9, 14, 19, 24 and 29) and physical self-concept (PS) (items 5, 10, 15, 20, 25 and 30). While in the study by García et al. [23] a reliability of  $\alpha = 0.810$  was established, in this research work similar values were obtained ( $\alpha = 0.790$ ).

Anthropometric measurements. The measures were carried out in accordance with the guidelines proposed by the International Society for the Advancement of Kinanthropometry [25]. The weight was calculated using the Seca Corporation electronic balance (model 707, 50g precision). The height was determined using the GPM stadiometer (Seritex, 1mm precision). Likewise, the BMI was decreed using the standard equations; whose results of underweight, normal weight, overweight and obesity were defined according to international criteria [26] for the descriptive study. For the correlational study, the real values of the uncategorized BMI were used.

Questionnaire of Experiences Related to Videogames (QERV), validated in a sample of Spanish young people by Chamorro et al. [27]. The instrument allows you to assess the problematic use of videogames, consisting of 17 items of negative connotation, which are scored using a Likert scale of 4 options (1 = Almost Never; 2 = Sometimes; 3 = Quite a few times; 4 = Almost always). For correlational analysis, this instrument allows us to assess the problematic use of videogames through a summation, in order not to lose statistical power. Likewise, the internal consistency of this instrument for this research was  $\alpha = 0.872$ .

Ad-Hoc Questionnaire. A questionnaire of our own elaboration was used to record sociodemographic variables such as sex, age and the practice or not of physical activity outside school hours.

### 2.3. Procedure

The collaboration of the educational center was requested through an informative letter elaborated from the Corporal Expression Area of the University of Granada. Given the consent of the center, an authorization was made for the parents or legal guardians of students participating in the third grade of Primary Education. An apart from relevant information of the procedure and study objective, informed consent was requested to participate in this research on a voluntary basis and ensured the anonymity of all students.

Subsequently, data was collected, where 639 students from the third grade of Primary Education participated in the study, having to eliminate 62 questionnaires because they were poorly completed. The sample was composed by 577 participants. The application of the instruments for data collection was carried out during school hours in the different schools of Granada (Spain). In turn, the researchers informed the schoolchildren and were present throughout the process to ensure the correct application of the instruments and to provide guidance on how to complete the questionnaires. Finally, the Helsinki Research Ethics Agreement was respected, as was the ethical approval granted by the Ethics Committee of the University of Granada (462/CEIH/2017).

### 2.4. Data Analysis

For the statistical analysis IBM SPSS®24.0 statistical software was used. The descriptive study was established using means and frequencies. In the relational study, Pearson's bivariate correlations were used at the significance level of  $p < 0.05$  and  $p < 0.01$ .

### 3. Results

Table 1 shows the descriptive variables of the study. It is stated that the majority of the study sample is composed a 56.9% for boys as opposed 43.1% for girls. It should be noted that 75.9% of primary school students obtain a normal weight index, although there are notable percentages of overweight (8.8%) and obesity (13.8%). Likewise, 59.2% of young people present an adherence to the optimal MD, but 40.8% require an improvement in the dietary pattern. The majority of students had no problems with the use of videogames (87.4%;  $n = 504$ ) while 12.6% ( $n = 73$ ) had potential problems. Finally, it is revealed that the students obtain the highest average values of self-concept for the familiar ( $4.67 \pm 0.31$ ) and academic dimension ( $4.30 \pm 0.49$ ), while having the lowest emotional dimension ( $3.52 \pm 0.67$ ).

**Table 1.** Descriptive variables.

Sex			
<b>Boys</b>		n = 328 (56.9%)	
<b>Girls</b>		n = 249(43.1%)	
BMI		MD Adherence	
<b>Low weight</b>	n = 8 (1.5%)	<b>Optimal</b>	n = 342 (59.2%)
<b>Normal weight</b>	n = 438 (75.9%)		
<b>Over weight</b>	n = 51 (8.8%)	<b>Need improvement</b>	n = 235 (40.8%)
<b>Obesity</b>	n = 80 (13.8%)		
Problematic use of videogames			
<b>No Problems</b>		n = 504 (87.4%)	
<b>Potential problems</b>		n = 73 (12.6%)	
Self-concept			
<b>Academic Self-concept</b>	4.30 $\pm$ 0.49	<b>Family Self-concept</b>	4.67 $\pm$ 0.31
<b>Social Self-concept</b>	4.23 $\pm$ 0.58	<b>Physical Self-concept</b>	4.16 $\pm$ 0.52
<b>Emotional Self-concept</b>	3.52 $\pm$ 0.67		

For relational analysis between variables, the Table 2 shows Pearson's bivariate correlations for which statistically significant data have been obtained at level  $p = 0.05$  \* and  $p = 0.001$  \*\*. On the one hand, the BMI correlates positively and directly with social self-concept ( $r = 0.304$  \*\*) and the problematic use of videogames ( $r = 0.276$  \*). On the other hand, video game addiction correlates negatively and indirectly with academic self-concept ( $r = -0.236$  \*), levels of physical activity ( $r = -0.377$  \*\*) and adherence to the Mediterranean diet ( $r = -0.210$  \*). Finally, physical activity levels directly and positively relate to academic self-concept ( $r = 0.403$  \*\*) and emotional self-concept ( $r = 0.340$  \*\*).

**Table 2.** Pearson's bivariate correlations.

	BMI	AS	SS	ES	FS	PS	KID
AS	-0.089						
SS	0.304 **	0.315 **					
ES	-0.022	0.306 **	0.165				
FS	-0.192	0.358 **	-0.057	0.073			
PS	-0.027	0.403 **	0.205	0.340 **	0.123		
KID	-0.113	0.161	0.150	-0.020	0.292 **	0.105	
VID	0.276 *	-0.236 *	-0.144	-0.104	-0.106	-0.377 **	-0.210 *

#### 4. Discussion

This research study describes levels of BMI, adherence to the MD, problematic use of videogames and self-concept in primary school students. As well as the existing correlations between variables, has a nature similar to the studies of authors such as Cvencek et al. [28], Partida et al. [29] and Vernetta-Santana et al. [30].

The majority of primary school students offer a normal weight, although one in five subjects obtain obesity and/or overweight indexes. Based on the figures of the ENKid study carried out by Serrá-Majem et al. [31], it is revealed that in Spain the problems of obesity and the combination of this problem with overweight are similar to the figures of this study in populations with similar characteristics [32,33]. In this sense, it should be noted that in other countries there are figures that highlight that at least a fifth of boys and similarly in girls, have varying degrees of obesity [34,35].

In terms of schoolchildren's diet, two out of five subjects need to improve their adherence to the MD, while the rest obtain an optimal diet. The data provided by Navarro-Solera et al. [36] allude to the fact that although half of the study participants obtain a high-quality diet, two fifths have a medium-low adherence. Within early youth, one-third of students still need to improve their dietary pattern [37].

Similarly, the highest percentage of young people between the ages of 11 and 12 are not addicted to videogames, although one in ten already offers a high level of problematic use of videogames. The truth is that too much digital gaming is emerging as a mental health disorder, as young people are losing track of time and control of their own lives [38,39]. Likewise, the symptoms of video game addiction in adolescence have an ascending character, being closely related to social aspects [40].

The young students' perception of the different dimensions of self-concept is adequate, except for a slight deficit in the emotional category. Likewise, the study of Grandmontagne and Isasti [41] and Resett et al. [42] conducted in schoolchildren reveal high scores for this psychosocial construct. In this way it can be deduced that at early ages the intrinsic perception of the students is high, since they are accepted as they are, although special attention must be paid to their emotional context [43].

Higher BMI are associated with increased problematic use of videogames. Authors such as Castro-Sánchez et al. [44] and Mérelle et al. [45] confirm that an abusive use of new technologies in general and videogames in particular, reduces the practice of physical activity and increases sedentary behaviors, therefore higher levels of being overweight and obese are registered [46,47].

Thus, social self-concept experiences a positive and significant relationship with BMI, since a reality today is that young people live in the knowledge society and utilize new technologies [48,49]. This fact implies that students, from an early age, communicate and relate through social networks and apps [50–52], this being a double-edged sword, since on the one hand the subjects who spend more time with these technological devices acquire a high level of competence and social satisfaction, although a collateral effect of the same is the increase in sedentary lifestyles and high BMI [53–55].

On the other hand, video game addiction is related to decreased levels of physical activity, since it is important to note that the pathological use of videogames in school children is closely related to physical inactivity [44,56,57], although active videogames, given their high motivating potential, complement levels of physical-sporting activity, allowing adherence to healthy lifestyles [58–62].

The same relationship is highlighted for videogames and students' academic self-concept, where Hunter et al. [63] and Yılmaz et al. [64] indicate that subjects with video game problems exhibit problematic behaviors, including communication and behavior problems within the school environment, leading to poorer academic performance. In the same way, the analysis of structural equations in university students proposed by Chacón-Cuberos et al. [65] revealed negative relations between the abusive use of videogames and the academic dimension of the participants. In this line, it was found that for young adolescents who played videogames during the week, the results in reading, science and mathematics were poorer than those who did not play. On the other hand, the consumption of videogames during the weekend was positively associated with academic performance [66–68]. In this way, the type of video game used and the time of the week will have different influences on

the students' academic results. In this way, adherence to the MD was negatively correlated with the abusive use of videogames, where students who presented an adequate diet showed less addiction to videogames [46,69,70]. In this same way, it can be highlighted that time in front of the screens presents strong associations with a poor diet [71–74]. In fact, the findings of the study by Zurita et al. [70] developed in schoolchildren, conclude that a low BMI and shorter screen time is related to higher levels of physical activity, being related to a higher quality of life and better adherence to the MD. Finally, the realization of physical-sports practice is directly related to academic and emotional self-concept, since it has been demonstrated that Physical Education is positively associated with academic performance [75,76]. The findings support evidence that physical activity has a positive effect on cognitive development, specifically in the emotional realm [77]. In this same way it was highlighted that regular physical activity has a positive effect on the emotional self-concept [78–80]. The emotional self-concept is intimately linked to emotional intelligence [81,82], where it is highlighted that a greater level of physical-sport activity improves emotional and academic competences [83–85].

## 5. Conclusions

The main conclusions of the research carried out on a sample of 577 schoolchildren aged between 10 and 12 years are that most of them have a normal weight, although one in five have problems experiencing being overweight or obese. In addition, half of them need to improve adherence to the MD. It should also be noted that students generally do not have a problematic usage of videogames, although a tenth of them in these early ages do experience severe problems. In regards to psycho-social aspects, it stands out that the students have adequate self-concepts, emphasizing a high familiar and academic self-perception and a detriment of the emotional self-concept.

BMI correlates positively with problematic video game use and social self-concept. Likewise, greater addiction to videogames is associated with poorer academic performance, low levels of physical activity and poor adherence to the MD. Finally, it should be pointed out that the continuous practice of physical-sports activity favors emotional competences and academic efficiency and performance.

This study provides important data on behaviors, habits and lifestyles in early childhood students, which allows for establishing connections as a basis for further studies and for the implementation of intervention programs involving emotional education, physical-sports activity and active videogames, in order to reduce sedentary behaviors and improve physical, psycho-social and academic skills.

Although this research provides recommendations and relationships between very specific variables to develop implementation programs, it is a descriptive study of an ex post facto cross-sectional cut, which cannot be generalized to all populations. Even so, a base of action is established for teachers in the area of Physical Education, in order to combat the problems that still persist today.

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