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2 **Understanding the Relationship between Physical Activity and Physical Self-perception**

3 **in Adolescent Females: the Role of Body Image**

4

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24 **Abstract**

25 The aim of this study was to explore the role of body image concern in the relationship
26 between physical activity and physical self-concept. A total of 441 Spanish adolescent
27 college females aged 12 to 17 completed the Physical Self-Concept Questionnaire (CAF), the
28 Body Shape Questionnaire (BSQ) and Gardner's Scale for the Assessment of Body Image.
29 Data on body mass index (BMI) and participation in physical activity were also collected.
30 The results showed a positive relationship between physical activity and physical self-concept
31 with all its subdimensions, as well as general self-concept. This relationship was notably
32 higher in the absence of body image concern. However, no relationship was found between
33 exercise and the subdimension of body attractiveness in the case of adolescents who were
34 dissatisfied with their bodies. This emphasizes the importance of a healthy body image in
35 shaping an adolescent female's self-concept.

36 *Keywords:* body image, physical self-concept, physical activity, adolescence, female

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48 **Understanding the Relationship between Physical Activity and Physical Self-perception**
49 **in Adolescent Females: the Role of Body Image**

50 Body image is a complex construct that includes perceptions, attitudes and thoughts
51 over one's own body (Baile, Raich, & Garrido, 2003). Adolescence is a critical life stage
52 with regards to body image concerns (Hermes & Keel, 2003), particularly amongst women
53 (Ålgars, Santtila, & Sandnabb, 2010). Puberty-related body changes, the onset of romantic
54 relationships and a growing awareness of a culturally slim ideal make female adolescents
55 especially sensitive to body image concerns (Bell & Dittmar, 2011). During adolescence a
56 positive body image is associated with greater relationship confidence (Markey & Markey,
57 2006), improved social status (Eisenberg, Neumark-Sztainer, Haines, & Wall, 2006) and
58 heightened self-concept and self-esteem (van den Berg, Mond, Eisenberg, Ackard, &
59 Neumark-Sztainer, 2010). In contrast, female adolescents who possess a negative body image
60 are more likely to experience low self-concept, depression (Stice & Bearman, 2001) and the
61 onset of eating disorders (Rodríguez-Fernández & Goñi, 2012).

62 Physical self-concept, as defined by Fox (1997), is a broader construct than body
63 image. According to Fox's model, the four subdimensions of *sport competence*, *physical*
64 *condition*, *strength* and *body attractiveness* contribute to one's physical self-concept. This
65 physical self-concept is itself a subdomain of overall or global self-concept. It is directly
66 related to numerous positive health outcomes such as a physically active lifestyle,
67 psychological wellbeing, and life satisfaction (Goñi, Rodríguez, & Esnaola, 2010). As such,
68 physical self-concept is widely considered to be a crucial dimension in shaping an
69 adolescent's global self-concept (Harter, 1999). Like body image, physical self-concept is
70 subject to sociocultural influences from the mass media, family environment and peers
71 (Rodríguez-Fernández, González, & Goñi-Grandmontagne, 2013).

72 Numerous studies have explored the relationship between physical activity levels and
73 general and physical self-concept. Meta-analyses have shown that, independent of age and
74 gender, physical activity produces moderate and measurable effects on self-concept (Spence,
75 McGannon, & Poon, 2005; Spence, Poon, & Duck, 1997). Moreover, from the
76 multidimensional and hierarchical structure of self-concept, physical self-concept would be a
77 halfway dimension between exercise and global self-concept (Sonström, 1997). In terms of
78 the relationship between physical self-concept and physical activity participation, it appears
79 that regular physical exercise has positive effects over perceptions of *sport competence*,
80 *physical condition and strength* (Contreras, Fernández-Bustos, García, Palou, & Ponseti,
81 2010; Moreno, Cervelló, & Moreno, 2008). Although some studies maintain that the
82 subdomain of *body attractiveness* is positively correlated with physical activity (González &
83 Alvariñas, 2004), others argue that there is no physical activity-physical attractiveness
84 relationship (Goñi, Ruiz de Azúa, & Rodríguez, 2004; Hayes, Crocker, & Kowalski, 1995;
85 Marsh, 1997). Further, it has also been stated that regular physical activity is associated with
86 low perceptions of attractiveness as it is the desire to improve body attractiveness that
87 motivates physical activity participation (Esnaola, 2004).

88 With regards to the physical activity-body image relationship, several studies have
89 shown a positive link between physical activity and body satisfaction (Campbell &
90 Hausenblas, 2009), although most of them only found this positive relationship in men
91 (Hausenblas & Fallon, 2006). In contrast, some scholars have found an association between
92 physical activity and increased body dissatisfaction (Davis et al., 1997; Tata, Fox, & Cooper,
93 2001; Wichstrom, 1995). These conflicting findings may be explained as a consequence of
94 differences between study groups. For example, physical activity is likely to lead to greater
95 body satisfaction improvements in groups with a higher baseline level of body dissatisfaction

96 (Contreras et al., 2012). The type of physical activity practiced may also have an important
97 role on these differences (Camacho, Fernández, & Rodríguez, 2006; Sundgot-Borgen &
98 Torsveit, 2004).

99 Research has seldom addressed the relationship between physical self-concept, body
100 image and physical activity. Nevertheless, studies agree that a strong relationship exists
101 between body dissatisfaction and low perceptions of body attractiveness, physical self-
102 concept and general self-concept (Baile, Raich, & Garrido, 2003; Goñi & Rodríguez, 2004).
103 Esnaola (2005) sought to relate physical self-concept to body image between physically active
104 and physically inactive participants; yet he did not find any differences between body
105 attractiveness and body satisfaction between groups.

106 According to Fernández-Bustos, Contreras, García and González (2010), the absence
107 of a relationship between physical activity and improved perceptions in attractiveness, may be
108 due to the motivations that lead many female adolescents to participate in certain types of
109 physical activities. Specifically, the primary motivation for some female adolescents might
110 be improving their physical appearance rather than the intrinsic value of the activity itself. It
111 is likely that such individuals possess an existing preoccupation with appearance and a poor
112 global self-concept (Furnham, Badmin, & Sneade, 2002), which in turn is caused by body
113 dissatisfaction (Lepage & Crowther, 2010). On the other hand, female adolescents motivated
114 by health benefits or fun, may possess a heightened physical and global self-concept
115 (Fernández-Bustos et al., 2010), as well as improved body satisfaction (Lepage & Crowther,
116 2010). Body dissatisfaction, hence, would be closely linked to physical self-concept, physical
117 activity motivations, and the type of physical activity chosen (Fernández-Bustos et al., 2010).

118 Given these conflicting findings, this study aims to verify and deepen the
119 understanding of the relationship between physical activity, physical self-concept and body

120 satisfaction in female adolescents. Previous studies assessed either the relationship between
121 exercise and physical self-concept, or exercise and body image, without considering the
122 subject's prior worries or dissatisfaction as an influencing variable. Therefore, the primary
123 objective of the study is to explore the influence of physical activity on physical self-concept
124 and its respective subdomains, while considering body satisfaction as an independent variable.
125 Specifically, we seek to assess the extent to which body satisfaction/dissatisfaction influences
126 the relationship between physical activity and physical self-concept. The hypothesis is that
127 whether women are satisfied or dissatisfied with their body image, those who regularly take
128 part in physical activity will have better physical perceptions and self-concept. Also included
129 within this hypothesis is the possibility that among the women concerned about their body
130 image, there are no differences regarding perceptions of physical attractiveness between those
131 physically active and those not. Additionally, the second objective of this research was to
132 measure the importance of physical exercise in comparison with other variables such as body
133 satisfaction and BMI in building physical and general self-concept. The hypothesis states that
134 the most important variable in building self-concept in the adolescent female is body
135 satisfaction but that physical activity is important in the perceptions of physical condition,
136 sports ability and strength.

137 **Method**

138 **Participants**

139 A total of 441 students aged 12 to 17 took part in the present study ($M = 14.57$; $DT =$
140 1.51). The research was conducted at a Spanish Compulsory Secondary Education School
141 and 1° Bachillerato School. The number of participants equates to almost the entire female
142 schooled population between these ages in the town of La Roda, in Albacete, Spain. The
143 participants were classified as active or non-active according to their level of participation in

144 physical sporting activities. Females who exercised at least twice a week for a minimum of
145 50 minutes each session were considered active. The two months prior to data collection was
146 taken into account for this classification.

147 **Instruments**

148 The Questionnaire of Physical Self-concept (CAF) by Goñi, Ruiz de Azúa and
149 Rodríguez (2006) was utilized to assess physical self-concept. This CAF is based on Fox's
150 (1997) model and it is the only Spanish physical self-concept questionnaire not translated
151 from another language. It consists of 36 items divided into four specific subscales that
152 correspond to the four subdomains of physical self-concept (*physical attractiveness, physical*
153 *ability, physical condition and strength*). Answers are obtained by a 5-point Likert-type scale,
154 ranging from 1 (*false*) to 5 (*true*). The score of each scale is calculated by the sum of the
155 items score within any given scale. The questionnaire reliability coefficient (alpha Cronbach)
156 is $\alpha = .93$. A description of the Physical Self-concept dimensions of the CAF and the
157 reliability of each one (Goñi, Ruiz de Azúa, & Rodríguez, 2006) is as follows:

- 158 1. Sports competence. Perception of personal qualities (e.g. "I am good; I have
159 qualities") and abilities (e.g. "I see myself as able"; "I see myself as self-
160 confident") and a predisposition to sports. For example: I am good at sports.
161 Reliability of this scale was $\alpha = .84$
- 162 2. Physical condition. Physical condition and form; confidence in own fitness. For
163 example: I am in good physical shape. Alpha Cronbach $\alpha = .88$
- 164 3. Physical attractiveness. Perception of own physical appearance; self-assured and
165 satisfied with the body image. For example: I feel confident with the body image I
166 convey. Scale's reliability $\alpha = .87$

- 167 4. Strength. Sees oneself and/or feels strong, with the ability to lift weights, feels
168 confident with doing exercises that require strength and a predisposition to carry
169 out such exercises. For example: I feel strong. Reliability $\alpha = .83$.
- 170 5. General Physical Self-concept. Positive opinion and feelings (happy, satisfied,
171 proud and confident) regarding Physical self-concept. For example: Physically I
172 feel good. Alpha Cronbach coefficient $\alpha = .86$.
- 173 6. General Self-concept. Self-satisfied and satisfied with life in general. For
174 example: I feel happy. $\alpha = .84$.

175 Body dissatisfaction was assessed with two instruments. The first one called Body
176 Shape Questionnaire (BSQ, adapted by Raich et al., 1996) was used to assess the cognitive
177 and behavioural component of body image. The original source was designed by Cooper,
178 Taylor, Cooper, and Fairburn (1987) to measure body dissatisfaction in the female population,
179 together with the fear of weight gain, the negative aversion of one's own physical appearance,
180 with the consequent avoidance of situations where physical appearance might be an issue so
181 as not to draw attention to themselves and the desire to reduce weight. The BSQ is a self-
182 administered questionnaire which consists of 34 items, with 6-points of Likert-type scale (1 =
183 *never*, 2 = *rarely*, 3 = *sometimes*, 4 = *often*, 5 = *very often*, 6 = *always*). From the total score
184 obtained, it is possible to establish four categories: no concern about body image (score < 81),
185 slight concern (score between 81 and 110), moderate concern (score between 111 and 140)
186 and extreme concern (score > 140) (Cooper & Taylor, 1988). The measure possesses an
187 internal consistency of $\alpha = .95$.

188 The perceptive component was assessed by using Gardner's Scale of Evaluation of Body
189 Image (Gardner, Stark, Jackson, & Freedman, 1999) adapted for a Spanish speaking
190 population (Rodríguez, Beato, Rodríguez, & Martínez-Sánchez, 2003). The figural drawing

191 scale is formed by 13 silhouettes which represent body contours devoid of any human body
192 attributes (e.g. hair, face, etc.). The body figures were designed according to statistics of
193 National Health Centre of the United States, in such a way that the average body shape and
194 size represents the average weight for the reference population. Gradual modifications were
195 made on both sides of the central figure to increase or reduce the volume + and – 30 % of the
196 total volume so as to create six figures on each side representing a 5 % increasing weight on
197 the right side and a 5 % decreasing weight on the left side. The result is a continuum of body
198 shapes whose ends represent both an extremely lean figure at one end and an overweight
199 figure at the other. The scale allows for self-estimation of the individual's actual body size
200 and the ideal one (in other words, the perceived size and the assessment of their ideal size
201 figure). Any difference between both would correspond to the discrepancy between the
202 desired body size and what is actually perceived by the individual. The greater the
203 discrepancy, the higher the body dissatisfaction. Whereas the central figure represents 0
204 value, the figures on the left are given negative values (from - 1 to - 6) and the figures on the
205 right positive ones (from + 1 to + 6). The deviation value between desired-perceived figure is
206 measured by subtracting the figural drawing matching the ideal size the participant would like
207 to have from the actual size they perceive themselves (the value of desired body size and the
208 perceived one). Hence, whilst positive values within the perceived discrepancy indicate that
209 the individual desires to gain weight, negative values indicate desire to lose weight.

210 Finally, individual measurements of weight and height were gathered to calculate
211 BMI; all this following ISAK standardized guidelines by a level 1 ISAK researcher. To
212 measure weight, a calibrated digital scale was used, brand Tanita, model UM-075, (with a
213 sensibility of 0.1 kg); on other hand, a 2 meter altimer, brand Holtex was utilized to measure
214 height.

215 Additionally, to classify the participants as active or inactive, the following question was
216 included:

217 Without including Physical Education classes, have you taken part in any physical activity for
218 more than one hour a week, in a regular manner, during the past two months? (playing sports,
219 jogging, dancing, cycling, etc).

- 220 a) Yes, I have practiced for more than one hour every week.
- 221 b) No I have not practiced regularly, or have practiced for less than one hour a
222 week.
- 223 c) No, I never practice when I am not in the Physical Education classes.

224 We considered participants 'active' if they had selected option a) and 'inactive' if they had
225 selected options b) or c).

226 **Procedure**

227 Full University ethical approval was granted prior to commencement of data
228 collection. Informed consent was gathered from all relevant parties, including the
229 participating colleges, parents and the students themselves. Female volunteer students
230 completed the questionnaires in groups of 20-30. Two qualified researchers administered the
231 questionnaire in a classroom large enough for the participants to be sufficiently separated so
232 that responses remained anonymous and confidential. Guidelines to complete the
233 questionnaires correctly were given in advance and participants were reminded of the
234 importance of reading items carefully and responding with honesty. To avoid social
235 desirability in the answers, the participants were informed that the questionnaire was totally
236 anonymous, and that its completion was not identifiable. All data was inputted into a
237 database created in statistical package SPSS version 19.0.

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Results

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Table 1 compares the average BSQ scores for physically active and inactive female adolescents. Participants who had lower BSQ scores, whether physically active or inactive, showed better perceptions in all the scales studied except for *strength* ($F = 3.74$ $p > 0.5$). These differences were more important in attractiveness, general physical self-concept and general self-concept. Furthermore, where physically active female adolescents showed different results on specific scales (*competence* $F = 45.01$ $p < .001$; *physical condition* $F = 50.96$ $p < .001$; *attractiveness* $F = 144.82$ $p < .001$; *strength* $F = 10.54$ $p = .001$); non-practitioners showed more differences in general scales (*general physical self-concept* $F = 144.07$ $p < .001$; *general self-concept* $F = 120.61$ $p < .001$).

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Results also showed that the female adolescents who engaged in physical activity on a regular basis obtained higher scores in all the scales compared to those who did not engage in any physical activity, regardless of their concern about body image. These differences were significant in all cases within the group satisfied with their bodies, especially in *competence* ($F = 78.58$ $p < .001$) and *physical condition* ($F = 80.81$ $p < .001$). On the other hand, within the group who showed body dissatisfaction, the differences between active and inactive participants were smaller and were significant for *competence* ($F = 12.12$ $p = .001$), *condition* ($F = 11.58$ $p = .001$), *strength* ($F = 4.48$ $p < .05$) and *general self-concept* ($F = 3.92$ $p < .05$).

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Table 1. CAF scores in terms of body satisfaction with CI and practice

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Table 2 details participants' *Questionnaire of Physical Self-Concept* scores. The results show the discrepancy between perceived body figure and ideal body figure for active and inactive participants. Participants who presented a negative discrepancy showed lower self-perception of body image in all the scales, independently of the practice of physical

263 activity, than girls who either did not present any discrepancy at all or whose self-perception
264 was positive. The differences in score were significant in all cases except in *competence* ($F =$
265 $2.19 p > .05$) and *strength* ($F = .83 p > .05$) amongst those who did not practice PA. Likewise,
266 these differences were more marked in the scales of *attractiveness*, *general and physical self-*
267 *concept*, and even more striking in girls who practice physical activity. In general, physically
268 active female adolescents consistently showed better perceptions than passive female
269 adolescents, especially those whose perceived body matched their desired body. The
270 differences in self-perceptions between active and inactive girls were greater in *sport*
271 *competence* (negative discrepancy $F = 26.48 p < .001$; Satisfaction $F = 39.36 p < .001$;
272 positive discrepancy $F = 33.96 p < .001$); and *physical condition* (negative condition $F =$
273 $24.14 p < .001$; Satisfaction $F = 46.89 p < .001$; positive Discrepancy $F = 33.35 p < .001$)
274 though smaller in *attractiveness* (Satisfaction $F = 4.81 p < .05$; positive Discrepancy $F = 4.63$
275 $p < .05$) and *general physical self-concept* (negative Discrepancy $F = 5.96 p < .05$;
276 Satisfaction $F = 6.69 p < .05$; positive discrepancy $F = 9.86 p < .01$). Regarding
277 attractiveness, statistical significance was not found in the group with negative discrepancy.

278 Table 2. Scores of CAF in terms of discrepancy perceived-desired body figure and practice of
279 physical activity

280 To understand how much each of the scales of CAF is influenced by every
281 independent variable (practice, body satisfaction, BMI and discrepancy), a multiple regression
282 analysis is carried out for each of the dependent variables. As Table 3 shows, the sport
283 participation has a significant influence on the variance of each and every scale; but
284 particularly on *competence* ($t = 8.62 p < .001$), *physical condition* ($t = 8.55 p < .001$) and
285 *strength* ($t = 5.65 p < .001$).

286 Body dissatisfaction as measured by BSQ also has a relevant influence over all the
287 dimensions of physical and *general self-concept*. This relationship is always negative and
288 very important as far as *attractiveness* ($t = -13.66 p < .001$); *general physical self-concept* ($t =$
289 $-14.30 p < .001$) and *general self-concept* ($t = -12.58 p < .001$) are concerned.

290 BMI has a positive effect on the perception of *strength* ($t = 6.07 p < .001$), whereas it
291 impacts negatively on the perception of *attractiveness* ($t = -2.04 p < .05$). Moreover,
292 discrepancy seems to have no significant impact on the proposed regression models, being
293 *general physical self-concept* ($t = -2.07 p < .05$) the only predictor factor. It is otherwise
294 noteworthy that the multiple regression model (physical activity, dissatisfaction assessed by
295 BSQ, BMI and discrepancy of perceived-desired body) would also explain the 58% of the
296 variance of general physical self-concept, 54% of attractiveness and 48% of general self-
297 concept. However, specific scales of *competence*, *physical condition* and *strength* would only
298 account for 28, 31 and 18%, respectively.

299 Table 3. Analysis of regression in terms of practice, BSQ, BMI and body discrepancy

300 Discussion

301 The main goal of this investigation is to study the importance of body satisfaction in
302 the relationship between physical activity and physical self-concept. This was measured by
303 conducting two analyses. One included independent variables such as physical in/activity,
304 and concern/no concern about body image was considered for the analysis of variance. The
305 objective was to discover if there was any difference in physical self-concept amongst
306 subjects satisfied and non-satisfied with their body image in terms of physical activity. A
307 further goal was to establish intra and inter-group difference factors not yet studied in the
308 literature. Finally, a regression analysis was performed in order to evaluate the influence of

309 related variables (physical activity, body satisfaction, discrepancy between perceived-desired
310 body and BMI) on general and physical self-concept.

311 In response to the primary objective of this investigation, many studies have
312 questioned the existing relationship between physical activity and the subdomain of
313 *attractiveness* (Contreras et al., 2012; Esnaola, 2005; Fox & Corbin, 1989; Goñi, Ruiz de
314 Azúa, & Rodríguez, 2004; Hayes et al., 1995; Marsh, 1997), as well as the influence of
315 physical activity over body image (Davis et al., 1997; Tata, Fox, & Cooper, 2001; Wichstrom,
316 1995). One possible explanation could stem from aesthetic motivations which lead
317 adolescent females to practice physical activity in an attempt to improve their body figure and
318 physical appearance (Fernández-Bustos et al., 2010). These motivations are likely related to
319 an existing poor self-concept (Furnham, Badmin, & Sneade, 2002) and body dissatisfaction
320 (Lepage & Crowther, 2010). For this reason, studies exploring the influence of physical
321 activity on one's physical self-concept must differentiate between participants with high and
322 low body dissatisfaction as well as between physically active and physically inactive
323 participants.

324 We emphasize that, independent of physical activity engagement, students satisfied
325 with their body image present both a higher physical and general self-concept than students
326 dissatisfied with their body image. This provides further confirmation that regardless of
327 engagement in physical activity, satisfaction with one's own body is important for the
328 evaluation of physical self-perception (Baile, Guillén, & Garrido, 2003; Fernández-Bustos,
329 2008; Goñi & Rodríguez, 2004) and global self-esteem (Fox, 2000; Calado, Lameiras, &
330 Rodríguez, 2004).

331 Furthermore, the physical perceptions of the girls who engaged in some physical
332 activity were noticeably greater, especially in the perceptions of sport competence and
333 physical condition, whether or not they were satisfied with their body image. These results
334 did not correspond with those of Esnaola (2005), which did not show differences in
335 satisfaction and attractiveness between physically active and inactive adolescent females. The
336 differences in all the scales studied were statistically significant in the group of students
337 satisfied with their body image; but not so in the group with body image concerns where the
338 scales of *general physical self-concept* and *body attractiveness* did not mark significant
339 differences. In support of previous research (Contreras et al., 2010; Esnaola, 2005; Fox &
340 Corbin, 1989; Goñi, Ruiz de Azúa, & Rodríguez, 2004; Marsh, 1997; Moreno, Cervelló, &
341 Moreno, 2008), these results show that physical activity significantly improves three of the
342 four physical self-perception constructs (*physical condition, strength, sport competence*),
343 regardless of body image concern. Also, in line with Contreras et al., (2012), this impact is
344 greater for those satisfied with their body image. General self-concept was improved amongst
345 physically active girls, regardless of their concern about body image. This finding supports
346 the importance of physical activity in improving self-concept (Spence, McGannon, & Poon,
347 2005; Spence, Poon, & Duck, 1997).

348 In line with previous findings (see González & Albariñas,2004), the relationship
349 between physical activity engagement and perceived *body attractiveness* was positive
350 amongst girls who were satisfied with their body image; yet such a relationship was not found
351 in girls dissatisfied with their body image. This finding could explain the absence of a
352 relationship noted in previous studies where no differentiation between body satisfaction and
353 body dissatisfaction occurred (Contreras et al, 2010; Esnaola, 2005; Fox & Corbin, 1989;
354 Ruiz de Azúa & Rodríguez, 2004; Hayes et al., 1995; Marsh, 1997). It seems that for many,

355 feelings of dissatisfaction motivate engagement in physical activity and, as such, the
356 conclusions offered in studies not making this distinction can be called into question. For this
357 reason, it is necessary to distinguish this analysis in terms of individual body image concern.
358 This answers the primary objective by fulfilling the hypothesis posed: females who exercise
359 have better physical perceptions and a higher self-concept, regardless of the worry about their
360 body, except in the subdimension of physical attractiveness where no significant differences
361 were found between those dissatisfied.

362 With reference to the second objective of this study, and fulfilling the hypothesis
363 posed, the multiple analysis regression showed that physical activity engagement is positively
364 and significantly related to perceptions of *attractiveness, physical and general self-concept,*
365 but especially with *sport competence and physical condition.* In line with other authors (e.g.
366 Pastor, Balaguer, & Benavides, 2002; Harter, 1999), it becomes evident that body satisfaction
367 is the most important aspect in shaping physical and general self-concept of adolescent
368 females. These factors, taken as a whole, would explain approximately 50% variance of
369 physical and general self-concept. As found in previous studies (Goñi & Rodríguez, 2004),
370 BMI was only statistically relevant to perceptions of *strength,* suggesting that it is not a major
371 factor in determining self-concept (Salvador, García-Gálvez, & De la Fuente, 2010).

372 Finally, on the basis of the data obtained in the current study, we would like to offer
373 some concluding observations. A healthy body image is important if adolescent females are
374 to attain a balanced general and physical self-concept. There is a positive relationship
375 between physical activity and an improved general and physical self-concept. This
376 improvement is greater amongst adolescent females less concerned about their body image.
377 Lastly, participating in physical activity becomes an important means to prevent body
378 dissatisfaction amongst female adolescents satisfied with their body image. It is for this

379 reason that specific physical education programmes to help students develop a healthier
380 physical self-concept should be implemented in schools and colleges, which could in turn lead
381 to a healthier body image and self-concept.

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540

Table 1.

CAF scores in terms of body satisfaction with CI and practice

		NO CONCERN BSQ<81			CONCERN FOR BI BSQ>81			ANOVA	
		<i>M</i>	<i>N</i>	<i>DT</i>	<i>M</i>	<i>N</i>	<i>DT</i>	<i>F</i>	<i>p</i>
SA	Inactive	18.39	142	4.84	16.13	116	4.64	14.35	.000(***)
	Active	23.35	117	4.00	18.74	66	5.18	45.07	.000(***)
	ANOVA	78.58			12.12				
	<i>F</i>								
	<i>p.</i>	.000(***)			.001(**)				
PC	Inactive	17.20	142	4.93	14.44	116	5.21	18.93	.000(***)
	Active	22.69	117	4.83	17.19	66	5.27	50.96	.000(***)
	ANOVA	80.81			11.58				
	<i>F</i>								
	<i>p.</i>	.000(***)			.001(**)				
PA	Inactive	21.12	142	5.46	13.46	116	5.59	122.82	.000(***)
	Active	23.25	117	4.14	14.33	66	5.82	144.82	.000(***)
	ANOVA	12.06			.98				
	<i>F</i>								
	<i>p.</i>	.001(**)			.323				
S	Inactive	15.97	142	5.02	14.80	116	4.64	3.74	.054
	Active	19.38	117	5.36	16.53	66	6.28	10.54	.001(**)
	ANOVA	27.70			4.48				
	<i>F</i>								
	<i>p.</i>	.000(***)			.036(*)				
PSC	Inactive	22.85	142	4.85	14.78	116	5.48	156.96	.000(***)
	Active	25.27	117	3.61	16.42	66	6.36	144.07	.000(***)
	ANOVA	19.98			3.34				
	<i>F</i>								
	<i>p.</i>	.000(***)			.069				
GSC	Inactive	24.18	142	3.66	18.33	116	4.47	133.31	.000(***)
	Active	26.25	117	2.99	19.75	66	5.01	120.61	.000(***)
	ANOVA	24.15			3.92				
	<i>F</i>								
	<i>p.</i>	.000(***)			.049(*)				

Note: SA = Sport Competence; PC = Physical condition; PA = physical attractiveness; S= strength; PSC= Physical Self-concept and GSC = General self-concept.

Concern for BI group includes: slight concern (score 81-110), moderate concern (score 111-140) and extreme concern (score > 140)

* $p < .05$

** $p < .001$

Table 2.

Scores of CAF in terms of discrepancy perceived-desired body figure and practice of physical activity

		Negative Discrepancy			Body Satisfaction			Positive Discrepancy			ANOVA		Post hoc
		<i>M</i>	<i>N</i>	<i>DT</i>	<i>M</i>	<i>N</i>	<i>DT</i>	<i>M</i>	<i>N</i>	<i>DT</i>	<i>F</i>	<i>p.</i>	Tukey
SA	Inactive	16.95	184	4.68	18.54	42	5.48	18.03	30	4.97	2.19	.113	
	Active	19.92	113	5.08	25.02	37	3.26	24.00	33	3.00	23.64	.000(***)	a<b,c
	ANOVA	26.48			39.36			33.96					
	<i>F</i>												
		<i>p.</i> .000(***)			.000(***)			.000(***)					
PC	Inactive	15.36	184	5.30	17.73	42	4.92	17.03	30	4.74	4.33	.014	a<b
	Active	18.46	113	5.25	24.75	37	4.07	23.84	33	4.35	31.35	.000(***)	a<b,c
	ANOVA	24.15			46.89			33.35					
	<i>F</i>												
		<i>p.</i> .000(***)			.000(***)			.000(***)					
PA	Inactive	16.09	184	6.27	23.14	42	5.19	20.20	30	6.42	25.35	.000(***)	a<b,c
	Active	17.44	113	6.43	25.37	37	3.60	22.93	33	3.32	34.49	.000(***)	a<b,c
	ANOVA	3.17			4.81			4.63					
	<i>F</i>												
		<i>p.</i> .076			.031(*)			.035(*)					
S	Inactive	15.53	184	4.91	15.64	42	5.16	14.33	30	4.30	.83	.434	
	Active	17.35	113	6.30	20.97	37	4.82	18.84	33	4.27	5.74	.004(**)	a<b
	ANOVA	7.67			22.26			17.40					
	<i>F</i>												
		<i>p.</i> .006(**)			.000(***)			.000(***)					
PSC	Inactive	17.62	184	6.23	24.54	42	4.38	22.06	30	5.71	27.18	.000(***)	a<b,c
	Active	19.47	113	6.52	26.78	37	2.95	25.72	33	3.32	33.50	.000(***)	a<b,c
	ANOVA	5.96			6.69			9.86					
	<i>F</i>												
		<i>p.</i> .015(*)			.011(*)			.003(**)					
GSC	Inactive	20.70	184	5.04	24.69	42	3.52	22.70	30	4.48	12.90	.000(***)	a<b
	Practice	22.34	113	5.21	27.21	37	2.27	25.57	33	3.74	18.87	.000(***)	a<b,c
	ANOVA	7.24			13.90			7.70					
	<i>F</i>												
		<i>p.</i> .008(**)			.000(***)			.007(**)					

Note. SA = Sport Competence; PC = Physical Condition; PA = Physical Attractiveness; S = Strength; PSC = General Physical Self-concept and GSC = General Self-concept

Negative discrepancy: body wanted-perceived <-2

Positive discrepancy: body wanted-perceived >2

Body satisfaction: body wanted-perceived ≥2 and ≤2

**p* < .05

***p* < .01

****p* < .001

Table 3.

Analysis of regression in terms of practice, BSQ, BMI and body discrepancy

		Beta	T	Sig.	R ² corrected	ANOVA(F)
SA	Practice	.35	8.62	.000***	.28	43.51
	BSQ	-.31	-5.26	.000***		
	BMI	.03	.79	.426		
	Discrepancy BI	.09	-1.43	.153		
PC	Practice	.34	8.55	.000***	.31	49.78
	BSQ	-.26	-4.68	.000***		
	BMI	-.09	-1.92	.055		
	Discrepancy BI	.11	-1.72	.085		
PA	Practice	.08	2.39	.017*	.54	126.64
	BSQ	-.64	-13.66	.000***		
	BMI	-.08	-2.04	.042*		
	Discrepancy BI	.06	-1.25	.212		
S	Practice	.25	5.65	.000***	.18	24.73
	BSQ	-.28	-4.57	.000***		
	BMI	.31	6.07	.000***		
	Discrepancy BI	.05	-.75	.450		
PSC	Practice	.11	3.62	.000***	.58	151.54
	BSQ	-.63	-14.30	.000***		
	BMI	-.07	-1.88	.061		
	Discrepancy BI	.10	-2.07	.039*		
GSC	Practice	.14	4.09	.000***	.48	103.10
	BSQ	-.62	-12.58	.000***		
	BMI	-.03	-.88	.378		
	Discrepancy BI	.04	-.84	.400		

Note: SA = Sport Competence; PC = Physical condition; PA = Physical Attractiveness; S = Strength; PSC = General Physical Self-concept and GSC = General Self-concept.

* $p < .05$

** $p < .01$

*** $p < .001$