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RELATIONSHIP BETWEEN BODY IMAGE AND PHYSICAL ACTIVITY ON SPANISH ADOLESCENTS

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Relationship between Body Image and Physical Activity on Spanish Adolescents.

Relación entre la imagen corporal y la actividad física en adolescentes españoles.

TESIS DOCTORAL

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En Málaga, a 09 de Noviembre del 2015

Dr. D. José Luis Chinchilla Minguet.

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A la que fue ( ) y a la que es la mujer de mi vida,
A mi Madre y a mi Mujer.

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Abstract

A distortion of body image should be related with some body composition-related disorders, which has a behavioral etiology, mainly for adolescents. The body shape self-perception should one important risk factor, and some surveys have suggested that physical activity (PA) would be contributor to promote a better body self-perception. However, there is not enough evidence about what is the relationship between body composition, different patterns of PA and body shape in adolescents. **PURPOSE**: To explore the relationship between body image perception, body composition and PA in Spanish adolescents. **METHODS**: 829 healthy students accepted and were authorized to participate in this study (405 boys and 424 girls; 14.3 ±1.2 years; body mass index, 20.7 4.0 kg/m^2). Body composition was estimated using bioelectric impedance and anthropometry. Body shape was assessed with Figure Rating Scale (FRS) and body satisfaction with Body Shape Questionnaire (BSQ), Daily PA and out-of-school PA (OSSP) were recorded by a validated physical activity questionnaire for Spanish adult children (PAQ-A). Pearson's correlation coefficient was used to explore the relationships between variables. Independent sample T-test was carried out to compare body image perception between adolescents with and without OSSP. **RESULTS:** A significant relationship between body image and Body Mass Index (BMI) was found (rho=0.653, p<0.001). Significant relationship was found between BSQ score and PA (rho =0.142, p<0.001). BSQ score was significantly different between adolescents with OSSP and without NOSSP (53.6 ±24.4 vs. 61.7 ±29.5). **CONCLUSION:** Our main finding was that adolescents, who reported OSSP showed an improved body shape perception. However, PA was related with BSQ score. Also, in accordance with other studies with adolescent, the higher BMI higher BSQ score. These results suggest that some characteristics of the OSSP can help to improve body self-perception; however more research is necessary in order to clarify this relationship.

***Keywords*– Body Image, Physical Activity, Adolescents, Body Compositions**.

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Resumen

La distorsión de la imagen corporal debe estar relacionada con algunos trastornos relacionados con la composición corporal, que tiene una etiología del comportamiento, sobre todo para los adolescentes. La autopercepción del cuerpo debe ser un factor de riesgo importante, y algunos estudios han sugerido que la actividad física (AF) sería un contribuyente a promover una mejor percepción de nuestro propio cuerpo. Sin embargo, no hay suficiente evidencia acerca de la relación que existe entre la composición corporal, diferentes patrones de AF y la forma del cuerpo en los adolescentes. **OBJETIVO**: Explorar la relación entre la percepción de la imagen corporal, la composición corporal y la AF en adolescentes españoles.. **MÉTODOS:** 829 estudiantes adolescentes, sanos y autorizados a participar en este estudio (405 niños y 424 niñas; 14,3 ± 1,2 años; índice de masa corporal, 20.7 4.0 kg/m^2). La composición corporal se estimó mediante impedancia bioeléctrica y antropometría. La imagen corporal se evaluó a través del cuestionario figura Rating Scale (FRS) y la satisfacción corporal con el cuestionario Body Shape Questionnaire (BSQ), la AF dentro (OSSP) y fuera del horario escolar (NOSSP) se registraron mediante un cuestionario de actividad física validados para adolescentes españoles (PAQ-A). Coeficiente de correlación de Pearson fue utilizado para explorar las relaciones entre las variables. Muestra independiente t-test se realizó para comparar la percepción de la imagen corporal entre los adolescentes con y sin OSSP. **RESULTADOS:** Se encontraron una relación significativa de la imagen corporal y el IMC entre (rho = 0,653, p <0,001). Se encontró una relación significativa entre la puntuación BSQ y PA (rho = 0,142, p <0,001). Puntuación BSQ fue significativamente diferente entre los adolescentes con OSSP y sin NOSSP (53,6 ± 24,4 vs 61,7 ± 29,5). **CONCLUSIONES:** Nuestro principal hallazgo fue que los adolescentes, que informaron como OSSP mostraron una mejora en la percepción de la forma del cuerpo. Sin embargo, la AF estaba relacionado con la puntuación BSQ. Asimismo, de acuerdo con otros estudios con adolescentes, el mayor IMC representa mayor puntuación BSQ. Estos resultados sugieren que algunas características del grupo OSSP pueden ayudar a mejorar la autopercepción corporal.

***Palabras Clave*– Imagen Corporal, Actividad Física, Adolescente, Composición Corporal**.

UNIVERSIDAD DE MÁLAGA

Contents.

ACKNOWLEDGMENT **VII**

ABSTRACT **XI**

CONTENTS. **XIII**

TABLE CONTENTS. **XV**

FIGURE CONTENTS. **XVII**

ABBREVIATIONS **XIX**

INTRODUCTION **XXIII**

CHAPTER I. THEORETICAL FRAMEWORK. **29**

1. BODY IMAGE VARIABLES. **31**

1.1. Body Image and related disorders. *31*

1.2. Body Satisfaction and Dissatisfaction *33*

1.3. Non-modifiable Risk Variables Associated with Body Image Development *35*

1.3.1 Gender 35

1.3.2 Age 36

1.4. Adolescence as Risk Stage for Body Image Development *37*

1.5. Media and Body Satisfaction *40*

2. PHYSICAL ACTIVITY. **42**

2.1. Definitions *42*

2.2. Physical Activity and Health *42*

2.3. Physical Activity during Adolescence *44*

2.4. Physical Activity and Body Image *46*

3. BODY COMPOSITION. **48**

3.1. Concepts *48*

4. BODY IMAGE, PHYSICAL ACTIVITY AND BODY COMPOSITION DURING ADOLESCENCE: A SYSTEMATIC REVIEW. **50**

4.1. A study Review *50*

4.2 Discussion *65*

UNIVERSIDAD DE MÁLAGA

CHAPTER II. VARIABLES, AIMS AND HIPHOTESIS. 71

5. VARIABLES, AIMS AND HYPOTHESIS. 73

5.1. Aims 73

5.2. Hypothesis 74

5.3. Variables 74

CHAPTER III. STUDY DESIGN 77

6. DESIGN. 79

7. SAMPLE AND RECRUITMENT. 79

CHAPTER IV. METHODS AND PROTOCOLS 85

8. METHODS. 87

9. TOOLS AND PROTOCOLS. 89

9.1. Body Composition 89

9.2. Body Image 92

9.3. Physical Activity 95

10. STATISTICAL ANALYSIS. 97

CHAPTER V. RESULTS 99

11. RESULTS. 101

11.1 SAMPLE CHARACTERISTICS 101

11.2. BODY DISSATISFACTION AND SATISFACTION PREVALENCE. 104

11.3. BODY SELF-PERCEPTION PERCEPTION 106

11.4. PREVALENCE OF PHYSICAL ACTIVITY PARTICIPATION 109

11.5. ASSOCIATIONS BETWEEN BODY COMPOSITION AND PHYSICAL ACTIVITY VARIABLES, AND BODY IMAGE VARIABLES. 110

11.6. DIFFERENCES BETWEEN AFTER-SCHOOL SPORT PRACTICE GROUPS. 113

11.7. BODY DISSATISFACTION AND SATISFACTION DETERMINANTS 119

CHAPTER VI: DISCUSSION 121

12. DISCUSSION. 123

UNIVERSIDAD DE MÁLAGA

CHAPTER VII: LONGITUDINAL STUDY. 147

13. LONGITUDINAL CHANGES IN BODY SATISFACTION AND BODY SELF-PERCEPTION 149

14. DISCUSSION LONGITUDINAL STUDY 152

CHAPTER VIII: CONCLUSIONS 155

15. CONCLUSIONS 157

16. FUTURE RESEARCH 159

17. REFERENCES 160

18. APPENDIX 207

18.1 Resumen de la investigación 207

18.2. Study information for participants. 227

18.3 Informed consent 229

18.4. Physical activity questionnaire for adolescents 231

18.5. Body shape questionnaire. 233

UNIVERSIDAD DE MÁLAGA

Table contents.

Table. 1. Summarize of cross-sectional studies 59

Table 2. Cont. Summarize of cross-sectional studies 60

Table 3. Summarize of follow-up studies 61

Table 4. Summarize of Trials studies 63

Table 5. Effects practice PA or Sport for BI 64

Table. 6. Gender distribution in the final sample size 82

Table 7. Sample size by socio-demographic characteristics, academic level and out-of school sport practice and school 83

Table 8. Summary of the assessments following the order of execution 88

Table 9. Biological characteristic of the sample. 102

Table 10. Intention-to-treat analysis by differences on morphological variables, age, physical activity and body satisfaction 103

Table.11. Distribution of participants by body satisfaction categories and school 104

Table.13. Mean values of body satisfaction (BSQ scores) across academic level and gender 106

Table. 14. Body dissatisfaction descriptive results 107

Table. 15. Differences between school and OSSP NOSSP 109

UNIVERSIDAD DE MÁLAGA

Table 16. Spearman's coefficient correlations between body satisfaction variables and morphological variables, and age 110

Table 17. Distribution of groups with after-school-sport practice (OSSP) and without (NOSSP) by gender 113

Table 18. Comparison of medians between after-school-sport practice (OSSP) and without (NOSSP) groups 114

Table 19. Proportions of after-school sport practice (OSSP) group across perceived BMI categories 118

Table 20. Logistic regression model for predicting body satisfaction 120

Table 21. Changes in morphological variables, total daily physical activity, body satisfaction and body self-perception after 1-year of follow-up 149

UNIVERSIDAD DE MÁLAGA

Figure Contents.

Figure 1. Flowchart of selected studies by inclusion criteria 57

Figure 2. Flowchart representing, final sample size, drop-outs and adherence to the study 81

Figure 3. Age distribution in the final sample size 82

Figure 4. Bioimpedance analysis (BIA) equipment 92

Figure 5. Anatomical model drawings 93

Panel 1. Body Dissatisfaction categories across academic level 105

Figura 6. Body Self-Perfection Distortion 108

Figure 7. Mean ranks on body dissatisfaction 111

Figure 8. Relationship between body dissatisfaction score 111

Figure 9. Mean ranks on body dissatisfaction 115

Figure 10. Body satisfaction differences between adolescents with after-school sport practice (OSSP) and without (NOSSP). 116

Figure 11. Differences of BMI between adolescents with Out school sport practice (OSSP) and without (NOSSP) 117

Figure 12. Differences between BMI_A and BMI_P across PBMI 119

Figure 13. Absolute and relative changes of body satisfaction 151

UNIVERSIDAD DE MÁLAGA

UNIVERSIDAD
DE MÁLAGA

Abbreviations

ACSM: American College of Sports Medicine.

ANOVA: Variance Analysis.

BCA: Body Composition Analysis

BSQ: Body Shape Questionnaire.

BI: Body Image.

BIC: Body Image Concern.

BIP: Body Image Perceptions.

BD: Body Dissatisfaction.

BDD: Body Dimorphic Disorders.

BMI: Body Mass Index.

BMI_A: Actual Body Mass Index.

BMI_P: Perceived Body Mass Index.

BS: Body Satisfaction.

ED: Eating Disorders.

EHC: European Health Council.

EYHS: European Youth Heart Study.

ERIC: Educational Resource Information.

ESO: Education Secondary Obligatory.

%FM: Fat Mass Percent.

FFM: Fat Free Mass.

FFMI: Fat Free Mass Index.

FMI: Fat Mass Index.

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FDR: Fernando de los Rios.

FRE: Figure Rating Scale.

g: grams.

HBSC: Health Behavior School Children.

IES: Institute of Secondary Education.

JDR: Juan de la Rosa.

Kcal: kilocalories.

MVPA: Moderate-vigorous Physical Activity.

NASPE: National Association for sport and physical education.

OSSP: Out of School Sport Practice.

NOSSP: Non Out of School Sport Practice.

PA: Physical Activity

PAQ-A: Physical Activity Questionnaire for Adolescents.

PE: Physical Education.

SD: Standard Deviation.

USA: United States of America

WHO: World Health organization.

NBCA: Students without Body Composition Assessment.

NC: Normal Concern.

MOC: Moderate Concern.

MIC: Mild Concern.

MAC: Marked Concern

UNIVERSIDAD DE MÁLAGA

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Introduction

Since the end of the XX century the relationship between physical activity (PA) and health has been growing in relevance as consequence of several psychological and physiological benefits, which has been associated with a regular practice of PA (ACSM, 1991; Pastor, Y. & Pons, 2003; Taylor, Moore, & Holland, 1985; Van Amersfoort, 2004; World Health Organization, 2005).

Although the importance of PA for health was firstly more investigated in adults, nowadays there is not a matter of doubt that it is one of the most important issues for a healthy development during childhood and adolescence. So, it has been suggested that an appropriated and well-prescribed PA program will allow wide range of healthy psychological and physiological benefits such as an improved cardiovascular, respiratory, motor, cognitive, affective and social development (Neil Armstrong & Welsman, 2007). Cardiovascular, energy metabolism and body composition (BC) are the most relevant physiological concerns influenced by PA during adolescence, which may be additionally influenced by psychological alterations during the puberty. As consequence PA has been proposed as health markers during childhood and adolescence (Ortega, Ruiz, Castillo, & Sjöström, 2008; World Health Organization, 2005; Held et al., 2012). Nevertheless, several theories and/or inferences associated with PA during this part of the vital cycle remain to be confirmed. The fact that children and adolescences are generally in a good health status, it has been

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one of the main limitations to study health consequences associated with absence of PA. However the importance of PA behavior goes above and beyond its early benefits and will affect adulthood health.

In spite of this growing scientific knowledge of PA-related benefits for youth, research evidence has reported a decrease in participation in PA during adolescence (Kimm et al., 2000; Telama & Yang, 2000; Ritterman Weintraub, Fernald, Adler, Bertozzi, & Syme, 2015) and an increased rate of sedentary in developed countries such Spain (Ortega, F.B., Ruíz, J.R., Castillo, M.J., Moreno, L.A., González-Gross, M., Warnberg, J., & Gutiérrez, 2005; Fernández García et al., 2008; Hernández de Vera, n.d.; Serra, 2008; Martínez-gómez et al., 2009; WHO, 2010; Martínez et al., 2011; López, 2008.; Labrado, 2011). As consequence, rates of overweight and obesity continue to be above 40% in United States and several countries in Europe, including Spain (WHO, 2010; Flegal, Carroll, Kit, & Ogden, 2012; Mura G, Vellante M, Nardi AE, Machado S, 2015). Moreover, it is paradigmatic that young people are concerned with weight control and body image (BI) as they become older (F. M. Berg, 1999; Cash, T. Pruzinsky, 1990; L Smolak & Levine, 2001), which are problems not only related with the excess of adiposity but also with bulimic syndrome and anorexia.

Education for a healthy lifestyle may provide useful tools for the future life. In this regard, physical education (PE) classes offer good opportunities to modify and improve attitudes about election of healthy diet and PA plans among children and adolescents, which may be a helpful "lifelong

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learning". However, most part of the research related with health benefits of PA among pediatric and adolescent population has been traditionally conducted out of the school time (Blair, Cheng, & Holder, 2001) which had to do with a physiological performance perspective for the success of PE (Simons-Morton DG, 1987). Currently, this approach has been modified and PE subject covers a wider range of topics and concerns and its outcomes are not only physiological but also psychological and social, and most of the times eclectic. Metabolic and psychological disorders such as obesity and anorexia are serious preoccupations in Spain and around the world, which can be susceptible to be detected and treated early in the adolescence. So, identifying risk factors and means of treatment must be a main goal for adolescences education.

Body self-perception variables have been proposed as risk factors to develop several behavior disorders, which affect BC (Ferron, Narring, Cauderay, & Michaud, 1999). BI and body dissatisfaction (BD) have been two of the most important variables studied in the field of body weight disorders. In adults, BD affects more females than males (Carlson Jones, 2004; Davison & McCabe, 2006; Miranda, Conti, de Carvalho, Bastos, & Ferreira, 2014) and BI distortion is more prevalent in girls than boys, and this is probably related with a social model for females mainly related with thinness (Bener & Tewfik, 2006), which has made in the past the most part of the studies had been conducted in females. Nevertheless, boys may experience their specific difficulties during adolescence.

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In general when the concern and dissatisfaction with body it does not conform to reality, occupy the mind with intensity and frequency, and generate discomfort negatively interfering in everyday life we talk about BI disorder.

It has been argue that PA can influence BI perception in adults (González-Montero de Espinosa, M. André, A. García-Petuya, E. López-Ejeda, N. Mora, A. Marrodán, 2010) and studies with adults have shown a connection between PA and body satisfaction (BS) (Teixeira PJ1, Carraça EV, Markland D, Silva MN, 2012). Complementarily, BI and BD may be the reason for choosing PA and exercise as a strategy for obtaining the optimal image, especially in adolescents girls (Mellor, McCabe, Ricciardelli, & Ball, 2004; Smith, Handley, & Eldredge, 1998) and conversely BI dissatisfaction has been also related with less engagement in PA (Farhat, Iannotti, & Caccavale, 2014).

Professional working in this field often use the perception of BI as a measure of self-esteem and satisfaction with one's own image (Thompson & Chad, 2000). Surely multiple biological, social and cultural factors modulate this perception, but in some cases these factors are difficult to value (Pilar Montero, 2004).

The work carried out in this doctoral thesis try to cover a specific lack of knowledge in the field of BI such as the plausible relationship between total daily PA, out of school sport practice (OSSP), BC (adiposity) and BI

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features (self-perception and BS). Although, BI is a topic widely reported in the scientific literature, there are some gaps not completely close. Specifically, our studies were conducted in students during adolescence period in school context, cross-sectional and longitudinal data were analyzed, and BC, PA and BI was analyzed all together. This manuscript is organized in four main parts:

I. A review of the literature related with relationship between BI and PA during adolescence. A systematic review was performed in order to analyze the state of art of this topic.

II. The design and methodology used to assess BI, PA and BC variables in a school context.

III. A cross sectional study to analyze the associations between total PA, BC and BI variables. The influence of OSSP in BC and BI variables were also explored. Differences between girls and boys and the influence of age were also reported.

IV. The last part is focused in the analysis of longitudinal changes in BI variables along adolescence and its relationship with PA.

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CHAPTER I.

THEORETICAL FRAMEWORK.

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1. BODY IMAGE VARIABLES.-

1.1. Body Image and related disorders.-

The BI has been widely conceptualized in the literature, and many terms and variables have been used as synonyms to define it, which sometimes have created an epistemological confusion. However, there is a consensus in the scientific community in differentiating some terms related with BI concept, which are not synonyms and cannot define by themselves the body perception concept. The most important are: Body scheme, self-esteem, BS, appearance and BI; all of these concepts are naturally related, and it is difficult obtain an exclusive definition. (B. Schilder, 1951) defined BI in first half of the XX century as "The image of the human body means the picture of our own body which we form in our mind, that is to say the way in which the body appears to ourselves". More recently, the theories of Higgins (self-discrepancy) and Markus (self-schema) were the start point for more elegant and modern definitions, which considered the body image as an internalized self-representation, and additionally these theories predict "specific information processing consequences of an organized cognitive representation" (Altabe & Thompson, 1996). This later conception went further than others previously published since it considered the consequences of disturbances in information processing, which may lay the foundations of BI-related disorders. So the same research group (Thompson, J. K., Heinberg, L. J., Altabe, M., & Tantleff-Dunn,

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1999) suggested several terms such as BS, body ideal size or body size perception in order to define more precisely the BI concept. Others have even suggested that a networking of several BI´s (Cash, T. Pruzinsky, 1990). However, most of the times the term scientists use is more related with the component of the BI construct they want study or the technique they use to assess BI. As a consequence, it is difficult to summarize the BI concept just in a definition and nowadays it seems that a multidimensional theoretical construct is the most accepted way to define BI.

Considering BI as a multidimensional concept, the most recent literature defines BI based in two main constructs (Burrowes, 2013):

1. Body perception. This is an individuals' self-assessment of the physical proportions of their bodies and the extent to which this assessment is accurate. This capacity is well described in terms of normative references and in the worst scenario individuals suffer from body dimorphic disorder (BDD), a psychological disorders where by people cannot accurately perceive their body size.

2. Body satisfaction. This is the extent to which an individual is content with their body size and shape. Incorporated into this theme are terms such as body confidence, body esteem, and body dissatisfaction.

In this way measuring body perception or defining BS can assess BI. Body perception assessment relies more in quantifying the actual whole body shape or size and contrasting it with the self-assessment (see assessment

UNIVERSIDAD DE MÁLAGA

tools section). Regarding BS, it is more focused in specific parts of the body and qualitative and subjective aspects such as appearance. Alterations in one or both dimensions may take to BI disturbances and finally life-threating psychological disorders as anorexia or morbid obesity. BI disturbances are organized in two categories distorted patterns of thinking (BI distortion, BD, BDD or distorted body perception) and maladaptive behaviors (Reas & Grilo, 2004). This thesis is in the scope of BI disturbances and does not include the study or assessment of serious syndromes (i.e. bulimia nervous, anorexia and so on). Specifically, we are concerned with BD disturbance and body perception in healthy adolescents.

1.2. Body Satisfaction and dissatisfaction.-

BS, BI perception and health status are not always in agreement. Two scenarios of BI disturbance could be plausible; firstly individuals with BD, unhealthy BC (for example excessive thinness) and distorted body perception (overestimation of actual weight status); on the other had, individuals with BS, unhealthy BC (for example obesity) and distorted body perception (underestimation of actual weight status). Both syndromes may interact and be affect by PA and diet, although they are commonly designated as eating disorders (ED) and are far to be an exclusive problem of adults. Adolescents are a risk population for these disturbances since they experience ample physical changes during the period of puberty and

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face dynamic perceptions of BI (Alwan, Viswanathan, Paccaud, & Bovet, 2011; Swaminathan, Selvam, Pauline, & Vaz, 2013), which are additionally influenced by media and social stereotypes with a deep impact in BS and psychological wellbeing among adolescents (Durkin & Paxton, 2002; Groesz, Levine, & Murnen, 2002). Currently, this situation growing in importance and a high rate of adolescents are worried with BI issues, which could be in the origin of ED (Camacho MJ, Fernández E, 2006).

Regarding the gender, BI distortion is more prevalent in females than in males (Carlson Jones, 2004; Davison & McCabe, 2006; Miranda et al., 2014), so the former maybe more affected by social stereotypes such as thin beauty ideal and thinness (Groesz et al., 2002) and as consequence it seems that eating-related disorders at earlier ages (Bener & Tewfik, 2006). Although, BD it is not exclusive of female, and different social models may influence male adolescents, mainly those related with a mesomorfic BC and it has been suggested that males show more self-esteem, body shape and physical condition (Fernandez, J. 1999) and females present higher body mass index (BMI) (values) during adolescence than males (Cole, Bellizzi, Flegal, & Dietz, 2000). However, girls have a leptosomic BC ideal pattern of and health care concerns (Striegel-Moore, 1997). All together, these previous characteristics make women tend to overestimate their body weight, specifically in waist, breast and head regions in order to adjust their actual figure to beauty expectancies, which enable more probabilities of BD (Lowery et al., 2005) (Ansari, Dibba, & Stock, 2014).

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1.3. Non-modifiable Risk Variables Associated with Body Image Development.-

1.3.1 Gender

Traditionally, BI is a more significant issue for life women than men (Koff, Rierdan, & Stubbs, 1990; V, 1999) and as consequence the former have given more importance to physical appearance and weight management (Goñi, A. y Zulaika, 2000). Although, BI care is gaining interest progressively among men and health-threating risk behaviors have been already described nowadays (Cafri et al., 2005), however it seems that women continue to be more influenced by social model of beauty based in an extreme thinness (Franzoi & Shields, 1984).

Across the vital cycle, females are at higher risk for negative BI than males (Elgin & Pritchard, 2006; Feingold & Mazzella, 1998). In general, when the most port of female with BI concerns are dissatisfied because they feel overweight (Thompson, J. K., Heinberg, L. J., Altabe, M., & Tantleff-Dunn, 1999), and they would prefer a slender shape, which may be strongly influenced by the dramatic changes in body fat accumulation in hips since adolescence, which may interfere with their satisfaction later in life (AAUW report, 1992). In contrast, reasons in men are more heterogeneous, with almost 50% indicating they are weight dissatisfied and want to gain weight and muscularity (Cafri et al., 2005; Mellor et al., 2004;

UNIVERSIDAD DE MÁLAGA

Marrodán Serrano et al., 2008).

This previous female pattern may be related with a lower self-concept among women than men (Freedman, 1984; Brooks-Gunn, 1992; Kearney-Cooke, 1999) which in turn could bring women to higher likelihood of ED. While there is not a strong mechanistic evidence to explain this women pattern, female biology, familiar environment and sociocultural context have been suggested to have influence (Gardner, Stark, Friedman, & Jackson, 2000; Leung, Thomas, & Waller, 2000; Thompson & Chad, 2000).

All these differences seem to be exacerbated during adolescence, where girls show an impaired perceptive capacity and difficult in accepting their physical appearance (Corbin, 2002; Marcotte, D., Fortin, L., Potvin, P., & Papillon, 2002). This variability along the cycle vital may confirm age as a risk factor for BI disturbances to bear in mind when working with children, adolescents and young adults.

1.3.2 Age

As pointed out in the previous section, age is an important cause for the changes of BI perception and related consequences, and childhood and adolescence (particularly puberty transition) has been described as sensible time periods for the development of disturbances. In children, (Mellor et al., 2004) found about 40% of girls and 25% boys of elementary school are dissatisfied with their body. BD continually increases towards adolescence both females and males, with girls continuing to report higher negative BI than boys (Paxton, Eisenberg, & Neumark-Sztainer, 2006; Muth

UNIVERSIDAD DE MÁLAGA

& Cash, 1997; Zaimin Wang, Byrne, Kenardy, & Hills, 2005) which must be related with physiological and morphological changes that happen during puberty, so while girls start to accumulate more body fat, male gain muscle mass, strength and improved motor skills (González-Montero de Espinosa, M. André, A. García-Petuya, E. López-Ejeda, N. Mora, A. Marrodán, 2010). So, a conflict between pubertal growth and esthetic ideal has been suggested as the critical determinant for the highly prevalent BD among youth (Eisenberg, Neumark-Sztainer, Story, & Perry, 2005; Blaivas, Levine, & Murnen, 2002). Moreover, it seems that BS diminished from 13 to 18 years old to keep steady afterwards (Tiggemann, 2004). Nevertheless, adults continue reporting higher BI concerns than younger populations, which may indicate that BI dissatisfaction during adulthood is mainly determined in adolescence.

1.4. Adolescence as Risk Stage for Body Image Development.-

Adolescents are constantly worried about their weight, seeking a beauty ideal, and the lack of acceptance of the body makes them feel excluded from society. As described in the previous paragraphs, BI perception and satisfaction may be developed earlier in life. Recent evidence suggest that BI issues rise since childhood and throughout adolescent, so 55% of girls between 7 and 12 years old wish to be thinner,

UNIVERSIDAD DE MÁLAGA

while among adolescent females the prevalence is 80%, which is also associated with low self-esteem (Singh, Ashok, Binu, Parsekar, & Bhumika, 2015). In the same way, 50% of British females (12-18 years old) would like to lose weight, 60% believed they must modify dietary habits and 20% were performing severe caloric restriction (Furnham A, 1986). In fact, there is a higher percentage of adolescents insatisfaction with their BI than satisfied (Gómez Peresmitré, 1995; Pineda. G, 2000).

Many of the studies that found a link between negative BI (both BS and body perception) and depression were conducted with adolescents. The relationship between depression and BI was found for both girls (Pesa, Syre, & Jones, 2000) and boys (Cohane & Pope, 2001), although girls are more likely to experience depression along with negative BI than boys (Sujoldzić & De Lucia, 2007).

Adolescents who are overweight are more likely to experience low BS and depression (Chaiton, Cohen, O'Loughlin, & Rehm, 2009). Research indicates that low BS may be the link that explains this association between weight and depression. (Pesa et al., 2000) found that there was no statistical relationship between weight and depression when the influence of BS scores was controlled, implying that BI is important in understanding the relationship between weight and depression.

In terms of other psychological factors that are related to BI, (Izgiç, Akyüz, Doğan, & Kuğu, 2004) found that individuals who had previously suffered from a social phobia were at increased risk of suffering from

UNIVERSIDAD DE MÁLAGA

lower BI. (Cafri et al., 2005) found that 'internalizing the thin idea' (taking on board societal thin ideals as standards for yourself) were key components of negative BI. Increased levels of social comparison (an increased tendency to evaluate yourself by comparing yourself to others) is linked to an increased risk of low BS (Myers & Crowther, 2009).

In a study that explored the interaction between parental and peer relationships with BS (Holsen, Jones, & Birkeland, 2012) found that good quality relationships with parents and peers were associated with higher BS whereas poor quality relationships with parents and peers were associated with lower BS. The quality of these relationships also predicted BS over time, with individuals who had good quality relationships in childhood also experiencing higher BS in adulthood.

Many authors highlight the importance of the role of parents when considering any attempts to improve BI amongst young people. Mothers and fathers are able to influence BI in positive directions through words of encouragement and negative directions through criticism (Rodgers et al., 2009). This is especially the case for girls (Crespo, Kielpikowski, Jose, & Pryor, 2010; P. van den Berg, Wertheim, Thompson, & Paxton, 2002). Parents are also able to influence the BS of their children by acting as role models. In a study focusing on the impact of mothers' attitudes towards their own bodies (van den Berg et al., 2010) found that mothers who are concerned about their weight are more likely to have daughters who are dissatisfied with their bodies and more likely to have both daughters and

UNIVERSIDAD DE MÁLAGA

sons who try to control their weight.

Girls who miss-perceive their actual body shape or size, and estimate that they are heavier than their actual weight, are more likely to use extreme weight control behaviors such as vomiting (Liechty, 2010). Lower BS appears to increase the chances of adolescents using unhealthy weight control behaviors (such as crash dieting) that are likely to result in weight gain and poorer overall health (Neumark-Sztainer et al., 2006). These papers all indicate that BI may have a key role in predicting risk of ED behavior.

1.5. Media and Body Satisfaction.-

One of the areas that have received a great deal of research attention is the impact of the media on BI. This area typically explores the impact of images of thin and attractive women, or men with well-defined muscles, on those who watch them.

Several methodologies have been used to investigate this phenomenon, although this topic is beyond the scope of this manuscript, we brifley summarized the most important. Traditionally studies have used images of 'idealized body shapes' but do not source these images directly from the media. Other methods include asking participants to report how many hours a week they expend watching TV to be related with BS. Finally,

UNIVERSIDAD DE MÁLAGA

structurated intervew are used to describe pressure teenagers felt from media in order to aim a perfect body shape. (Van Vonderen & Kinnally, 2012) (Benowitz-Fredericks, Garcia, Massey, Vasagar, & Borzekowski, 2012).

The majority of research indicates that face to idealized BI can result in a small to moderate reduction in BS and body perception (Grabe, Ward, & Hyde, 2008). This finding has been reproduced studies using both male and female participants (Barlett, Vowels, & Saucier, 2008), although we cannot considere it as an absolute truth. So, some studies have failed to replicate the finding and have found that exposure to idealized BI has the same impact as being exposed to images of inanimate objects instead (Holmstrom, 2004). In instance, women who are only slightly bigger than the models used in the media, exposure to media images improved their BS (Holstrom, 2004). This suggested that for these women exposure to thin images may act as a motivational factor to help maintain lower body weight.

The extremity range of the images utilized to assess BI is another that may influence responses from study participants, and it has been only found a relationship between idealized BI and low BS when extreme images were used (e.g. very muscular men) (Barlett et al., 2008)

In addition, any pre-existing low BS in the participants appears to have an impact on the results. Individuals who already have low BS are likely to be negatively affected by images of idealized body shapes

UNIVERSIDAD DE MÁLAGA

whereas individuals who have high BS are unlikely to be affected by images of idealized body shapes (Blond, 2008; Want, 2009). All together, these previous evidence make us be cautious when interpret data from our or already published studies.

2. Physical Activity.-

2.1. Definitions.-

PA is defined as any bodily movement produced in skeletal muscles that result in a significant increment of energy expenditure above resting conditions. PA in daily life is classically described by several dimensions (light, moderate, vigorous and moderate-vigorous (MVPA)) and categorized into occupational, sports, conditioning, household, or other activities. Exercise is a subset of PA that is planned, structured, and repetitive and has as a final or an intermediate objective the improvement or maintenance of physical fitness, which is a set of capacities that are either health- or skill-related such as cardiorespiratory fitness, strength, flexibility, balance, coordination and BC (Carpensen, C.J. et al., 2000).

2.2. Physical Activity and Health.-

Scientific evidence of the benefits of regular practice of PA for health is documented in literature (Haskell et al., 2007; Held et al., 2012),

UNIVERSIDAD DE MÁLAGA

including in the leisure, active commuting, and occupational and domestic contexts. The practice of leisure-time physical activities (physical exercises, sports, dances, fight or martial arts) represents the most easily modifiable and conducive context to stimulating the practice of PA´s, as well as for potential health benefits (Held et al., 2012). Regarding children and adolescents, sports are the most prevalent form of PA. Sports are mainly organized practices as games during school time and as exercise out of the school time.

In a health perspective, the main goal of PA must be related with meeting enough energy expenditure or time to improve or preserve the health-related physical fitness (WHO, ACSM, EHC and EYHS). PA can be performed in sports, school activities, playing with friends, or walking to school, regular PA leads to physical and psychological quality of life (Penedo & Dahn, 2005). However, cut-off values classically suggested for improving physical fitness have never been validated for BI outcomes.

Even considering the positive effects of PA during life span, the prevalence of PA participation continue to diminish dramatically among Spanish adults (Eurobarometer survey on sport and PA, 2014) and adolescents (Álvarez, 2004; Camacho MJ, Fernández E, 2006). Moreover, there is an increasing incidence of adolescents who only perform PA during PE (Gómez-Mármol, A., Sánchez-Alcaraz, B.J. & Mahedero, 2013).

UNIVERSIDAD DE MÁLAGA

2.3. Physical Activity during Adolescence.-

The health effects associated with the regular practice of PA during youth have been extensively documented and well accepted by health professionals (Leek et al., 2011; Pate RR, 1995; Cohen, McDonald, McIver, Pate, & Trost, 2014).So regular participation in physical activity is associated with increased bone mass, maintenance of a healthy weight, reduction of high blood pressure among hypertensive adolescents, and improved psychosocial outcomes (Kolody & Sallis, 1995).

Independently of improvement in the physical fitness outcomes, PA play double role during adolescence, firstly there is a large body of evidence that prove the positive effect of regular PA for a healthy growth and development (Sánchez Barrera, M., Pérez, M. y Godoy, 1995; Malina, 1996; K F Janz, Dawson, & Mahoney, 2000; Telama & Yang, 2000; J. W. Twisk, Kemper, & van Mechelen, 2000; J. W. Twisk et al., 2000) Tudor-Locke, Ainsworth & Popkin, 2001; J. W. R. Twisk, Kemper, & van Mechelen, 2002; Gavarry & Falgairette, 2004). On the other hand, it appears to be an early engagement in PA is related with a better adherence to healthy lifestyle and less probability of metabolic and cardiovascular diseases. So, adolescents who meet daily recommendations of PA may have higher probabilities of healthy development and lower likelihood of undergoing non-communicable chronic diseases during the adulthood.

Although PA is clearly associated with health benefits, population

UNIVERSIDAD DE MÁLAGA

surveys show that many young people are not meeting the guidelines. In a meta-analysis where the level of PA during adolescence was track from 1967 to 1991, students from secondary schools of several occidental countries (Germany, Australia, Austria, Belgium, Canada, Scotland, United States, Finland, Wales, Holland, England, North Ireland, Italy, Norway and Sweden) did not meet enough quantity of PA to maintain a good health status (Cale & Almond, 1992), conversely in other studies 80% of adolescents are estimated to spend at least 30 active, probably less than 50% are actually active, and only 66% of adolescent boys and 33% of adolescent girls report doing 20 min of MVPA at least three times per week (Glenmark, Hedberg, & Jansson, 1994). Spanish data do not differ from those found in other countries, so the survey conducted by (Devís Devís & Cantera Garde, 2002) described a prevalence of inactivity of 42.8% in 367 adolescents. Nevertheless, other investigations did not confirm these numbers (Youth Risk Behavior Survey, National Children and Youth Survey and Adolescent Injury Control Study (Aaron & Laporte (1997), which might be related with sociocultural environment and specific traits of the sample analyzed.

Because PA has important health benefits in youth and many young people are not meeting established guidelines, improving the PA levels of youth is an important public health challenge.Although the determinants of PA among adolescents are not well understood, engaging in out of school sport practice (OSSP) has been suggested as the most important way to meet daily MVPA recommendations (Ortega et al., 2008). One potential

UNIVERSIDAD DE MÁLAGA

determinant may be the level of mastery of the movement skills that are used to participate in this kind of activities. Since fundamental movement skills are considered a prerequisite to, or foundation of, the specific skills used in popular forms of adult PA (Payne & Isaacs, 2008) it is reasonable to assume that there may be a relationship between an individual's participation in PA and his/her mastery of fundamental movement skills, which may be associated with self-efficacy and competence.

In several studies that have been focused in study relationships between health and PA in adolescents was that PA activity was only analyzed in OSSP (Blair et al., 2001), which may limit several inferences since the educative profile of PE may help to develop other health-related variables such as BI. Even though the total amount of PA during PE cannot be enough to improve the health-related physical fitness variables (Parcel et al., 1987), it has been found that either school or non-school sport teams practice was associated with a better BI (Fuchs, Eschenbeck, Krug, Schlaud, & Kohlmann, 2012).

2.4. Physical Activity and Body Image.-

PA has been proved to be effective as mean to increase self-esteem among women, which may related with an acquisition of self-achievement, self-competence and new skills (Trew, Scully, Kremer, & Ogle, 1999), although scores in these variables are influenced by gender (Brustad, 1993).

UNIVERSIDAD DE MÁLAGA

Although, men report higher scores of self-competence, beauty, physical condition than women, they tend to overestimate physical capacities when compared with women (Eccles & Harold, 1991). So, it can be suggested that gender seems to play an important role in the connection between BI and PA the association between gender and PA was explored in the above-mentioned studies (Slater & Tiggemann, 2011; Currie et al., 2008), and many other studies have documented differences in girl´s BI dissatisfaction to be associated with PA (Monteiro, Amaral, Oliveira, & Borges, 2011). Some of girls set up unrealistic goals to achieve ideal body shape while their body weight is absolutely normal; so it might be one of reasons to drop out exercising in adolescence (Jankauskiene & Kardelis, 2005).

PA plays a paradoxical role as treatment strategy of BD, while some authors refer BD may be the reason for choosing PA and exercise as a strategy for obtaining the optimal image, especially in adolescents girls (Mellor et al., 2004; Smith et al., 1998) conversely BD has been also related with less engagement in PA. Regardless the association between BI dissatisfaction and PA has not yet been properly quantified, as previous research was carried out only among specific gender or age group.

Finally, it is important to notice that less is known in relation with the association between PA, BI and satisfaction, and BC. In instance, after puberty an increment in body fat may cause discomfort during some forms of PA (Cumming, Sherar, Gammon, Standage, & Malina, 2012), which may consequently lead to decreased levels of PA. This later aspect may

UNIVERSIDAD DE MÁLAGA

highlight the importance of BC assessment in order to understand how regional adiposity interferes with BS and PA.

3. Body Composition.-

3.1. Concepts.-

BC is a study area of the biology, which refers to each component of the human body. The assessment of BC may be a cornerstone of the physical fitness assessment because it offers the ability to classify a subject with regard to health, development and performance. Additionally, several chronic adaptations that occur as a result of exercise or PA, diseases or development match with changes in BC more tan with body weight (Sardinha, 2012). Specifically BC assessment constitutes a cornerstone to assess the nutritional status in patients suffering with chronic or acute malnutrition and the clinical construct of obesity diagnosis (VALTUEÑA, S.: ARIJA, V. y SALAS, 1996). So there is not matter of doubt in considering BI disturbances a BC issue.

The study of BC can be split in five levels of progressive complexity: atomic, molecular, cellular, tissue–organ and whole body. Levels are the first criteria of the hierarchical organization of human BC. The second criteria are the components or compartments of BC. These are several simple entities that can be measured in a level of

UNIVERSIDAD DE MÁLAGA

organization. However, not all components can be measured easily or frequently *in vivo*.

The Molecular level is the most commonly assessed and fat mass (FM) and fat free mass (FFM) are the most important components in this level (ZiMian Wang, Wang, & Heymsfield, 1999). FM measurement is difficult and barely performed in clinical or school settings, however anthropometry and whole-body bioelectrical impedance analysis (BIA) measurements have been developed to estimated FM and FFM in field settings (see methods section). In spite of the FM and FFM are the clinical and biological constructs more valid than body weight in the diagnosis of BI-related disturbances, body weight and BMI continue to be the most important physical constructs associated with BI.

All the studies that explored the relationship between BI and body weight found that increased weight was associated with lower BS. Body weight was found to be the strongest predictor of negative BI regardless of gender or ethnicity (Xanthopoulos et al., 2011). The research suggests that overweight people are more prone to low BS compared to people of normal weight. Individuals who are obese are particularly likely to have low BS (Goldfield et al., 2011).

Due to the methodology that can be used when studying the relationship between body weight and BI none of the studies are able to provide evidence that increased body weight causes lower BS, or lower BS causes increased body weight. It is possible that for some individuals an

UNIVERSIDAD DE MÁLAGA

increase in body weight is associated with social pressure to lose weight, which leads to a reduction in BS (Cafri et al., 2005). For other individuals low BS may lead to ineffective or unhealthy dieting behaviors that result in weight gain (Goldfield et al., 2011).

As a result, boys may become involved in efforts to improve their muscularity. Adolescents are influenced by social and cultural trends and are under the pressure to materialize the ideal body of the culture to which they belong (MJ, 2005).

4. Body Image, Physical Activity and Body Composition during Adolescence: A systematic review.-

4.1. A study Review.-

Adolescence is a stage of physical and psychological changes and above all of group acceptance. Social roles are defined and they come into conflict with the current society, especially if they are not able to achieve the effects of the cultural idealism. It is the goal of the school and the physical education (PE) professionals to teach about healthy lifestyles and to make our students aware about the real importance of having a BI satisfaction and acceptance. Therefore, the importance of PE and sport practice must be included in BI and satisfaction research.

UNIVERSIDAD DE MÁLAGA

Adolescence period is not only cognitive, but also is related entirely to the subjective valuations of the students and it determines their social status. For adolescents, it is very important how their classmates see them and some would do anything to be part of a group and not be excluded, a situation that can cause them stress, frustration and sadness (Singh et al., 2015).

BI is a term defined in literature as "the picture of our body which we form in our mind, that is to say the way in which the body appears to ourselves" (P. Schilder, 1936). It is considered as a crucial element to explain important aspects of the personality such as self-esteem or self-concept and especially to create tools to help in diagnosing prematurely possible psychopathologies (Baile Ayensa, 2003).

BS is the acceptance of each individual of their body, it is a cognitive element, as well as multifactorial, both BS and BD are shown in the reviewed literature a dependence on different variables such as age, gender and the type of the PA practiced (Jaffee, Lutter, Rex, Hawkes, & Bucaccio, 1999; McAuley & Blissmer, 2000). Previous studies revealed low levels of BS in teenagers (Wilkosz, Chen, Kenndey, & Rankin, 2011), however most of the studies that have analyzed the relationship between BI and PA did it on university students and/or young adults (Weaver & Byers, 2006; Williams & Cash, 2001; LePage & Crowther, 2010; Shriver et al., 2013). As cited by (Reel et al., 2007) in their meta-analysis, it is important and urgent to know which is the real situation of adolescents, since it is necessary to establish a common goal during this stage to avoid ED that might appear during puberty.

UNIVERSIDAD DE MÁLAGA

PA, as well as sport practice inside and outside the school context, can help reduce psychic anxiety, improve personal satisfaction and accept a positive BI (Netz, Wu, Becker, & Tenenbaum, 2005; L. a Tucker & Maxwell, 1992; McAuley, Bane, Rudolph, & Lox, 1995).

Regular PA leads to both physical and mental health benefits, which can make an important contribution to improve the physical and psychological quality of life (Kopcakova, Veselska, Geckova, van Dijk, & Reijneveld, 2014). So, evidence from the literature has proved an association between PA and BI (Snyder W, Cook M, Nasset E, Karhausen L, Howells G, 1975; Marsh & Peart, 1988; MEYER, 1987; COLLADO FERNÁNDEZ, 2005; Marín Regalado, 2007). Additionally, either sport practice or PA was positively related to other variables affecting BI and physical self-concept (Sonströem, R.J., Speliotis, E.D. y Fava, 1992) and general self-concept (Felker, D.W., y Kay, 1971; Deo, P., y Bhullar, 1974).

Therefore the main goal of this review was to analyze the state of art of the literature analyzing the relationship between BI, BS/BD and PA/ sport practice (inside and outside the school context) during the stage of adolescence. Secondly, we explored studies analyzing the plausible relationship between improvement on BI and/or BS and enhancement BC (adiposity markers) mediated by PA.

UNIVERSIDAD DE MÁLAGA

METHODS

This review was conducted as a systematized review focused in mapping out and categorizing studies covered the relationship between BI or BS and PA/sport topic. We followed an organized search based on inclusion criteria and an Internet-based bibliographic search.

Inclusion Criteria

The criteria for including studies in this review were based on those suggested by Cochrane Collaboration (Higgins JPT & Green, 2008) so types of studies, participants, interventions and outcome measurements were defined as follow.

Types of studies

Cross-sectional and follow-up studies, surveys, randomized trials (control and not control) where BI and/or BS were a main outcome.

Types of participants

This analysis was limited to studies with adolescents (aged between 12 and 18 years) either in the school, sport or clinical context. Participants included in the studies were from all countries ethnicities around the world. Those studies where the participants were under surgery treatment, blind adolescents or mental impairment were excluded.

UNIVERSIDAD DE MÁLAGA

Types of Design

All kinds of design were included in the review, however only those, where a measurement of PA was described, were selected as valid. Specifically, in cross-sectional and follow-up studies were needed to report validated questionnaires and monitors/sensors used to quantify PA. Additionally, *ad hoc* recalls where two or more categories of PA/sport participation were reported was accepted in large-cohorts of epidemiological studies. Finally, randomized control trials (RCTs), randomized trials (RTs) or clinical trials (CTs, for example, interventions with adolescences in hospitals without any control group) were included when a PA or exercise intervention was included in the treatment at least in one group.

Types of outcomes

Primary outcomes

Many of the papers in this review use a BI 'score'. This score can reflect body perception or BS. When BI was not accurately measured or estimated that studies were removed from this review since including them will have an adverse impact on the accuracy of the findings. There are a number of different techniques for measuring this BI score, including:

1. **Self-report questionnaire**. These scales include the Body Shape Questionnaire, Body Esteem Scale and the Body Shape

UNIVERSIDAD DE MÁLAGA

Satisfaction Scale, Physical Self-perception Profile among others.

2. Figure drawings. Typically when using this method a participant is presented with a series of drawings of body shape and asked to identify their 'ideal' body shape or the body shape that they feel best reflects their actual body shape. Figure Rate Scale, Gardner Silluete, Collins' Child Figure Drawings, Contour Drawing Rating Scale, among others.

Secondary Outcomes,

- Anthropometric variables: Body mass index (BMI, weight/height^2), circumferences and skinfolds.
- Body composition components: FM, FFM and FM percent (%FM) assessed by anthropometry, BIA or other techniques based in a molecular-approach.

Search Methods

An Internet-based search was carried out using the following sources: PubMed, Educational Resource Information Center (ERIC), Web of Knowledge and Dialnet. A combined set of two blocks of keywords was used. The first block included: BI, body perceptions and BD/BS. The second block: PA, sport and exercise. All studies in the final selection included at least one word from each block in the title or abstract. Additionally, studies included participants younger than 12 years and older than 18

UNIVERSIDAD DE MÁLAGA

years were discarded. Additionally, publications included in meta-analysis and reviews, which were not found in the previous search, were reviewed for eligibility.

Finally, the list of references met inclusion criteria, undertook a qualitative analysis for further evaluation since the abstract information could not be enough to describe the study characteristics as valid. So, so full articles were red in order to know if they offer enough information to be included in the final analysis. Briefly, many of those articles have not been included in the final list due to not having enough statistic information, not report physical activity data and duplicate of the same study. Finally, the results from all papers met the inclusion criteria were organized in three categories: cross-sectional analysis, follow-up studies and trials (RTs, RCTs and CTs). Also, classifying each of the previous categories was performed an evidence-based analysis, so a summary of studies found a statistically significant positive or negative effect of PA on BI perception or BS were categorized.

In the first stage of the search 2313 articles were found, and after applying the inclusion criteria a total of 35 cross-sectional analysis, 14 follow-up and 2 trials were selected (Figure 1).

UNIVERSIDAD DE MÁLAGA

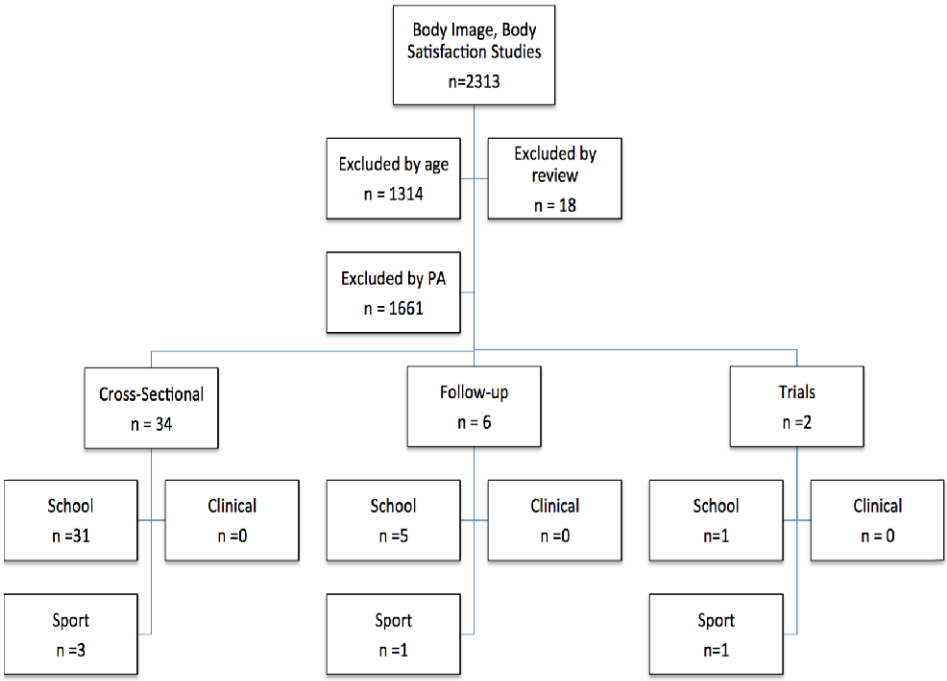

Figure 1. Flowchart of selected studies by inclusion criteria.

BI was the main variable in n=39, BD/BS: n=9. A total number of 47.846 participants have taken part in all the reviewed studies. Also, the majority of the investigations were conducted in females, 91,5% in cross-sectional; 6,4 % in follow-ups and 2,1% in trials.

Regarding the methods used to assessed BI the most common tool was BSQ (n= 2 studies) and other questionnaires (n=31 studies), and FRS was used n=3. PA, energy expenditure and dimensions related with PA or sport participation were mainly estimated using PAQ-C/A (n=4 studies) others research used movement sensors or quantifications of exercise training (n=2 trials).

UNIVERSIDAD DE MÁLAGA

Twenty two investigations including participants with a normal weight, overweight or obese participants, although BC data were reported in 21 studies, moreover the analysis of the relationship between BS/BD and PA/sport practice was carried in all studies to be a obligatory criteria. Most part of the studies was conducted in Spain (n=8), in the United States (n=7), the United Kingdom (n=4), Canada (n=4) and others.

The main goal of our review was to determine if there was a relationship between PA or sport practice and BI variables, and we could find 35 cross sectional studies, which described a positive association with BI (n=29) and BS (n=9), but another 6 did not discover any significant association and negative (n=3) BI and BD respectively,

UNIVERSIDAD DE MÁLAGA

UNIVERSIDAD
DE MÁLAGA

Table 1. Summarize of cross-sectional studies analyzing the relationship between physical activity (PA) and body image (BI) variables in adolescents.

									Methods		
Authors	Aims	Year	Study	Codec	Country	Sample	Age	Bmi	PA	BI	BC
Shaw, S.M, et al.	PA	1989	C-S	SCHOOL	CANADA	627F	13-17	NON-USE	AD-HOC	POSTERS	NON-USE
Guinn, B, et al.	BI, PA, BC	1997	C-S	SCHOOL	USA-MEX	254F	10--15	22.9	SJBCS	AST	ANT/BMI
Bruusgaard, P, et al.	BI, PA	2000	C-S	SCHOOL	NORWAY	569	10--15	NON-USE	AD-HOC	AD-HOC	NON-USE
Crocker, P.R, et al.	BI,PA	2000	C-S	SCHOOL	CANADA	246F, 220M	10--14	NON-USE	PAQ-C	PSPP	NON-USE
Furnham. A, et al.	BI, PA	2001	C-S	SCHOOL	U.K	111M, 124F	12--16	NON-USE	QUEST	SES/CDRS	NON-USE
Jáuregui-Lobera. I, et al.	BI, PA,BC	2002	C-S	SCHOOL	SPAIN	313F, 342M	12--17	BMI CAT.	IPAQ	SES /BAS	BMI
Kirkcaldy. B, et al.	BI,PA	2002	C-S	SCHOOL	GERMANY	447M,551F	14--18	NON-USE	AD HOC	GSCL	NON-USE
Duncan, M.J, et al.	BI, PA	2004	C-S	SCHOOL	U.K	111F, 166M	11--14	NON-USE	FB1. PARQ	BESC	NON-USE
Pon, L.W, et al.	BI,PA,BC	2004	C-S	SCHOOL	MALASIA	291	13-15	20.61	AD HOC	FRS	BMI
Sherblom.P.R, et al.	BI,PA,BC	2004	C-S	SCHOOL	USA	135F	11--13	NON-USE	NON-USE	BISQ/FRC	BMI
Jankauskiene. R, et al.	BI,PA,BC	2005	C-S	SCHOOL	LITUANIA	405	17	20.8/19.1/20.6	AD HOC	24 ITEMS	BMI
Markland, D, et al.	BI,PA,BC	2007	C-S	SCHOOL	U.K	50M, 48F	16	20.54M. 21.36F	TEQ	FRS	BMI
Martinez-Gomez D, et al.	BI,PA,BC	2007	C-S	SCHOOL	SPAIN	52F,58M	12--17	21,32	PAQ-A	BSQ-S	BMI
Niven, Alisa G, et al.	BI,PA	2007	C-S	SCHOOL	U.K	208F	11--12	NON-USE	PAQ-C/CPSPP	CPSPP	NON-USE
Kamtsios, S, et al.	BI,PA,BC	2008	C-S	SCHOOL	GRECCE	413F, 362M	11--12	BMI CAT.	LTEQ	PSPP	BMI
Hernández-Alcántara, A, et al.	BI,PA,BC	2009	C-S	SPORTS	MEXICO	307F	9--16	NO-ID	NON-USE	AD HOC	BMI
Brudzynski, L, et al.	BI, PA	2010	C-S	SCHOOL	USA	686F,355M	17--55	NON-USE	AD HOC	BIEPS	NON-USE
González-Montero, M, et al.	BI,PA,BC	2010	C-S	SCHOOL	SPAIN	236F, 274M	13--19	20.85M,21.19F	AD HOC	BS	ANT
Urrutia, S, et al.	BI,PA	2010	C-S	SCHOOL	SPAIN	468F, 442M	13--17	NON-USE	AD HOC	GADNER	NON-USE

BI, Body Image; PA, Physical Activity; BC, Body Compositions; C-S, Cross-sectional; SC, School; SP, Sports; U.K, United Kingdom; Mex, Mexico; F, Female; M, Male; BMI CAT, Body Mass Index categories; NON-ID, Non identify; SJCS, Second-Jorard Boy Cathexis Scale; PAQ-C, Physical Activity Questionnaire for Children; RFE, Reason for Exercise; QUEST, Questionnaire; IPAQ, International Physical Activity Questionnaire; PARQ, Physical Activity Readliness Questionnaire; PAQ-A, Physical Activity Questionnaire for Adolescents; CPSPP, Children Physical SelfPhysical Profile; LTEQ, Leisure time exercise Questionnaire; AST, a Selftest; PSPP, Physical Self-perception profile; SES, Self-Esteeem Scale; CDRS, Contour Drawings Rating Scale; BAS, Body Apreciations Scale; GSCL, Gissen Subjective Complaints List; BESC, Body Esteem Scale for Children; FRS, Figure Rating Scale; BISQ, Body Investment Scale Questionnaire; Body Shape Questionnaire; PSPP, Children's Physical Self-Perception Profile; ANT, Anthropometry. BMI, Body Mass Index.

Table 2. Cont. Summarize of cross-sectional studies analyzing the relationship between physical activity (PA) and body image (BI) variables in adolescents.

									Methods		
Authors	Aims	Year	Study	Codec	Country	Sample	Age	Bmi	PA	BI	BC
Farah Wahida, Z, et al.	BI, PA	2011	C-S	SCHOOL	MALAYSIAN	195F, 163M	11--14	19.1M/19.8F	PAQ-C	BIAS	BMI
Finne, Emily, et al.	PA,BC	2011	C-S	SCHOOL	GERMANY	3238F, 3392M	11--17	NON-USE	GHI	LTEQ	%BF
Goldfield, Gary S, et al.	BI,PA, BC	2011	C-S	SCHOOL	CANADA	746F, 512M	12--18	21.8M, 21.5F	GL-TEQ	BESAA	BMI
Morano, M, et al.	BI,PA,BC	2011	C-S	SPORTS	SPAIN	162M	12.1	18,9-19.2	PPAS	COLLINS	BMI
Slater M, et al.	BI,PA,BC	2011	C-S	SPORTS	USA	332F,282M	12--16	19.96f, 20.33	AD HOC	BSS	BMI
Bibiloni, M, et al.	PA, BC	2012	C-S	SCHOOL	SPAIN	1022F, 939M	12--17	BMI CAT.	IPAQ-A	FRS	ANT
Kołoło, Hanna, et al.	BI,PA	2012	C-S	SCHOOL	POLAND	1191F, 1086M	15	NON-USE	MVPA	BISUB	NON-USE
Altıntaş A, et al	BI,PA,BC	2013	C-S	SCHOOL	TURKEY	486F, 526M	11--18	21.4M, 21.35F	WAC	BISC/PSPP-C/RSEI	BMI
Dina Labbrozzi, et al.	BI,PA,BC	2013	C-S	SCHOOL	ITALY	134F	11--13	21.6	PAES	PSDQ	ANT/BMI/T
Gómez-Mármol, A, et al.	BI,PA	2013	C-S	SCHOOL	SPAIN	76F, 77M	12--16	NON-USE	PCERT	BS	NON-USE
Malete, L, et al.	BI,PA,BC	2013	C-S	SCHOOL	BOTSWANA	464F, 292M	14--16	BMI CAT.	IPAQ	BIQ	BMI
Zach, S, et al.	PA,BC	2013	C-S	SCHOOL	ISRAEL	3392F,3238M	7--12	BMI CAT.	AD HOC	AD HOC	BMI
Kopcakova, J, et al.	BI,PA	2014	C-S	SCHOOL	SLOVAKIA	4132F, 3910M	10--19	19.75M, 18.96F	HBSQ	HBSQ	NON-USE
Kantanista, A, et al.	BI,PA,BC	2015	C-S	SCHOOL	POLAND	1702F,1547M	15--17	20.58F, 20.63.M	PASM	BIS	BMI
Ruiz-Ariza. A, et al.	BI,PA,BC	2015	C-S	SCHOOL	SPAIN	582F,439M	14--18	22,03M, 21,64F	AD HOC	BSQ/49	BMI

BI, Body Image; PA, Physical Activity; BC, Body Compositions; C-S, Cross-sectional; F, Female; M, Male; BMI CAT, Body Mass Index categories; PAQ-C, Physical Activity Questionnaire for Children; KIGGS, German Health Interview and Examination Survey; GL-TEQ; Godin Leisure-Time Exercise Questionnaire; PPAS, Perceived Physical Ability Scale; IPAQ-A, International; Physical Activity Questionnaire; MVPA, Moderate to Vigorous Physical Activity Scale; WAC, Eekly Activity Checklist; PAES, Physical Activity Enjoyment Scale; PCERT; Physical Children´s effort Rating Scale; HBSQ, Health Behaviour in School aged Children; PASM, Physical Activity Screening Measure; CDRS, Contour Drawings Rating Scale; LTEQ, Leisure time exercise Questionnaire; BESAA,; FRS, Figure Rating Scale; BSS, Body Shame Scale; BISUB,; BISC, Body Image Satisfaction Scale; PSPP, Children's Physical Self-Perception Profile; RSEI,; PSDQ,Physical Self- Perception Questionnaire; BS, Body Scale; BIQ, Body Ideals Quest; BIS, Body Investment Scale; BSQ, Body Shape Questionnaire; BMI, Body Mass Index; ANT, Anthropometry; T, Tanner Scale.

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Table 3. Summarize of follow-up studies analyzing the relationship between physical activity (PA) and body image (BI variables in adolescents.

								Methods		
Authords	Aims	Year	Codec	Country	Sample	Age	Bmi	PA	BI	BC
Parks PS, et al.	BI,PA	1997	SPORTS	USA	44(S)30 (CR)	14--18	NON-USE	REI	BZD/BES	NON-USE
Raustorp, A, et al.	BI,PA,BC	2009	SCHOOL	SWEDEN	41F, 36M	12.7--17.7	BMI CAT.	AD HOC	PPSE	ANT/BMI
Frisen, Ann, et al.	BI,PA	2010	SCHOOL	SWEDEN	15F, 15 M	10--13	NON-USE	AD HOC	BESAA	NON-USE
Mikulan, R, et al.	BI,PA,BC	2012	SCHOOL	HUNGARY	347	12--17	21.9S, 22.2A	QUEST	QUEST	BMI
Dyremyhr, AE, et al.	PA,BI,BC	2014	SCHOOL	NORWAY	1291F, 1219M	15--22	22M,23F	AD HOC PAQ	AD HOC	BMI
Kaminsky, Laura a, et al.	BI,PA,BC	2014	SCHOOL	CANADA	10F, 5M	12--16	NON-ID	LTEQ	BEE/BSE	BMI

BI, Body Image; PA, Physical Activity; BC, Body Compositions; SC, School; SP, Sports; S, soccer; CR, Cross-running; F, Female; M, Male; BMI CAT, Body Mass Index categories; NON-ID, Non identify; REI, Reason for exercise inventory; QUEST, Questionnaire; PAQ, Physical Activity Questionnaire; LTEQ, Leisure time exercise Questionnaire; BZD, Body Size Drawings; BES, Binge Eating Scale; PPSE, ; BESAA, Body Esteem Scale for Adolescents and Adults; BSE, Body Silhouette Chart; ANT; Anthropometry.

Six follow-up studies informed us about the longitudinal change across adolescence. All studies reported changes in PA was associated with modifications in BI (n= 5 positive and n =1 Non effect).

There is a lack of trials where the effect of PA or exercise training on BI variables (BS/BD) was evaluated in adolescents. Only two studies in school and another in sport context have been conducted in United State.

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Table 4. Summarize of Trials studies analyzing the relationship between PA and BI variables in adolescents.

										Methods		
Authors	Aims	Year	Study	Codec	Country	Sample	Gender	Age	Bmi	PA	BI	BC
Gillison, F.B, et al.	BI, PA	2010	TRIALS	SCHOOL	USA	153F,157F	MIXED	13--15	19.94.21.53	LTEQ	BCI	BMI
Jeannie S. Huang, M, et al.	BI, PA	2007	TRIALS	SCHOOL	USA	349F,308M	MIXED	12--14	NON-ID	SRQ	AD HOC	BMI

SC, School; F, Female; M, Male; NON-ID, Non- identify; LTEQ, Leisure Time Exercise Questionnaire; BCI, Body Change Inventory ;EDI, Eating Disorder inventory; RSE,Rosenberg Self-Esteem; BMI, Body Mass Index.

In the table 5 is summarized overall studies organized by their positive, negative or neutral effect on BI variables. The most part of the studies analyzed proved a positive effect of PA on BI, however almost all are cross-sectional surveys as described previously.

Table 5. Table summary of studies reporting positive, neutral or negative relationship between practice PA/sport practice and BI,

Sport & Physical Activity = Body Image Positive		Sport & Physical Activity = Body Image Neutral or Negative	
Autors	**Year**	**Autors**	**Year**
Alley TR.	1991	Shaw.	1991
Rodin & Larson.	1992	McDonald & Thompson.	1992
Tucker & Mortell.	1993	Williamson, et al	1995
Jarfee & lutter.	1995	Petrie.	1996
Croasen & Raymore.	1997	Powers & Johnson.	1996
Parks & Read.	1997	Hubbard et al.	1998
Sonstroem.	1997	Tiggeman & Williamson.	2000
Parks P, et al.	1997	Camacho MJ.	2001
Waaler.	1998	Hausenblas & Symons.	2001
Ebbeck & Gibbons.	1998	Dunca M.J, et al.	2004
Rodriguez et al.	1999		
Smolak et al.	2000		
Phelps, et al.	2000		
Williams & Cash	2001		
Martinez et al.	2001		
Abellan A.	2003		
Katzmarzyk P, et al.	2003		
Camacho MJ.	2005		
Tornero et al.	2008		
Campbell & Hausenblas.	2009		
Urrutia S, et al.	2010		
Slater M, et al.	2011		
Finne C. et al.	2011		
Kantanista A. Et al.	2015		

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4.2 Discussion.-

This review was concerned with the relationship between PA/ exercise training and BI perception and BS during adolescence. The main finding of our searching was that the most part of the studies, were from cross-sectional studies. Also, it appeared to be PA and exercise training had a positive effect on BI perception. This result is in accordance with previous evidence reported in young adults, therefore three meta-analyses have been published with a wide range of effect size (Campbell & Hausenblas, 2009; Reel et al., 2007; H. a. Hausenblas & Fallon, 2006). (H. a. Hausenblas & Fallon, 2006) found small sized effects based on 121 studies; on the other hand (Reel et al., 2007) described a moderate effect based on 35 studies. Finally, (Campbell & Hausenblas, 2009) revealed that some exercises resulted in an improved BI perception, they included 57 publications in this meta-analysis. We can consider this relationship as strong evidence in young adults since all three meta-analyses where the exercise effect, as consequence a causality relationship can be strongly suggested. Nevertheless, we cannot conclude the same in adolescents since only 2 publications were conducted in trials.

Researches analyzing the effect of age are scarce, we found large effects on older collectives compared to younger collectives; these facts agree with the review made by (Vaquero-Cristóbal, Alacid, Muyor, & López-Miñarro, 2013), in which they note that researches that have compared children and adolescents with adults show that the issue increases over

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the years, since the perception of one's own BI becomes more distorted, however relevant studies come to the conclusion that in the adolescence a 80% of the girls are unhappy about their bodies over a 55% of young female university students. This is especially significant among women, since they are more vulnerable to be influenced by socially established body shapes. (Strasburger, Jordan, & Donnerstein, 2010).

Body Satisfaction. BI dissatisfaction may be the reason for choosing PA and exercise as a strategy for obtaining the optimal image, especially in adolescents boys and girls (Mellor et al., 2004; Smith et al., 1998) and inversely, BI dissatisfaction as also related with less engagement in PA. Regardless the association between BI dissatisfaction and PA has not yet been properly quantified, as previous research was carried out only among specific gender or age subgroup.

Body Composition. Few studies have used real measurements of BC as a way to control their analysis, despite the fact that it has been proven that the use of real measurements provides more accuracy to the analysis of results. (Fingeret, Gleaves, & Pearson, 2004) (Williamson, Gleaves, Watkins, & Schlundt, 1993).

This review does not include those sports practiced by adolescents nor their intensity level, as there are works that separate team sports as a clear positive complement on the student's BS (Jaffee et al., 1999). On the contrary, (Shaw & Kemeny, 1989) found that the participation in individual aerobic activities, for example physical fitness or aerobics, is associated with a negative BI.

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Gender: Most of the review studies take the female gender as a reference for the analysis of the BI. In our selection of review studies we considered as criterion that each study included males, females or mixed. Since we can obtain important data about the reality of the perception of the BI of each gender, and so be able to analyze the relation between them. It has been written about the previous knowledge that the female gender shows a larger distortion about their BI, hence higher levels of BD (Sallis, Prochaska, & Taylor, 2000; Arroyo et al., 2008; Rivarola, 2003; Davis, 1991).

Boys present better levels of perception of their BI and they are displayed as more active toward the practice of sports (Davis, 1991; Lantz, Hardy, & Ainsworth, 1997) and this can be a primary reason as to why their BI is positive and it does not show high anxiety levels for their body, which reduces other possible consequences of an alteration of their BI. (ED, depression, school dropout rate, etc).

Physical activity: It is a potential element of our review, knowing the current state of sport practice of adolescent students outside school hours, if they are active or passive regarding their spare time and if said activity/practice can be considered fairly active or very/highly active. The suggested reviews regarding the analysis of BI and PA find two opposite tendencies. In the one group we find the positive inclination of PA and/or sport practice on the personal self-concept. PA causes a drop in the body fat percentage and a more balanced BMI, which provokes a more appropriate adjustment on the current aesthetic canon. (El Ghoch, Soave,

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Calugi, & Dalle Grave, 2013; Bartlewaki et al., 1996).

In the other line we saw those studies that focus on the negative effect on the perception of the BI. Some factors associated with that effect are the need to practice some PA in order to lose weight and to fit into a culturally established aesthetic model, so consequently there is a premise of an unwanted BI, not accepted and unhealthy. In practices such as high performance sports and competitive sports there is an increase of the social pressure over the adolescents as it is associated to a result and connected to a few body requirements for specific sports, with the goal of achieving better results individually as well as in group (H.A. Hausenblas & Fallon, 2002; Camacho MJ, Fernández E, 2006).

Regarding the type of sport or PA some studies have found that both aerobic and anaerobic exercises are effective to reduce the worries about BI (H. A. Hausenblas & Fallon, 2002; Caruso & Gill, 1992). There is in fact a big consensus by which the participation in team sports is associated with a healthy BI in opposition of the participation in individual sports. (Parks & Read, 1997; Rodríguez et al., 1999).

This review section has explored the state of art of the connection between BI perception and physical appearance/BS, BC and PA. As conclusion, we can summarize that the current excessive concern about BI as a consequence of diverse factors (for example, social pressure and media) is causing a large amount of alterations over the perception, which

UNIVERSIDAD DE MÁLAGA

consequently, in many cases, leads to the use of diets and alterations like eating disorders, as a way of trying to adjust the BI as much as possible to those ideals established by society. There are also other factors that have an influence over the BI and its perception, such as the practice of PA, although the results of the connection of both factors can be contradictory. Due to the big increase these alterations are undergoing in the present society, it is necessary to give an in-depth examination to this topic, and create tools to detect disturbances and go into detail and develop a program for the prevention and intervention for teenagers and young women, as these groups are the most affected by those factors, although alterations of the BI affect people of all ages.

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CHAPTER II. VARIABLES, AIMS AND HIPOTHESIS.

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5. VARIABLES, AIMS AND HYPOTHESIS.-

5.1. Aims.-

Considering the lack of Spanish and international studies related with PA, BC and BI in school contexts. It was our purpose to:

- Evaluate the BI perception and BD in Spanish male and female adolescents in a school context.
- Describe the prevalence and grade of BI distortion and dissatisfaction among Spanish male and female adolescents.
- Describe the prevalence of BI distortion and dissatisfaction across three grades of weight status (thinness, normal weight and overweight and obese).
- Explore the associations between total daily PA, BI and BD.
- Compare differences on BI and BD between adolescents who were involved OSSP and NOSSP.
- Estimate determinants or predictors of BD (PA, BC, age and gender).
- Evaluate if there will be significant changes in BI and BD after the first year in the compulsory secondary education.

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5.2. Hypothesis.-

Based on the previous literature in adults and adolescents, we hypothesized that:

- PA will be positively negatively associated with BD and those adolescents more active will have lower distortion of their BI perception.
- Adolescents who engage in regular OSSP activities will have a more favorable self-image and lower BD than their counterparts with NOSSP.
- Gender will not play an independent role in BD when adjusted for PA and BC composition variables (FM and FFM).
- PA and BC variables will predict BD and BI distortion.

5.3. Variables.-

Several variables physiological, psychological and sociocultural variables may describe, explain, determine and influence BI, however the analyze of all them is out of the scope of this thesis. So, the analysis presented in this manuscript will be only focused in the next group of variables:

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A. Dependent variables: **BI perception** (assessed by estimated BMI from figure drawings, ordinal factor), **body dissatisfaction** (assessed by BSQ, continuous scale variable), **BI distortion** (assessed by the difference between actual BMI and perceived BMI from figure drawings, continuous scale variable).

B. Independent variables:

- Physical activity: Total daily PA (estimated from PAQ-A, continuous scale variable) and OSSP (estimated from an *ad hoc* questionnaire, dichotomy factor (yes or no)).

- Body Composition: BMI (calculated from height and weight, continuous scale variable), FFM (estimated from BIA method, continuous scale variable), FM (estimated from FFM by two-component model, continuous scale variable) and weight status (thinness, normal weight and overweight/obese, estimated from international gender and aged-specific BMI cutoff values, ordinal factor)

- Gender (dichotomy factor (male/female)).

C. Control variables: Age (continuous variable), school (dichotomy factor (2 schools)).

Finally, it is important to refer that more sophisticated methods

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are available nowadays to measure most part of these variables, however we decided to select indirect measurements since they can be easily used in school context without ethical issues or especial requirements other than the guaranty of anonymity. Additionally, it will offer the opportunity of a friendly reproduction of this study in other school.

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CHAPTER III. STUDY DESIGN

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6. DESIGN.-

This study was split in phases. Firstly, it was a cross sectional study with correlational and categorical analysis, where the participants were selected progressively during a 4-year period until complete the final sample size. Afterwards, a 1-year follow-up was carried out in a smaller sample in order to analyze the change of the dependent variables during one academic year.

7. SAMPLE AND RECRUITMENT.-

Participants were students of compulsory secondary education (ESO in Spanish) attending to two schools in the same city in the South of Spanish (Ronda, Málaga). A probabilistic method was used to select the sample, the next criteria were used: easy access to the sample, select a representative sample of ESO schools in our city (2 of 5), select a significant percent of the population of both schools school (66%).

The recruitment process was carried out by one of the PE teacher in the school. Briefly, an informative document and proposal of the study was present to the administrative committee of the school. After obtaining the administrative waiver, full information of procedures and assessments were shown or sent to students and their parents or guardians respectively. Then, an informative meeting, where all doubts and questions were answered, a written informed consent was handed in. Both

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male and female adolescents between 12 and 18 years old were accepted to participated in the study always they me the next inclusion criteria:

- Hand signed written informed consent in.
- Not suffer any acute or chronic disease by the time of the study.
- Not be under medications that could interfere with BC and perceptive capacity.
- Students with partial or complete amputation where permitted to participate but their were not included in the final analysis.
- Agree to complete all assessments.

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An schematic representation of the recruitment process and the final sample size is shown in the figure 2.

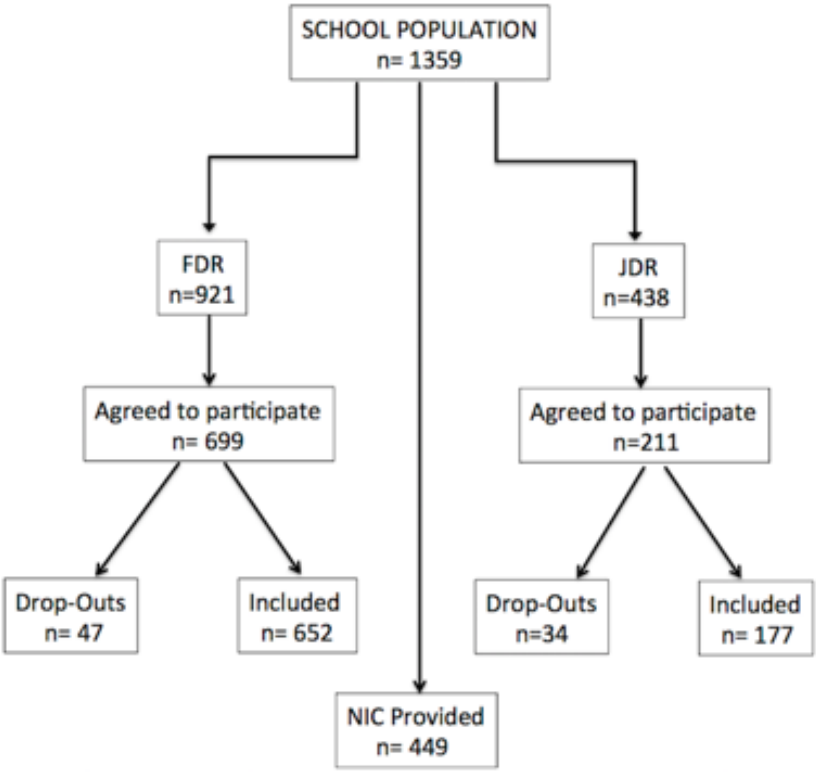

Figure 2. Flowchart representing, final sample size, drop-outs and adherence to the study. FDR, Fernando de los Ríos School; JDR, Juan de la Rosa School. NIC, non informed consent

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A gender and age distribution of the final sample size can be observed in table 6 and figure 3 respectively.

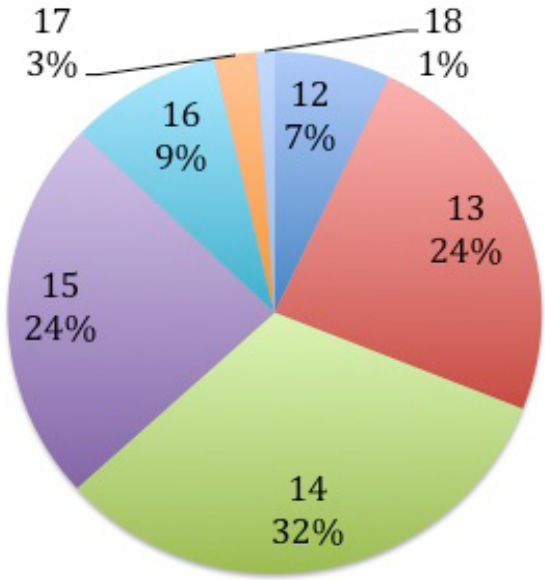

Figure 3. Age distribution in the final sample size.

Table. 6. Gender distribution in the final sample size.

Sex	n=	%
Male	405	49
Female	424	51

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Sample size proportions by gender, ages and academic level and OSSP by school are shown in table 7.

Table 7. Sample size by socio-demographic characteristics, academic level and out-of school sport practice and school.

Variables	FDR n= 659		JDR n= 168		TOTAL
Socio-demographic variables					
Gender					
Male	310		98		408
Female	342		78		420
Age (years)	**Male**	**Female**	**Male**	**Female**	
12	24	29	1	5	59
13	67	67	34	30	198
14	92	110	40	22	264
15	88	98	8	3	197
16	38	39	0	11	88
17	2	3	6	1	12
18	2	0	4	3	9
Course	**Male**	**Female**	**Male**	**Female**	
1º ESO	33	41	15	19	108
2º ESO	41	31	20	13	105
3º ESO	87	107	42	25	261
4º ESO	149	163	22	21	355
Physical Activity variables					
OSSP	351		101		452
NOSSP	308		68		376

FDR, Fernando de los Ríos School; JDR, Juan de la Rosa School; OSSP, Out School Sport Practice; NOSSP, Non Out School Practice.

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CHAPTER IV.

METHODS AND PROTOCOLS

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8. METHODS.-

Once we obtained students and parents signed written informed consent a schedule of assessments were send to the administrative team of the school. All assessments of BC, PA and body self-perception, were performed at the begging of academic year. A free teaching day was provided to carry out the assessments, and when some of them could not be performed that day, it was permitted to complete it along the same week.

An assessment day was as follow, students arrived to the sports complex facility 8:30 a.m. and a general overview about the organization was explained by the leader of research team, in summary the evaluations follow the next order: BC, PA and BI (table 8) Students were in fasting conditions and they were permitted to eat after BC assessment was performed. Each student filled all questionnaires personally and trained researcher was always on-site to provide help and confirm all items were properly answered.

This study was part of a larger study (GEOS study stated in 2010, funded by the Spanish government of Economy and Competitiveness, code: DEP2011-30565), which was approved by an institutional board of the Departments of Didactics of Music, Plastic and Corporal Expression, and Sports and Physical Education. Also, all procedures were in agreement with "The Helsinki Declaration of Ethical Principles for Medical Research

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Involving Human Subjects" (World Medical Association 2013) and "Standards and Operational Guidance for Ethics Review of Health-Related Research with Human Participants." (WHO, 2010).

Table 8. Summary of the assessments following the order of execution.

Variables	Tools		Reference
Body Composition	*Height: Stadiometer.*		*ISAK* (Marfell-Jones, M., et al. *2006)*
	Weight, %FM and FFM: BIA. TANITA BC 360 Model.		*Balance equation: % FM and FFM*
Total Daily Physical Activity	*Physical Activity Questionnaire (PAQ-A) Score*		*(Kowalski KC, Croquer P, Donen RM; 2004). Validation for Spanish adolescents (Martinez-Gomez et al. 2009)*
Body Image	*BI/ Perception*	*Figure Rating Scale*	*(Stunkard et al. 1990)*
	*BI/ Subjective**	*Body Shape Questionnaire*	*(Cooper et al 1998), Validation for Spanish people (Raich, et al;1996).*

BMI, body mass index; BIA, Bioelectrical impedance analysis; ISAK, the International Society for the Advancement of Kinanthropometry *, it was used to assess body dissatisfaction.

UNIVERSIDAD DE MÁLAGA

9. TOOLS AND PROTOCOLS.-

9.1. Body Composition.-

BC was assessed using anthropometric method. All procedures followed the next protocol: All students were in fasting conditions, although water was permitted until one-hour before doing the BIA measurements (except for body weight). Participants refrained from taking tea, coffee, chocolate or any other kind of stimulants; also they did not perform any intense exercises or efforts during the previous 24 hours before the tests.

Anthropometry. The height and weight were measured to the nearest 0.1 cm 0.1 kg respectively with a stadiometer (Tanita® Leicester) and scale (Tanita®, model UM-060). An inextensible tape (Rosscraft, Canada) was used to obtain waist (WC) with a precision of 0.1 cm. All measurements were carried out according to the standardized procedures described in the literature (Lohman, T. G., Roche A. F., Martorell, 1988) and in accordance with guidelines of The International Society for the Advancement of Kinanthropometry (Stewart A, Marfell-Jones, Olds, & Al., 2011). Based on the previous measurements BC components were calculated as follow. BMI was calculated using the formula (weight *(kg)* / squared height *(m^2)*).

Bioimpedance Analysis. Individual components of BC (%FM, FM and FFM) were obtained based on a classical two-component model (Carnero & Sardinha, 2015), (equation 1). Weight was obtained from anthropometric measurement and FFM was estimated from BIA measurement. The BIA

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method rely on a simple physical principle such as the voltage of low frequency current entering into the human body suffers a drop in voltage (impedance), which will be inversely proportionally to the quantity of water inside the body and so valid estimations of the total body water can be obtained from whole body impedance measurements. Since the hydration constant of the FFM is stable in steady state conditions, it is possible to estimate FFM (kg) from the total body water measurements using specific-age models or equations, which have been previously validated for all age groups and specifically for adolescents (Haroun et al., 2009; Haroun et al., 2010; Quiterio et al., 2009; Suprasongsin, Kalhan, & Arslanian, 1995). More of the rational and mathematical assumptions of the technique have been previously published elsewhere (Kyle et al., 2004), although we do not include here because they are far of the scope of the theme of this manuscript.

The use of BIA as a bedside method has increased because the equipment is portable and safe, the procedure is simple and noninvasive, and the results are reproducible and rapidly obtained. More recently, segmental BIA has been developed to permit standing measurements and avoid the traditional electrodes system to input the electrical current into the body. So, simple scales with step and hand contact electrodes offer fast, valid and reliable measurements, which permits perform assessment in more ecological contexts as schools.

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In this study, the percentage of FFM, FM and fat mass percent (%FM) was obtained by single frequency tetrapolar BIA following the procedures of the manufacture (Tanita BC360, Japan, Image 4). Briefly, the participants stand erect and still over the scale by stepping the feet electrodes. Shoulders were abducted 45° and elbows extended 180° while grapping hand electrodes (see image 4). They were in this latter position until the device displayed the body composition values. Additionally, all participants were asked to void the bladder before performing the BIA measurement to avoid non-metabolically active water was included in the measurement (overestimation of FFM). FFM (FFMI) and FM (FMI) indexes were proposed as nutrition status indexes for adults (VanItallie, Yang, Heymsfield, Funk, & Boileau, 1990) and adolescents (Alvero-Cruz et al., 2010). We used as additionally variables to explain and correct variability introduced by the natural growing (height) in BC analysis (equations 3 and 4), which may influence the relationship between BC and BI.

Weight (kg) = FFM (kg) + FM (kg) *Equation 1*

FM (kg) = Weight - FFM *Equation 2*

FMI = FM (kg) / Height $(m)^2$ *Equation 3*

FFMI = FFM (kg) / Height $(m)^2$ *Equation 4*

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Figure 4. Bioimpedance analysis (BIA) equipment (Tanita BC360).

9.2. Body Image.-

Estimation of Body dissatisfaction. Body shape questionnaire (BSQ) was used to estimate BD; it is a self-reported questionnaire (Cooper, Cooper, Cooper, & Fairburn, 1987) although in our study there was always a member of the research team to help out the participants. This questionnaire has been validated both adolescents and adults of the Spanish population. It measures the dissatisfaction produced by our own bodies, the fear of gaining weight, the lack of self-worth perceived due to physical appearance, the desire to lose weight and to avoid bringing

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attention to the physique whilst in the company of others (Raich et al., 1996). So, it has been considered a valid tool to assess the feelings about body weight and BI, it can be also used to explore BI disturbances (BD) and ED. The questionnaire consists of 34 items, which are rated with a Likert scale from 1 to 6 points, subjective categories are as follow:

1. Never.
2. Rarely.
3. Sometimes.
4. Often.
5. Very Often.
6. Always

The final score range is between 34 and 204. By using the punctuation of the final score 4 weight-related concern categories can be established as follow:

a) No concern: <81.

b) Mild Concern: 81-110.

c) Moderate concern: 111- 140.

d) Marked concern: >140.

Considering these previous cut-off values, we create a categorical variable, so students with records between a) and b) were coded as

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BS variable, conversely those, who reported values between c) and d) were classified with BD. Nevertheless, it is important to note that this questionnaire is not specific for the diagnosis of obesity or thinness, so adolescents in risk of both extreme nutritional status will rate themselves high. An original copy of the Spanish version can be looked up in the appendix of this manuscript.

Self Perception. Figure Rating Scale (A. J. Stunkard & Sørensen, 1983). This is fundamentally based on the identification of the subject with a determined type of silhouette that corresponds to a specific BMI, which was hidden from the students at all times (figure 5). The procedure was performed as follow: Firstly, each student selected a figure, which corresponded with his or her own silhouette. Secondly, they choose the one they would like to have. Finally, they were asked to choose their ideal preference of body type in the opposite sex. Comparing the perceived and desired values of BMI with those of their actual measurements from anthropometry (desired BMI – estimated BMI), we could obtain a pattern of the distortion of their own body self-perception. The 3rd question asked we could determine the feminine figure most desired by boys and the male figure most desired by girls (we did not use this variables in our analysis).

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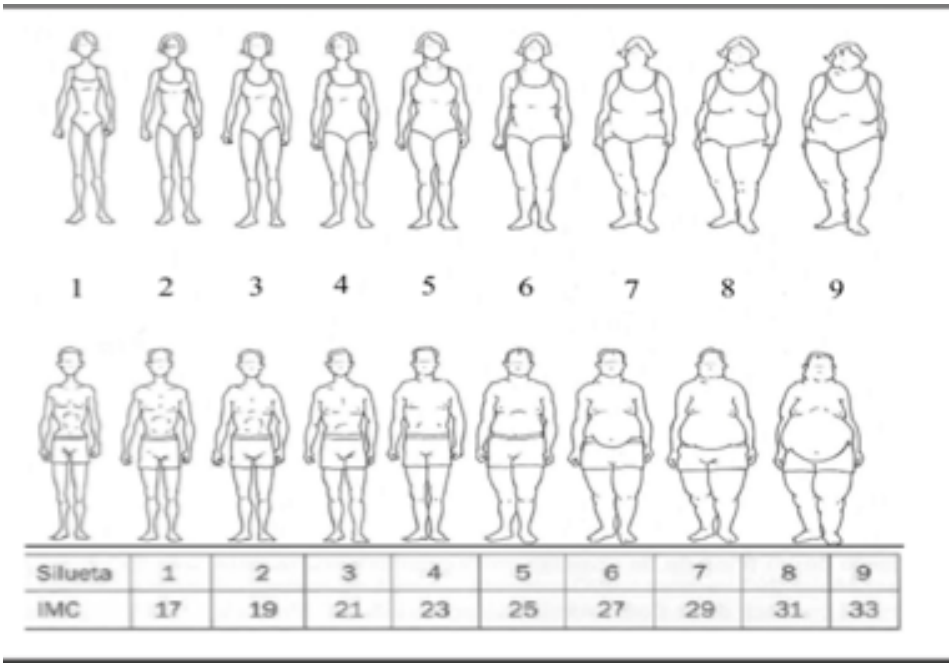

Silueta	1	2	3	4	5	6	7	8	9
IMC	17	19	21	23	25	27	29	31	33

Figure 5. Anatomical model drawings used to assess body self-perception. Spanish version adapted from original version of Figure Rating Scale (A. J. Stunkard & Sørensen, 1983) by (Marrodán Serrano et al., 2008). Silueta, Silluette; IMC. Body Mass Index.

9.3. Physical Activity.-

Total daily PA. The final score from the PA questionnaire for Adult Children *(PAQ-A)* (Kowalski, Crocker, & Donen, 2004) was used as an index of the total daily PA. Each participant filled in his/her questionnaire and a member of the research team was available to answer questions and confirm that all items were completed; similar procedure was used with other questionnaires. A validated version of the PAQ for Spanish adolescents (Martínez-Gómez et al., 2009) was used in this study. The

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total score (PA-S) was used to describe weekly PA. Additionally, the item numbers 4 and 5 were utilized to classify adolescents involved in OSSP or not NOSSP.

PAQ-A has a good concurrent validity as proved from accelerometer studies (Bervoets et al., 2014; Kathleen F. Janz, Lutuchy, Wenthe, & Levy, 2008); in our study PAQ-A score was positively associated with light, moderate, vigorous, MVPA and steps measured by accelerometry (rho=0.33, rho=0.21, rho=0.39, rho=0.36 rho=0.41, respectively; P<0.001). Regarding construct validity PAQ-A has a good correlation with indicators of fatty tissue, bone marrow, and variances in heart beat as well as certain psychological factors such as participation in competitive sports, corporal satisfaction, and anxiety (Crocker, Bailey, Faulkner, Kowalski, & McGrath, 1997; Brunet & Sabiston, 2009).

These later studies may confer external validity (Bell, 2002) to this questionnaire. Additionally, we confirmed the external validity of PAQ-C in a subset of the sample of our project (n=99 boys, n=79 girls), so a positive correlation between VO_{2Max} and the PAQ-A was confirmed (rho = 0.28, P<0.01).

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10. Statistical Analysis.-

Continuous variables were expressed as mean and standard deviation (SD) when normally distributed. Always normality was not confirmed continuous variables were treated as median, ranks and intervals of confidence. Categorical variables were reported as frequencies by school and separately for females and males. The Kolmogorov-Smirnov test was used to confirm the normality of the distribution.

Chi-square tests were computed in order to compare rates of students between gender categories, school, education level and OSSP categories to confirm proportionality across all possible combinations of categories.

Pearson's coefficient correlation was used to analyze associations between BI variables and independent variables. Spearman's correlation coefficient was utilized when non normal distribution was detected. These previous correlations were conducted for the total sample and for NOSSP and OSSP groups adjusted for age and in the same way for BS and BD. These treatments were performed to confirm our hypothesis of relationship between PA, BC and BI.

The Mann-Whitney test was used to compare BD (BSQ score) and BD image (difference between measured BMI and perceived BMI) between the two groups of OSSP. Also, BC variables and PAQ-A score were compared between these groups. This treatment may confirm if those students with PA and sport practice out of the school have better BI perception and BC profile.

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One-way ANOVA was carried to compare differences in PAQ-A and distortion score across different grades of perception (figures drawings). This analysis may help to understand if those students with an extreme body self-perception have more or less distortion and additionally if they were more or less active than those in the central categories. An ANCOVA analysis was applied then to confirm if this differences were dependent of PAQ-A score and FMI (both were covariates).

After this, four separate multifactorial logistic regression analysis examined the odds ratios for the levels of the dependent variable (BS and BD) and independent variables gender, PA adjusted for age and BMI for the first model. Afterwards a second model substituting BMI by FFMI and FMI were also carried out.

Finally, a related-sample Wilcoxon signed rank test was utilized to compare differences of main variables (BI and PA) at the first and last time points of the follow-up period.

All statistical procedures were executed with statistical package SPSS 20.0 and the an type I error or alpha value $P<0.05$ was accepted to confirm significance for all analysis.

A post hoc power analysis allow as to confirm that if we expected to detect correlation coefficient as low as 0.25, which assuming an alpha value of 0.001 and 80% of statistical power can be found with a sample size of 95 individuals. We could recruit 859 participants, which allowed us enough statistical power to confirm or refuse our hypothesis.

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CHAPTER V. RESULTS

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11. RESULTS.-

11.1 Sample characteristics.-

The biological characteristics of the final participants are shown in table 9. Although 829 adolescents accepted to participate in the study we could only have assessment of BC in 293 of them; and 125 completed the two assessments of the follow up study. However, we could confirm that our data were not biased by this fact since our ITT analysis proved that there were not significant differences in the main variables between the group with BC analysis and without it (table 10). Nonetheless, correlation analysis between PAQ-A and BSQ scores showed that only the group with non-BC analysis had significant correlation between both variables (BC group rho = -0.92, p =0.118 vs. NBC group rho = -0.169, $p<0.001$); as consequence this categorical variable will be included in the regression models, which will be carried out later in the analysis. Additionally, there were not significant differences in age, weight, BSQ, BMI_P or PA scores at first time point between responders and non-responders of the follow-up study. Also, none of the independent variables were normally distributed in the whole sample as confirmed in the Kolomogorov-Smirnof test, so all-statistical treatments were non-parametric, except for those where a normal distribution is not a mandatory requirement.

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Table 9. Biological characteristic of the sample at baseline.

Variables		n	Mean		SD	Min	Max	Median	Range
Age	*(years)*	829	14.3	±	1.2	12.0	18.5	14.0	6.5
Height	*(m)*	827	1.63	±	0.09	1.37	1.87	1.63	0.50
Weight	*(kg)*	828	57.6	±	12.3	32.0	122.9	55.7	90.9
%FM	*(%)*	293	26.8	±	8.0	3.3	50.2	26.4	46.9
FM	*(kg)*	293	16.1	±	7.7	2.1	50.1	14.2	48.0
FFM	*(kg)*	293	42.1	±	8.0	26.0	79.9	40.3	54.0
BMI	*(kg/m^2)*	827	21.48	±	3.62	15.04	40.27	20.73	25.24
FMI	*(kg/m^2)*	292	6.05	±	2.72	0.69	18.86	5.48	18.17
FFMI	*(kg/m^2)*	292	15.78	±	1.99	11.01	23.10	15.57	12.09
PAQ-A		829	2.4	±	0.7	1.0	4.0	2.2	3.0
BMI_P	*(kg/m^2)*	829	22.0	±	2.4	17.0	29.0	21.0	12.0
BSQ		826	60.7	±	23.1	6.0	176.0	56.0	170.0

SD. Standard Deviation; Min. minimum; Max. maximum; Sig. statistical significant; %FM. fat mass; FFM. fat free mass; BMI. body mass index; FFMI, fat free mass index; FMI, fat mass index; PAQ-A, physical activity questionnaire for Adolescents; BMI_P. body mass index perceive; BSQ, body shape questionnaire; BCA, students with body composition analysis; NBCA, students without body composition assessment

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Table 10. Intention-to-treat analysis by differences on morphological variables, age, physical activity and body satisfaction between students who complete (BCA) and not complete (NBCA) the body composition analysis.

Variables		NBCA			BCA			Mann-W
		n	Median	Range	n	Median	Range	*Sig.*
Age	*(years)*	536	14.0	6.5	293	14.0	6.0	**0.461**
Height	*(m)*	535	1.630	0.500	292	1.620	0.450	**0.289**
Weight	*(kg)*	535	55.0	90.9	293	57.1	90.7	**0.321**
BMI	*(kg/m²)*	535	20.6	22.2	292	21.0	25.2	**0.064**
BMI_P	*(kg/m²)*	536	21.0	12.0	293	21.0	10.0	**-**
BSQ		534	56.0	170.0	292	56.5	142.0	**0.298**
PAQ-A		536	2.20	3.00	293	2.30	3.00	**0.872**

BCA, students with body composition analysis; NBCA, students without body composition assessment; Mann-W Sig. statistical significance for Mann-Whitney U test; BMI, body mass index; BMI_P, perceived body mass index; PAQ-A, physical activity questionnaire for Adolescents; BSQ, body shape questionnaire.

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11.2. Body Dissatisfaction and Satisfaction Prevalence.-

The prevalence of moderate and marked concerns (dissatisfaction) was 34 students (4.1%). These categories of BS were equally distributed across schools (Chi-square, *p>0.05*; table 11).

Table.11. Distribution of participants by body satisfaction categories and school.

Variables	C. Fernando de los Rios n= 659	C. Juan de la Rosa n= 168	TOTAL
No concern	475	139	614
Mild Concern	158	22	180
Moderate Concern	24	4	28
Marked Concern	3	3	6

Regarding the analysis by academic level of education, a proportional distribution of BS categories across the educational level was observed only for boys (Chi-square = 9.402; *p>0.05; Panel 1 figure 1*). Nevertheless, higher prevalence for mild and marked concerns categories were detected (Chi-square = 16.984; *p = 0.049; Panel 1 figure 2*) in the 3rd (3°ESO= 31.8% and 44.4% for MOC and MAC respectively) 4th (4°ESO = 63.5% and 55.6% for MOC and MAC respectively) grades than in the others (1.6% in MOC for 1°ESO and 0% for 1° ESO and 2° ESO in the other categories). Also, MIC was higher in 4th grade (55.4%) than in 1st (11.5%), 2nd (15.4%) and 3rd (17.3%).

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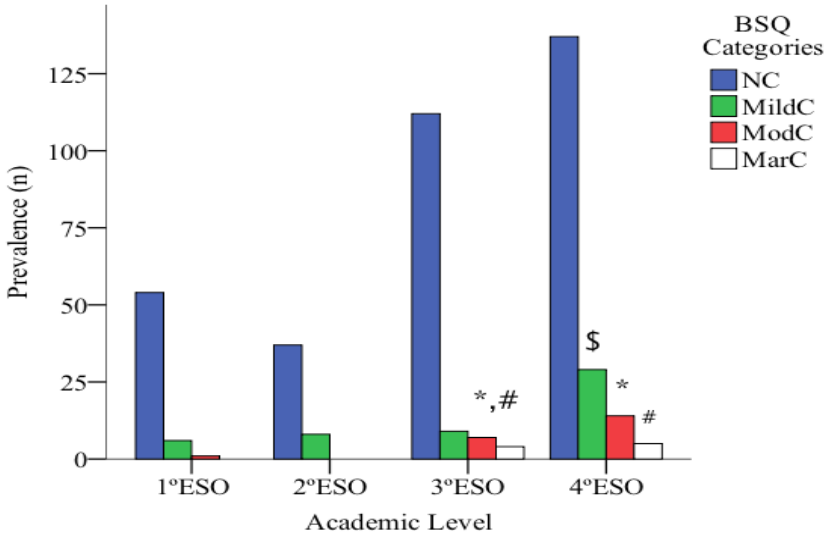

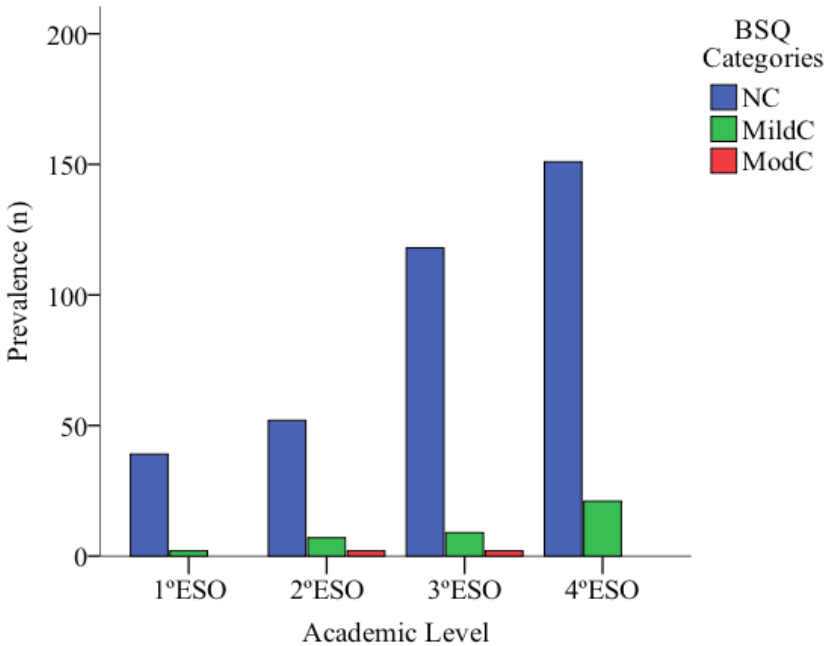

Panel 1. Body Dissatisfaction categories across academic level (compulsory secondary education) in females (figure 1) and males (figure 2).

NC. Normal concern; MOC. Moderate concerns; MIC. Mild concerns; MAC; marked concerns.
$, indicates significant different prevalence of MIC with the other groups.
*, indicates significant different prevalence of MOC with 1°ESO and 2°ESO.
#, indicates significant different prevalence of MOC with 1°ESO and 2°ESO.

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Mean values of BS were relatively similar boys and girls, and although there was a trend to higher values in girls in 4th year, this was not statistically significant. Additionally, the values were considered healthy on average.

Table 13. Mean values of body satisfaction (body shape questionnaire scores) across academic level and gender.

	Male		Female	
Level	Mean	SD	Mean	SD
1°	51.7	±14.5	59.0	±18.1
2°	58.5	±23.5	60.1	±19.3
3°	56.7	±17.3	63.2	±23.9
4°	55.5	±17.3	71.1	±28.3

SD: Standard Deviation.

11.3. Body Self-perception Perception-.

This capacity was assessed with body shape models (body drawings), where the most selected images were 3rd (BMI equivalent to 21 kg/m^2, 34.4%) and 4th (BMI equivalent to 23 kg/m^2, 26.7%). In the table 14, we can observe the prevalence of wrong perception is 68.4%. So, we could confirm that most part of the participants have BI distortion, which was related with both overestimation (22.4%) and underestimation (46%). An overestimated BI was more prevalent in girls and the opposite happened with underestimation (table 14).

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Table. 14. Descriptive results of Body self perception assessed by anatomical models.

	Siluette	Male	Female	%
Self-perception with BI lower (actual BMI lower BMI ideal)	1	6	10	1.9
	2	25	10	4.2
	3	13	20	3.9
	4	17	38	6.6
	5	19	11	3.6
	6	10	8	2.1
	7	0	1	0.1
BMIR=BMIP (satisfaction BI)	n	135	121	30.8
Self-perception with BI higher (actual BMI higher BMI ideal)	1	6	2	0.9
	2	56	21	9.2
	3	32	78	13.2
	4	42	65	12.9
	5	39	32	8.5
	6	7	3	1.2
	7	1	0	0.1

BIP. Body Image Perception; BMIR. Body Mass Index Real. BI. Body Image.

Body self-perception was not significantly influenced by academic level both girls (4.186, p=0.242 for Kruskal-Wallis test) and boys (7.041, p=0.071 for Kruskal-Wallis test). However, as we can see in the figure 6. The 3° ESO and 4° ESO medians are below the overall median; additionally those groups had more extreme values than the first two groups of academic level (figure 6).

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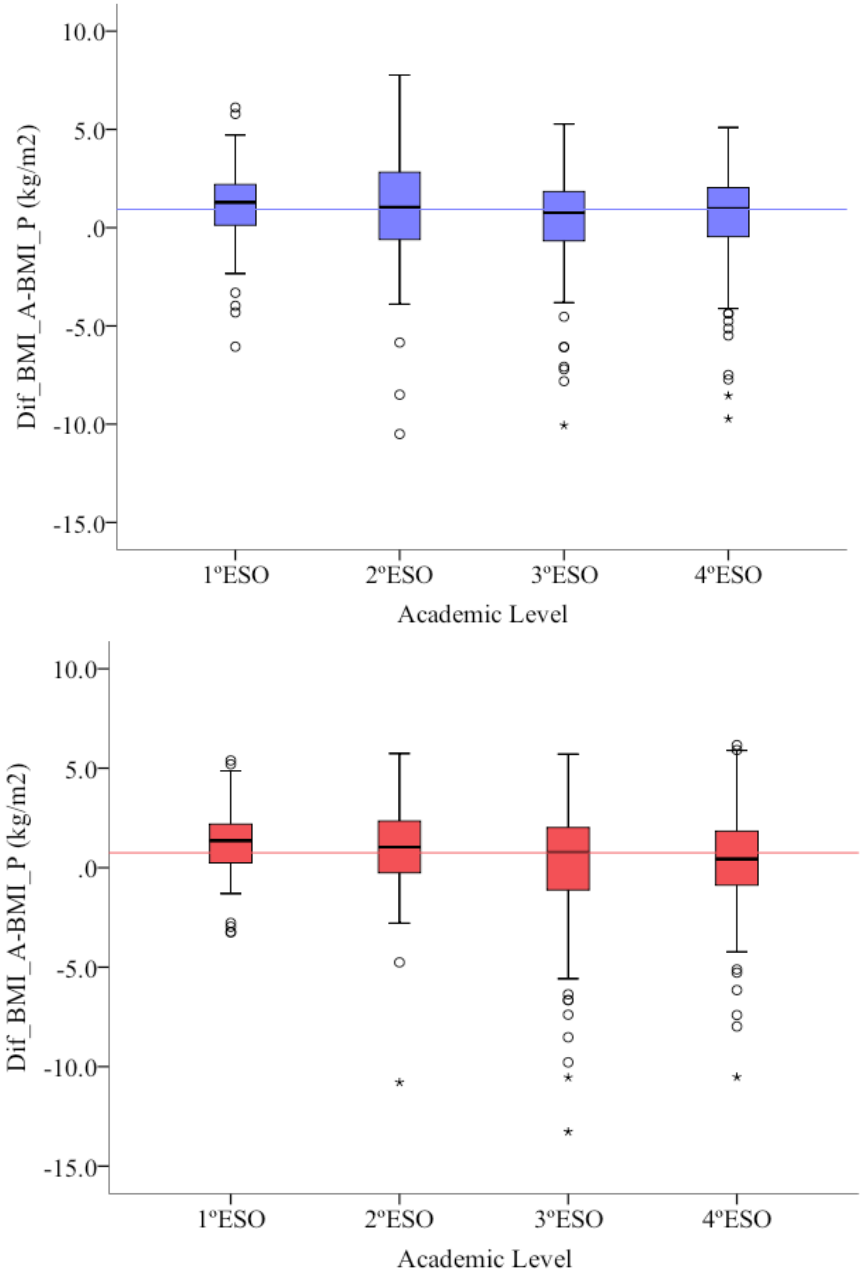

Figure 6. Body self-perception distortion (assessed as the difference between actual body mass index (BMI_A) and perceived BMI (Dif_BMI_A-BMI_P)) differences across academic level of compulsory secondary education. Boxplots in blue are girls' data (n= 421) and in red boys' data (n= 405). Blue and red lines represent total median for girls and boys respectively. Dots and starts are outliers higher/lower than one or two standard deviations respectively

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11.4. Prevalence of Physical Activity participation.-

We found a high prevalence of participants that did not perform any type of PA after-school, 46.7% in FDR and 40.3% in JDR school (table 15). Regarding differences between gender, boys has a higher prevalence of participation (71.80%) than girls (39.9 %).

Table. 15. Differences between school and OSSP –NOSSP.

	FDR		JDR	
	OSSP	NOSSP	OSSP	NOSSP
PA participation	351	308	101	68

FDR. Fernando de los Rios school; JDR. Juan de la Rosa School; PA, Physical Activity; OSSP, out school sport practice; NOSSP, Non out school practice.

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11.5. Associations between body Composition and Physical Activity variables, and Body Image variables.-

Body Satisfaction (BSQ score) and self-perception distortion assessed as the difference between actual and perceived BMI were correlated with weight, age, BMI and PA score (table 16). Also, BC variables were positively correlated with BSQ (Tau = 0.208, p<0.001 for FM; Tau = 0.234, p<0.001 for FMI; Tau = 0.084, p<0.05 for FFMI) and negatively associated with self-perception distortion (Tau = -0.282, p<0.001 for FFM; Tau = 0.356, p<0.001 for FM; Tau = -0.357, p<0.001 for FMI; Tau = -0.352, p<0.001 for FFMI)

Table 16. Spearman's coefficient correlations between Body Satisfaction variables and morphological variables, and age.

Variables	BID	BSQ
BMI	-0.653**	0.243**
PAQ-A	-0.018	-0.142**
AGE	-0.102**	0.091**
WEIGHT	-0.559**	0.153**

BMI, Body Mass index; PAQ-A, score of physical activity questionnaire for Adolescents; Dif_Bmir__Bmip, BID, Body Image Distortion; BSQ, body shape questionnaire.
**, p<0.01 for Spearman's correlation coefficient.

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Additionally, BSQ score and BI distortion (BMI_A-BMI_P) were significantly correlated (tau =- 0.089, *p<0.001*), which was similar for boys (tau =- 0.092, *p=0.004*) and girls (tau =- 0.104, *p=0.002*). A zero value or close to zero of BMI_A-BMI_P variable indicates perfect BMI self-perception, while a negative value denotes overestimation of actual BMI (participant see himself or herself bigger than he/she is) and a positive an underestimation (participant see himself or herself smaller than he/she is). In our data a positive difference was found and it was significantly different from zero value (Mean of the difference = 0.511 ±2.69 kg/m^2, *p<0.001* for one sample T-test and median of the difference = 0.86, *p<0.001* for one-sample Wilcoxon signed rank test), which may inform that on average our students underestimated their BMI. This result was consistent when the sample was split by gender categories (Mean difference for girls = 0.540 ±2.62 kg/m^2, *p<0.001* and median of the difference = 0.93, *p<0.001*; Mean difference for boys = 0.481 ±2.77 kg/m^2; *p<0.001 and* median of the difference = 0.75, *p<0.001*). No significant differences were observed in BMI_A-BMI_P between boys and girls (figure 7).

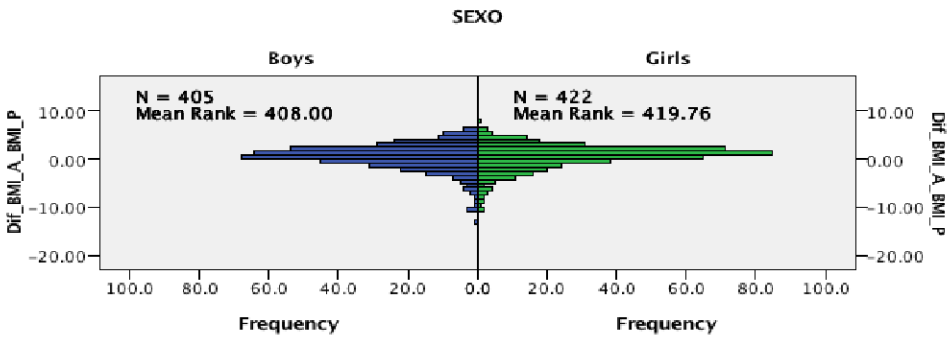

Figure 7. Mean ranks of body self-perception distortion (assessed as the difference between actual body mass index (BMI_A) and perceived BMI) between girls (green bars) and boys (blue bars). *Difference was not significant between groups (Mann-Whitney U test = 87,886.0, p=0.479).*

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All together this results may indicate lower BD (lower BSQ scores) higher underestimation (positive Dif_BMI_A-BMI_P value) or higher BD (higher BSQ scores) higher overestimation (negative Dif_BMI_A-BMI_P value). In the scatterplots of figure we can observe this trend, which was similar either boys and girls (figure 8).

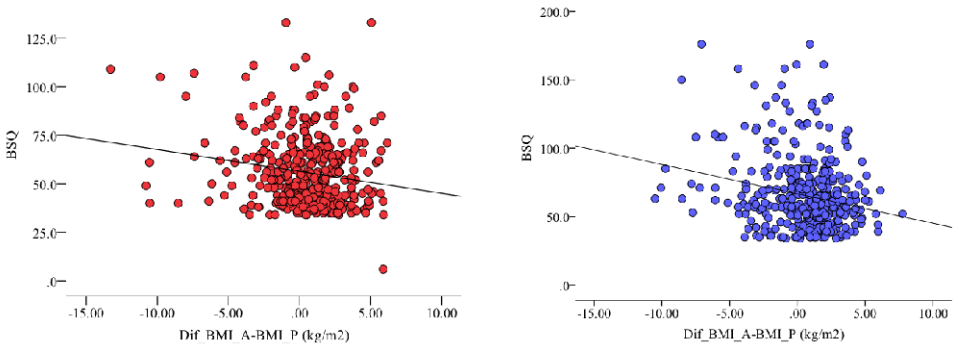

Figure 8. Relationship between body dissatisfaction score (assessed by body shape questionnaire BSQ)) and body self-perception distortion (assessed as the difference between actual body mass index (BMI_A) and perceived BMI). Red dots represent boys (n=403) and blue dots girls (n=421). Slopes were not significantly different between boys and girls (β = -1.128 vs. β= -2.146, p>0.05)

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11.6. Differences between After-School Sport Practice Groups.-

Regarding OSSP groups there was a significantly lower proportion of girls in the OSSP and lower boys in NOSSP (Chi-square = 97.339, p<0.001, table 17). Although none significant differences were found for medians of age (OSSP =14.0 range 6.0 vs. NOSSP = 14.0 range 6.5; mean ranks OSSP = 425.7 vs. NOSSP = 406.12; p = 0.234).

Table 17. Distribution of groups with after-school-sport practice (OSSP) and without (NOSSP) by gender.

	Male	%	Female	%
OSSP	290	71.80%	169	39.90%
NOSSP	114	28.20%	254	60.10%

PA, Physical Activity; OSSP, out school sport practice; NOSSP, Non out school practice.

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Mean ranks of BC variables were significantly different between OSSP, except for weight and FFMI (see Mann-Whitney U test significance at table 18). Body dissatisfaction was also significantly different and OSSP group report a lower score in the BSQ (table 18 and figure 9) and as expected higher score in the PAQ-A (table 18).

Table 18. Comparison of medians between after-school-sport practice (OSSP) and without (NOSSP) groups.

Variables		OSSP			NOSSP			Mann-W
		n	Median	Range	*n*	Median	Range	*Sig.*
Height	*(m)*	*453*	1.64	0.47	*374*	1.61	0.48	***
Weight	*(kg)*	*453*	56.20	90.70	*375*	55.20	69.90	-
%FM	*(%)*	*171*	24.35	44.04	*122*	27.99	40.67	***
FM	*(kg)*	*171*	13.41	47.96	*122*	15.10	44.22	*
FFM	*(kg)*	*171*	42.30	53.97	*122*	39.12	39.81	***
BMI	*(kg/m²)*	*453*	20.38	24.96	*374*	21.37	22.52	***
FMI	*(kg/m²)*	*171*	5.03	18.17	*121*	5.98	14.69	***
FFMI	*(kg/m²)*	*171*	15.72	11.47	*121*	15.42	11.90	-
BSQ		*451*	53.0	170.0	*375*	61.0	127.0	***
PAQ- A		*453*	2.90	2.60	*376*	1.85	2.80	***

OSSP, Out school sports practice; NOSSP, Non-out school sports practice; Sig. statistical significant; %FM. fat mass; FFM. Fat free mass; BMI. Body mass index; FFMI, fat free mass index; FMI, fat mass index; PAQ-A, physical activity questionnaire for Adolescents; BSQ, body shape questionnaire.

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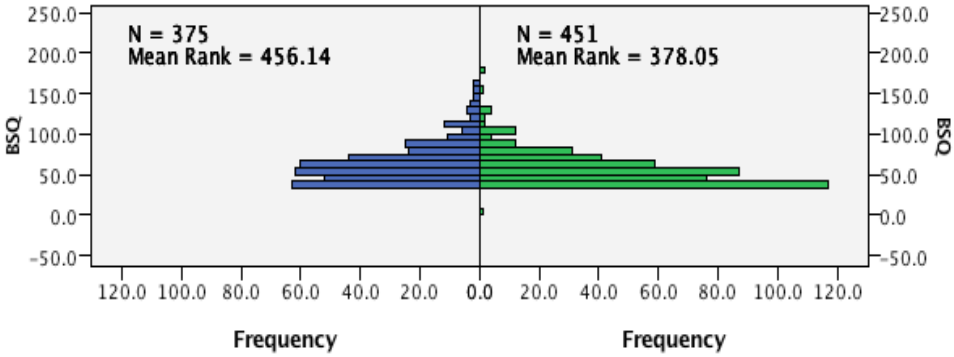

Figure 9. Mean ranks on body dissatisfaction (as assessed by body shape questionnaire (BSQ)) between adolescents with (green bars) and without (blue bars) after-school sport practice. *Difference was significant between groups (Mann-Whitney U test = 68574, p<0.001).*

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Regarding gender, girls report higher values of dissatisfaction than boys, although the effect of OSSP was significant for both genders (figure 10). Also, boys in NOSSP classified themselves with similar BD as girls in OSSP group. On average, either boys or girls had values below 75 score.

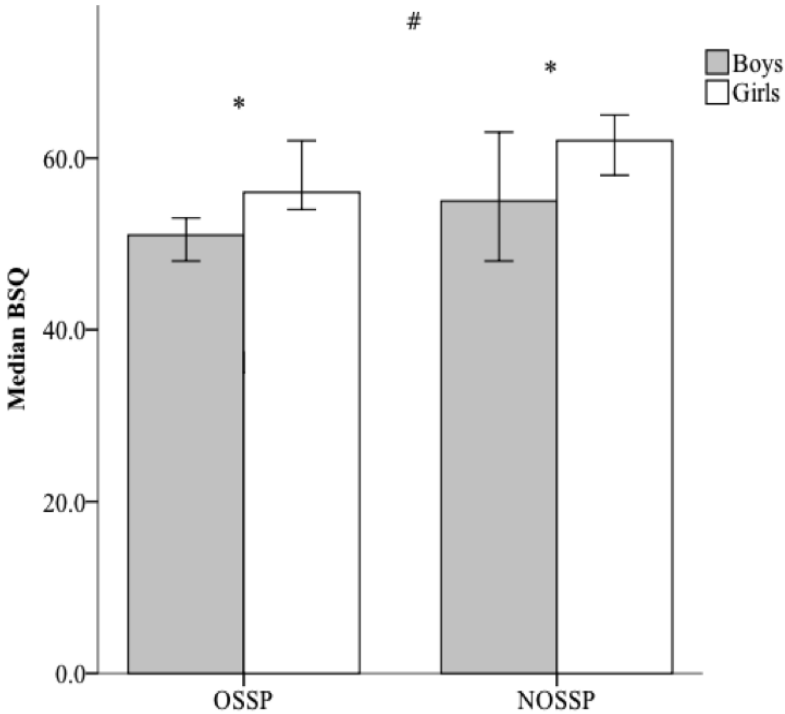

Figure 10. Body satisfaction differences between adolescents with after-school sport practice (OSSP) and without (NOSSP). Error bars represent median and 95% of confidence interval. *, p<0.05 for Man-Whitney´s U test for comparison between boys and girls. #, p<0.05 for Man Whitney´s pair simple U for comparison between OSSP and NOSSP for total simple. Independent variables: Sex .BSQ, Body Shape Questionnaire.

UNIVERSIDAD DE MÁLAGA

In the figure 11 we can observe that there are no significant BMI differences between OSSP and NOSSP groups, and this was similar either male or females, who did not differ in BMI inside OSSP or NOSSP groups (figure 11).

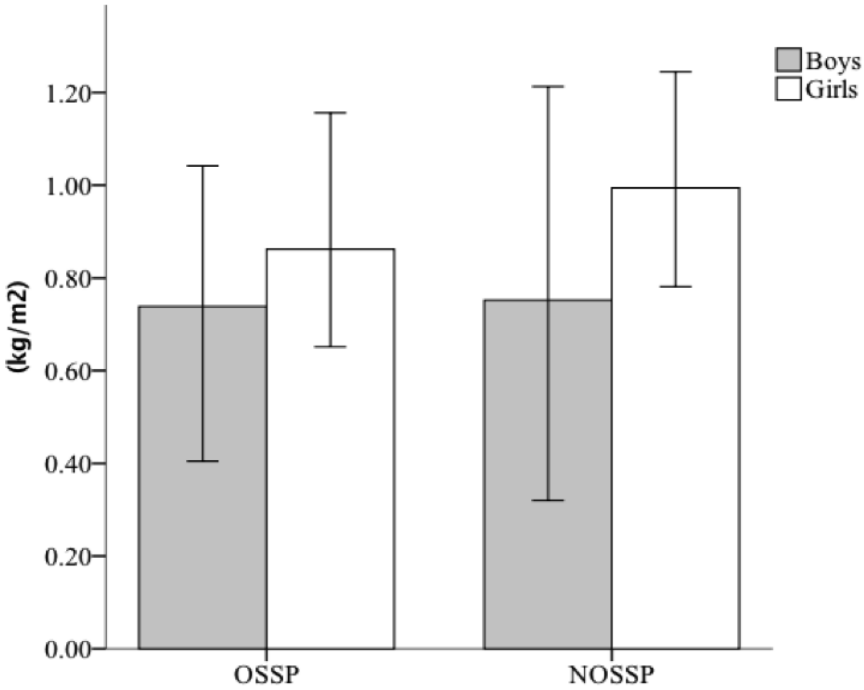

Figure 11. Differences of BMI between adolescents with Out school sport practice (OSSP) and without (NOSSP). Error bars represent median of international Z-scores using WHO LMS references to calculate Z-scores by sex and age and 95% of confidence interval.

In respect to BI self-perception, similar proportions of after-school sport practice were found for lower (17) and upper (27 and 29) extreme categories (table 19, $p<0.001$ for Kendall's tau ordinal proportions). It was interesting to note that there were more adolescents in the OSSP group in the BMI groups of those adolescents that perceived themselves as healthy (groups 19, 21 and 23; table 19) and the opposite happened in the highest groups of perceived BMI (25, 27 an 29; table19).

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Table 19. Proportions of after-school sport practice (OSSP) group across perceived BMI categories.

		Perceived BMI Categories							Total
		17	19	21	23	25	27	29	
OSSP	n	**18**$_{a, b, c, d}$	**80**$_{c, d}$	**172**$_{b, d}$	**113**$_{a, b, c, d}$	**51**$_{a}$	**18**$_{a, b, c, d}$	**1**$_{a, b, c, d}$	**453**
	% within OSSP	4.0%	17.7%	38.0%	24.9%	11.3%	4.0%	.2%	**100.0%**
	% within BMI	69.2%	60.6%	60.4%	51.1%	40.5%	52.9%	20.0%	**54.6%**
	% of Total	2.2%	9.7%	20.7%	13.6%	6.2%	2.2%	.1%	**54.6%**
NOSSP	n	**8**$_{a, b, c, d}$	**52**$_{c, d}$	**113**$_{b, d}$	**108**$_{a, b, c, d}$	**75**$_{a}$	**16**$_{a, b, c, d}$	**4**$_{a, b, c, d}$	**376**
	% within OSSP	2.1%	13.8%	30.1%	28.7%	19.9%	4.3%	1.1%	**100.0%**
	% within BMI	30.8%	39.4%	39.6%	48.9%	59.5%	47.1%	80.0%	**45.4%**
	% of Total	1.0%	6.3%	13.6%	13.0%	9.0%	1.9%	.5%	**45.4%**
Total	n	**26**	**132**	**285**	**221**	**126**	**34**	**5**	**829**
	% within OSSP	3.1%	15.9%	34.4%	26.7%	15.2%	4.1%	.6%	**100.0%**
	% within BMI	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	**100.0%**
	% of Total	3.1%	15.9%	34.4%	26.7%	15.2%	4.1%	.6%	**100.0%**

BMI, Body Mass Index; OSSP, Out School Sport Practice; NOSSP, Non-out school sport Practice.

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11.7. Body Dissatisfaction and Satisfaction Determinants.-

The differences between BMI_A and BMI_P ranks were significantly reduced across PBMI level as observed after carting out Wilcoxon´s independent samples test (p<0.05, figure 9).

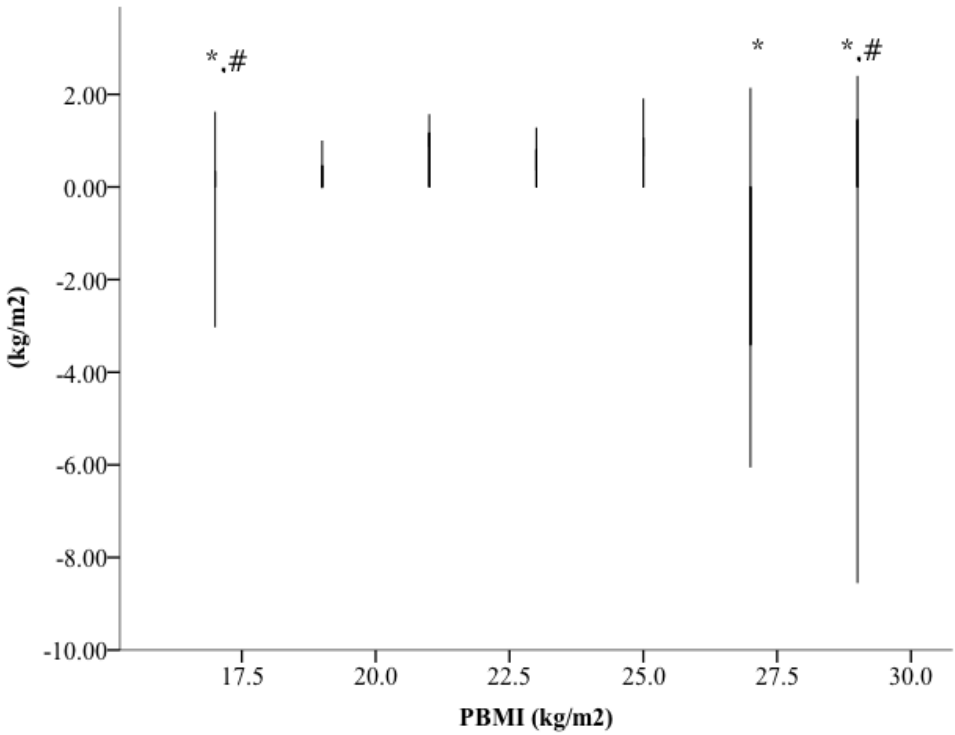

Figure 12. Differences between PBMI-BMIr across PBMI categories. Error bars represent median and 95% of confidence interval. *, p<0.05 for differences with 2nd, 3rd, 4th and 5th categories, Mann Withney´s pair sample test. #, p<0.05 for differences between 1st and 7th, Mann Whitney's pair sample test.

UNIVERSIDAD DE MÁLAGA

Logistic regression analysis confirm that PA, gender, age and BC assessment group were significant predictors of BS, so boys, participants with OSSP and those students with BC assessment had significant less probability to report BS.

Table 20. Logistic regression model for predicting body satisfaction.

Variables	B	S.E.	Sig.	β	95% C.I. Lower	95% C.I. Upper	Nagelkerke R^2
Constant	-8.76	2.07	0.00	**0.00**			
PA (OSSP=1)	1.28	0.62	0.00	**7.43**	2.22	24.89	**0.153**
Gender (Male=1)	2.01	0.62	0.03	**2.16**	1.07	4.35	
BC (Yes=1)	0.77	0.36	0.04	**2.08**	1.04	4.15	
Age (years)	0.33	0.14	0.03	**2.16**	1.07	4.35	

PA, physical activity category (tested condition was students who had after-school sport practice, OSSP); BC, body composition assessment category (tested condition was students who had body composition assessment, Yes). Dependent variable was body dissatisfaction as assessed from body shape questionnaire (score >110 = body dissatisfaction; tested condition was body satisfaction).

UNIVERSIDAD DE MÁLAGA

CHAPTER VI: DISCUSSION

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12. DISCUSSION.-

The main findings of this study confirm partially our final hypothesis, so BD was not only determining by gender and age, and as hypothesized PA participation (OSSP group) was the most important determinant of BD. So, participants involved in OSSP had 7.43 less probabilities of reporting BD issues. Additionally, our follow-up analysis did not confirm the importance of total daily PA in the change of BD. The implication and importance of these results is discussed during this section.

Body Dissatisfaction

The results of our study showed 5.4% of BD prevalence (34 participants), although 25.9% reported at least mild BIC, which means that 74.1% had none BI concern. These results are different from those data reported by (Ortega Becerra, 2010). Who described a lower prevalence of dissatisfaction (52.7%). Usually, BIC are more prevalent in females than males, which was confirmed in our sample. However, the prevalence of BIC among male was lower (10.4%) than UK males (20%) (Furnham, Badmin, & Sneade, 2002; Liao et al., 2010).

On average BD did not change significantly along academic level but the prevalence in females was higher in the 3rd and 4th levels of academic education. Nevertheless this was not in accordance with a previous study by (Veggi AB, Lopes CS, Faerstein E, 2004) where adolescents as young as 10-13 years old were highly dissatisfied with their BI and reject their own

UNIVERSIDAD DE MÁLAGA

body. This did not happened in our sample where only one girl between 10-13 years of age reported moderate concerns with her BI, which represent a female prevalence of 0.2%.

The Spanish research using BSQ to determine BD in healthy adolescents is scarce; therefore, it is difficult to establish comparisons across all Spanish regions. The most important dataset was reported in 2003 and average BSQ values by age groups for girls described a progressive rising of average score with age (12-13 year old; 57.50±25.01; 15-16 year old, 75.10±27.32 and for 17-19 year old, 76.50±30.77). The values reported in boys were lower and none trend along age groups was observed (12-13 year old, 50.93±25.38; 15-16 year old, 51.46±22.43 and 17-19 year old, 50.56±16.31) (Baile, María, & Garrido, 2003). These data can be complete with the study by (Martínez-Gómez et al., 2009), which evaluated girls and boys of 12 years old (63.3 ±25.9 and 55.6 ±18.3). Our data for boys were similar with this latter study and slightly higher than the survey by (Ayensa I. et al., 2002). Conversely, girls in these previous studies reported higher dissatisfaction than ours mainly at older ages. This issue may be confirmed in early studies with Spanish college students (Raich et al., 1996; Baile et al., 2003), where were found even higher values (84.75 ±30.42). Therefore, it seems that BD prevalence increase along adolescence in girls (confirmed by increased prevalence of MOC and MAC at 3° ESO and 4° ESO) until early adulthood. We did not find this pattern in boys, so a similar proportion of BD categories were observed in all academic

UNIVERSIDAD DE MÁLAGA

levels for boys. The age effect has been found also in older populations, while adults reporting higher BIC than younger populations (Campbell & Hausenblas, 2009). Conversely, the previously prevalence of BD in children of primary school was lower than our data (40% of girls and 25% of boys were dissatisfied with their bodies) (Mellor et al., 2004; Linda Smolak, 2004). Accordingly, BD might continually increases across adolescence for female and male populations, with girls continuing to report higher negative BI than boys (Eisenberg et al., 2005; Muth & Cash, 1997; Zaimin Wang et al., 2005).

However, previous studies did not confirm the expectation that BD increases with age and the results may be influenced by the tool used to assessed BD. Therefore, BD of young and old adult women was found to be similar when evaluated by (Fallon & Rozin, 1985). Figure Rating Scale (BD was measured as the discrepancy between current and ideal figure ratings) across various age groups (Altabe & Thompson, 1996; Sue Lamb, Jackson, Cassiday, & Priest, 1993; Fallon & Rozin, 1985; Stevens & Tiggemann, 1998; Tiggemann & Lynch, 2001).

These changes might be related with maturation and progressive change of social interest, which may affect differently girls. It has been suggested that this different BD issue may be due to greater awareness of social pressure, less tolerance criticizes, worse BI perception and emotional stress in comparison to the boys. Among, the main agents driven this alterations, media and other social institutions showing an ideal

UNIVERSIDAD DE MÁLAGA

but unrealistic BI have been suggested as plausible responsible (Koyuncu, Tok, Canpolat, & Catikkas, 2010).

Fluctuations in BI dissatisfaction are more than an aesthetic issue and could turn in deleterious acute consequences for adolescents' health and in middle and long-term would affect adult health, so it has been described people who are dissatisfied with their BI have a higher risk of acquiring potentially negative habits, such as: dieting, induced vomiting, use of diuretics, laxatives and anorectics use (Striegel-Moore, 1997). All together this results could provide a plausible connection of BD and more prevalent ED in females than males; however this hypothesis must be confirmed in clinical trials. Additionally, our data confirm that this problem is far to be resolved since the prevalence in our educative center continues to be similar with that reported ten years ago (Baile et al., 2003).

PE classes could be one of the most important ways to localize an early BI distortion and help to resolve it. During PE adolescents have an excellent opportunity to compare their bodies and PE teacher may propose activities in order to help students to compare their body with realistic and healthy models. These activities may promote an improved BI perception, which has been suggested as a plausible factor for BD when body self-perception is modified. We have analyzed BI perception to try to establish a relationship between BD, BI perception and PA variables.

UNIVERSIDAD DE MÁLAGA

Body Image perception

On the perception of BI it is remarkable to note that 68.4% of adolescents perceived themself incorrectly (74.4 % of girls and 33.1% of boys), of which 22.4% do think having a smaller BMI than they actually had and 46% did it by overestimating their actual BMI; so considering they had more weight and size than real. Our data were not similar with other Spanish study reporting 52.3% and 38.7% of boys and girls respectively had right BMI self-perception, and 29.2% of boys and 8.6% of girls were thinner than their body self perceptions; although 41.1% of the girls and 18.5% of boys were heavier (P Montero, Morales, & Carbajal, 2004; Sherblom & Rust, 2004) in this study reported that 10.5% was overweight, 13.6% unlimited of overweight. Another discrepancy between perceptions and real BMI of overweight and obesity boys and girls, more than half perceive ok.

These dissimilarities may be due related to primarily age with differences between samples, so (P Montero et al., 2004) survey analyzed adults between 18-35 years old our sample was only adolescents.Thus it seems that young adults, whom are physically and psychologically more matures, perceive themselves better than adolescents (P Montero et al., 2004). We could partially ratify this hypothesis in our sample since a significant negative correlation between age and BMI_A-BMI_P was observed and although when analyzed by academic level data were not statistically different, more outliers were observed at 3° ESO and 4° ESO courses.

UNIVERSIDAD DE MÁLAGA

With other Spanish study reporting 46.2% and 37.4% of boys and girls respectively had right BMI self-perception, and 25.3% of boys and 12.3% of girls were thinner than their body self perceptions; although 50.2% of the girls and 28.6.1% of boys were heavier (González-Montero de Espinosa, M. André, A. García-Petuya, E. López-Ejeda, N. Mora, A. Marrodán, 2010). These data are similar to those obtained in our study and may be due to the sample from which this made on Spanish adolescents students.

The grade of distortion (difference between perceived BMI and actual BMI) was negatively associated with BMI, which means that higher BMI higher underestimation, and the opposite might be true for extremely low BMI (excessive thinness). Our coefficients of correlation were similar with other studies (Fingeret et al., 2004; A. D. Stewart, Benson, Michanikou, Tsiota, & Narli, 2003) although the variable they analyzed was current body size (CBS) and as consequence their correlations were positive and not negative. The correlation between BMI and CBS is often considerer one of the most important measures of concurrent validity for body self-perception (A. Stunkard, 2000). We could confirm this fact with our BC data, which confirm that more adiposity (FM and FMI) or muscularity (FFM and FFMI) lower BD at least in adolescents.

Regarding gender differences, it has been commonly reported that there is more probability women perceive themselves as overweight (Halmi, 1983; Cash & Green, 1986) more worried about being or becoming fat and express greater concern with dieting and body weight (Kelly JT et

UNIVERSIDAD DE MÁLAGA

al 1983). In a figure drawing test, college-age women rated their current figures as heavier than the desired or ideal figure. In contrast, men's ratings of their current figures corresponded to the ideal (Drewnowski & Yee, 1987). However, we could not confirm this difference between girls and boys.

As pointed out in the previous paragraph, we found a high prevalence of alliterated BIP. In Spanish college students 55% of women and 63% of men had a distorted judgment of their body (Míguez Bernárdez, Montaña Miguélez, González Carnero, & González Rodríguez, 2011). Similarly, research across undergraduate college students in Austria, France and USA observed a wide discrepancy between men´s actual body satisfaction and their ideal BI (Pope H.G. et al., 2000).

A plausible reason of this high rate of BI distortion among women could be the widely accepted ideal of a slim and fragile body shape makes it difficult for young girls to accept the puberty-related alterations of their bodies (Holsen et al., 2012; Linda Smolak, 2004). So, while 58.3% of women with a normal BMI category rate themselves above their ideal body mass, only 23.5% of men do it. This failure to resemble with an ideal model may cause a high degree of BD, which along with other factors are source for more serious disorders such as anorexia, bulimia and vigorexia (Neumark-Sztainer et al., 2006). We did not obtain any valid measurement of ideal body shape so we could not confirm any relationship between current and ideal BI in order to confirm a physical dissatisfaction (difference between

UNIVERSIDAD DE MÁLAGA

current, perceived and ideal BI). Nonetheless, it was important to note that only 30.8% perceived themselves correctly, which is a lower prevalence than that found to BS, which could mean a wrong self-perception does not imply always a body self-perception distortion. Although our correlation coefficient analysis confirm an inverse relationship between BD and self-perception distortion, therefore there would be a possible association indicating those adolescents, whom overestimated their BMI reported higher rates of dissatisfaction; also, a BMI underestimation was associated with lower rate of BD. In fact, we barely observed participants with a BSQ score above 111 points (one case in boys), which is the cut off for moderate or marked BI concerns, among those with positive values of BMI_A-BMI_P (those with higher current BMI than perceived BMI).

Additionally, there were a higher percentage of students with OSSP among those that rated themselves in the two lowest categories of perceived BMI (BMI drawings), and the opposite was true for the highest BMI category (table 18). This could be related with the grade of body self-perception distortion since the latter was higher in the extreme categories of perceived BMI (BMI drawings, figure 12) and inversely correlated with PAQ-A score (PA).

All together, our data may suggest our adolescents are representative of Spanish body self-perception average, which may not be affected by sex, and is negatively associated with BD (BSQ score) and PAQ-A score; indicating volume of total daily PA could be play a role for diminishing overestimation of body self-perception.

UNIVERSIDAD DE MÁLAGA

Physical Activity on Body image variables.

As expected from other Spanish and European dataset (Commission, 2010) low regular involvement in PA (55.3%), although there were differences by gender and a higher percentage of males were involved in OSSP (male 71.8% vs. 39.9% female) and the majority of girls (60.1%) were not involved in any OSSP. Those data were in accordance with other study (Jankauskiene & Kardelis, 2005), that showed that only 11.6% of the girls practiced regularly PA, 29.6% were irregular and 58.8% were not engage in any form of leisure PA. In this study the main reason to engage in PA was to improve the BI (45.2%), health improvement (33.6%) and 21.2% reported other motives. Gender influences significantly on the results. Most studies show a difference in PA of about 20 % among boys and girls. Moreover, in some age groups, especially at the end of the school years, the percentage of girls who do not perform any practice of sport and PA rises to almost half of the population (about 47 %), while in the case of children this percentage decreases to approximately 25% (Hernández Álvarez, 2010; Babey, Hastert, Yu, & Brown, 2008).

Although some studies have suggested that the amount of PA declines with age (van Mechelen, Twisk, Post, Snel, & Kemper, 2000) we could no find any significant correlation or difference between age or academic level and total daily PA (PAQ-A score), as consequence the relationships between PA and BI variables might not be affected by multicollinearity. Finally, our differences must not be influenced by school environment,

UNIVERSIDAD DE MÁLAGA

since we did not find different proportions of participation by school.

The Relationship between BI and PA have been well documented in previous studies (Finne, Bucksch, Lampert, & Kolip, 2011; Fountoulakis, C., & Grogan, 2004). Adolescents with more positive BI may engage in PA because they do not perceive barriers to exhibit their bodies in public settings; this permitted us to speculate that PA may play a role in BIP and BS/BD.

Evidence from previous studies appears to suggest that some experience in PA is associated with better BI (Alley, 1991; L. A. Tucker & Mortell, 1993; Parks & Read, 1997; Camacho MJ, Fernández E, 2006; Campbell & Hausenblas, 2009; Urrutia, Azpillaga, de Cos, & Munoz, 2010; Slater & Tiggemann, 2011; Finne et al., 2011). In our analysis by groups of after-school sport and PA practice, significant differences in mean ranks of BC variables were found, except for weight and FFMI. BD was also significantly different between PA practice groups, so OSSP group reported a lower score in the BSQ and perceived BMI. In our knowledge there are not previous studies considering OSSP and NOSSP groups as an independent variable of BI, although there have been published analysis that have considered the sport practice as indicator BS or BD (Jaffee et al., 1999), and it seems that playing on school or non-school sport teams was associated with better BS (Kopcakova et al., 2014) and Body self perceptions (Veselska, Madarasova Geckova, Reijneveld, & van Dijk, 2011). Therefore, it was hypothesized that participation in OSSP and total daily

UNIVERSIDAD DE MÁLAGA

PA has a strong relevance for an enhanced body self-perception and thus a lower likelihood of BD, we could confirm this hypothesis by the significant negative correlation between PAQ-A score and BSQ score, and also from the significant differences on BSQ score ranks between NOSSP and OSSP, which is in accordance with previous studies (Martínez-Gómez D, 2007; Martínez-Gómez et al., 2009).

Gender seems to play an important role in the connection between BI and PA (Gillison, Standage, & Skevington, 2011), for example adolescent girls, who are engaged in PA practice perceive the latter as a sort of duty, and their motivation for PA may be related to their physical attractiveness, health benefits and feeling good about themselves, which may be connected with the way they perceive themselves (Gillison et al., 2011). While boys self-perception did not play such an important role as in girls, because their motivation for PA differs from girls. Boys are more engaged in team sports with the aim of being part of peer relationships, which is not connected directly with the way they perceive themselves (Veselska et al., 2011). In our adolescents, BI self-perception had similar proportions of after-school sport practice for lower (17) and upper (27 and 29) extreme categories. It was also interesting to note that there were more adolescents in the OSSP group in the BMI groups of those adolescents that perceived themselves as healthy (groups 19, 21 and 23). However, correlation analysis did not confirm a significant association between BMI_A-BMI_P difference and total daily PA (PAQ-A score), and

UNIVERSIDAD DE MÁLAGA

so we cannot confirm the hypothesis more volume of PA better body self-perception. Our result must be in accordance with findings from previous study, where the individual difference in actual body size and perceived body size or body size discrepancies have potential negative consequences for exercise motivation and this relationship differs among males and females, In contrast, other studies support the notion that participation in sports and activities that have a strong focus on appearance is related to higher levels of BIC (Slater & Tiggemann, 2011; Ingledew, Hardy, & Cooper, 1995; Ingledew & Sullivan, 2002).

A probable explanation for the previous disagreement could be related with body weight status and adiposity. So, some authors suggested relationship between PA and body self-perception may be valid only for obese and overweight people, who are more dissatisfied with their body sizes than normal weight people (Schwartz & Brownell, 2004) and reported higher BI scores (Fowler, 1989). Our results supported partially this evidence since significant negative correlations were found between BMI_A-BMI_P and all indexes of adiposity (FM, BMI and FMI). Several factors may have contributed to the high BSQ scores of the obese and overweight subjects. Firstly, since they are not extremely overweight, they may have been experienced to less negative social feedbacks. On the other hand, since the overweight adolescents does not have a large amount of weight to lose. Third, views on ideal weight status as defined by the norms of current society have changed in the last few years, with

UNIVERSIDAD DE MÁLAGA

the trend towards more tolerance and acceptance of the big body shapes.

The association between BID and PA has not yet been properly explored in quantitative research, and there is little evidence on the association between BI and PA in boys still. Inferences from previous studies (Kantanista, Osiński, Borowiec, Tomczak, & Król-Zielińska, 2015; Monteiro et al., 2011) concluded that higher levels of PA in adolescents had a protective effect on BD, which is independent of BMI or gender. We could confirm this evidence in our correlational analysis by an inverse relationship between PAQ-A and BSQ scores. Additionally, the logistic regression analysis, confirm PA participation is main determinant of BS independently of gender and age. Nonetheless, past research revealed that physical abilities must be the most important dimension of BS for boys (McCabe, A. E., Roberts, B. T., & Morris, 1991) and BMI is positively associated with BD (Newman, Thompson, & Roberts, 2006; Wardle & Cooke, 2005), as confirmed too in this sample of adolescents. In this line, it has been found participants between 9-23 years old, whom performed more PA and showed better self-concept of them (Moreno, Cervelló, & Moreno, 2008).

Sport and leisure time activities are not part of the lifestyle of the majority of the Spanish females and the value of PA or sport for BI perception is not well understood. It has been speculated that body-related perceptions may have lower importance than ability and fitness in determining female adolescents' PA behaviors (JM Moreno, ACM Baena,

UNIVERSIDAD DE MÁLAGA

2012). As consequence, information on the main difficulties to practice PA during leisure-time physical activities may provide clues to implement institutional actions aiming at the increase of this practice, preferably with the use of spaces at out-of school of time.

BD was strongly related with PA variables, conversely BIP was not associated with PA in the whole sample, although OSSP was more prevalent among students, whom qualified themselves in healthy BMI groups, this does not imply any positive relationship. The correlation analysis by gender confirms a significant inverse relationship between BIP and PAQ-A score for boys (rho= - 0.155) but not for girls.

This lack of association between PA and BI perception in girls could be explain by feelings of alienation arising from being unable to conform to a desired physique and conflict between sport participation and female ideology (N Armstrong & McManus, 1994). Also, early pubertal maturation may lead to low PA for variety of reason including both intrapersonal factor (e.g. body self-esteem, depression and perceived skillfulness) and interpersonal factor, which could be a reason to explain that early-maturing girls report a poorer BI perception than later maturing ones (Graber JA, Brooks-Gunn J, 1999). This finding could also be supported by having less discriminated function of body attractiveness for PA of girl (Hagger, Basil, & Stambulova, 1998).

UNIVERSIDAD DE MÁLAGA

Body Mass Index, Body Image and Physical Activity

A paradigm for a PA-related improvement in BI variables (BIP and as consequence BS) could be suggested by the influence of PA in BMI or BC variables. So, a first simplistic hypothetical mechanism would be more PA healthier BMI or BC, as consequence improved self-perception and BI satisfaction. On the other hand, exercise and PA has been proved to influence the activity of proprioceptive sense, which may help to perceive accurately body shape and body weight (Proske & Gandevia, 2012). We could not obtain any neurophysiological measurements to confirm these mechanisms, but a relationship between BI variables and BMI/BC adjusted by PA score and BI and BMI differences between OSSP groups may be a first step to prove this hypothesis. Additionally, if this mechanism is just related with BMI or BC analysis will add up additional information, it is also part of this discussion (next section of the discussion).

The association between BMI, BI and PA has been widely reported along the vital cycle (Mullan & Markland, 1997; Wilson, Tripp, & Boland, 2005) as higher BMI higher BSQ score. In the vast majority of studies, where a positive effect between exercise and BI was reported, PA was the best predictor of BI Satisfaction for male adolescents (See in Table 20). Our BMI values were positively correlated with BS for both males and females, and negatively with BMI self-perception. These finding were consistent with the previous research that indicated a negative relationship between BMI and BI such as BMI perception (McCabe & Ricciardelli, 2003; Morano,

UNIVERSIDAD DE MÁLAGA

Colella, & Capranica, 2011). A plausible connection between BMI, PA and BS was difficult to establish since no significant differences in BMI were found between groups of OSSP, which is accordance with a previous study (Lindomar da Silva-Filho, Alethéa C.Rabelo-Leitao, 2008).

We could observe strong associations between BMI and both BIP which may suggests BMI is important either body satisfaction and BIP during adolescence as proposed previously (Eisenberg, Neumark-Sztainer, Story, & Perry, 2005; Mellor et al., 2004; Morano et al., 2011). Although, only BSQ score (BD) was significantly different between OSSP groups, which may limit the importance of PA as a determinant of BI perception, which in accordance with a previous study (Lubans & Cliff, 2011). Moreover, the importance of participating in PA may be independent of relationship between BMI and BSQ score, since BMI between OSSP groups was not significantly different each other. This latter fact was confirmed in our logistic regression model, where OSSP was a predictor of BS but not BMI.

This study may complete current knowledge such that PA participation may follow the efficacy (PA as category) and efficiency criteria (PA as a continuous variable and plausible dose-response effect). So, our results have shown PA participation (OSSP group) may help to obtain better BSQ scores than none participation (efficacy criterion). Additionally, the negative relationship between BSQ and PA scores suggested higher volume of PA more BS (efficiency criterion). In previous studies have been focused mainly in the efficacy criteria (Furnham &

UNIVERSIDAD DE MÁLAGA

Calnan, 1998; Krane, 2001) and limited types of exercise (Williams & Cash, 2001). Although, there has not been enough evidence, where both efficiency and efficacy criteria have been analyzed in the same sample. These results may confirm and agree with previous research reporting separately a significant association between PA (efficiency criteria) and BI (Wetterhahn, Hanson, & Levy, 2002; Williams & Cash, 2001), and that participation in PA (efficacy criteria) BI (Mirza, Davis, & Yanovski, 2005; Furnham & Calnan, 1998; Krane, 2001), although only for BD in line with earlier studies (Markland, 1999; Crocker, Eklund, & Kowalski, 2000; Hagger et al., 1998; Raudsepp & Liblik, 2002; Stein et al., 2000). Finally it is important to note that we classified students as physically active, if they met at leas two days a week with one-hour duration of PE classes plus after school regular PA or sports practice. This may explain the discordance between current findings and that of previous research and BI may provide different conclusions depending on the measure of PA used (Michael J Duncan, Al-Nakeeb, Nevill, & Jones, 2006; M. J. Duncan, 2004).

While gender and age influence healthy BMI values (Cole et al., 2000), it could be suggested they have impact in the previously suggested PA-related mechanism, which connect PA, BMI and BI. BMI increases along childhood and adolescence and influences the BIP and appearance both men and women (Holsen et al., 2012). We could confirm the influence of age since it was a significant predictor of BS.

UNIVERSIDAD DE MÁLAGA

Regarding gender it seems BI and appearance are important for the participation of PA among adolescents of both sexes (Biddle & Fuchs, 2009); however we found boys were more provable satisfied with their bodies than girls, which was consistent with other studies (Kowalski et al., 2004) but independently of PA participation (differences in BSQ score for boys were higher than girls in both OSSP groups and the ß coefficient was positive in the logistic regression). Furthermore, PA participation was lower in females than males but not Z-score BMI, which may suggests again PA was most important than BMI for reporting BS. According to recent research (Gómez-López, Gallegos, & Extremera, 2010) participation in PA during leisure time decreases with aging, and women spend less time practicing moderate and vigorous PA. This could be influenced by the fact women need social support to exercise while men rely more in environmental factors (Sallis JF, Owen N, 2008), which may explain progressively low participation of women in PA outside the home, indicating possible stereotypes sexual level.

Our cross-sectional findings are consistent with the study by (Monteiro et al., 2011), who concluded that higher levels of PA in adolescent had a protective effect on BI dissatisfaction, which was independent of BMI of gender. Nevertheless, this analysis must not imply causality and follow-up studies and randomized control trials must be conducted in order to confirm these data.

In a subset of sample we assessed longitudinal changes during

UNIVERSIDAD DE MÁLAGA

one year. We could not find any relationship between PA and BSQ score changes. A previous longitudinal study explored associations between BS and health behaviors in adolescent boys and girls (Neumark-Sztainer et al., 2006), and they observed among females that lower levels of BS were associated with lower levels of PA independently of BMI. Additionally, results from other study (Hellin & Moreno, 2007) stood out that students who practice extracurricular sports have better scores on the body attractive, physically perceived more competent and better than their peers less active fitness, which was confirmed by the same group in other analysis (Moreno et al., 2008). These studies confirmed earlier cross-sectional analysis in a sample of Valencian students found that BI of the subjects improved with increasing their level of PA. (Pastor, Balaguer, & García-Merita, 2003), in accordance with our transversal study but not with the follow-up results.

There is still another controversy in the literature concerning the positive or negative effect of PA participation on BI variables. Some authors have proposed participation in PA is associated with a positive BI (MJ, 2005), a statement that had been confirmed more than fifteen years ago in intervention programs (L. A. Tucker & Mortell, 1993; Williams & Cash, 2001). A second line of evidence pointed out to a potentially negative effect of exercise on BI based on the relationship between the influence of practice and athletic performance and body perception of the subject and the likelihood of ED. This is a problem more related with

UNIVERSIDAD DE MÁLAGA

thinness and maybe athletic performance, so an excessive concern with the body size and shape may lead to undergo to a higher probability ED (Williamson et al., 1993). Although, anorexia and bulimic syndrome are prevalent and important concerns in our society (Peláez Fernández, Raich i Escursell, & Labrador Encinas, 2010); we barely recorded and assessed adolescents with excessive thinness and BD, which did not permit us to conduct a specific analysis by BMI categories (thinness, normal and overweight). However, in our ITT analysis by BC the group of adolescents, who accepted to participate in the BC assessment, had a higher probability to report BS. We speculate we could be analyzing a biased sample not only in BC variables but also for BMI, PA and BI variables; thus those with more serious concerns might not accept to participate in the study.

All these latter results and conclusions may be influence by the BMI does not inform about actual BC, and some of the differences we found between boys and girls could be influenced by difference in BC. Additionally, BMI healthy cut off change significantly every half year during adolescence (Cole et al., 2000) and as consequence adiposity assessment may be affected. Therefore, the analysis of the results from a BC perspective could contribute with additional information.

Body Composition, Body Image and Physical Activity

There is few evidence relating BC, PA and BI variables. Only some

UNIVERSIDAD DE MÁLAGA

studies with young adults has provided information in this regard (Fingeret et al., 2004; Williamson et al., 1993; Teixeira et al., 2006; Teixeira PJ1, Carraça EV, Markland D, Silva MN, 2012)).

In our study, BC variables (% FM, FM, FFM, FMI, FFMI) were positively correlated with BS, although the coefficients of correlation were similar or even lower than for BMI. Moreover, all variables were positively correlated with BSQ score, which may indicate that there is not any specific effect related with a BC component. This result can also confirm that using BMI values is enough to obtain valid results as to evaluate BI-related risk without requiring a more comprehensive analysis of the variables of BC.

Body dissatisfaction and Satisfaction determinants

Findings from previous research had reported overweight young females were more dissatisfied with their BI (Kakeshita & de Sousa Almeida, 2006), however, our results could not confirm this hypothesis. This discrepancy may be might be explained by the differences on subjects' characteristics enrolled in the studies, so other studies have only included female university students (Raich et al., 1996; Kakeshita & de Sousa Almeida, 2006; Weaver & Byers, 2006; Di Pietro & Silveira, 2009). We included boys and girls under eighteen years old and this without doubt influenced our results.

Female populations are at higher risk for negative BI than male

UNIVERSIDAD DE MÁLAGA

population (Elgin & Pritchard, 2006; Feingold & Mazzella, 1998). In our study, gender was a main determinant of BD, so adjusted odd ratios analysis indicated boys had 2.16 times higher probability of being classified as body satisfied than women. Age was another significant determinant of BS, with a positive odds ratio, which indicate that every year adolescents had 2.16 more probabilities to qualified themselves as body satisfied, this may be in agreement with our data of BD prevalence, where females has higher proportion of BD in the 4th level of education than the lower levels, but males did not showed this tendency. The group with BC analysis had a significant ß coefficient and was included in the BS prediction model, however we cannot give any rational explanation for this fact. Finally, PA was the most important determinant of BS, which was independent of BMI, age and gender. The mechanistic model that explains these results remains to be described, and may be an interesting starting point for future research.

These age differences were also confirmed after controlling for BMI, thus suggesting that other factor were involved in these changes during the transition from childhood to adolescence. In this stage of life, not only physical transformation of the body, but also emotional changes, and social expectations and responsibilities can modify self-perceptions, attitudes and behavior in adolescents (Waylen, A., &Wolke, 2004).

Inverse Hypothesis

In this study we suggest PA as independent variable and BI variables

UNIVERSIDAD DE MÁLAGA

as dependent, however this is not always accepted in the literature and an opposite relationship has been suggested. BI could also identified as a barrier to exercise, negative BI has been described as a primary reason to exercise participation (Brudzynski & Ebben, 2010; Slater & Tiggemann, 2011). For example, (Biddle & Fuchs, 2009) reported that BI and appearance were important for PA participation of female adolescent. Additionally, female adolescents may need of social support for PA participations, in accordance with (Dowda, Dishman, Pfeiffer, & Pate, 2007) social support from significant others during the adolescence period may be an influencing factor for PA of females. However, we did not analyze this hypothesis, which requires a different study design and instruments, but open interesting future research line.

Our results are especially important since it has been shown that the health status, perceived BI and self-esteem are significantly and positively associated (Urrutia et al., 2010) that PA and sports are means improve the health of the subject and prevent obesity (Katzmarzyk, Janssen, & Ardern, 2003) and that these practices have a positive effect on the physical aspect and the pleasure associated (Alley, 1991).

UNIVERSIDAD DE MÁLAGA

UNIVERSIDAD
DE MÁLAGA

CHAPTER VII: LONGITUDINAL STUDY.

UNIVERSIDAD DE MÁLAGA

UNIVERSIDAD
DE MÁLAGA

13. Longitudinal Changes in Body Satisfaction and Body Self-perception.-

As expected age, height and weight changed after a year of follow-up. Conversely, BMI and total daily PA as estimated from PAQ-A score did not modify (table 21). Regarding BI variables, BS was significantly diminished as assessed by BSQ and students rated significantly lower at first year than at second year of assessment their body self-perception (table 21).

Table 21. Changes in morphological variables, total daily physical activity, body satisfaction and body self-perception after 1-year of follow-up.

Variables		2011		2012		Wilcoxon Signed Ranks T.		
		Median	Range	Median	Range	- Ranks	+ Ranks	Sig.
Age	*(years)*	13.0	6.0	13.5	6.0	0	123	***
Height	*(m)*	1.6	0.5	1.6	0.5	5	120	***
Weight	*(kg)*	49.2	50.9	55.0	62.5	14	108	***
BMI	*(kg/m²)*	19.8	17.4	20.2	16.7	72	53	-
PAQ-A		2.8	2.9	2.8	3.2	60	60	-
BSQ		48.0	75.0	62.0	92.0	35	63	***
BMI_P	*(kg/m²)*	21.0	14.0	21.0	10.0	53	37	*

BMI, Body mass index, PAQ-A, Physical Activity Questionnaire for Adolescents; BSQ, Body Shape Questionnaire; BMI_P, Body mass index perceive.

UNIVERSIDAD DE MÁLAGA

After calculating absolute and relative (%) changes for BS (BSQ score) and PA (PAQ-A score) and split the results by gender, we could confirm that girls increased BD (higher score higher dissatisfaction) changed significantly either as percentage or absolute values. Moreover, these increments were significantly higher in girls than boys, whom only increase significantly the relative change (figure 13). Regarding changes in PA, either boys or girls did not modify significantly their absolute total daily PA (difference PAQ-A 2011-2012 = 0.155 ±0.841 and -0.172 ±0.728, girls and boys; $p>0.05$ for both), but girls increase their relative PAQ-A score (10.3 ±38.3%; $p<0.05$). Nevertheless, change differences between boys and girls were statistically significant both absolute (0.327 ±0.140; $p<0.05$) and relative (13.7 ±6.2%; $p<0.05$). None significant correlations were found between changes in PAQ-A score and any BI variable.

UNIVERSIDAD DE MÁLAGA

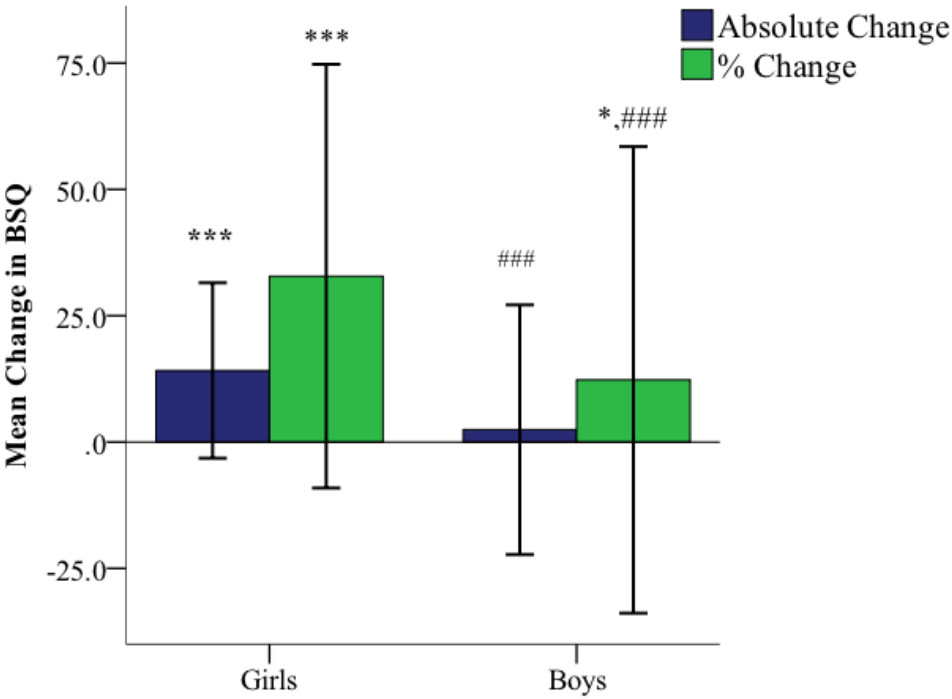

Figure 13. Absolute and relative changes (%) of body satisfaction (assessed by body shape questionnaire (BSQ)) after 1-year follow-up in adolescents. Error bars represent means and standard deviation.
*** and *, indicate *p<0.001* and *p<0.05* respectively for one sample T-test between the mean change and "0".
###, indicates *p<0.001* for paired sample T-test between boys and girls.

UNIVERSIDAD DE MÁLAGA

Finally, we tried to explore associations between changes in BSQ and total daily physical activity but we could find none association among these variables.

14. DISCUSSION LONGITUDINAL STUDY.-

Regarding de longitudinal analysis, the main findings were we observed adolescent reported significantly higher BSQ scores and lower BMI_P categories at second year than at the first. Moreover, these changes different between genders and only boys had a significant increase in absolute values; both scores were different when expressed as a percent of change, but the effect size in boys was higher than girls. Since our participants, were in the pubertal transition we can speculate that some hormonal and sociocultural variables maybe responsible for this increase in BD (BSQ score), however we had not any assessment of these variables, so we cannot confirm this hypothesis. In the cross sectional study, we describe that PA was a significant determinant of BD, which is in accordance with a meta-analysis of 57 studies (Campbell & Hausenblas, 2009), where PA intervention prove to influence changes in BD, however the changes in PA-Score was not associated with changes in BSQ, which may confirm that the quantity of PA assessed by PAQ-A did not explain changes in BD. This results do not may invalidate the utility of PA to manage BD or be in disagreement with the meta-analysis, since our adolescents did not change significantly PA.

UNIVERSIDAD DE MÁLAGA

BMI_P was reduced significantly, which means that they perceive themselves thinner although their BMI had not changed after the one-year of follow-up. The mechanism and reasons related with this misperception are not completely well described but wishes of thinner body shape may be plausible. This results is partially supported by previous studies, which suggests social issues as the origin of eating-related disorders and other psychological disturbances well-documented during adolescence, which are usually more prevalent among girls (Siegel, Yancey, Aneshensel, & Schuler, 1999; ter Bogt et al., 2006). This difference is kept even in athletes, so in (Parks & Read, 1997), 40% of females athletes from different sports overestimated 2 drawing levels with respect to their actual BMI, while that happened in 3% of males only. Considering our results we could confirm that the alteration in BMI_P and BD may be closely related.

It was still paradoxical that BSQ modification was higher in boys than girls and PA was increased significantly only in girls, and the later had greater positive changes than boys. These results are in disagreement with other studies, where a decrease in the PA practice during adolescence (Hallal, Victora, Azevedo, & Wells, 2006; Gómez-López et al., 2010) was described mainly in girls (Kopcakova et al., 2014; Butt, Weinberg, Breckon, & Claytor, 2011). This could help to explain the lower levels of BSQ score in girls, and we hypothesize that could be related with the aim of preserve the weight and BI during the pubertal transition during adolescence. However, it has been described that the desire of an improved BI must

UNIVERSIDAD DE MÁLAGA

not be enough to engage in higher levels of PA an so intrinsic motivation and intention to exercise are conditions of a consistent practice (Boone & Leadbeater, 2006).

It was interesting to confirm that even with significant changes in BD (BSQ) and body self-perception (BMI_P), we could no find differences in BMI (table 21), which may confirm an non-morphological dependent of BI. However, height and weight change significantly and may be due to natural biological maturation, and we cannot discard it is playing a role too, even a main morphological indicator we had, did not change (BMI). These results were no confirmed by the Carlson's study (2004), who found greater differences after one-year follow-up (19.65 and 20.64), we can speculated that a different maturational statuses could determine differences between both studies.

In our knowledge, there are not studies analyzing the same variables in a school context, which may help to enlarge the body of knowledge for intervention in the PE subject and body perception contents.

UNIVERSIDAD DE MÁLAGA

CHAPTER VII. CONCLUSIONS.

UNIVERSIDAD DE MÁLAGA

UNIVERSIDAD
DE MÁLAGA

15. CONCLUSIONS.-

- The evaluation of BI perception and BS in Spanish male and female adolescents in a school context permit us to describe the prevalence of BI distortion and BD in our sample. We could confirm the prevalence of BD was higher than the prevalence of BD, and the later was lower than that reported in previous Spanish studies in similar age groups. Also, the grade of distortion was higher in the extreme thinness and overweight and obesity groups.

- We could confirm that PA was positively associated BD score (BSQ) and with different levels of body self-perception.

- Students with after-school sport practice had significantly lower scores of BD, both males and females, although the former had higher values always than girls. Also, there were a higher proportion of OSSP in those students that select three lowest categories of body shape drawings.

- In this study, PA was the main determinant of BS, followed by age and gender. None morphological or BC variable was significant predictor of BS.

- There were significant increment in BD after one academic year, and this change was more important in boys than girls. Body self perception rates were also reduced which may indicated adolescents

UNIVERSIDAD DE MÁLAGA

underestimated their actual BMI. However, we could not confirm PA was related with these changes.

- Overall, these studies highlight the importance of the assessment of BI in the school context since our data show a high prevalence of BD and distortion. Finally, we could prove that PA is a main determinant of BS, which may confirm the relevance of the PE in the promotion of after-school sport and PA activity practice.

HYPOTHESIS

- PA will be positively negatively associated with BD and those adolescents more active will have lower distortion of their BI perception. We could confirm this hypothesis.
- Adolescents who engage in regular OSSP activities will have a more favorable self-image and lower BD than their counterparts with NOSSP. We could not confirm this hypothesis.
- Gender will not play an independent role in BD when adjusted for PA and BC variables (FM and FFM). We accepted the null hypothesis since gender was a significant determinant of BD.
- PA and BC variables will predict BD and BI distortion. This hypothesis was partially confirmed since PA participation was the main determinant of BD.

UNIVERSIDAD DE MÁLAGA

16. FUTURE RESEARCH.-

Based on the results and conclusions presented in previous sections, some research suggests prospects for future research investigations:

- Would be interesting to experiment with sample groups used in the study, manipulating some variables involved (type of PA, exercise intensity) in response checking the fulfillment of the objectives and hypotheses.

- Another line of research could lead to the performance of the professionals who run the extracurricular sports, changing its intervention groups to test the effect on the sample.

- Based on the investigations you can intervene directly on physical education classes and establishing a control group and an experimental and learn through a combination of subjective and objective testing more real values.

- Similarly, we propose a longitudinal study in the four years of compulsory secondary education to analyze the evolution of the physical self extracurricular depending on the sport.

UNIVERSIDAD DE MÁLAGA

17. REFERENCES.-

Abbott, B. D., & Barber, B. L. (2010). Embodied image: Gender differences in functional and aesthetic body image among Australian adolescents. *Body Image*, *7*(1), 22–31.

Akdemir, A., Inandi, T., Akbas, D., Kahilogullari, A. K., Eren, M., & Canpolat, B. I. (2012). Validity and reliability of a turkish version of the body shape questionnaire among female high school students: Preliminary examination. *European Eating Disorders Review*, *20*(1).

Alley, T. R. (1991). Visual detection of body-weight change in young-women. *Perceptual and Motor Skills*, *73*(3), 904–906.

Altabe, M., & Thompson, J. K. (1996). Body image: A cognitive self-schema construct? *Cognitive Therapy and Research*.

Altıntaş, a, Aşçı, F. H., Kin-İşler, a, Güven-Karahan, B., Kelecek, S., Ozkan, a, … Kara, F. M. (2013). The role of physical activity, body mass index and maturity status in body-related perceptions and self-esteem of adolescents. *Annals of Human Biology*, *4460*(5), 395–402.

Álvarez, C. (2004). (2004). Recomendaciones para la evaluación de la actividad física en población infantil. Revista Movimiento Humano y Salud. *Brettshneider*, *1*(1), 1–9.

Álvarez-Morán CI, L.-C. V, & C., I.-P. (2007). Artemisa El índice de masa corporal y la imagen corporal percibida como indicadores del estado nutricional en universitarios. *Rev Fac Med UNAM*, *50*(2), 76–79.

Alvero-Cruz, J. R., Alvarez Carnero, E., Fernández-García, J. C., Barrera Expósito, J., Carrillo de Albornoz Gil, M., & Sardinha, L. B. (2010). [Validity of body mass index and fat mass index as indicators of overweight status in Spanish adolescents: Esccola Study]. *Medicina Clínica*, *135*(1), 8–14.

Alwan, H., Viswanathan, B., Paccaud, F., & Bovet, P. (2011). Is Accurate Perception of Body Image Associated with Appropriate Weight-Control Behavior among Adolescents of the Seychelles. *Journal of Obesity*, *2011*, 817242.

UNIVERSIDAD DE MÁLAGA

Ansari, E., Dibba, E., & Stock, C. (2014). Body image concerns: levels, correlates and gender differences among students in the United Kingdom. *Cent Eur J Public Health*, *22*(2), 106–117.

Armstrong, N., & McManus, A. (1994). Children's fitness and physical activity - a challenge for physical education. *British Journal of Physical Education*, *25*(1), 20–26.

Armstrong, N., & Welsman, J. R. (2007). Aerobic fitness: what are we measuring? *Medicine and Sport Science*, *50*, 5–25.

Arroyo, M., Ansotegui, L., Pereira, E., Lacerda, F., Valador, N., Serrano, L., & Rocandio, A. M. (2008). Valoración de la composición corporal y de la percepción de la imagen en un grupo de mujeres universitarias del País Vasco. (Spanish). *Body composition assesment and body image perception in a group of university females of the basque country. (English)*, *23*(4), 366–372.

Arzu, D., Tuzun, E. H., & Eker, L. (2006). Perceived barriers to physical activity in university students. *Journal of Sports Science & Medicine*, *5*(4), 615–20.

Aşçi, F. H. (2004). Physical self-perception of elite athletes and nonathletes: a Turkish sample. *Perceptual and Motor Skills*, *99*(3 Pt 1), 1047–1052.

Babey, S. H., Hastert, T. a., Yu, H., & Brown, E. R. (2008). Physical Activity Among Adolescents. When Do Parks Matter? *American Journal of Preventive Medicine*, *34*(4), 345–348.

Baile Ayensa, J. I. (2002). *Diseño, construcción y validación de una escala de insatisfacción corporal para adolescentes*. Universidad Pública de Navarra.

Baile Ayensa, J. I., Monroy Martínez, K. E., & Garay Rancel, F. (2005). Alteración de la imagen corporal en un grupo de usuarios de gimnasios. *Red de Revistas Científicas de América Latina, El Caribe, España Y Portugal*, *10*(1), 161–169. Baile Ayensa, J. I. (2003). ¿Qué es la imagen corporal? *Cuadernos Del Marqués de San Adrián: Revista de Humanidades*, (2), 53–70.

Baile, J. I., María, R., & Garrido, E. (2003). Evaluación de Insatisfacción Corporal en adolescentes: Efecto de la forma de administración de una escala. *Anales de Psicología*, *19*, 187–192.

UNIVERSIDAD DE MÁLAGA

Barlett, C. P., Vowels, C. L., & Saucier, D. a. (2008). Meta-Analyses of the Effects of Media Images on Men's Body-image Concerns. *Journal of Social and Clinical Psychology*, *27*(3), 279–310. http://doi.org/10.1521/jscp.2008.27.3.279

Barnett, L. M., Ridgers, N. D., & Salmon, J. (2014). Associations between young children's perceived and actual ball skill competence and physical activity. *Journal of Science and Medicine in Sport*.

Behar A, R., Vargas F, C., & Cabrera V, E. (2011). Insatisfacción corporal en los trastornos de la conducta alimentaria: un estudio comparativo. Body dissatisfaction in eating disorders: a comparative study. *Revista Chilena de Neuro-Psiquiatria*, *49*(1), 26–36.

Bélanger, M., Casey, M., Cormier, M., Laflamme Filion, A., Martin, G., Aubut, S., … Beauchamp, J. (2011). Maintenance and decline of physical activity during adolescence: insights from a qualitative study. *International Journal of Behavioral Nutrition and Physical Activity*.

Bell, R. (2002). The effects of vigorous exercise during pregnancy on birth weight. *Journal of Science and Medicine in Sport / Sports Medicine Australia*, *5*(1), 32–6.

Bener, A., & Tewfik, I. (2006). Prevalence of overweight, obesity, and associated psychological problems in Qatari's female population. *Obesity Reviews : An Official Journal of the International Association for the Study of Obesity*, *7*(2), 139–145.

Berg, F. M. (1999). Health Risks Associated With Weight Loss and Obesity Treatment Programs. *Journal of Social Issues*, *55*(2), 277–297.

Bervoets, L., Van Noten, C., Van Roosbroeck, S., Hansen, D., Van Hoorenbeeck, K., Verheyen, E., … Vankerckhoven, V. (2014). Reliability and Validity of the Dutch Physical Activity Questionnaires for Children (PAQ-C) and Adolescents (PAQ-A). *Archives of Public Health = Archives Belges de Santé Publique*, *72*(1), 47.

Bibiloni, M. D. M., Pich, J., Córdova, A., Pons, A., & Tur, J. a. (2012). Association between sedentary behaviour and socioeconomic factors, diet and lifestyle among the Balearic Islands adolescents. *BMC Public Health*, *12*(1), 718.

UNIVERSIDAD DE MÁLAGA

Biddle, S. J. H., & Fuchs, R. (2009). Exercise psychology: A view from Europe. *Psychology of Sport and Exercise*, *10*(4), 410–419.

Blair, S. N., Cheng, Y., & Holder, J. S. (2001). Is physical activity or physical fitness more important in defining health benefits? *Medicine and Science in Sports and Exercise*, *33*(6 Suppl), S379–S399; discussion S419–S420.

Blair SN1, Cheng Y, H. J. (2001). Is physical activity or physical fitness more important in defining health benefits? *Med Sci Sports Exerc*, *33*(6), 79–99.

Blaivas, J. G., Levine, M. P., & Murnen, S. K. (2002). The effect of experimental presentation of thin media images on body satisfaction: A meta-analytic review. *International Journal of Eating Disorders*, *31*(1), 1–16.

Blond, A. (2008). Impacts of exposure to images of ideal bodies on male body dissatisfaction: A review. *Body Image*, *5*(3), 244–250.

Boone, E. M., & Leadbeater, B. J. (2006). Game on: Diminishing risks for depressive symptoms in early adolescence through positive involvement in team sports. *Journal of Research on Adolescence*, *16*(1), 79–90.

Borzekowski, D. L. G., & Bayer, A. M. (2005). Body image and media use among adolescents. *Adolescent Medicine Clinics*, *16*(2), 289–313.

Brennan, M. a, Lalonde, C. E., & Bain, J. L. (2010). Body Image Perceptions: Do Gender Differences Exist? *Psy Chi Journal of Undergraduate Research*, *15*(3), 130–138.

Brooks-Gunn, L. (1992). Growing up female: stressful events and transition to adolsecence. In Erlbaum (Ed.), *Stress and coping in infancy and childhood* (pp. 119–145).

Brudzynski, L., & Ebben, W. (2010). Body image as a motivator and barrier to exercise participation. *International Journal of Exercise Science*, *3*(1), 14–24.

Brunet, J., & Sabiston, C. M. (2009). Social physique anxiety and physical activity: A self-determination theory perspective. *Psychology of Sport and Exercise*, *10*(3), 329–335.

UNIVERSIDAD DE MÁLAGA

Brustad, R. J. (1993). Who will go out and play? Parental and psychological influences on children's attraction to physical activity. *Pediatric Exercise Science*, *5*, 210–223.

Bruusgaard, P., Smedbråten, B., Natvig, B., & Bruusgaard, D. (2000). [Physical activity and bodily pain in children]. *Tidsskrift for Den Norske Lægeforening :Tidsskrift for Praktisk Medicin, Ny Række*, *120*(26), 3173–5.

Bully, P., Elosua, P., & López Jáuregui, A. (2012). Insatisfacción corporal en la adolescencia: Evolución en una década. *Anales de Psicología*, *28*(1), 196–202.

Burrowes, N. (2013). Body image–a rapid evidence assessment of the literature. *Report for the Government Equalities Office*, (May).

Butt, J., Weinberg, R., Breckon, J., & Claytor, R. (2011). Adolescent physical activity participation and motivational determinants across gender, age, and race. *Journal of Physical Activity and Health*, *2011*, 1074–1083.

Cafri, G., Thompson, J. K., Ricciardelli, L., McCabe, M., Smolak, L., & Yesalis, C. (2005). Pursuit of the muscular ideal: Physical and psychological consequences and putative risk factors. *Clinical Psychology Review*, *25*(2), 215–239.

Calaf, M., León, M., Hilerio, C., & Rodríguez, J. (2005). Inventario de imagen corporal para féminas adolescentes (IICFA). *Interamerican Journal of Psychology*, *39*(3), 347–354.

Cale, L., & Almond, L. (1992). Physical activity levels of secondary-aged children: a review. *Health Education Journal*, *51*(4), 192.

Calogero, R. M., & Thompson, J. K. (2010). Gender and body image. In *Handbook of gender research in psychology* (Vol. 2, pp. 153–184).

Camacho MJ, Fernández E, R. M. (2006). Imagen corporal y práctica de actividad física en las chicas adolescentes: incidencia de la modalidad deportiva. *Revista Internacional de Ciencias Del Deporte.*, *3*(2), 1–19.

Campbell, A., & Hausenblas, H. a. (2009). Effects of exercise interventions on body image: a meta-analysis. *Journal of Health Psychology*, *14*(6), 780–793.

UNIVERSIDAD DE MÁLAGA

Carlson, E.A., & McAndrew, F.T. (2004). Body shape ideals and perceptions of body shape in Spanish and American college students. *Perceptual and Motor Skills*, *99*(3 Pt 1), 1071–1074.

Carlson Jones, D. (2004). Body image among adolescent girls and boys: a longitudinal study. *Developmental Psychology*, *40*(5), 823–835.

Borzekowski, D. L. G., & Bayer, A. M. (2005). Body image and media use among adolescents. *Adolescent Medicine Clinics*, *16*(2), 289–313.

Brennan, M. a, Lalonde, C. E., & Bain, J. L. (2010). Body Image Perceptions: Do Gender Differences Exist? *Psy Chi Journal of Undergraduate Research*, *15*(3), 130–138.

Brooks-Gunn, L. (1992). Growing up female: stressful events and transition to adolsecence. In Erlbaum (Ed.), *Stress and coping in infancy and childhood* (pp. 119–145).

Brudzynski, L., & Ebben, W. (2010). Body image as a motivator and barrier to exercise participation. *International Journal of Exercise Science*, *3*(1), 14–24.

Brunet, J., & Sabiston, C. M. (2009). Social physique anxiety and physical activity: A self-determination theory perspective. *Psychology of Sport and Exercise*, *10*(3), 329–335.

Brustad, R. J. (1993). Who will go out and play? Parental and psychological influences on children's attraction to physical activity. *Pediatric Exercise Science*, *5*, 210–223.

Bruusgaard, P., Smedbråten, B., Natvig, B., & Bruusgaard, D. (2000). [Physical activity and bodily pain in children]. *Tidsskrift for Den Norske Lægeforening :Tidsskrift for Praktisk Medicin, Ny Række*, *120*(26), 3173–5.

Bully, P., Elosua, P., & López Jáuregui, A. (2012). Insatisfacción corporal en la adolescencia: Evolución en una década. *Anales de Psicología*, *28*(1), 196–202.

Burrowes, N. (2013). Body image–a rapid evidence assessment of the literature. *Report for the Government Equalities Office*, (May).

Butt, J., Weinberg, R., Breckon, J., & Claytor, R. (2011). Adolescent physical activity participation and motivational determinants across gender,

UNIVERSIDAD DE MÁLAGA

age, and race. *Journal of Physical Activity and Health*, *2011*, 1074–1083.

Cafri, G., Thompson, J. K., Ricciardelli, L., McCabe, M., Smolak, L., & Yesalis, C. (2005). Pursuit of the muscular ideal: Physical and psychological consequences and putative risk factors. *Clinical Psychology Review*, *25*(2), 215–239.

Calaf, M., León, M., Hilerio, C., & Rodríguez, J. (2005). Inventario de imagen corporal para féminas adolescentes (IICFA). *Interamerican Journal of Psychology*, *39*(3), 347–354.

Cale, L., & Almond, L. (1992). Physical activity levels of secondary-aged children: a review. *Health Education Journal*, *51*(4), 192.

Calogero, R. M., & Thompson, J. K. (2010). Gender and body image. In *Handbook of gender research in psychology* (Vol. 2, pp. 153–184).

Camacho MJ, Fernández E, R. M. (2006). Imagen corporal y práctica de actividad física en las chicas adolescentes: incidencia de la modalidad deportiva. *Revista Internacional de Ciencias del Deporte.*, *3*(2), 1–19.

Campbell, A., & Hausenblas, H. a. (2009). Effects of exercise interventions on body image: a meta-analysis. *Journal of Health Psychology*, *14*(6), 780–793.

Carlson, E. A., & McAndrew, F. T. (2004). Body shape ideals and perceptions of body shape in Spanish and American college students. *Perceptual and Motor Skills*, *99*(3 Pt 1), 1071–1074.

Carlson Jones, D. (2004). Body image among adolescent girls and boys: a longitudinal study. *Developmental Psychology*, *40*(5), 823–835.

Carnero, E. A., & Sardinha, M. A. G. L. B. (2015). parte I: perspectiva histórica, *31*(5), 1957–1967.

Caruso, C. M., & Gill, D. L. (1992). Strengthening physical self-perceptions through exercise. *The Journal of Sports Medicine and Physical Fitness*, *32*, 416–427.

Cash, T. F. (2004). Body image: Past, present, and future. *Body Image*, *1*(1), 1–5.

Cash, T. F. (2012). Cognitive-behavioral perspectives on body image. In *Encyclopedia of Body Image and Human Appearance* (Vol. 1, pp. 334–342).

UNIVERSIDAD DE MÁLAGA

Cash, T. F., & Green, G. K. (1986). Body weight and body image among college women: perception, cognition, and affect. *Journal of Personality Assessment*, *50*(2), 290–301.

Cash, T. F., Morrow, J. a, Hrabosky, J. I., & Perry, A. a. (2004). How has body image changed? A cross-sectional investigation of college women and men from 1983 to 2001. *Journal of Consulting and Clinical Psychology*, *72*(6), 1081–1089.

Cash, T. F., & Pruzinsky, T. (1990). The psychology of physical appearance: Aesthetics, attributes, and images. In *Body Images: Development, Deviance, and Change* (pp. 51–79).

Cash, T. Pruzinsky, T. (1990). *Body Images: development, deviance and change*. *New Yok: The Guilford Press*.

Casillas-Estrella, M., Montaño-Castrejón, N., Reyes-Velázquez, V., & Jiménez-Cruz, A. (2006). A mayor IMC mayor grado de insatisfaccion de la imagen corporal. *Biomedica*, *17*(4), 243–249.

Caspersen, C. J., Powell, K. E., & Christenson, G. M. (1985). Physical activity, exercise, and physical fitness: definitions and distinctions for health-related research. *Public Health Reports*, *100*(2), 126–131.

Chaiton, M. O., Cohen, J. E., O'Loughlin, J., & Rehm, J. (2009). A systematic review of longitudinal studies on the association between depression and smoking in adolescents. *BMC Public Health*, *9*, 356.

Cohane, G. H., & Pope, H. G. (2001). Body image in boys: A review of the literature. *International Journal of Eating Disorders*, *29*(4), 373–379.

Cohen, A., McDonald, S., McIver, K., Pate, R., & Trost, S. (2014). Assessing physical activity during youth sport: the observational system for recording activity in children. *Pediatric Exercise Science*, *26*(2), 203–9.

Cole, T. J., Bellizzi, M. C., Flegal, K. M., & Dietz, W. H. (2000). Establishing a standard definition for child overweight and obesity worldwide: international survey. *BMJ (Clinical Research Ed.)*, *320*(7244), 1240–3.

COLLADO FERNÁNDEZ, D. (2005). Transmisión y adquisición de valores a través de un programa de Educación Física basado en el juego motor, en un grupo de alumnos y alumnas de Primero de la ESO. University of Granada.

UNIVERSIDAD DE MÁLAGA

Collins, M. E. (1991). Body Figure Perceptions and Preferences Among. *International Journal of Eating Disorders*, *10*(2), 199–208.

Commission, E. (2010). Sport and Physical Activity. Special Eurobarometer 334 (Wave 71.3). *TNS Opinion & Social/ Brussels*.

Cooper, P. J., Cooper, M. J., Cooper, Z., & Fairburn, C. G. (1987). The Development and Validation of the Body Shape Questionnaire. *International Journal of Eating Disorders*, *6*(4), 485–494.

Corbin, C. B. (2002). Physical Activity for Everyone: What Every Physical Educator Should Know about Promoting Lifelong Physical Activity. *Journal of Teaching in Physical Education*, *21*(2), 128–144.

Costa, L. da C. F., & de Vasconcelos, F. de A. G. (2010). Influence of socioeconomic, behavioral and nutritional factors on dissatisfaction with body image among female university students in Florianopolis, SC. *Revista Brasileira de Epidemiologia = Brazilian Journal of Epidemiology*, *13*(4), 665–676.

Crespo, C., Kielpikowski, M., Jose, P. E., & Pryor, J. (2010). Relationships Between Family Connectedness and Body Satisfaction: A Longitudinal Study of Adolescent Girls and Boys. *Journal of Youth and Adolescence*, *39*(12), 1392–1401.

Crocker, P. R., Bailey, D. a, Faulkner, R. a, Kowalski, K. C., & McGrath, R. (1997). Measuring general levels of physical activity: preliminary evidence for the Physical Activity Questionnaire for Older Children. *Medicine and Science in Sports and Exercise*, *29*(10), 1344–1349.

Crocker, P. R., Eklund, R. C., & Kowalski, K. C. (2000). Children's physical activity and physical self-perceptions. *Journal of Sports Sciences*, *18*(6), 383–394.

Cumming, S. P., Sherar, L. B., Gammon, C., Standage, M., & Malina, R. M. (2012). Physical Activity and Physical Self-Concept in Adolescence: A Comparison of Girls at the Extremes of the Biological Maturation Continuum. *Journal of Research on Adolescence*, *22*(4), 746–757.

Currie, C., Gabhainn, S. N., Godeau, E., Roberts, C., Smith, R., Currie, D., … Barnekow, V. (2008). *Inequalities in young people's health. HBSC international report from the 2005/2006 survey. Health policy for children and adolescents series No 5*.

UNIVERSIDAD DE MÁLAGA

Currie, C., Roberts, C., Morgan, A., Smith, R., Settertobulte, W., & Samdal, O. (2002). Young people's health in context Health behavior in School-aged Children (HBSC) study: international report from the 2001/2002 survey. *WHO*, (4), 110–119.

Cusumano, D. L., & Thompson, J. K. (1997). Body image and body shape ideals in magazines: exposure, awareness, and internalization. *Sex Roles*.

Davis, C.. & C. M. P. (1991). Body image and exercise: A study of relationships and comparisons between physically active men and women. *Sex Roles*, *25*, 33–44.

Davison, K. K., & Lawson, C. T. (2006). Do attributes in the physical environment influence children's physical activity? A review of the literature. *The International Journal of Behavioral Nutrition and Physical Activity*, *3*(1), 19.

Davison, T. E., & McCabe, M. P. (2006). Adolescent body image and psychosocial functioning. *The Journal of Social Psychology*, *146*(1), 15–30.

de Hoyo Lora Borja Sanudo, M. C. (2007). Body composition and physical activity like health parameters in children in a rural Sevillian population. [Spanish]. [References]. *RICYDE*, *Revista in*(6), 52–62.

Deo, P., y Bhullar, J. (1974). Relationship of physical efficiency to selfconcept, intelligence and achievement. *Psychological Studies*, *19*, 56–59.

Devís Devís, J., & Cantera Garde, M.A. (2002). La promoción de la actividad física relacionada con la salud en el ámbito escolar: Implicaciones y propuestas a partir de un estudio realizado entre adolescentes. *Apunts: Educación Física Y Deportes*, 54–63

Devis, J., & Peiro, C. (1993). La actividad física y la promoción de la salud en niños/as y jóvenes: la escuela y la educación física. *párvulos Revista de Psicología del Deporte*, *1*, 71–86.

Di Pietro, M., & Silveira, D. X. da. (2009). Internal validity, dimensionality and performance of the Body Shape Questionnaire in a group of Brazilian college students. *Revista Brasileira de Psiquiatria (Sao Paulo, Brazil: 1999)*, *31*(1), 21–24.

UNIVERSIDAD DE MÁLAGA

Dionne, M. M., & Davis, C. (2004). Body image variability: The influence of body-composition information and neuroticism on young women's body dissatisfaction. *Body Image*, *1*(4), 335–349.

dos Santos, D. M., & Sichieri, R. (2005). Índice de massa corporal e indicadores antropométricos de adiposidade em idosos Body mass index and measures of adiposity among elderly adults. *Revista de Saúde Pública*, *39*(2), 163–168.

Dowda, M., Dishman, R. K., Pfeiffer, K.A., & Pate, R. R. (2007). Family support for physical activity in girls from 8th to 12th grade in South Carolina. *Preventive Medicine*, *44*(2), 153–9.

Drewnowski, A., & Yee, D. K. (1987). Men and body image: are males satisfied with their body weight? *Psychosomatic Medicine*, *49*, 626–634.

Duncan, M. J. (2004). Body image and physical activity in British secondary school children. *European Physical Education Review*, *10*(3), 243–260.

Duncan, M. J., Al-Nakeeb, Y., Nevill, A. M., & Jones, M. V. (2006). Body dissatisfaction, body fat and physical activity in British children. *International Journal of Pediatric Obesity : IJPO : An Official Journal of the International Association for the Study of Obesity*, *1*(2), 89–95.

Durkin, S. J., & Paxton, S. J. (2002). Predictors of vulnerability to reduced body image satisfaction and psychological wellbeing in response to exposure to idealized female media images in adolescent girls. *Journal of Psychosomatic Research*, *53*(5), 995–1005.

Dyremyhr, A. E., Diaz, E., & Meland, E. (2014). How adolescent subjective health and satisfaction with weight and body shape are related to participation in sports. *Journal of Environmental and Public Health*, *2014*, 851932.

Eccles, J. S., & Harold, R. D. (1991). Gender differences in sport involvement: Applying the eccles' expectancy-value model. *Journal of Applied Sport Psychology*, *3* (April 2014), 7–35.

Eisenberg, M. E., Neumark-Sztainer, D., Story, M., & Perry, C. (2005). The role of social norms and friends' influences on unhealthy weight-control behaviors among adolescent girls. *Social Science & Medicine*, *60*(6), 1165–1173.

UNIVERSIDAD DE MÁLAGA

El Ansari, W., Clausen, S. V., Mabhala, A., & Stock, C. (2010). How do i look? Body image perceptions among university students from England and Denmark. *International Journal of Environmental Research and Public Health*, *7*(2), 583–595.

El Ghoch, M., Soave, F., Calugi, S., & Dalle Grave, R. (2013). Eating disorders, physical fitness and sport performance: A systematic review. *Nutrients*, *5*, 5140–5160.

Elgin, J., & Pritchard, M. (2006). Gender differences in disordered eating and its correlates. *Eating and Weight Disorders*, *11*(3), e96–e101.

Esberger, K. (2011). *Body image. A Handbook of Science, Practice and Prevention*. *Journal of gerontological nursing* (Vol. 4).

Espinosa Cuevas, M. Á., Rivas Rodríguez, L., González Medina, E. C., Atilano Carsi, X., Miranda Alatriste, P., & Correa Rotter, R. (2007). Vectores de impedancia bioeléctrica para la composición corporal en población mexicana. *Revista de Investigación Clínica*, *59*(1), 15–24.

Ettarh, R., Van de Vijver, S., Oti, S., & Kyobutungi, C. (2013). Overweight, obesity, and perception of body image among slum residents in Nairobi, Kenya, 2008-2009. *Preventing Chronic Disease*, *10*(4), E212.

Evans, C., & Dolan, B. (1993). Body Shape Questionnaire: derivation of shortened "alternate forms". *The International Journal of Eating Disorders*, *13*(3), 315–321.

Fallon, A. E., & Rozin, P. (1985). Sex differences in perceptions of desirable body shape. *Journal of Abnormal Psychology*, *94*(1), 102–105.

Farah Wahida, Z., Mohd Nasir, M. T., & Hazizi, a. S. (2011). Physical activity, eating behaviour and body image perception among young adolescents in Kuantan, Pahang, Malaysia. *Malaysian Journal of Nutrition*, *17*, 325–336.

Farhat, T., Iannotti, R. J., & Caccavale, L. J. (2014). Adolescent overweight, obesity and chronic disease-related health practices: mediation by body image. *Obesity Facts*, *7*(1), 1–14.

Fawkner, S., Henretty, J., Knowles, A.-M., Nevill, A., & Niven, A. (2014). The influence of maturation, body size and physical self-perceptions on longitudinal changes in physical activity in adolescent girls. *Journal of*

UNIVERSIDAD DE MÁLAGA

Sports Sciences, *32*(4), 392–401.

Feingold, A., & Mazzella, R. (1998). Gender Differences in Body Image Are Increasing. *Psychological Science*, *9*(3), 190–195.

Felker, D. W., y Kay, R. S. (1971). Self-concept, sports interests, sport participation and body type of seventh and eighth grade boys. *Journal of Psychology*, *78*, 223–228.

Fernández, I. C., & Solá, I. B. (1994). Patrones fe Actividades Físicas rn Niños y Adolescentes. *Educaciín Física y Deportes*, *22*(54), 22–29.

Ferron, C., Narring, F., Cauderay, M., & Michaud, P. a. (1999). Sport activity in adolescence: Associations with health perceptions and experimental behaviours. *Health Education Research*, *14*(2), 225–233.

Field, A. (2012). *Discovering Statistics Using SPSS*. *Statistics* (Vol. 58). Retrieved from

Fingeret, M. C., Gleaves, D. H., & Pearson, C. a. (2004). On the methology of body image assessment: The use of figural rating scales to evaluate body dissatisfaction and the ideal body standards of women. *Body Image*, *1*(2), 207–212.

Finne, E., Bucksch, J., Lampert, T., & Kolip, P. (2011). Age, puberty, body dissatisfaction, and physical activity decline in adolescents. Results of the German Health Interview and Examination Survey (KiGGS). *International Journal of Behavioral Nutrition and Physical Activity*, *8*(1), 119.

Fisher, A., Lange, M. A., Young-Cureton, V., & Canham, D. (2005). The relationship between perceived and ideal body size and body mass index in 3rd-grade low socioeconomic Hispanic children. *J Sch Nurs*, *21*(1059-8405 (Print)), 224–228.

Fitzsimmons-Craft, E. E., Bardone-Cone, A. M., Wonderlich, S. a., Crosby, R. D., Engel, S. G., & Bulik, C. M. (2015). The Relationships Among Social Comparisons, Body Surveillance, and Body Dissatisfaction in the Natural Environment. *Behavior Therapy*, *46*(2), 257–271.

Flegal, K. M., Carroll, M. D., Kit, B. K., & Ogden, C. L. (2012). Prevalence of obesity and trends in the distribution of body mass index among US adults, 1999-2010. *JAMA :The Journal of the American Medical Association*, *307*(5), 491–7. http://doi.org/10.1001/jama.2012.39

UNIVERSIDAD DE MÁLAGA

Foster Page, L.A., Thomson, W.M., Jokovic, A., & Locker, D. (2008). Epidemiological evaluation of short-form versions of the Child Perception Questionnaire. *European Journal of Oral Sciences*, *116*(6), 538–544.

Foundation, A.A. of U.W. E. (1992). *How schools shortchange girls: The AAUW report. A study of major findings in education*. Washington (DC).

Fountoulakis, C., & Grogan, S. (2004). An investigation of the links between body image and exercise participation. *Sport & Exercise Psychology Review.*, *10*, 19–30.

Fowler, B.A. (1989). The relationship of body image perception and weight status to recent change in weight status of the adolescent female. *Adolescence*, *24*(95), 557–568.

Franklin, J., Denyer, G., Steinbeck, K. S., Caterson, I. D., & Hill, A. J. (2006). Obesity and risk of low self-esteem: a statewide survey of Australian children. *Pediatrics*, *118*(6), 2481–2487.

Franzoi, S. L., & Shields, S. a. (1984). The Body Esteem Scale: multidimensional structure and sex differences in a college population. *Journal of Personality Assessment*.

Freedman, R. J. (1984). Reflections on Beauty as It Relates to Health in Adolescent Females. *Women & Health*, *9*(2-3), 29–45.

Frisén, A., & Holmqvist, K. (2010). What characterizes early adolescents with a positive body image? A qualitative investigation of Swedish girls and boys. *Body Image*, *7*(3), 205–212.

Fuchs, T., Eschenbeck, H., Krug, S., Schlaud, M., & Kohlmann, C. W. (2012). Perception Makes the Difference: The Association of Actual and Perceived Weight Status with Self-Reported and Parent-Reported Personal Resources and Well-Being in Adolescents. *Applied Psychology: Health and Well-Being*, *4*(3), 321–340.

Furnham, A., Badmin, N., & Sneade, I. (2002). Body image dissatisfaction: gender differences in eating attitudes, self-esteem, and reasons for exercise. *The Journal of Psychology*, *136*(6), 581–596.

Furnham, A., & Calnan, A. (1998). Eating disturbance, self-esteem, reasons for exercising and body weight dissatisfaction in adolescent males. *European Eating Disorders Review*, *6*(1), 58–72.

UNIVERSIDAD DE MÁLAGA

Furnham, A., Titman, P., & Sleeman, E. (1994). Perception of Female Body Shapes as a Function of Exercise. *Journal of Social Behavior and Personality*, *9*(2), 335–352.

García, L. (2010). Diagrama de Flujo. *Folios Colombia*, *2*(1), 1–16.

Gardner, R. M. (2014). Weight status and the perception of body image in men. *Psychology Research and Behavior Management*, *7*, 175–184.

Gardner, R. M., Stark, K., Friedman, B. N., & Jackson, N. a. (2000). Predictors of eating disorder scores in children ages 6 through 14. A longitudinal study. *Journal of Psychosomatic Research*, *49*, 199–205.

Gavarry, O., & Falgairette, G. (2004). Habitual physical activity during development. *Canadian Journal of Applied Physiology-Revue Canadienne De Physiologie Appliquee*, *29*(2), 201–220.

Gillison, F. B., Standage, M., & Skevington, S. M. (2011). Motivation and body-related factors as discriminators of change in adolescents' exercise behavior profiles. *The Journal of Adolescent Health : Official Publication of the Society for Adolescent Medicine*, *48*(1), 44–51.

Glenmark, B., Hedberg, G., & Jansson, E. (1994). Prediction of physical activity level in adulthood by physical characteristics, physical performance and physical activity in adolescence: an 11-year follow-up study. *Eur J Appl Physiol Occup Physiol*, *69*(6), 530–538.

Goldfield, G. S. (2009). Predictors of response to an intervention modifying physical activity and sedentary behavior in overweight/obese children: attitudes vs. behavior. *Journal of Physical Activity and Health*, *6*, 463–6.

Goldfield, G. S., Henderson, K., Buchholz, A., Obeid, N., Nguyen, H., & Flament, M. F. (2011). Physical activity and psychological adjustment in adolescents. *Journal of Physical Activity & Health*, *8*(2), 157–163.

Gómez Peresmitré, G. (1995). Peso real, peso imaginario y distorsión de la imagen corporal. *Rev Mex Psicol.*, *12*, 185–198.

Gómez-López, M., Gallegos, A. G., & Extremera, A. B. (2010). Perceived barriers by university students in the practice of physical activities. *Journal of Sports Science and Medicine*, *9*(3), 374–381.

UNIVERSIDAD DE MÁLAGA

Franklin, J., Denyer, G., Steinbeck, K. S., Caterson, I. D., & Hill, A. J. (2006). Obesity and risk of low self-esteem: a statewide survey of Australian children. *Pediatrics*, *118*(6), 2481–2487.

Franzoi, S. L., & Shields, S. a. (1984). The Body Esteem Scale: multidimensional structure and sex differences in a college population. *Journal of Personality Assessment*.

Freedman, R. J. (1984). Reflections on Beauty as It Relates to Health in Adolescent Females. *Women & Health*, *9*(2-3), 29–45.

Frisén, A., & Holmqvist, K. (2010). What characterizes early adolescents with a positive body image? A qualitative investigation of Swedish girls and boys. *Body Image*, *7*(3), 205–212.

Fuchs, T., Eschenbeck, H., Krug, S., Schlaud, M., & Kohlmann, C. W. (2012). Perception Makes the Difference: The Association of Actual and Perceived Weight Status with Self-Reported and Parent-Reported Personal Resources and Well-Being in Adolescents. *Applied Psychology: Health and Well-Being*, *4*(3), 321–340.

Furnham, A., Badmin, N., & Sneade, I. (2002). Body image dissatisfaction: gender differences in eating attitudes, self-esteem, and reasons for exercise. *The Journal of Psychology*, *136*(6), 581–596.

Furnham, A., & Calnan, A. (1998). Eating disturbance, self-esteem, reasons for exercising and body weight dissatisfaction in adolescent males. *European Eating Disorders Review*, *6*(1), 58–72.

Furnham, A., Titman, P., & Sleeman, E. (1994). Perception of Female Body Shapes as a Function of Exercise. *Journal of Social Behavior and Personality*, *9*(2), 335–352.

Gardner, R. M. (2014). Weight status and the perception of body image in men. *Psychology Research and Behavior Management*, *7*, 175–184.

Gardner, R. M., Stark, K., Friedman, B. N., & Jackson, N. a. (2000). Predictors of eating disorder scores in children ages 6 through 14. A longitudinal study. *Journal of Psychosomatic Research*, *49*, 199–205. http://doi.org/10.1016/S0022-3999(00)00172-0

Gavarry, O., & Falgairette, G. (2004). Habitual physical activity during development. *Canadian Journal of Applied Physiology-Revue Canadienne*

UNIVERSIDAD DE MÁLAGA

De Physiologie Appliquee, *29*(2), 201–220.

Gillison, F. B., Standage, M., & Skevington, S. M. (2011). Motivation and body-related factors as discriminators of change in adolescents' exercise behavior profiles. *The Journal of Adolescent Health : Official Publication of the Society for Adolescent Medicine*, *48*(1), 44–51.

Glenmark, B., Hedberg, G., & Jansson, E. (1994). Prediction of physical activity level in adulthood by physical characteristics, physical performance and physical activity in adolescence: an 11-year follow-up study. *Eur J Appl Physiol Occup Physiol*, *69*(6), 530–538.

Goldfield, G. S. (2009). Predictors of response to an intervention modifying physical activity and sedentary behavior in overweight/obese children: attitudes vs. behavior. *Journal of Physical Activity and Health*, *6*, 463–6.

Goldfield, G. S., Henderson, K., Buchholz, A., Obeid, N., Nguyen, H., & Flament, M. F. (2011). Physical activity and psychological adjustment in adolescents. *Journal of Physical Activity & Health*, *8*(2), 157–163.

Gómez Peresmitré, G. (1995). Peso real, peso imaginario y distorsión de la imagen corporal. *Rev Mex Psicol.*, *12*, 185–198.

Gómez-López, M., Gallegos, A. G., & Extremera, A. B. (2010). Perceived barriers by university students in the practice of physical activities. *Journal of Sports Science and Medicine*, *9*(3), 374–381.

Gómez-Mármol, A. (2013). Relación entre la autopercepción de la imagen corporal y las clases de educación física, según su nivel de intensidad y diversión, en alumnos de educación secundaria. *Motricidad: European Journal of Human Movement*, *31*, 99–109.

Gómez-Mármol, A., Sánchez-Alcaraz, B.J. & Mahedero, M. (2013). Insatisfacción y distorsión de la imagen corporal en adolescentes de doce a diecisiete años de edad. *Ágora Para La Educación Física y el Deporte*, *15*(1), 54–63.

González-Montero de Espinosa, M. André, A. García-Petuya, E. López-Ejeda, N. Mora, A. Marrodán, M. (2010). Asociación entre actividad física y percepción de la imagen corporal en adolescentes madrileños. *Nutrición Clínica y Dietética Hospitalaria*, *30 (03)*, 4–12.

Goñi, A. y Zulaika, L. (2000). Relationships between physical education

UNIVERSIDAD DE MÁLAGA

classes and the enhancement of fifth grade pupils' self-concept. *Perceptual Motor Skills*, *97*(1), 246–250.

Goodwin, H., Haycraft, E., & Meyer, C. (2014). Sociocultural risk factors for compulsive exercise: A prospective study of adolescents. *European Eating Disorders Review*, *22*(5), 360–365.

Goswami, S., Sachdeva, S., & Sachdeva, R. (2012). Body image satisfaction among female college students. *Industrial Psychiatry Journal*, *21*(2), 168–72.

Gowers, S.G. y Shore, A. (2001). Development of weight and shape cocerns in the eatiology of eating disorders. *British Journal of Phychiatry, 179*, 236–242.

Grabe, S., Ward, L. M., & Hyde, J. S. (2008). The role of the media in body image concerns among women: a meta-analysis of experimental and correlational studies. *Psychological Bulletin*, *134*(3), 460–476.

Graber JA, Brooks-Gunn J, W. M. (1999). The vulnerable transition: puberty and the development of eating pathology and negative mood. *Women Health Iss*, *9*, 107–114.

Greguol, M., Gobbi, E., & Carraro, A. (2014). Physical activity practice, body image and visual impairment: A comparison between Brazilian and Italian children and adolescents. *Research in Developmental Disabilities*, *35*(4), 21–26.

Grogan, S. (2006). Body image and health: contemporary perspectives. *Journal of Health Psychology*, *11*(4), 523–530.

Guinn, B., Semper, T., Jorgensen, L., & Skaggs, S. (1997). Body image perception in female Mexican-American adolescents. *Journal of School Health*, *67*(3), 112–115.

Hagger, M., Basil, A., & Stambulova, N. (1998). Russian and British Children's Physical Self-Perceptions and Physical Activity Participation. *Human Kinetics Journals*, *10*(2), 137–152.

Hallal, P. C., Victora, C. G., Azevedo, M. R., & Wells, J. C. (2006). Adolescent physical activity and health: a systematic review. *Sports Med*, *36*(12), 1019–1030.

UNIVERSIDAD DE MÁLAGA

Hallal, P. C., Victora, C. G., Azevedo, M. R., & Wells, J. C. K. (2006). Adolescent Physical Activity and Health. *Sports Medicine*, *36*(12), 1019–1030.

Halmi, K. A. (1983). The state of research in anorexia nervosa and bulimia. *Psychiatr Dev*, *1*(3), 247–262.

Hargreaves, D. a, & Tiggemann, M. (2006). "Body image is for girls": a qualitative study of boys' body image. *Journal of Health Psychology*, *11*(4), 567–576.

Haroun, D., Croker, H., Viner, R. M., Williams, J. E., Darch, T. S., Fewtrell, M. S., … Wells, J. C. K. (2009). Validation of BIA in obese children and adolescents and re-evaluation in a longitudinal study. *Obesity (Silver Spring, Md.)*, *17*(12), 2245–2250.

Haroun, D., Taylor, S. J. C., Viner, R. M., Hayward, R. S., Darch, T. S., Eaton, S., … Wells, J. C. K. (2010). Validation of bioelectrical impedance analysis in adolescents across different ethnic groups. *Obesity (Silver Spring, Md.)*, *18*(6), 1252–1259.

Haskell, W. L., Lee, I. M., Pate, R. R., Powell, K. E., Blair, S. N., Franklin, B. a., … Bauman, A. (2007). Physical activity and public health: Updated recommendation for adults from the American College of Sports Medicine and the American Heart Association. *Medicine and Science in Sports and Exercise*, *39*(8), 1423–1434.

Hausenblas, H. A., & Fallon, E. A. (2002). Relationship among body image, exercise behavior, and exercise dependence symptoms. *The International Journal of Eating Disorders*, *32*(2), 179–85.

Hausenblas, H. a., & Fallon, E. a. (2006). Exercise and body image: A meta-analysis. *Psychology & Health*, *21*(1), 33–47.

Held, C., Iqbal, R., Lear, S. a., Rosengren, A., Islam, S., Mathew, J., & Yusuf, S. (2012). Physical activity levels, ownership of goods promoting sedentary behaviour and risk of myocardial infarction: Results of the INTERHEART study. *European Heart Journal*, *33*, 452–466. Hellin, G., & Moreno, J. antonio. (2007). Motivación, autoconcepto físico, disciplina y orientación disposicional en estudiantes de educación física, 251.

Heras Gómez, E., Palacios Gil-Antuñano, N., Sainz Fernández, L., & Serna de Pedro, I. de la (dir. . (2004). Alteración de la percepción de la imagen

UNIVERSIDAD DE MÁLAGA

corporal en el deporte. *Monografías de Psiquiatría*, *16*(2), 32–40.

Hernández Álvarez, J. . & R.V. (2010). La educación física, los estilos de vida y los adolescentes: cómo se ven, qué saben y qué opinan. (Grao., Ed.) La educación física, los estilos de vida y los adolescentes: cómo se ven, qué saben y qué opinan. Barcelona.

Hernández de Vera, O. (2008). (Thesis). *La Condición Física, hábitos de vida y salud del alumnado de Educación Secundaria del norte de la isla de Gran Canaria*. UNIVERSITY OF LAS PALMAS G.C.

Hernández-Alcántara, A., Arechiga-Viramontes, J., & Martínez, C. P. (2009). Alteración de la imagen corporal en gimnastas. *Archivos de Medicina del Deporte*, *26*(130), 84–92.

Hernández-Prado, B., Campuzano, J. C., Salmerón Pintos, J., & Osuna Ramírez, I. (2006). Indice de masa corporal y percepción de la imagen corporal en una población adulta mexicana: la precisión del autorreporte. *Salud Pública de México*.

Higgins JPT & Green, S. (2008). Cochrane Handbook for Systematic Reviews of. *The Cochrane Collaboration*.

Holmstrom, A. J. (2004). The effects of the media on body image : A meta-analysis. *Journal of Broadcasting & Electronic Media*, *48*(2), 196–217.

Holsen, I., Jones, D. C., & Birkeland, M. S. (2012). Body image satisfaction among Norwegian adolescents and young adults: A longitudinal study of the influence of interpersonal relationships and BMI. *Body Image*, *9*(2), 201–208.

Hrabosky, J. I., Masheb, R. M., White, M. A., Rothschild, B. S., Burke-Martindale, C. H., & Grilo, C. M. (2006). A prospective study of body dissatisfaction and concerns in extremely obese gastric bypass patients: 6- and 12-month postoperative outcomes. *Obesity Surgery*, *16*(12), 1615–1621.

Huang, J. S., Norman, G. J., Zabinski, M. F., Calfas, K., & Patrick, K. (2007). Body image and self-esteem among adolescents undergoing an intervention targeting dietary and physical activity behaviors. *The Journal of Adolescent Health: Official Publication of the Society for Adolescent Medicine*, *40*(3), 245–51.

UNIVERSIDAD DE MÁLAGA

Huerta, R. B., Campos, S. C., & Cruzado, L. (2012). Insatisfacción corporal en estudiantes de medicina de la Universidad Peruana Cayetano Heredia medida con el Body Shape. *Rev Neuropsiquiatr*, *75, núm.3*, 85–92.

Ibarzábal, F. a., & Caracuel Tubío, J. C. (2008). Imagen Corporal En Varones Fisicoculturistas. *Acta Colombiana de Psicología*, *11*(1), 75–88.

Ignacio, J., Ayensa, B., Grima, F. G., Landívar, E. G., & Questionnaire, S. (2002). Insatisfacción corporal en adolescentes medida con el Body Shape Questionnaire (BSQ): efecto del anonimato, el sexo y la edad 1. *International Journal of Clinical and Health Psychology*, *2*, 439–450.

Inchley, J., Kirby, J., & Currie, C. (2011). Longitudinal changes in physical self-perceptions and associations with physical activity during adolescence. *Pediatric Exercise Science*, *23*(2), 237–249.

Ingledew, D. K., Hardy, L., & Cooper, C. L. (1995). Latent class analysis applied to health behaviours. *Personality and Individual Differences*, *19*(1), 13–20.

Ingledew, D. K., & Sullivan, G. (2002). Effects of body mass and body image on exercise motives in adolescence. *Psychology of Sport and Exercise*, *3*(4), 323–338.

Izgiç, F., Akyüz, G., Doğan, O., & Kuğu, N. (2004). Social phobia among university students and its relation to self-esteem and body image. *Canadian Journal of Psychiatry*, *49*(1), 630–634.

Jaffee, L., Lutter, J. M., Rex, J., Hawkes, C., & Bucaccio, P. (1999). Incentives and barriers to physical activity for working women. *American Journal of Health Promotion*, *13*(4), 215–218.

Jankauskiene, R., & Kardelis, K. (2005). Body image and weight reduction attempts among adolescent girls involved in physical activity. *Medicina (Kaunas, Lithuania)*, *41*(9), 796–801.

Janz, K. F., Dawson, J. D., & Mahoney, L. T. (2000). Tracking physical fitness and physical activity from childhood to adolescence: the muscatine study. *Med Sci Sports Exerc*, *32*(7), 1250–1257.

Janz, K. F., Lutuchy, E. M., Wenthe, P., & Levy, S. M. (2008). Measuring activity in children and adolescents using self-report: PAQ-C and PAQ-A. *Medicine and Science in Sports and Exercise*, *40*(4), 767–772.

UNIVERSIDAD DE MÁLAGA

Jáuregui-Lobera, I., Ezquerra-Cabrera, M., Carbonero-Carreño, R., & Ruiz-Prieto, I. (2013). Weight Misperception, Self-Reported Physical Fitness, Dieting and Some Psychological Variables as Risk Factors for Eating Disorders. *Nutrients*, *5*(11), 4486–4502.

JM Moreno, ACM Baena, J. G. (2012). Motives of Practice Physical Activity and Sport in Spanish Adolescents at the End of their Secondary Education. *Electronic Journal of Research in Educational Psychology*, *10*(1), 371–396.

Jones, D. C., & Smolak, L. (2011). Body Image during Adolescence: A Developmental Perspective. In *Encyclopedia of Adolescence* (Vol. 1, pp. 77–86).

Kabir, Y., Zafar, T. a, & Waslien, C. (2013). Relationship between perceived body image and recorded body mass index among Kuwaiti female university students. *Women & Health*, *53*(7), 693–705.

Kakeshita, I. S., & de Sousa Almeida, S. (2006). [Relationship between body mass index and self-perception among university students]. *Revista de Saúde Pública*, *40*(3), 497–504.

Kaminsky, L. a., & Dewey, D. (2014). The Association between Body Mass Index and Physical Activity, and Body Image, Self Esteem and Social Support in Adolescents with Type 1 Diabetes. *Canadian Journal of Diabetes*, *38*(4), 244–249.

Kamtsios, S., & Digelidis, N. (2008). Physical activity levels, exercise attitudes, self-perceptions and BMI type of 11 to 12-year-old children. *Journal of Child Health Care : For Professionals Working with Children in the Hospital and Community*, *12*, 232–240.

Kantanista, A., Osiński, W., Borowiec, J., Tomczak, M., & Król-Zielińska, M. (2015). Body image, BMI, and physical activity in girls and boys aged 14-16 years. *Body Image*, *15*, 40–43. http://doi.org/10.1016/j.bodyim.2015.05.001

Katzmarzyk, P.T., Janssen, I., & Ardern, C. I. (2003). Physical inactivity, excess adiposity and premature mortality. *Obesity Reviews*, *4*, 257–290.

Kearney-Cooke, A. (1999). Gender differences and self-esteem. *The Journal of Gender-Specific Medicine*, *2*, 46–52.

UNIVERSIDAD DE MÁLAGA

Kelly, A. M., Wall, M., Eisenberg, M. E., Story, M., & Neumark-Sztainer, D. (2005). Adolescent girls with high body satisfaction: Who are they and what can they teach us? *Journal of Adolescent Health*, *37*(4), 391–396.

Kelly JT, Patten SE, J. A. (1982). Analysis of self-reported eating and related behaviors in an adolescent population. *Nutr Res*, *2*, 417–432.

Khor, G. L., Zalilah, M. S., Phan, Y. Y., Ang, M., Maznah, B., & Norimah, A. K. (2009). Perceptions of body image among Malaysian male and female adolescents. *Singapore Medical Journal*, *50*(3), 303–311.

Kimm, S. Y., Glynn, N. W., Kriska, A. M., Fitzgerald, S. L., Aaron, D. J., Similo, S. L., … Barton, B. A. (2000). Longitudinal changes in physical activity in a biracial cohort during adolescence. *Medicine and Science in Sports and Exercise*, *32*(8), 1445–1454.

Kimm, S.Y., Orbazanek, E., Barton, B.A., Aston, C.E., Smilo, S.L., Morrison, J. A. y cols. (1996). Race, Socioeconomic status. *Annaals of Epidemioloty*, *5*(4), 266–275.

Kirchengast, S., & Marosi, A. (2008). Gender differences in body composition, physical activity, eating behavior and body image among normal weight adolescents--an evolutionary approach. *Collegium Antropologicum*, *32*(4), 1079–86.

Kirkcaldy, B. D., Shephard, R. J., & Siefen, R. G. (2002). The relationship between physical activity and self-image and problem behaviour among adolescents. *Social Psychiatry and Psychiatric Epidemiology*, *37*(11), 544–550.

Koff, E., Rierdan, J., & Stubbs, M. L. (1990). Gender, Body Image, and Self-Concept in Early Adolescence. *The Journal of Early Adolescence*, *10*(1), 56–68.

Kolody, B., & Sallis, J. F. (1995). A prospective study of ponderosity, body image, self-concept, and psychological variables in children. *Journal of Developmental and Behavioral Pediatrics*, *16*(1), 1–5.

Kołoło, H., Guszkowska, M., Mazur, J., & Dzielska, A. (2012). Self-efficacy, self-esteem and body image as psychological determinants of 15-year-old adolescents' physical activity levels. *Human Movement*, *13*(3), 264–270.

Kopcakova, J., Veselska, Z., Geckova, A., van Dijk, J., & Reijneveld, S. (2014).

UNIVERSIDAD DE MÁLAGA

Is Being a Boy and Feeling Fat a Barrier for Physical Activity? The Association between Body Image, Gender and Physical Activity among Adolescents. *International Journal of Environmental Research and Public Health*, *11*(11), 11167–11176.

Kowalski, K. C., Crocker, P. R. E., & Faulkner, R. A. (1997). Validation of the Physical Activity Questionnaire for Older Children. *Pediatric Exercise Science*, *9*(2), 174–186.

Kowalski, K. C., Crocker, P. R. E., & Kowalski, N. P. (1997). Convergent Validity of the Physical Activity Questionnaire for Adolescents. *Pediatric Exercise Science*. Retrieved from

Kowalski, K., Crocker, P. R. E., & Donen, R. M. (2004). The Physical Activity Questionnaire for Older Children (PAQ-C) and Adolescents (PAQ-A) Manual. *College of Kinesiology, University of Saskatchewan*, (August), 1–37.

Kowalski, N. P., Crocker, P. R., & Kowalski, K. C. (2001). Physical self and physical activity relationships in college women: does social physique anxiety moderate effects? *Research Quarterly for Exercise and Sport*, *72*(1), 55–62.

Koyuncu, M., Tok, S., Canpolat, a. M., & Catikkas, F. (2010). Body image satisfaction and dissatisfaction, social physique anxiety, self-esteem, and body fat ratio in female exercisers and nonexercisers. *Social Behavior and Personality: An International Journal*, *38*(4), 561–570.

Krane, V. (2001). We Can Be Athletic and Feminine, But Do We Want To? Challenging Hegemonic Femininity in Women's Sport. *Quest*, *53*(1), 115–133.

Kyle, U. G., Bosaeus, I., De Lorenzo, A. D., Deurenberg, P., Elia, M., Gómez, J. M., … Pichard, C. (2004). Bioelectrical impedance analysis - Part I: Review of principles and methods. *Clinical Nutrition*, *23*(5), 1226–1243.

Kyle, U. G., Bosaeus, I., De Lorenzo, A. D., Deurenberg, P., Elia, M., Manuel Gómez, J., … Pichard, C. (2004). Bioelectrical impedance analysis-part II: utilization in clinical practice. *Clinical Nutrition (Edinburgh, Scotland)*, *23*(6), 1430–1453.

Labbrozzi, D., Robazza, C., Bertollo, M., Bucci, I., & Bortoli, L. (2013). Pubertal development, physical self-perception, and motivation toward physical

UNIVERSIDAD DE MÁLAGA

activity in girls. *Journal of Adolescence*, *36*(4), 759–765.

Labrado, S. 2011. (Thesis). Diferencias de género en los niveles de práctica de actividad física y hábitos saludables en la población adolescente de Castilla-La Mancha Eficacia de un Programa de Intervención. Universidad de Castilla La Mancha.

Lantz, C. D., Hardy, C. J., & Ainsworth, B. E. (1997). Social physique anxiety and perceived exercise behavior. *Journal of Sport Behavior*, *20*(1), 83–93.

Leek, D., Carlson, J. a, Cain, K. L., Henrichon, S., Rosenberg, D., Patrick, K., & Sallis, J. F. (2011). Physical activity during youth sports practices. *Archives of Pediatrics & Adolescent Medicine*, *165*(4), 294–299.

Lenart, E. B., Goldberg, J. P., Bailey, S. M., Dallal, G. E., & Koff, E. (1995). Current and ideal physique choices in exercising and nonexercising college women from a pilot athletic image scale. *Perceptual and Motor Skills*, *81*(3), 831–848.

Lentillon-Kaestner, V., Berchtold, A., Rousseau, A., & Ferrand, C. (2014). Validity and reliability of the French versions of the body shape questionnaire. *Journal of Personality Assessment*, *96*(4), 471–7.

LePage, M. L., & Crowther, J. H. (2010). The effects of exercise on body satisfaction and affect. *Body Image*, *7*(2), 124–130.

Lerner, R. M.. Karabenick, S. A., & S. J. L. (1973). Relations among physical attrac- tiveness. body attitudes and self concept in male and female college students. *The Journal of Psychology, 85*, 119–129.

Leung, N., Thomas, G., & Waller, G. (2000). The relationship between parental bonding and core beliefs in anorexic and bulimic women. *The British Journal of Clinical Psychology / the British Psychological Society*, *39 (Pt 2)*, 205–13.

Li, Y., Hu, X., Ma, W., Wu, J., & Ma, G. (2005). Body image perceptions among Chinese children and adolescents. *Body Image*, *2*(2), 91–103.

Liao, Y., Knoesen, N. P., Castle, D. J., Tang, J., Deng, Y., Bookun, R., … Liu, T. (2010). Symptoms of disordered eating, body shape, and mood concerns in male and female Chinese medical students. *Comprehensive Psychiatry*, *51*(5), 516–523.

UNIVERSIDAD DE MÁLAGA

Liechty, J. M. (2010). Body image distortion and three types of weight loss behaviors among nonoverweight girls in the United States. *Journal of Adolescent Health*, *47*(2), 176–182.

Lindomar da Silva-Filho, Alethéa C.Rabelo-Leitao, R. L. M.-C. and M. I. K. (2008). No Title. *Rev. Salud Pública.*, *10*(4), 550–560.

Lohman, T. G., Roche A. F., Martorell, R. (1988). *Anthropometric standardization ref-erence manual.*

López, E. (2011). (Thesis). *Compromiso de los adolescentes de Canarias con un estilo de vida físicamente activo y saludable*. Universidad de las Palmas de Gran Canaria.

Lovell, G. P., Ansari, W. El, & Parker, J. K. (2010). Perceived exercise benefits and barriers of non-exercising female university students in the United Kingdom. *International Journal of Environmental Research and Public Health*, *7*(3), 784–798.

Lowery, S. E., Kurpius, S. E. R., Befort, C., Blanks, E. H., Sollenberger, S., Nicpon, M. F., & Huser, L. (2005). Body Image, Self-Esteem, and Health-Related Behaviors Among Male and Female First Year College Students. *Journal of College Student Development*, *46*(6), 612–623.

Lubans, D. R., & Cliff, D. P. (2011). Muscular fitness, body composition and physical self-perception in adolescents. *Journal of Science and Medicine in Sport*, *14*(3), 216–221.

Lyu, M., & Gill, D. (2012). Perceived physical competence and body image as predictors of perceived peer acceptance in adolescents. *Asian Journal of Social Psychology*, *15*(1), 37–48.

Madrigal, H., Sánchez-Villegas, A., Martínez-González, M. A., Kearney, J., Gibney, M. J., Irala, J., & Martínez, J. A. (2000). Underestimation of body mass index through perceived body image as compared to self-reported body mass index in the European Union. *Public Health*, *114*(6), 468–473. http://doi.org/10.1038/sj.ph.1900702

Malete, L., Motlhoiwa, K., Shaibu, S., Wrotniak, B. H., Maruapula, S. D., Jackson, J., & Compher, C. W. (2013). Body image dissatisfaction is increased in male and overweight/obese adolescents in Botswana. *Journal of Obesity*, *2013*.

UNIVERSIDAD DE MÁLAGA

Malina, R. M. (1996). Tracking of physical activity and physical fitness across the lifespan. *Research Quarterly for Exercise and Sport*, *67*(3 Suppl), S48–S57.

Malina, R. M. (2001). Adherence to Physical Activity From Childhood to Adulthood: A Perspective From Tracking Studies. *Quest*, *53*(3), 346–355.

Malina, R. M., & Little, B. B. (2008). Physical activity: The present in the context of the past. *American Journal of Human Biology*, *20*(4), 373–391.

Marcotte, D., Fortin, L., Potvin, P., & Papillon, M. (2002). Gender Differences in Depressive Symptoms During Adolescence: Role of Gender-Typed Charachteristics, Self-Esteem, Body Image, Stressful Life Events and Pubertal Status. *Journal of Emotional and Behavioral Disorders*, *10*(1), 29–42.

Marfell-Jones, M. (1991). *Kinanthropometric assessment. Guidelines for athlete assessment in New in New Zealand Sport*.

María, P., Ortiz, T., Veloz, I. D. C., Angélica, I. I., & Solís, F. (2010). Insatisfacción con la imagen corporal asociada al Índice de Masa Corporal en adolescentes Disatisfaction with de body shape associated to the Body Mass Index in adolescents Introducción. *Revista Cubana de Enfermería*, *26*, 144–154.

Marín Regalado, M. N. (2007). *Efectos de un programa de Educación Física basado en la Expresión Corporal y el Juego Cooperativo para la mejora de habilidades sociales, valores y actitudes en alumnado de Educación Primaria*. Universidad de Granada.

Markey, C. N. (2010). Invited Commentary: Why Body Image is Important to Adolescent Development. *Journal of Youth and Adolescence*, *39*(12), 1387–1391.

Markland, D. (1999). Self-Determination Moderates the Effects of Perceived Competence on Intrinsic Motivation in an Exercise Setting. *Journal of Sport & Exercise Psychology*.

Markland, D., & Ingledew, D. K. (2007). The relationships between body mass and body image and relative autonomy for exercise among adolescent males and females. *Psychology of Sport and Exercise*, *8*(5), 836–853.

UNIVERSIDAD DE MÁLAGA

Marrodán Serrano, M. D., Montero-Roblas, V., Mesa, M. S., Pacheco del Cerro, J. L., González Montero de Espinosa, M., Bejarano, I., … Carmenate Moreno, M. M. (2008). Realidad, percepción y atractivo de la imagen corporal: condicionantes biológicos y socioculturales. *Zainak. Cuadernos de Antropología-Etnografía*.

Marsh, H., & Peart, N. (1988). Competitive and cooperative physical fitness training programs for girls: Effects on physical fitness and multidimensional self-concepts. *Journal of Sport & Exercise Psychology*, *10*, 390–407.

Martínez, J. G., Robles, Á. S., & Ozcorta, F.-. (2014). Imagen Corporal en centros fitness. Un problema a abordar. E155–167.

Martínez López, E.J., Cachón, J. y Moral, J. (2009). Influences of the school and family context in the adolescent ́s physical activity. Special attention to the obese. *Journal of Sport and Health Research*, *1*, 26–45.

Martínez López, E.J., Lara, A.J. y Moral, J. . (n.d.). Satisfacción de vida de adolescentes escolares y su relación con la práctica de actividad física. *VIII Congreso Internacional sobre La Enseñanza de La Educación Física y el Deporte Escolar*.

Martinez-Gomez D, V.-Nu. O. (2007). Insatisfacción corporal en adolescentes: relaciones con la actividad física e índice de masa corporal. … *de la Actividad Física y del* …, *7*(número 27), 253–265.

Martínez-gómez, D., Martínez-de-haro, V., Pozo, T., Welk, G. J., Villagra, A., Calle, M. E., … Veiga, O. L. (2009). Fiabilidad y validez del cuestionario de actividad física paq-a en adolescentes españoles. Reliability and Validity of the PAQ-A Questionnaire to Assess Physical La actividad física se define como actividad física ha sido identificada como un agente releva, 427–439.

Martínez-Gómez, D., Martínez-De-Haro, V., Pozo, T., Welk, G. J., Villagra, A., Calle, M. E., … Veiga, O. L. (2009). Reliability and validity of the paq-a questionnaire to assess physical activity in Spanish adolescents. *Revista Espanola de Salud Publica*, *83*(3), 427–439.

Martínez Gómez, D., & Veiga Núñez, O. L. (2007). Insatisfacción corporal en adolescentes: relaciones con la actividad física e índice de masa corporal. *Body Dissatisfaction in Adolescents: Relationships with Physical*

UNIVERSIDAD DE MÁLAGA

Activity and Body Mass Index, *7*(27).

McAuley, E., Bane, S. M., Rudolph, D. L., & Lox, C. L. (1995). Physique anxiety and exercise in middle-aged adults. *The Journals of Gerontology. Series B, Psychological Sciences and Social Sciences*, *50*(5), P229–P235.

McAuley, E., & Blissmer, B. (2000). Self-efficacy determinants and consequences of physical activity. *Exercise and Sport Sciences Reviews*.

McCabe, M. P., Fotu, K., Mavoa, H., & Faeamani, G. (2010). Body image and body change strategies among Tongan adolescents in Tonga and New Zealand. *The New Zealand Medical Journal*, *123*(1326), 37–46.

McCabe, M. P., & Ricciardelli, L. a. (2003). Sociocultural influences on body image and body changes among adolescent boys and girls. *The Journal of Social Psychology*, *143*(1), 5–26.

McCabe, A. E., Roberts, B. T., & Morris, T. E. (1991). Athletic activity, body image, and adolescent identity. In Hemisphere (Ed.), *Mind-body maturity: psychological approaches to sports, exercise and fitness* (Diamant, pp. 91–103). New York.

McCabe, M. P., Ricciardelli, L. A., & Ridge, D. (2006). (2006). Who thinks I need a perfect body?.Perceptions and internal dialogue among adolescents about their bodies. Sex Roles. *Sex Roles*, *55*, 409–419.

Mediano-Stoltze, F., Repetto, P. B., & Molina, Y. (2013). Insatisfacción corporal, creencias sobre control del peso y consumo de cigarrillos en jóvenes. [Body dissatisfaction, beliefs about weight control, and cigarette use among youth.]. *Terapia Psicológica*, *31*(2), 155–163.

Medicine, A. C. of S. (1993). Current comment from the American College of Sports Medicine. August 1993--"The prevention of sport injuries of children and adolescents". *Medicine and Science in Sports and Exercise*. Retrieved from

Mellor, D., McCabe, M., Ricciardelli, L., & Ball, K. (2004). Body image importance and body dissatisfaction among indigenous Australian adolescents. *Body Image*, *1*(3), 289–97.

MEYER, R. (1987). Imagen del yo en los adolescentes y posición escolar en educación física y deportiva. Estudio comparativo con alumnos varones de 3º. *Infancia y Aprendizaje*, *37*, 45–56.

UNIVERSIDAD DE MÁLAGA

Míguez Bernárdez, M., Montaña Miguélez, J. D. la, González Carnero, J., & González Rodríguez, M. (2011). Agreement between the self-perception on the body image and the nutritional status in college students from Orense. *Nutrición Hospitalaria: Órgano Oficial de La Sociedad Espanola de Nutrición Parenteral y Enteral*, *26*(3), 472–479.

Mikulan, R., & Piko, B. E. (2012). High school students' body weight control: differences between athletes and non-athletes. *Collegium Antropologicum*, *36*(1), 79–86.

Miranda, V. P. N., Conti, M. A., de Carvalho, P. H. B., Bastos, R. R., & Ferreira, M. E. C. (2014). Body image in different periods of adolescence. *Revista Paulista de Pediatria : Orgão Oficial Da Sociedade de Pediatria de São Paulo*, *32*(1), 63–9.

Mirza, N. M., Davis, D., & Yanovski, J. A. (2005). Body dissatisfaction, self-esteem, and overweight among inner-city Hispanic children and adolescents. *Journal of Adolescent Health*, *36*(3).

MJ, C. (2005). *Imagen corporal y práctica de actividad física en la adolescencia.* Universidad Complutense de Madrid. España.

Monteiro, M. J., Amaral, T. F., Oliveira, B. M. P. M., & Borges, N. (2011). Protective effect of physical activity on dissatisfaction with body image in children - A cross-sectional study. *Psychology of Sport and Exercise*, *12*(5), 563–569.

Montero, P. (2004). Valoración de la percepción de la imagen corporal mediante modelos anatómicos . *Antropo*, *8*, 107–116.

Montero, P., Morales, E. M., & Carbajal, A. (2004). Valoración de la percepción de la imagen corporal mediante modelos anatómicos Evaluation of the perception of body image by the use of anatomical models. *Antropo*, *8*, 107–116.

Moore, J. B., Hanes, J. C. J., Barbeau, P., Gutin, B., Treviño, R. P., & Yin, Z. (2007). Validation of the Physical Activity Questionnaire for Older Children in children of different races. *Pediatric Exercise Science*, *19*(1), 6–19.

Moral, J. (2010). Actividad física y compocición corporal en escolares Andaluces de 13-16 años. Análisis de la calidad de vida y motivación que induce a la práctica de actividades Físico-Deportivas.

UNIVERSIDAD DE MÁLAGA

Moral, J. (2010). (n.d.). Actividad física y compocición corporal en escolares Andaluces de 13-16 años. Análisis de la calidad de vida y motivación que induce a la práctica de actividades Físico-Deportivas.

Morano, M., Colella, D., & Capranica, L. (2011). Body image, perceived and actual physical abilities in normal-weight and overweight boys involved in individual and team sports. *Journal of Sports Sciences*, *29*(4), 355–362.

Moreno González, M. A., & Ortiz Viveros, G. R. (2009). Trastorno Alimentario y su Relación con la Imagen Corporal y la Autoestima en Adolescentes. *Terapia Psicológica*, *27*(22 8), 181–190.

Moreno, J. A., Cervelló, E., & Moreno, R. (2008). Importancia de la práctica físico-deportiva y del género en el autoconcepto físico de los 9 a los 23 años. *International Journal of Clinical and Health Psychology*, *8*(1), 171–183.

Moreno, R. F., Diego, J., Salas, Z., José, S., & Rica, C. (2009). La educación Fisica y el deporte como medios para adquirir y desarrollar valores en el nivel de primaria. *Revista Educación, 33*(1), 133–143.

Morgan, P. J., Saunders, K. L., & Lubans, D. R. (2012). Improving physical self-perception in adolescent boys from disadvantaged schools: Psychological outcomes from the Physical Activity Leaders randomized controlled trial. *Pediatric Obesity*, *7*(3), 27–32.

Mullan, E., & Markland, D. (1997). Variations in self-determination across the stages of change for exercise in adults. *Motivation and Emotion*, *21*(4), 349–362.

Mura G1, Vellante M, Nardi AE, Machado S, C. M. (n.d.). Effects of school-based physical activity interventions on cognition and academic achievement: a systematic review.

Murdey, I. D., Cameron, N., Biddle, S. J. H., Marshall, S. J., & Gorely, T. (2005). Short-term changes in sedentary behaviour during adolescence: Project STIL (Sedentary Teenagers and Inactive Lifestyles). *Annals of Human Biology*, *32*(June), 283–296.

Muth, J. L., & Cash, T. F. (1997). Body-Image Attitudes: What Difference Does Gender Make? 1. *Journal of Applied Social Psychology*, *27*(16), 1438–1452.

Myers, T. a, & Crowther, J. H. (2009). Social comparison as a predictor

UNIVERSIDAD DE MÁLAGA

of body dissatisfaction: A meta-analytic review. *Journal of Abnormal Psychology*, *118*(4), 683–698.

Netz, Y., Wu, M.-J., Becker, B. J., & Tenenbaum, G. (2005). Physical activity and psychological well-being in advanced age: a meta-analysis of intervention studies. *Psychology and Aging*, *20*(2), 272–284.

Neumark-Sztainer D, Story M, Hannan PJ, Perry CL, & Irving LM. (2002). Weight-related concerns and behaviors among overweight and nonoverweight adolescents: Implications for preventing weight-related disorders. *Archives of Pediatrics & Adolescent Medicine*, *156*(2), 171–178.

Neumark-Sztainer, D. R., Friend, S. E., Flattum, C. F., Hannan, P. J., Story, M. T., Bauer, K. W., … Petrich, C. a. (2010). New moves-preventing weight-related problems in adolescent girls: A group-randomized study. *American Journal of Preventive Medicine*, *39*(5), 421–432.

Neumark-Sztainer, D., Wall, M., Guo, J., Story, M., Haines, J., & Eisenberg, M. (2006). Obesity, disordered eating, and eating disorders in a longitudinal study of adolescents: How do dieters fare 5 years later? *Journal of the American Dietetic Association*, *106*(4), 559–568.

Newman, M., Thompson, C., & Roberts, A. P. (2006). Helping practitioners understand the contribution of qualitative research to evidence-based practice.[see comment]. *Evid Based Nurs*, *9*(1), 4–7.

Nichols, S. D., Dookeran, S. S., Ragbir, K. K., & Dalrymple, N. (2009). Body image perception and the risk of unhealthy behaviours among university students. *The West Indian Medical Journal*, *58*(5), 465–471.

Niven, A. G., Fawkner, S. G., Knowles, A.-M., & Stephenson, C. (2007). Maturational differences in physical self- perceptions and the relationship with physical activity in early adolescent girls. *Pediatric Exercise Science*, *19*(14), 472–480.

Okely, A. D., Booth, M. L., & Patterson, J. W. (2001). Relationship of physical activity to fundamental movement skills among adolescents. *Med Sci Sports Exerc*, *33*(11), 1899–1904.

Olive, L. S., Byrne, D. G., Cunningham, R. B., & Telford, R. D. (2012). Effects of physical activity, fitness and fatness on children's body image: The Australian LOOK longitudinal study. *Mental Health and Physical Activity*, *5*(2), 116–124.

UNIVERSIDAD DE MÁLAGA

Olmsted, M. P., & McFarlane, T. (2004). Body Weight and Body Image. *BMC Women's Health*, *4*(Suppl 1), S5.

Organization, W. H. (2010). Recomendaciones Mundiales sobre Actividad Física para la Salud. *Geneva: WHO Library Cataloguing-in-Publication*, (Completo), 1–58.

Ortega Becerra, M. A. (2010). *Relación entre la insatisfacción con la imagen corporal, autoestima, autoconcepto físico, y la composición corporal*.

Ortega, F. B., Ruiz, J. R., Castillo, M. J., & Sjöström, M. (2008). Physical fitness in childhood and adolescence: a powerful marker of health. *International Journal of Obesity (2005)*, *32*(1), 1–11.

Ortega, F.B., Ruíz, J.R., Castillo, M.J., Moreno, L.A., González-Gross, M., Warnberg, J., & Gutiérrez, A. (2005). Bajo nivel de forma física en los adolescentes españoles. Importancia para la salud cardiovascular futura (Estudio AVENA). *Revista Española de Cardiologí*, *58*, 898–909.

Ortiz, P. M. T., Veloz, D. C., Solís, A. F., Montano, F. E. M., & Esparza, G. V. (2010). Insatisfacción con la imagen corporal asociada al índice de masa corporal en adolescents. *Revista Cubana de Enfermeria*, *26*(3), 150–160.

Martínez de Quel Pérez O. (2010). Percepción de dificultades para la práctica de actividad física en chicas adolescentes y su evolución con la edad. *Apuntes Educación Física y Deportes N° 99, 1er Trimestre*, (1577 - 4015), 92–99.

Pallares Neila, J., & Baile Ayensa, J. I. (2012). Estudio de la Obesidad Infantil y su relación con la Imagen Corporal en una muestra Española. In *Nutricion Hospitalaria* (Vol. 6, pp. 13–21).

Parcel, G. S., Simons-Morton, B. G., O'Hara, N. M., Baranowski, T., Kolbe, L. J., & Bee, D. E. (1987). School promotion of healthful diet and exercise behavior: an integration of organizational change and social learning theory interventions. *J Sch Health*, *57*(4), 150–156.

Parks, P. S., & Read, M. H. (1997). Adolescent male athletes: body image, diet, and exercise. *Adolescence*, *32*(127), 593–602.

Pastor, Y., Balaguer, I., & García-Merita, M. L. (2003). El autoconcepto y la autoestima en la adolescencia media: análisis diferencial por curso

UNIVERSIDAD DE MÁLAGA

y género Self-concept and self-esteem in middle adolescence: Differential analyses by grade and gender. *Revista de Psicología Social*.

Pastor, Y. y Pons, D. (2003). Actividad física y salud. En A. Hernández (Coord.). *Psicología del Deporte (Vol. I)- Fundamentos 2*, 168–189.

Pate RR, P. M. (1995). Physical activity and public health: A recommendation from the centers for disease control and prevention and the american college of sports medicine. *JAMA*, *273*(5), 402–407.

Paxton, S. J., Eisenberg, M. E., & Neumark-Sztainer, D. (2006). Prospective predictors of body dissatisfaction in adolescent girls and boys: a five-year longitudinal study. *Developmental Psychology*, *42*(5), 888–899.

Payne, V. G., & Isaacs, L. D. (2008). *Human motor development : a lifespan approach*. *Physical Therapy* (Vol. 70).

Peláez Fernández, M. A., Raich i Escursell, R. M., & Labrador Encinas, F. J. (2010). Trastornos de la conducta alimentaria en España: Revisión de estudios epidemiológicos. *Revista Mexicana de Trastornos Alimentarios/ Mexican Journal of Eating Disorders*, *1*(1), 62–75.

Penedo, F. J., & Dahn, J. R. (2005). Exercise and well-being: a review of mental and physical health benefits associated with physical activity. *Current Opinion in Psychiatry*, *18*(2), 189–193.

Perpiñá, C., & Baños, R. (1990). Distorsión de la imagen corporal: Un estudio en adolescentes. *Anales de Psicología*, *6*(1), 1–9. Retrieved from

Pesa, J. A., Syre, T. R., & Jones, E. (2000). Psychosocial differences associated with body weight among female adolescents: the importance of body image. *Journal of Adolescent Health*, *26*(5), 330–337.

Petrides, K. V., & Furnham, A. (2001). Trait emotional intelligence: Psychometric investigation with reference to established trait taxonomies. *European Journal of Personality*, *15*(6), 425–448.

Pineda. G. (2000). *Imagen Corporal asociada a la edad de la menarca en una muestra de estudiantes preadolescentes.* Unam. España.

Pon, L. W., Kandiah, M., & Mohd Nasir, M. T. (2004). Body image perception, dietary practices and physical activity of overweight and normal

UNIVERSIDAD DE MÁLAGA

weight Malaysian female adolescents. *Malaysian Journal of Nutrition*, *10*(2), 131–47.

Pook, M., Tuschen-Caffier, B., & Brähler, E. (2008). Evaluation and comparison of different versions of the Body Shape Questionnaire. *Psychiatry Research*, *158*(1), 67–73.

Pope H.G., J., Gruber, a. J., Mangweth, B., Bureau, B., DeCol, C., Jouvent, R., & Hudson, J. I. (2000). Body image perception among men in three countries. *American Journal of Psychiatry*, *157*(8), 1297–1301.

Proske, U., & Gandevia, S. C. (2012). The Proprioceptive Senses: Their Roles in Signaling Body Shape, Body Position and Movement, and Muscle Force. *Physiological Reviews*, *92*(4), 1651–1697.

Quiterio, A. L., Silva, A. M., Minderico, C. S., Carnero, E. A., Fields, D. A., & Sardinha, L. B. (2009). Total body water measurements in adolescent athletes: a comparison of six field methods with deuterium dilution. *Journal of Strength and Conditioning Research / National Strength & Conditioning Association*, *23*(4), 1225–1237.

Raich, R. M., Mora, M., Marroquin, H., Pulido, S. A., & Soler, A. (1997). Tratamiento Cognitivo-Conductual de la Insatisfacción Corporal. *Análisis y Modificación de Conducta*, *23* (89), 405–424.

Raich, R. M., Mora, M., & Sole, A. (1994). Trastorno de la Imagen Corporal: Evaluación y Tratamiento. *Cuadernos de Medicina Psicosomótica*, (30), 105–109.

Raich, R. M., Mora, M., Soler, A., Avila, C., Clos, I., & Zapater, L. (1996). Adaptación de un instrumento de evaluación de la insatisfacción corporal. *Clinica y Salud*, *7*(1), 51–66.

Raudsepp, L., & Liblik, R. (2002). Relationship of perceived and actual motor competence in children. *Perceptual and Motor Skills*, *94*(3 Pt 2), 1059–70.

Rauste-Von Wright, M., & Von Wright, J. (1981). A longitudinal study of psychosomatic symptoms in healthy 11-18 year old girls and boys. *Journal of Psychosomatic Research*, *25*(6), 525–534.

Raustorp, A., Archer, T., Svensson, K., Perlinger, T., & Alricsson, M. (2009). Physical self-esteem, a five year follow-up study on Swedish

UNIVERSIDAD DE MÁLAGA

adolescents. *International Journal of Adolescent Medicine and Health*, *21*(4), 497–507.

Reas, D. L., & Grilo, C. M. (2004). Cognitive-behavioral assessment of body image disturbances. *Journal of Psychiatric Practice*, *10*(5), 314–322.

Reas, D. L., Masheb, R. M., & Grilo, C. M. (2004). Appearance vs. health reasons for seeking treatment among obese patients with binge eating disorder. *Obesity Research*, *12*(5), 758–760.

Reel, J. J., Greenleaf, C., Baker, W. K., Aragon, S., Bishop, D., Cachaper, C., … Hattie, J. (2007). Relations of body concerns and exercise behavior: A meta-analysis. *Psychological Reports*, *101*, 927–942.

Reichert, F. F., Barros, A. J. D., Domingues, M. R., & Hallal, P. C. (2007). The role of perceived personal barriers to engagement in leisure-time physical activity. *American Journal of Public Health*, *97*(3), 515–519.

Revuelta, L. & Esnaola, I. (2011). Clima familiar deportivo y autoconcepto físico en la adolescencia. *European Journal of Education and Psychology*, *4*(1), 19–31.

Ritterman Weintraub, M. L., Fernald, L. C. H., Adler, N., Bertozzi, S., & Syme, S. L. (2015). Perceptions of Social Mobility: Development of a New Psychosocial Indicator Associated with Adolescent Risk Behaviors. *Frontiers in Public Health*, *3*(April), 1–9.

Rivarola, M. F. (2003). La imagen corporal en adolescentes mujeres: su valor predictivo en trastornos alimentarios. *Fundamentos en Humanidades*, 149–161.

Rodriguez, J., & Terrados, N. (2006). Métodos para la valoración de la Actividad Física y el Gasto Energético en niños y adultos. *Archivos de Medicina del Deporte*, *XXIII*(115), 365–377.

Rodríguez, S., & Cruz, S. (2008). Insatisfacción corporal en adolescentes latinoamericanas y españolas. *Psicothema*, *20*(1), 131–137.

Roman, B., Serra-Majem, L., Ribas-Barba, L., Pérez-Rodrigo, C., & Aranceta, J. (2008). How many children and adolescents in Spain comply with the recommendations on physical activity? *Journal of Sports Medicine and Physical Fitness*, *48*(3), 380–387.

UNIVERSIDAD DE MÁLAGA

Rosen, J. C., Jones, A., Ramirez, E., & Waxman, S. (1996). Body shape questionnaire: Studies of validity and reliability Body shape questionnaire: Studies of validity and reliability. *International Journal of Eating Disorders*, *20*(3), 315–319.

Rueda-Jaimes, G. E., Camacho López, P.A., Flórez, S. M., & Rangel Martínez-Villalba, A. M. (2012). Validez y confiabilidad de dos escalas de siluetas para valorar la imagen corporal en estudiantes adolescentes. *Revista Colombiana de Psiquiatría*, *41*(1), 101–110.

Salaberria, Karmele; Rodríguez, Susana; Cruz, S. (2007). Percepción de la imagen corporal. *Osasunaz. Cuadernos de Ciencias Médicas*, *8*, 171–183.

Salazar Mora, Z. (2008). Adolescencia e imagen corporal en la época de la delgadez. *Reflexiones*, *87*, 67–80.

Salbach, H., Klinkowski, N., Pfeiffer, E., Lehmkuhl, U., & Korte, A. (2007). Body image and attitudinal aspects of eating disorders in rhythmic gymnasts. *Psychopathology*, *40*(6), 388–393.

Sallis, J. F., Prochaska, J. J., & Taylor, W. C. (2000). A review of correlates of physical activity of children and adolescents. *Med Sci Sports Exerc*, *32*(5), 963–975.

Sallis, J. F., & Saelens, B. E. (2000). Assessment of physical activity by self-report: Status, limitations, and future directions. *Research Quarterly for Exercise and Sport*, *71*(2), 1–14.

Sallis, J., Prochaska, J., & Taylor, W. (2000). A review of correlates of physical activity of children and adolescents. *Medicine and Science in Sports and Exercise*, *32*(5), 963–975.

Sallis JF, Owen N, F. E. (2008). Social and Behavioral Theories. *Health Behavior and Health Education: Theory, Research, and Practice*, *4th*, 465–486.

Sánchez Barrera, M., Pérez, M. y Godoy, J. (1995). Patrones de actividad física de una muestra española. *Revista de Psicología Del Deporte*., *7*(8), 51–71.

Sánchez-Villegas, A., Madrigal, H., Martinez-Gonzalez, M. A., Kearney, J., Gibney, M. J., de Irala, J., & Martinez, J. A. (2001). Perception of body image as indicator of weight status in the European Union. *J Hum Nutr Diet*, *14*(2), 93–102.

UNIVERSIDAD DE MÁLAGA

Sardinha, L. B. (2012). Functional Body Composition: Need for a New Agenda. *Archives of Exercise in Health & Disease*, *3*(3), 183–187.

Scagliusi, F. B., Alvarenga, M., Polacow, V. O., Cordás, T. A., de Oliveira Queiroz, G. K., Coelho, D., … Lancha, A. H. (2006). Concurrent and discriminant validity of the Stunkard's figure rating scale adapted into Portuguese. *Appetite*, *47*(1), 77–82.

Schilder, B. (1951). The Image and Appearance of the Human Body: Studies in the Constructive Energies of the Psyche. *JAMA: The Journal of the American Medical Association*, *145*(4), 1107.

Schilder, P. (1936). The Image and Appearance of the Human Body. *The Journal of Nervous and Mental Disease*.

Schwartz, M. B., & Brownell, K. D. (2004). Obesity and body image. *Body Image*, *1*(1), 43–56.

Serra, J. R. (2008). (Thesis). *Factores que influencian la práctica de Actividad física en la población adolescente de la Provincia de Huesca*. Universidad de Zaragoza.

Shaw, S. M., & Kemeny, L. (1989). Fitness promotion for adolescent girls: the impact and effectiveness of promotional material which emphasizes the slim ideal. *Adolescence*.

Sherblom, P. R., & Rust, D. M. (2004). Body image, figure rating, and body mass index of girls enrolled in health, physical education, or athletics classes. *Perceptual and Motor Skills*, *99*(2), 473–482.

Sherwood, N. E., & Jeffery, R. W. (2000). The behavioral determinants of exercise: implications for physical activity interventions. *Annual Review of Nutrition*, *20*, 21–44. http://doi.org/10.1146/annurev.nutr.20.1.21

Shriver, L. H., Harrist, A. W., Page, M., Hubbs-Tait, L., Moulton, M., & Topham, G. (2013). Differences in body esteem by weight status, gender, and physical activity among young elementary school-aged children. *Body Image*, *10*(1), 78–84.

Siegel, J. M., Yancey, A. K., Aneshensel, C. S., & Schuler, R. (1999). Body image, perceived pubertal timing, and adolescent mental health. *Journal of Adolescent Health*, *25*(2), 155–165.

UNIVERSIDAD DE MÁLAGA

Simons-Morton DG, S.-M. B. (1987). Health promotion and disease prevention. Roles for the primary care physician. *Postgrad Med.*, *81*(8), 235–241.

Simpson, M., Müller, M. J., Lagerpusch, M., Enderle, J., Schautz, B., Heller, M., … Salud, S. C. De. (2012). Percepción de la propia imagen corporal en pacientes obesos o con. *ProQuest Dissertations and Theses*, *6*(2), 24–31.

Singh, M. M., Ashok, L., Binu, V. S., Parsekar, S. S., & Bhumika, T. V. (2015). Adolescents and Body Image: A Cross Sectional Study. *The Indian Journal of Pediatrics*, 1–5.

Slater, A., & Tiggemann, M. (2010). Body image and disordered eating in adolescent girls and boys: A test of objectification theory. *Sex Roles*, *63*(1), 42–49.

Slater, A., & Tiggemann, M. (2011). Gender differences in adolescent sport participation, teasing, self-objectification and body image concerns. *Journal of Adolescence*, *34*(3), 455–63.

Smith, B. L., Handley, P., & Eldredge, D. A. (1998). Sex differences in exercise motivation and body-image satisfaction among college students. *Perceptual and Motor Skills*, *86*(2), 723–32.

Smolak, L. (2004). Body image in children and adolescents: Where do we go from here? *Body Image*, *1*(1), 15–28.

Smolak, L., & Levine, M. P. (2001). A two-year follow-up of a primary prevention program for negative body image and unhealthy weight regulation. *Eating Disorders*, *9*(4), 313–25.

Snyder W, Cook M, Nasset E, Karhausen L, Howells G, T. I. (1975). *Report of the Task Group on Reference Man. Protection ICoR*. (U. Oxford, Ed.).

Sonströem, R.J., Speliotis, E.D. y Fava, J. L. (1992). Percieved physical competence in adults: an examination of the physical self-perception profile. *Journal of Sports and Exercise Psychology*, *14*, 207–221.

Sousa, T. F. de, Fonseca, S. A., & Barbosa, A. R. (2013). Perceived barriers by university students in relation the leisure-time physical activity. *Revista Brasileira de Cineantropometria e Desempenho Humano*, *15*(2), 164–173. http://doi.org/10.5007/1980-0037.2013v15n2p164

UNIVERSIDAD DE MÁLAGA

Spessato, B. C., Gabbard, C., Robinson, L., & Valentini, N. C. (2013). Body mass index, perceived and actual physical competence: The relationship among young children. *Child: Care, Health and Development*, *39*(6), 845–850.

Steinfeldt, J. A., Zakrajsek, R., Carter, H., & Steinfeldt, M. C. (2011). Conformity to gender norms among female student-athletes: Implications for body image. *Psychology of Men & Masculinity*.

Stevens, C., & Tiggemann, M. (1998). Women's body figure preferences across the life span. *The Journal of Genetic Psychology*, *159*(1), 94–102. http://doi.org/10.1080/00221329809596137

Stewart, a a, Marfell-Jones, M., Olds, T., & Al., E. (2011). International standards for anthropometric assessment. *Lower Hutt, New Zealand: International Society for the Advancement of Kinanthropometry*, 125f.

Stewart, A. D., Benson, P. J., Michanikou, E. G., Tsiota, D. G., & Narli, M. K. (2003). Body image perception, satisfaction and somatotype in male and female athletes and non-athletes: results using a novel morphing technique. *Journal of Sports Sciences*, *21*(10), 815–823.

Stice, E., Rohde, P., Shaw, H., & Marti, C. N. (2013). Efficacy trial of a selective prevention program targeting both eating disorders and obesity among female college students: 1- and 2-year follow-up effects. *Journal of Consulting and Clinical Psychology*, *81*(1), 183–9.

Stice, E., Shaw, H., & Marti, C. N. (2007). A meta-analytic review of eating disorder prevention programs: encouraging findings. *Annual Review of Clinical Psychology*, *3*, 207–231.

Stice, E., & Whitenton, K. (2002). Risk factors for body dissatisfaction in adolescent girls: A longitudinal investigation. *Developmental Psychology*, *38*(5), 669–78.

Strasburger, V. C., Jordan, A. B., & Donnerstein, E. (2010). Health effects of media on children and adolescents. *Pediatrics*, *125*(4), 756–767.

Streeter, V. M., Milhausen, R. R., & Buchholz, A. C. (2012). Body Image, Body Mass Index, and Body Composition: In Young Adults. *Canadian Journal of Dietetic Practice and Research*, *73*(2), 78–83.

Striegel-Moore, R. (1997). Risk factors for eating disorders. *Annals of the*

UNIVERSIDAD DE MÁLAGA

New York Academy of Sciences, *817*, 98–109.

Stunkard, A. (2000). Old and new scales for the assessment of body image. *Perceptual and Motor Skills*, *90*(3 Pt 1), 930.

Stunkard, A., & Harris, J. (1990). The body-mass index of twins who have been reared apart. *New England Journal. 322*(21), 1483–1487.

Stunkard, A. J., Fernstrom, M. H., Price, A., Frank, E., & Kupfer, D. J. (1990). Direction of weight change in recurrent depression. Consistency across episodes. *Archives of General Psychiatry*, *47*(9), 857–60.

Stunkard, A. J., & Sørensen, T. (1983). Use of the Danish Adoption ... [Res Publ Assoc Res Nerv Ment Dis. 1983] .

Sue Lamb, C., Jackson, L. a., Cassiday, P. B., & Priest, D. J. (1993). Body figure preferences of men and women: A comparison of two generations. *Sex Roles*, *28*(5-6), 345–358.

Sujoldzić, A., & De Lucia, A. (2007). A cross-cultural study of adolescents--BMI, body image and psychological well-being. *Collegium Antropologicum*, *31*(1), 123–130.

Suprasongsin, C., Kalhan, S., & Arslanian, S. (1995). Determination of body composition in children and adolescents: validation of bioelectrical impedance with isotope dilution technique. *Journal of Pediatric Endocrinology & Metabolism: JPEM*, *8*(2), 103–109.

Swaminathan, S., Selvam, S., Pauline, M., & Vaz, M. (2013). Associations between body weight perception and weight control behaviour in South Indian children: a cross-sectional study. *BMJ Open*, *3*(3).

Taylor, J. K., Moore, J. A., & Holland, M. G. (1985). Simulation: an evolving methodology for health administration education. *The Journal of Health Administration Education*, *3*(3), 341–354.

Taylor, W., Blair, S. N., Cummings, S., Wun, C., & Malina, R. (1999). Childhood and adolescent physical activity patterns and adult physical activity. *Medicine & Science in Sports & Exercise*, *31*(1), 118–123 ST – Childhood and adolescent physical ac.

Teixeira, P. J., Going, S. B., Houtkooper, L. B., Cussler, E. C., Metcalfe, L. L., Blew, R. M., … Lohman, T. G. (2006). Exercise motivation, eating, and

UNIVERSIDAD DE MÁLAGA

body image variables as predictors of weight control. *Med Sci Sports Exerc*, *38*(1), 179–188.

Teixeira PJ1, Carraça EV, Markland D, Silva MN, R. R. (2012). Exercise, physical activity, and self-determination theory: a systematic review. *Int J Behav Nutr Phys Act*, *22*, 9–78.

Telama, R., & Yang, X. (2000). Decline of physical activity from youth to young adulthood in Finland. *Medicine and Science in Sports and Exercise*, *32*(9), 1617–1622.

Telama, R., Yang, X., Laakso, L., & Viikari, L. M. (1997). Physical Activity in Childhood and Adolescence as predictor of physical activity in young adulthood. *Am J Prev Med*, *13*(4), 317–23.

ter Bogt, T. F. M., van Dorsselaer, S. a F. M., Monshouwer, K., Verdurmen, J. E. E., Engels, R. C. M. E., & Vollebergh, W. a M. (2006). Body Mass Index and Body Weight Perception as Risk Factors for Internalizing and Externalizing Problem Behavior Among Adolescents. *Journal of Adolescent Health*, *39*(1), 27–34.

Thein-Nissenbaum, J. M., & Carr, K. E. (2011). Female athlete triad syndrome in the high school athlete. *Physical Therapy in Sport : Official Journal of the Association of Chartered Physiotherapists in Sports Medicine*, *12*(3), 108–16.

Thompson, a M., & Chad, K. E. (2000). The relationship of pubertal status to body image, social physique anxiety, preoccupation with weight and nutritional status in young females. *Canadian Journal of Public Health. Revue Canadienne de Santé Publique*, *91*(3), 207–11.

Thompson, J. K., Heinberg, L. J., Altabe, M., & Tantleff-Dunn, S. (1999). Exacting beauty: Theory, assessment and treatment of body image disturbance. Washington, DC. *American Psy- Chological Association*.

Tiggemann, M. (2004). Body image across the adult life span: Stability and change. *Body Image*, *1*(1), 29–41.

Tiggemann, M., & Lynch, J. E. (2001). Body image across the life span in adult women: the role of self-objectification. *Developmental Psychology*, *37*(2), 243–253.

Touvier, M., Méjean, C., Kesse-Guyot, E., Pollet, C., Malon, A., Castetbon,

UNIVERSIDAD DE MÁLAGA

K., & Hercberg, S. (2010). Comparison between web-based and paper versions of a self-administered anthropometric questionnaire. *European Journal of Epidemiology*, *25*(5), 287–296.

Trew, K., Scully, D., Kremer, J., & Ogle, S. (1999). Sport, Leisure and Perceived Self-Competence among Male and Female Adolescents. *European Physical Education Review*, *5*(1), 53–74.

Trujano, P., Nava, C., de Gracia, M., Limón, G., Alatriste, A. L., & Merino, M. T. (2010). Trastorno de la imagen corporal: Un estudio con preadolescentes y reflexiones desde la perspectiva de género. *Anales de Psicología*, *26*(2), 279–287.

Tucker, L. a, & Maxwell, K. (1992). Effects of weight training on the emotional well-being and body image of females: predictors of greatest benefit. *American Journal of Health Promotion: AJHP*, *6*(5), 338–44, 371.

Tucker, L.A., & Mortell, R. (1993). Comparison of the effects of walking and weight training programs on body image in middle-aged women: an experimental study. *American Journal of Health Promotion*, *8*(1), 34–42.

Twisk, J. W., Kemper, H. C., & van Mechelen, W. (2000). Tracking of activity and fitness and the relationship with cardiovascular disease risk factors. *Medicine and Science in Sports and Exercise*, *32*(8), 1455–61. Retrieved from

Twisk, J.W. R., Kemper, H. C. G., & van Mechelen, W. (2002). The relationship between physical fitness and physical activity during adolescence and cardiovascular disease risk factors at adult age. The Amsterdam Growth and Health Longitudinal Study. *International Journal of Sports Medicine*, *23 Suppl 1*, S8–14.

UNICEF, W. (1995). Breastfeeding and maternal medication: recommendations for drugs in the 8th WHO Model List of Essential Drugs. *Geneva: WHO Library Cataloguing-in-Publication*.

Urrutia, S., Azpillaga, I., de Cos, G. L., & Munoz, D. (2010). Relation between health perception, sportsphysical practice and body image in adolescents. *Relación entre la percepción de Estado de Salud con la Práctica Fisicodeportiva y la Imagen Corporal en adolescentes*.

V, C. (1999). El autoconocimiento y la autoestima en el desarrollo de la

UNIVERSIDAD DE MÁLAGA

madurez personal. (Aljibe, Ed.). Archidona. Málaga.

Valenciano, M., Solano, N. (2012). La insatisfacción corporal en mujeres adultas: un estudio piloto. *Revistatog*, *9*, 1–23.

VALTUEÑA, S.: ARIJA, V. y SALAS, J. (1996). Estado actual de los métodos de evaluación de la composición corporal: descripción, reproducibilidad, precisión, ámbitos de aplicación, seguridad, coste y perspectivas de futuro. *Medicina Clínica*, *106*(16), 624–635.

Valverde, P. R., de los Santos, F. R., & Rodríguez, C. M. (2010). Diferencias de sexo en imagen corporal, control de peso e Índice de Masa corporal de los adolescentes españoles. *Psicothema*, *22*(1), 77–83.

Den Berg Van, P., Wertheim, E. H., Thompson, J. K., & Paxton, S. J. (2002). Development of body image, eating disturbance, and general psychological functioning in adolescent females: a replication using covariance structure modeling in an Australian sample. *The International Journal of Eating Disorders*, *32*(1), 46–51.

Mechelen Van, W., Twisk, J. W., Post, G. B., Snel, J., & Kemper, H. C. (2000). Physical activity of young people: the Amsterdam Longitudinal Growth and Health Study. *Medicine and Science in Sports and Exercise*, *32*(9), 1610–1616.

VanItallie, T. B., Yang, M. U., Heymsfield, S. B., Funk, R. C., & Boileau, R. A. (1990). Height-normalized indices of the body's fat-free mass and fat mass: Potentially useful indicators of nutritional status. *American Journal of Clinical Nutrition*, *52*(6), 953–959.

Vaquero-Cristóbal, R., Alacid, F., Muyor, J. M., & López-Miñarro, P. Á. (2013). Imagen corporal; revisión bibliográfica. *Nutricion Hospitalaria*, *28*(1), 27–35.

Vázquez Arévalo, R., Ocampo Téllez-Girón, M. T., López Aguilar, X., Mancilla Díaz, J. M., & Álvarez Rayón, G. L. (2002). La influencia de modelos estéticos e insatisfacción corporal en estudiantes de danza con trastorno alimentario. *Psicología Conductual*, *10*(2), 355–369.

Veggi AB, Lopes CS, Faerstein E, S. R. (2004). Índice de massa corporal, percepção do peso corporal e transtornos mentais comuns entre funcionários de Psiquiatr uma universidade no Rio de Janeiro. *Rev.*

UNIVERSIDAD DE MÁLAGA

Bras 25, *26*(4), 242–247.

Veselska, Z., Madarasova Geckova, A., Reijneveld, S. a, & van Dijk, J. P. (2011). Aspects of self differ among physically active and inactive youths. *International Journal of Public Health*, *56*(3), 311–8. http://doi.org/10.1007/s00038-010-0203-y

Vocks, S., Hechler, T., Rohrig, S., & Legenbauer, T. (2009). Effects of a physical exercise session on state body image: The influence of pre-experimental body dissatisfaction and concerns about weight and shape. *Psychology & Health*, *24*(6), 713–28.

Walker, T., Watson, H. J., Leach, D. J., McCormack, J., Tobias, K., Hamilton, M. J., & Forbes, D. a. (2014). Comparative study of children and adolescents referred for eating disorder treatment at a specialist tertiary setting. *International Journal of Eating Disorders*, *47*(1), 47–53.

Wang, Z., Byrne, N. M., Kenardy, J. a, & Hills, A. P. (2005). Influences of ethnicity and socioeconomic status on the body dissatisfaction and eating behaviour of Australian children and adolescents. *Eating Behaviors*, *6*(1), 23–33.

Wang, Z., Wang, Z.-M., & Heymsfield, S. B. (1999). History of the study of human body composition: A brief review. *American Journal of Human Biology : The Official Journal of the Human Biology Council*, *11*(2), 157–165.

Want, S. C. (2009). Meta-analytic moderators of experimental exposure to media portrayals of women on female appearance satisfaction: Social comparisons as automatic processes. *Body Image*, *6*(4), 257–269.

Wardle, J., & Cooke, L. (2005). The impact of obesity on psychological well-being. *Best Practice & Research. Clinical Endocrinology & Metabolism*, *19*(3), 421–440.

Warren, C. S., Cepeda-Benito, A., Gleaves, D. H., Moreno, S., Rodriguez, S., Fernandez, M. C., … Pearson, C.A. (2008). English and Spanish versions of the Body Shape Questionnaire: Measurement equivalence across ethnicity and clinical status. *International Journal of Eating Disorders*, *41*(3), 265–272.

Wasylkiw, L., MacKinnon, A. L., & MacLellan, A. M. (2012). Exploring the link

UNIVERSIDAD DE MÁLAGA

between self-compassion and body image in university women. *Body Image*, *9*(2), 236–245.

Waylen, A., & Wolke, D. (2004). Sex "n" drugs "n" rock "n" roll: the meaning and social consequences of pubertal timing. *European Journal of Endocrinology.*, *151*, 151–159.

Weaver, A. D., & Byers, E. S. (2006). The relationships among body image, body mass index, exercise, and sexual functioning in heterosexual women. *Psychology of Women Quarterly*, *30*(4), 333–339.

Wetterhahn, K. a, Hanson, C., & Levy, C. E. (2002). Effect of participation in physical activity on body image of amputees. *American Journal of Physical Medicine & Rehabilitation / Association of Academic Physiatrists*, *81*(3), 194–201.

Wilkosz, M. E., Chen, J. L., Kenndey, C., & Rankin, S. (2011). Body dissatisfaction in California adolescents. *Journal of the American Academy of Nurse Practitioners*, *23*(2), 101–109.

Williams, P. a., & Cash, T. F. (2001). Effects of a circuit weight training program on the body images of college students. *International Journal of Eating Disorders*, *30*, 75–82.

Williamson, D. A., Gleaves, D. H., Watkins, P. C., & Schlundt, D. G. (1993). Validation of self-ideal body size discrepancy as a measure of body dissatisfaction. *Journal of Psychopathology and Behavioral Assessment*, *15*(1), 57–68. http://doi.org/10.1007/BF00964324

Wilson, J. M., Tripp, D. a, & Boland, F. J. (2005). The relative contributions of subjective and objective measures of body shape and size to body image and disordered eating in women. *Body Image*, *2*(3), 233–247.

World Health Organization. (2005). Nutrition in adolescence: issues and challenges for the health sector: issues in adolescent health and development. *Geneva: WHO Library Cataloguing-in-Publication*.

World Medical Association. (2013). World Medical Association Declaration of Helsinki Ethical Principles for Medical Research Involving Human Subjects. *Jama*, *JAMA Publi*(jama.com), E1 – E4.

Xanthopoulos, M. S., Borradaile, K. E., Hayes, S., Sherman, S., Veur, S. Vander,

UNIVERSIDAD DE MÁLAGA

Grundy, K. M., … Foster, G. D. (2011). The impact of weight, sex, and race/ethnicity on body dissatisfaction among urban children. *Body Image*, *8*(4), 385–389.

Zach, S., Zeev, A., Dunsky, A., Goldbourt, U., Shimony, T., Goldsmith, R., & Netz, Y. (2013). Perceived body size versus healthy body size and physical activity among adolescents - Results of a national survey. *European Journal of Sport Science*, *13*(6), 723–31.

UNIVERSIDAD DE MÁLAGA

18. APPENDIX.-

18.1. RESUMEN DE LA INVESTIGACIÓN.-

Resumen.

En la última década la preocupación por la imagen corporal, la satisfacción por la propia imagen y su relación con la practica deportiva es y será cada un foco muy importante de atención en la investigación con adolescentes.

El proceso de crecimiento y desarrollo en los adolescentes posee un condicionante genético que está fuertemente influido por el entorno socioeconómico y ambiental en el que de desenvuelve el sujeto. Se trata de un fenómeno complejo, gradual y continuo en el que pueden diferenciarse una serie de etapas que trasforman al recién nacido en adulto. Entre ellas, la denominada pubertad, periodo de transición entre la niñez y la juventud, es especialmente problemática ya que, es un intervalo temporal relativamente corto, donde se producen grandes cambios de índole biológica, psicológica y social.

Por ello, es la adolescencia (periodo que abarca entre los 10 ó 11 años hasta los 16 ó 17 años) un periodo de cambios físicos que desencadenan, por lo general, un desconcierto del individuo ante la nueva apariencia física y una necesidad de que esta sea aceptada y valorada por los demás. Todo ello relacionado con conflictos psíquicos habituales de la pubertad como son: las relaciones con los padres, el repliegue sobre

UNIVERSIDAD DE MÁLAGA

si mismo o la búsqueda de autonomía e identidad personal. Pero además, los mecanismos hormonales que producen la maduración biológica son responsables de la dinámica sexual y afectiva en la que se ven inmersos los jóvenes y, esto a su vez, acarrea una fuente de problemas personales y sociales, por lo tanto, estamos hablando de un periodo sumamente crítico y en el los adolescentes son proclives a desarrollar conductas adictivas o perniciosas para su salud.

En España, asistimos a un excesivo alargamiento de la adolescencia la calidad de vida ha propiciado una maduración biológica cada vez más precoz. Por ello es necesarios e importante tener un conocimiento real de lo que piensan nuestros adolescentes, como se ven y cuales son sus hábitos de vida para poder poner en practica programas y herramientas suficientes para cumplir los objetivos. En esta línea sería deseable que compartieran la propuesta y se trabajara con un objetivo común desde las áreas de la Educación, biológicas y psicológicas para conseguir un desarrollo integral del adolescente, tanto en el plano físico como intelectual.

Este problema es muy importante en España porque los adolescentes están sobreestimando su peso. Los problemas de la imagen corporal están asociada a numerosas psicopatologías, entre ellas la ansiedad, el estrés y los problemas de la conducta alimentaria (anorexia, bulimia) que deben ser una prioridad a solucionar desde el contexto escolar. La imagen corporal que cada persona tiene de si mismo es tan subjetiva que no necesariamente ha de coincidir con la que de él tienen los demás, ya que,

UNIVERSIDAD DE MÁLAGA

influyen muchos factores, como las vivencias afectivas y experiencias que van consolidando la personalidad o la autoestima.

Esto hace que muchos adolescentes, que ven como su cuerpo se está modificando rápidamente, se muestren inseguros, no acepten su aspecto físico y traten de cambiarlo a través de conductas poco saludables que pueden poner en grave riesgo su salud. De este modo, incrementan peligrosamente la práctica deportiva o inician dietas sumamente restrictivas, que quizás desemboquen en un trastorno de la conducta alimentaria (TCA).

Los TCA constituyen un creciente problema de salud pública en los países desarrollados. En el panorama internacional, según la revisión hecha por Gandarilla et al., (2003), nos habla de cifras que van desde el 1.6% al 10% situándose España en un lugar intermedio con una prevalencia que se localiza entre el 4.1% y 4.7% según comunidades autónomas. Dichas patologías, que pueden desembocar en graves alteraciones mal nutritivas, como la anorexia nerviosa y la bulimia, con criterios diagnósticos bien establecidos. También se encuadran aquí los denominados TCA no especificados como son la vigorexia y la ortorexia (Pérez- Gaspar, 2002).

Según la Organización Mundial de la Salud (OMS) los niños y jóvenes de este grupo de edades deben practicar la actividad física a través de juegos, deportes, desplazamientos, actividades recreativas, educación física o ejercicios programados, en el contexto de la familia, la escuela o las actividades comunitarias. Con el fin de mejorar las funciones

UNIVERSIDAD DE MÁLAGA

cardiorrespiratorias y musculares y la salud ósea y de reducir el riesgo de enfermedades no trasmisibles (ENT), por ello recomienda que:

- Los niños y jóvenes de 5 a 17 años inviertan como mínimo 60 minutos diarios en actividades físicas de intensidad moderada a vigorosa.
- La actividad física por un tiempo superior a 60 minutos diarios reportará un beneficio aún mayor para la salud.
- La actividad física diaria debería ser, en su mayor parte, aeróbica. Convendría incorporar, como mínimo tres veces por semana, actividades vigorosas que refuercen, en particular, los músculos y huesos.

A pesar de esto y de la reconocida mejora que dicha practica físico-deportiva regular produce a nivel físico, psíquico y social, así como en la calidad de vida (Martínez-Gómez et al., 2009), se muestra un descenso de los niveles de actividad físico-deportiva conforme aumenta la edad de los jóvenes (Román et al., 2008), produciéndose los mayores índices de abandono en la adolescencia (Currie et al., 2008).

Las ultimas medidas objetivas realizadas sobre dicha población (Parfitt et al., 2009), manifiestan niveles de practica bajos (Nilsson et al., 2009), al no cumplir estos grupos de edad con las recomendaciones mínimas para una mejora de la salud de 60 minutos de actividad físico-deportiva diaria con una intensidad de moderada a vigorosa (Andersen, 2009).

UNIVERSIDAD DE MÁLAGA

La inactividad física esta cada vez más extendida en muchos países, y ello repercute considerablemente en la salud general de la población mundial, en la prevalencia de ENT (por ejemplo, enfermedades cardiovasculares, diabetes o cáncer) y en sus factores de riesgo, como la hipertensión, el exceso de glucosa en la sangre o el sobrepeso.

Está demostrado que la actividad física practicada con regularidad reduce el riesgo de cardiopatías coronarias y accidentes cerebrovasculares, diabetes de tipo II, hipertensión, cáncer de colon, cáncer de mama y depresión. Además, la actividad física es un factor determinante en el consumo de energía, por lo que es fundamental para conseguir el equilibrio energético y el control del peso.

Existen evidencias que en nuestro país la practica de actividad física es insuficiente, tanto a nivel escolar (2 horas/semana) como a nivel extraescolar, donde los niveles de practica física-deportiva está en niveles muy bajos. Es en este tipo de actividad donde no conocemos la participación real de nuestra muestra, por ello entendemos la actividad extraescolar como:

- Practica deportiva realizada en el centro educativo en horario no lectivo, denominada popularmente como "actividad deportiva extraescolar".

- Practica deportiva realizada en horario no lectivo llevada a cabo en clubes deportivos, asociaciones, etc., es decir, actividades organizadas por instituciones publicas o privadas.

UNIVERSIDAD DE MÁLAGA

En esta línea España, según el Euro barómetro de Actividad Física, somos un país poco activo, donde el 40% de los adolescentes reconoce no realizar ningún tipo de actividad física, el 10% dice realizarlo pocas veces y solamente el 15% lo realiza de forma regular y lo suficiente para cumplir con las necesidades básicas que recomienda la OMS. Si tomamos como referencia la diferencia de sexo en cuanto a la practica de actividad física tenemos que hacer referencia Gómez Mármol, A. (2013) la actividad física esta descendiendo en entre los adolescentes además comprueba como las chicas son menos activas que los chicos y que estas presentan por tanto niveles más elevados de sedentarismo, estos niveles se pueden asociar a diferentes motivos, en el estudio de (Camacho Miñano et al., 2006) explica como si existe cierto consenso en que la participación en deportes se asocia a una imagen corporal más saludable, y mas concretamente en los deportes de equipo frente a los deportes individuales.

En esta línea Furnham (2002) afirmar que los principales motivos por los que los adolescentes realizan actividad física también pueden asociarse al genero, si bien las chicas pueden realizar actividad física con el objetivo de la perdida de peso , conseguir una figura más estilizada frente a los chicos que presentan como objetivo la diversión con los compañeros y ser más robustos (Marrodán MD et al., 2008).

Los adolescentes se ven fuertemente condicionadas por los medios de comunicación para adoptar y mantener las normas que impone la cultura de la delgadez (Striegel- Moore RH et al., 1989). Esta preocupación

UNIVERSIDAD DE MÁLAGA

provoca en los alumnos una gran preocupación respecto a la perdida de peso y a la figura. Sobre los motivos que tienen tanto los chicos como las chicas de presentar necesidad de pérdida de peso o de insatisfacción corporal podemos decir que existen varias tendencias, por un lado el deseo de resultar atractivas (Arroyo M et al., 2008) y por otro lado la necesidad de acercarse al modelo ideal que la sociedad actual estereotipa.

Este impresionante poder de influencia de los medios de comunicación, puede provocar Insatisfacción Corporal también en hombres (Derenne y Beresin, 2006); sin embargo, las mujeres jóvenes son significativamente más vulnerables al potencial peligro de esta influencia social (Toro y col., 2005). De modo que, la exposición de una imagen delgada como la ideal podría contribuir al desarrollo de un TCA causando Insatisfacción Corporal, baja autoestima y síntomas de TCA principalmente en las mujeres (Hawkins y col., 2004).

Se ha encontrado una asociación directa entre el Índice de Masa Corporal y la Insatisfacción Corporal (Blowers, y col., 2003). Diversos estudios han mostrado que los sujetos con sobrepeso tienen mayor probabilidad de estar insatisfechos con su imagen corporal y tratan de perder peso (Vander Wal y Thelen, 2000; Robinson y col., 2001, Packard y Krogstrand, 2002; Davison y col., 2003). Esto podría ser porque los sujetos con sobrepeso son estigmatizados y perciben una presión social mayor relacionados con los estándares de ideal de delgadez. La presión por estar delgados mediante los comentarios directos y persuasivos establece

UNIVERSIDAD DE MÁLAGA

la importancia de realizar dietas restrictivas. Por tanto, los sujetos con sobrepeso tienen mayor probabilidad de desarrollar alteraciones en los hábitos alimentarios o algún síntoma de Anorexia Nerviosa o Bulimia Nerviosa (Rukavina y Pokrajac-Bulian, 2006).

La inquietud por los efectos del sedentarismo está muy extendida entre la comunidad médica. La inactividad física es el cuarto factor de riesgo de la mortalidad mundial (se atribuyen a esta causa el 6% de las muertes registradas en el mundo).

Se encuentra que en la adolescencia los problemas de distorsión de la imagen corporal son muy preocupantes, debido a su gran incidencia y a que se mantienen durante largos periodos de tiempo. En esta línea, en un grupo de chicas británicas de 12-18 años de edad se ah encontrado que mas del 50% deseaba adelgazar, cerca del 60% consideraba que debía de restringir su alimentación o modificar sea hábitos alimentarios y cerca del 20% se encontraba haciendo algún tipo de dieta restrictiva Furnham A, (1986). De hecho hay un mayor porcentaje de adolescentes insatisfechos con su imagen corporal que satisfechos (Gómez P, 1995; Pineda G, 2000).

La imagen corporal es un aspecto que centra la atención de las personas y sobre todo de las mujeres, en mayor medida que en los varones (Koff, Rierdan y Stubbs, 1990; Cardenal, 1999), prestando más interés por la apariencia física y el control del peso corporal (Goñi, Ruiz y Rodríguez, 2004). Como hemos visto con anterioridad la imagen corporal está compuesta por diferentes parámetros, entre los cuales existen

UNIVERSIDAD DE MÁLAGA

diferencias significativas entre el sexo de los sujetos. Los varones le dan más importancia a aspectos relativos a la fuerza y la condición física y por su parte las mujeres se centran más en el atractivo físico, la condición física y el peso corporal. Esto puede ser debido a la gran influencia que ejerce la sociedad actual sobre todo lo referente al aspecto y atractivo físico, unido todo ello al vigente modelo de belleza femenina, muy en consonancia con una delgadez muy acusada (Franzoi y Shields, 1984).

Si hay una época vital donde estas diferencias se mantienen es la adolescencia, aquí los valores de las mujeres caen por debajo de los niveles atribuidos a los varones, viéndose la imagen corporal de las chicas mucho más reducida. Contribuyen a ello de forma decisiva la deficiente percepción que ellas tienen sobre su apariencia y capacidad física (Corbin, 2002; Marcotte, Fortín, Potvin y Papillon, 2002).

El nivel de práctica de AF es una variable importante para analizar la autoestima de las personas. No en vano hay estudios que afirma que la autoestima de las mujeres se incrementa conforme aumenta el tiempo destinado a la práctica de actividades físico-deportivas, en buena parte debido a los sentimientos de logro y pertenencia a un grupo experimentados, así como a la adquisición de nuevas habilidades (Trew, Scully, Kremer y Olge, 1999). Los sentimientos que les reportan a las personas la práctica deportiva varían en función del género, así pues las mujeres se sienten más inseguras que los varones en el desarrollo de actividades de carácter físico-deportivas (Brustad, 1993). Los hombres suelen presentan puntuaciones

UNIVERSIDAD DE MÁLAGA

más altas en todo lo relativo a la competencia percibida, atractivo corporal, condición y fuerza física, presentando también una tendencia a sobrevaloración de su capacidad física en relación con las chicas (Eccles y Harold, 1991). Nos encontramos ante una tarea con un marcado carácter competitivo y cuando se otorga un feedback.

Como profesionales de la enseñanza que trabajan diariamente con adolescentes hemos creído que es importante centrar el interés del estudio de tesis en detectar conductas y actitudes no positivas hacia la imagen corporal y sus variables asociadas, tanto la satisfacción corporal como la insatisfacción son determinante en el desarrollo integral del alumno, y más aún, durante la adolescencia, con el objetivo principal de aportar la información necesaria para poder desarrollar programas de prevención e intervención durante el periodo escolar.

Nuestra investigación se trata de un estudio descriptivo, cuantitativo y de corte transversal y longitudinal en población mediante encuestas. La muestra fueron estudiantes adolescentes de un nivel educativo de la ESO, con un numero total de 829 adolescentes, entre 12 y 18 años (14.3±1.21) del curso escolar 2012/2013, en la localidad de Ronda (Málaga), seleccionando dos centros educativos donde el 51% era del sexo femenino y el 49% del genero masculino.

Se han seleccionado dos centros educativos de un total de 5, situados en dos zonas distintas de la misma ciudad, un centro de mayor numero de alumnos (FDR) frente a un centro de una sola línea educativa y por lo

UNIVERSIDAD DE MÁLAGA

tanto con menor numero de adolescentes (JDR).

Este trabajo de tesis doctoral pretende analizar el concepto de Imagen corporal y su relación con la practica de actividad físicas y deportivas, dentro y fuera del contexto escolar, así como, la relación con la composición corporal de los alumnos y la Imagen corporal en sus parámetros de autopercepción y satisfacción. En el presente estudio se pretende unificar variables que nos ayuden a identificar y clarificar posibles relaciones entre la práctica de la actividad física y una mejor percepción de la imagen corporal, así mismo, estudiar parámetros de la insatisfacción corporal en estudiantes adolescentes. Estas asociaciones acentuadas en el periodo de la adolescencia por los cambios físicos y psíquicos de los estudiantes provocan la necesidad de estudio y reflexión sobre su trabajo.

Los instrumentos de trabajo seleccionando fueron cuestionarios y mediciones antropométricas, donde se seleccionó información para conocer los hábitos de actividad física y deporte (Physical Activity Questionnaire PAQ-A, Kowalski, K, (2004)) un cuestionario autoaplicado que valora la actividad física realizada en los últimos 7 días teniendo en cuenta: actividades deportivas y juegos realizados durante el tiempo libre, las clases de educación física, distintos periodos del día , días de la semana y autovaloración de la actividad física realizada cada día. Para obtener los datos relaciones con la satisfacción e insatisfacción corporal (Body Shape Questionnaire, Cooper et al., (1987)), se trata de un cuestionario de 34 cuestiones con 6 tipos de respuesta que van desde Nunca hasta Siempre,

UNIVERSIDAD DE MÁLAGA

y sobre la percepción de la imagen corporal (Figure Rating Scale, Stunkard, A (2000) a través de la selección de siluetas por parte del alumno.

En este objetivo, hemos tratado de comprobar la valoración que de la percepción de su imagen corporal rea liza el alumnado participante en la investigación, mediante el uso de modelos anatómicos que corresponden a determinados valores del índice de masa corporal. De la misma manera, hemos tratado de verificar el grado de satisfacción e insatisfacción con la percepción de su imagen corporal, a través de las respuestas emitidas en el cuestionario sobre insatisfacción con la imagen corporal.

Existen estudios previos que han estudio estas variables y su relación pero la mayoría utiliza la población universitaria y adulta como referencia, es por ello, que hemos seleccionado la etapa de la adolescencia por ser una muestra poco estudia y donde creemos que los resultados puedan ayudar a futuras líneas de investigación.

Se han utilizado como variables dependientes la Imagen Corporal, dividiendo el concepto multifactorial de la misma Percepción, Insatisfacción y distorsión de la Imagen Corporal. Como variables independientes la Actividad Física, realizada dentro y fuera del contexto escolar, LA composición corporal a través de los valores de IMC real y perceptiva y otros valores antropométricos (% Masa grasa, % masa libre de grasa, peso y altura), y el sexo, en el estudio han participado tanto chicos como chicas. Se utiliza como variables de control la edad y el centro educativo al que corresponde el adolescente.

UNIVERSIDAD DE MÁLAGA

La metodología utilizada en primer lugar ha sido un cuestionario autoaplicado sobre la insatisfacción producida por nuestro propio cuerpo. En segundo término conocer la composición corporal real del alumno mediante técnicas antropométricas. En tercer lugar conocer la percepción subjetiva de la imagen corporal mediante modelos anatómicos y finalmente un cuestionario sobre la práctica de la actividad física tanto en el contexto escolar como extraescolar.

El trabajo realizado en esta tesis doctoral trata de cubrir la falta de conocimiento específico en el campo de la imagen corporal, como la relación plausible entre el nivel de actividad física, dentro (OSSP) y fuera (NOSSP) del contexto escolar deportiva escolar, la composición corporal (adiposidad) y la imagen corporal (auto-percepción y satisfacción corporal). Aunque, la imagen corporal es un tema ampliamente reportado en la literatura científica, hay algunas lagunas y no se cierra completamente. En concreto, se llevaron a cabo nuestros estudios en los estudiantes durante el período de la adolescencia en el contexto escolar, se analizaron los datos transversales y longitudinales, y la composición corporal, la Actividad Física y la Imagen Corporal. Este manuscrito está organizado en cuatro partes principales:

I. Una revisión de la literatura relacionada con la relación entre el Imagen Corporal y la Actividad Física durante la adolescencia. Se realizó una revisión sistemática con el fin de analizar el estado del arte de este tema.

UNIVERSIDAD DE MÁLAGA

II. El diseño y la metodología utilizados para evaluar Imagen Corporal, la Actividad Física y variables de Composición Corporal en un contexto escolar.

III. Un estudio transversal para analizar las asociaciones entre el total de la Actividad Física, la Composición Corporal y las variables de Imagen Corporal. La influencia de OSSP en la Composición Corporal y las variables de Imagen Corporal también fueron exploradas. También se informaron diferencias entre niños y niñas y la influencia de la edad.

IV. La última parte se centra en el análisis de los cambios longitudinales en las variables de Imagen Corporal a lo largo de la adolescencia y su relación con los cambios de Actividad Física.

Los objetivos de la investigación teniendo en cuenta la falta de estudios nacionales e internacionales relacionados con el PA, la Composición Corporal y BI en contextos escolares. Era nuestro propósito:

• Evaluar la percepción de la imagen corporal y la insatisfacción corporal en los hombres españoles y mujeres adolescentes en un contexto escolar.

• Describir la prevalencia y grado de distorsión de la imagen corporal y la insatisfacción entre los varones españoles y mujeres adolescentes.

UNIVERSIDAD DE MÁLAGA

• Describir la prevalencia de la distorsión de la imagen corporal y la insatisfacción a través de tres grados de estado de peso (delgadez, peso normal y con sobrepeso y obesidad).

• Explorar las asociaciones entre la actividad física diaria total, la imagen corporal y la insatisfacción corporal.

• Comparar las diferencias de la imagen corporal y la insatisfacción corporal en entre los adolescentes que participaron OSSP y NOSSP.

• Estimar determinantes o predictores de insatisfacción corporal (actividad física, la composición corporal, la edad y el sexo).

• Evaluar si habrá cambios significativos en BI y la insatisfacción corporal después del primer año de la educación secundaria obligatoria.

Las hipótesis planteadas sobre la base de la literatura anterior en adultos y adolescentes, establecemos que:

• La actividad física está positivamente asociada con la insatisfacción corporal y los adolescentes más activos tendrán menor distorsión de la percepción de la imagen corporal.

• Los adolescentes que participan en actividades regulares OSSP tendrá una autoimagen más favorable y menor insatisfacción corporal que sus contrapartes con NOSSP.

• El género no jugará un papel independiente en la insatisfacción corporal cuando se ajusta por PA y variables de composición corporal

UNIVERSIDAD DE MÁLAGA

(FM y FFM).

• PA y de composición corporal variables serán predecir la insatisfacción corporal y la distorsión de la imagen corporal.

Las características biológicas de los participantes se muestran en la tabla 1 de los resultados. 829 adolescentes aceptaron participar en el estudio de los cuales pudimos obtener la composición corporal en 293 de ellos. Sin embargo, pudimos confirmar que nuestros datos no fueron sesgados por este hecho ya que nuestro análisis ITT pudo probar que no hubo diferencias significativas en las principales variables entre el grupo con el análisis de la composición corporal y sin ella (tabla 2). No obstante, el análisis de correlación entre las puntuaciones PAQ-A y BSQ mostró que sólo el grupo con el análisis de la NBC tuvo correlación significativa entre ambas variables (grupo BC rho = -0,92, p = 0,118 vs. grupo NBC rho = -0,169, p <0,001); como consecuencia de esta variable categórica se incluirá en los modelos de regresión, que se llevaron a cabo en la discusión de los resultados. Además, ninguna de las variables independientes una distribución normal en toda la muestra como se confirmó en la prueba Kolomogorov-Smirnof, por lo que los tratamientos de todos los análisis estadísticos mostraron una muestra no paramétrica, con excepción de aquellos en los que una distribución normal no es un requisito obligatorio.

A continuación vamos a presentar las principales conclusiones que se desprenden tras la realización de nuestro trabajo de investigación, siguiendo el esquema general de cada uno de los objetivos propuestos.

UNIVERSIDAD DE MÁLAGA

- La evaluación de la percepción de la imagen corporal y la insatisfacción corporal en varones españoles y mujeres adolescentes en un contexto escolar nos permite describir la prevalencia de la insatisfacción corporal y la distorsión de la imagen en nuestra muestra. Pudimos confirmar que la prevalencia de distorsión de la imagen corporal fue mayor que la prevalencia de la insatisfacción corporal y corroborar que era menor que en estudios españoles previos en unos grupos de edades similares. Además, el grado de distorsión fue mayor en las categorías de delgadez extrema y grupos de sobrepeso y obesidad.

- Podemos afirmar que la actividad física se asoció positivamente con la insatisfacción corporal (BSQ) y con diferentes niveles de auto-percepción del cuerpo.

- Los estudiantes que realizan actividad física fuera del horario escolar (OSSP) tenían puntuaciones significativamente más bajas de insatisfacción corporal, tanto hombres como mujeres. Las chicas presentan valores más altos que los chicos.

- En este estudio, la actividad física es el principal predictor de la satisfacción corporal, seguido por edad y sexo. Ninguna variable de composición corporal era predictor significativo de la satisfacción del cuerpo.

- Existe un incremento significativo en la insatisfacción corporal después de un año académico, y este cambio fue mas importante en

UNIVERSIDAD DE MÁLAGA

niños que en niñas. La Autopercepción corporal indica que también puede indicarse en adolescentes. El IMC actual está subestimado. Sin embargo, no hemos podido confirmar que la actividad física estaba relacionada con eso cambios.

- En general, este estudio destacan la importancia de la evaluación de la imagen corporal en el contexto escolar, ya que nuestros datos muestran una alta prevalencia de la insatisfacción corporal y la distorsión. Por último, demostrar que la actividad física si pudo ser un determinante principal de la satisfacción del cuerpo, lo que puede confirmar la necesidad de la educación física en la promoción del deporte y la concienciación de la practica física deportiva fuera del horario escolar.

- Actividad física es una posible forma de mejorar la salud en la adolescencia, y la cantidad de actividad física no solo depende del género, también depende de la imagen corporal. Un reto en la promoción de la salud es mantener su relativamente buena percepción de la imagen corporal.

Las hipótesis planteadas en el comienzo de la investigación se resumen se la siguiente manera:

• La actividad física está positivamente asociado con la insatisfacción corporal y los adolescentes más activos tendrán menor distorsión de la percepción de la imagen corporal. Podríamos confirmar esta hipótesis.

• Los adolescentes que participan en actividades regulares OSSP

UNIVERSIDAD DE MÁLAGA

tendrá una autoimagen más favorable y menor insatisfacción corporal que sus que NOSSP . No pudimos confirmar esta hipótesis.

• El género no jugará un papel independiente en la insatisfacción corporal cuando se ajusta por la actividad física y por las variables de composición corporal (FM y FFM). Nuestros resultados pueden aceptar la hipótesis nula ya que el género es un determinante importante de la insatisfacción corporal .

• La actividad física y la composición corporal serán predictores de la insatisfacción corporal y la distorsión de la imagen corporal . Esta hipótesis fue parcialmente confirmado ya que la participación en actividades deportivas fue el principal determinante de la insatisfacción corporal .

Todas estas conclusiones están en la línea de lo investigado hasta ahora. Las mujeres tienen una mayor presión social hacia una determinada imagen corporal, y quizás menos recursos personales de crítica y auto aceptación, lo que genera una mayor insatisfacción corporal que en los hombres. Es interesante comprobar igualmente que el período sensible para que se asiente la insatisfacción corporal es el que va de los 12 a los 17 años, pues a los 12 aún habiendo es muy baja, y esta aumento conforme la edad va creciendo. Los datos son coherentes con las actitudes hacia la autoimagen en chicas adolescentes; así, en un estudio de Baile y Garrido (1999) casi el 80% de una muestra de chicas de 15 a 17 años deseaba estar más delgada. Esto nos indica cuál es el grupo de edad en el que se podría trabajar en prevención de la insatisfacción corporal, y que corresponde

UNIVERSIDAD DE MÁLAGA

con el período de la Educación Secundaria Obligatoria.

Además se puede observar como el nivel de actividad física es insuficiente con respecto a otro países de nuestro entorno y que los niveles de proactiva deportiva en el sexo femenino roza el 30%, por ello, es necesario promover y coincidir desde las instituciones que trabajan con adolescentes en el desarrollo de programas y herramientas suficientes para concienciar de la importancia de adquirir hábitos saludables en la adolescencia, periodo que marca el camino de las próximo hábitos como adulto.

Palabras Clave- Imagen Corporal, Actividad Física, Adolescentes, Composición Corporal.

UNIVERSIDAD DE MÁLAGA

18.2. STUDY INFORMATION FOR PARTICIPANTS.-

Estudio "Body Image and Physical Activity".-

"En este documento se presenta la información resumida sobre el estudio Body Image. Su finalidad es dar una visión global del proyecto a los responsables de centros educativos de enseñanza primaria y secundaria, con el objetivo de obtener su colaboración para el proyecto. En caso de aceptar la colaboración se realizará una reunión para una explicación más detallada del mismo".

TÍTULO DEL ESTUDIO: *Relación entre la Imagen Corporal y la Actividad Física en Adolescentes españoles.*

CARACTERÍSTICAS TÉCNICAS DEL ESTUDIO:

- Proyecto desarrollado en el Laboratorio de Biodinámica y Composición Corporal de la Facultad de Ciencias de la Educación de la Universidad de Málaga.
- Colaboran la Escuela de Medicina del Deporte de la Universidad de Málaga y la Facultad de Ciencias de la Educación de la Universidad de Jaén.
- Todos los procedimientos están de acuerdo con las normas de la declaración de Helsinki para estudios de investigación con humanos, actualizadas en la 59ª Asamblea general en Seul en Octubre del 2008 .

RESUMEN DEL ESTUDIO.

El diseño de este estudio está focalizado en algunos de los aspectos más relevantes en el área de educación física. Se analizará la percepción en la imagen corporal, la composición corporal y otros comportamientos

UNIVERSIDAD DE MÁLAGA

de AF escolar, extraescolar deportiva y extraescolar no estructurada. Es un estudio transversal y en él se observarán los comportamientos de actividad física (AF) y las alteraciones de la composición corporal molecular y celular, de escolares españoles durante 1 año natural completo. En el se realizarán evaluaciones de composición corporal y AF utilizando tecnologías de referencia y otros cuestionarios.

Las dos novedades principales del estudio son: Su diseño, en el cual se coordina el área de la actividad física para la salud y las estrategias de enseñanza, durante una intervención trasversal; sin embargo, la principal novedad del proyecto será la evaluación en adolescentes.

OBJETIVOS:

- Estudiar los cambios de la composición corporal, AF, y hábitos de los alumnos fuera del centro escolar.
- Analizar la percepción de la imagen corporal y su relación con la AF.
- Conocer la satisfacción corporal de los alumnos con respecto a su propio cuerpo.

SOLICITUD AL CENTRO Y A LOS PARTICIPANTES.

- Para la realización del proyecto necesitaremos de 2 centros de secundaria. En cada centro serán seleccionados "x" niños de todos los niveles educativos entre los 12 a los 16 años.
- En cada momento de evaluación habrá dos días de recogida de datos:
    - Día 1: Cuestionarios de Imagen Corporal, siluetas corporales.
    - Día 2: Condición física, Antropometría, Impedancia Bioeléctrica.
- Reunión con los responsables de educación de los estudiantes.
- Posible utilización de alguna aplicación informática sobre el contenidos transversales en actividad física.

UNIVERSIDAD DE MÁLAGA

18.3 INFORMED CONSENT.-

Consentimiento Informado para la Participación en el Estudio

Yo, (nombre y apellidos del padre/madre) _____ _____ **con DNI nº:**_____**, autorizo a mi hijo/a del curso** _____**a la participación en el estudio descrito en el centro educativo** _____**.Además:**

- He leído la hoja de información que se ha entregado.
- He recibido suficiente información sobre el estudio.
- Podré resolver todas las dudas sobre el estudio con el Profesor PHD St. Manuel Dorado Guzmán, docente del centro educativo Fernando de los Ríos. mdoradoef@uma.es

Comprendo que su participación es voluntaria.

Comprendo que el niño puede o puedo retirarse/lo del estudio:

1. *Cuando quiera.*
2. *Sin tener que dar explicaciones.*
3. *Sin que esto repercuta en su evaluación educativa.*

Doy la conformidad para que mi hijo/a participe en el estudio : "Relación entre la Imagen Corporal y la Actividad Física en adolescentes españoles".

En Ronda, _____ de _____ del 2012

Firma del Participante madre o tutor

Firma del padre,

UNIVERSIDAD DE MÁLAGA

18.4. PHYSICAL ACTIVITY QUESTIONNAIRE FOR ADOLESCENTS.-

Cuestionario de actividad física para adolescentes (PAQ-A)

Nombre y apellidos: Edad:

Queremos conocer cuál es tu nivel de actividad física en los últimos 7 días (última semana). Esto incluye todas aquellas **actividades como deportes, gimnasia o danza que** te hacen sudar o sentirte cansado, o juegos que hagan que se acelere tu respiración como jugar al pilla-pilla, saltar a la comba, correr, trepar y otras.

Recuerda:
1. No hay preguntas buenas o malas. Esto NO es un examen.
2. Contesta las preguntas de la forma más honesta y sincera posible. Esto es muy importante

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1. Actividad Física en tu tiempo libre: ¿Has hecho alguna de estas actividades en los últimos 7 días (última semana)? Si tu respuesta es sí: ¿cuántas veces las has hecho? (*Marca un solo círculo por actividad*)

	No	1-2	3-4	5-6	7 veces o +
Saltar a la comba……	❍	❍	❍	❍	❍
Patinar …….....	❍	❍	❍	❍	❍
Jugar a juegos como el pilla-pilla...	❍	❍	❍	❍	❍
Montar en bicicleta……..	❍	❍	❍	❍	❍
Caminar (como ejercicio)……	❍	❍	❍	❍	❍
Correr/footing……..	❍	❍	❍	❍	❍
Aeróbic/spinning……	❍	❍	❍	❍	❍
Natación……..	❍	❍	❍	❍	❍
Bailar/danza……	❍	❍	❍	❍	❍
Bádminton……..	❍	❍	❍	❍	❍
Rugby……	❍	❍	❍	❍	❍
Montar en monopatín……..	❍	❍	❍	❍	❍
Fútbol-fútbol-sala……	❍	❍	❍	❍	❍
Voleibol……...	❍	❍	❍	❍	❍
Hockey……	❍	❍	❍	❍	❍
Baloncesto……...	❍	❍	❍	❍	❍
Esquiar……	❍	❍	❍	❍	❍
Otros deportes de raqueta……	❍	❍	❍	❍	❍
Balonmano……..	❍	❍	❍	❍	❍
Atletismo……	❍	❍	❍	❍	❍
Musculación/pesas……...	❍	❍	❍	❍	❍
Artes marciales (judo, kárate, …)..	❍	❍	❍	❍	❍
Otros:_____	❍	❍	❍	❍	❍
Otros:_____	❍	❍	❍	❍	❍

UNIVERSIDAD DE MÁLAGA

2. En los últimos 7 días, durante las clases de educación física, ¿cuántas veces estuviste muy activo durante las clases: jugando intensamente, corriendo, saltando, haciendo lanzamientos? (Señala sólo una)

No hice/hago educación física…….. ❍
Casi nunca…… ❍
Algunas veces…….. ❍
A menudo…… ❍
Siempre…… ❍

3. En los últimos 7 días ¿qué hiciste normalmente a la hora de la comida (antes y después de comer)? (Señala sólo una)

Estar sentado (hablar, leer, trabajo de clase).... ❍
Estar o pasear por los alrededores…… ❍
Correr o jugar un poco....…….. ❍
Correr y jugar bastante…… ❍
Correr y jugar intensamente todo el tiempo.… ❍

4. En los últimos 7 días, inmediatamente después de la escuela hasta las 6, ¿cuántos días jugaste a algún juego, hiciste deporte o bailes en los que estuvieras muy activo? (Señala sólo una)

Ninguno…… ❍
1 vez en la última semana…… ❍
2-3 veces en la última semana…….. ❍
4 veces en la última semana…… ❍
5 veces o más en la última semana……... ❍

5. En los últimos 7 días, cuantas días a partir de media tarde (entre las 6 y las 10) hiciste deportes, baile o jugaste a juegos en los que estuvieras muy activo? (Señala sólo una)

Ninguno…… ❍
1 vez en la última semana…… ❍
2-3 veces en la última semana…….. ❍
4 veces en la última semana…… ❍
5 veces o más en la última semana……... ❍

6. El último fin de semana, ¿cuántas veces hiciste deportes, baile o jugar a juegos en los que estuviste muy activo? (Señala sólo una)

Ninguno…… ❍
1 vez en la última semana…… ❍
2-3 veces en la última semana…….. ❍
4 veces en la última semana…… ❍
5 veces o más en la última semana……... ❍

UNIVERSIDAD DE MÁLAGA

7. ¿Cuál de las siguientes frases describen mejor tu última semana? Lee las cinco antes de decidir cuál te describe mejor. (Señala sólo una)

Todo o la mayoría de mi tiempo libre lo dediqué a actividades que suponen poco esfuerzo físico …… ❍

Algunas veces (1 o 2 veces) hice actividades físicas en mi tiempo libre (por ejemplo, hacer deportes, correr, nadar, montar en bicicleta, hacer aeróbic) ….. ❍

A menudo (3-4 veces a la semana) hice actividad física en mi tiempo libre ……... ❍

Bastante a menudo (5-6 veces en la última semana) hice actividad física en mi tiempo libre…….. ❍

Muy a menudo (7 o más veces en la última semana) hice actividad física en mi tiempo libre…….. ❍

8. Señala con qué frecuencia hiciste actividad física para cada día de la semana (como hacer deporte, jugar, bailar o cualquier otra actividad física)

	Ninguna	Poca	Normal	Bastante	Mucha
Lunes……	❍	❍	❍	❍	❍
Martes……	❍	❍	❍	❍	❍
Miércoles……...	❍	❍	❍	❍	❍
Jueves……	❍	❍	❍	❍	❍
Viernes……...	❍	❍	❍	❍	❍
Sábado……...	❍	❍	❍	❍	❍
Domingo……	❍	❍	❍	❍	❍

9. ¿Estuviste enfermo esta última semana o algo impidió que hicieras normalmente actividades físicas?

Sí …….. ❍
No…… ❍

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18.5. BODY SHAPE QUESTIONNAIRE.-

B.S.Q.

Nos gustaría saber cómo te has sentido respecto a tu figura en el último mes. Por favor, lee cada pregunta y señala con una cruz el número que consideres que corresponde a la respuesta más adecuada. Contesta a todas las preguntas.

Nunca	Raramente	Algunas veces	A menudo	Muy a menudo	Siempre
1	2	3	4	5	6

	Nunca	Raramente	Algunas veces	A menudo	Muy a menudo	Siempre
1. Cuando te aburres, ¿te preocupas por tu figura?	1	2	3	4	5	6
2. ¿Has estado tan preocupada por tu figura que has pensado que debías ponerte a dieta?	1	2	3	4	5	6
3. ¿Has pensado que tus muslos, caderas o nalgas(culo) son demasiado grandes en proporción con el resto de tu cuerpo?	1	2	3	4	5	6
4. ¿Has tenido miedo a convertirte en gordo/a (o más gordo/a?	1	2	3	4	5	6
5. ¿Te ha preocupado el que tu carne no sea suficientemente firme?	1	2	3	4	5	6
6. ¿Sentirte lleno/a (después de una comida) te ha hecho sentir gordo/a?	1	2	3	4	5	6
7. ¿Te has sentido tan mal con tu figura que incluso has llorado por ello?	1	2	3	4	5	6
8. ¿Has evitado correr para que tu carne no botara, saltara?	1	2	3	4	5	6
9. ¿Estar con chicos/as delgados/as te ha hecho fijar en tu figura?	1	2	3	4	5	6
10. ¿Te has preocupado por el hecho de que tus muslos se ensanchen cuando te sientas?	1	2	3	4	5	6
11. ¿El solo hecho de comer una pequeña cantidad de alimento te ha hecho sentir gordo/a?	1	2	3	4	5	6
12. ¿Te has fijado en la figura de otros chicos/as y has comparado la tuya con la de ellos desfavorablemente?	1	2	3	4	5	6
13. ¿Pensar en tu figura ha interferido en tu capacidad de concentración (cuando estás mirando la televisión, leyendo o manteniendo una conversación)?	1	2	3	4	5	6
14. Estar desnudo/a, por ejemplo cuando te duchas, ¿te ha hecho sentir gordo/a?	1	2	3	4	5	6
15. ¿Has evitado llevar vestidos que marquen tu figura?	1	2	3	4	5	6

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16. ¿Te has imaginado cortando partes grasas de tu cuerpo?	1	2	3	4	5	6
17. Comer caramelos, pasteles u otros alimentos altos en calorias, ¿te ha hecho sentir gordo/a?	1	2	3	4	5	6
18. ¿Has evitado ir a actos sociales (por ejemplo, a una fiesta) porque te has sentido mal respecto a tu figura?	1	2	3	4	5	6
19. ¿Te has sentido excesivamente gordo/a y lleno/a?	1	2	3	4	5	6
20. ¿Te has sentido acomplejado/a por tu cuerpo?	1	2	3	4	5	6
21. La preocupación por tu figura, ¿te ha inducido a ponerte a dieta?	1	2	3	4	5	6
22. ¿Te has sentido más a gusto con tu figura cuando tu estómago estaba vacio (por ejemplo por la mañana)?	1	2	3	4	5	6
23. ¿Has pensado que tienes la figura que tienes a causa de tu falta de autocontrol?	1	2	3	4	5	6
24. ¿Te ha preocupado que la otra gente te vea *michelines* alrededor de tu cintura?	1	2	3	4	5	6
25. ¿Has pensado que no es justo que otras chicas/os sean más delgados/as que tú?	1	2	3	4	5	6
26. ¿Has vomitado para sentirte más delgado/a?	1	2	3	4	5	6
27. Estando en compañia de otras personas, ¿te ha preocupado ocupar demasiado espacio (por ejemplo en el autobús, en el cine...)?	1	2	3	4	5	6
28. ¿Te ha preocupado que tu carne tenga aspecto de *piel de naranja o celulitis*?	1	2	3	4	5	6
29. Verte reflejado/a en un espejo, ¿te hace sentir mal respecto a tu figura?	1	2	3	4	5	6
30. ¿Has pellizcado zonas de tu cuerpo para ver cuánta grasa hay?	1	2	3	4	5	6
31. ¿Has evitado situaciones en las cuales la gente pudiera ver tu cuerpo (por ejemplo, piscinas, duchas, vestidores...)?	1	2	3	4	5	6
32. ¿Ha tomado laxantes para sentirte más delgado/a?	1	2	3	4	5	6
33. ¿Te has fijado más en tu figura cuando estás en compañia de otra gente?	1	2	3	4	5	6
34. ¿La preocupación por tu figura te hace pensar que deberías hacer ejercicio?	1	2	3	4	5	6

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