

## Perception of body size and dissatisfaction in children aged 3 to 6: a systematic review

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**Título:** Percepción del tamaño corporal e insatisfacción en Niños de 3 a 6 años: una revisión sistemática.

**Resumen:** La imagen corporal es un constructo ampliamente estudiado, sobre todo en lo que se refiere a la percepción e insatisfacción con la propia imagen. La mayoría de las investigaciones se centran en la adolescencia y adultez, aunque los problemas de insatisfacción aparecen cada vez a edades más tempranas. Por tanto, el propósito de este estudio fue analizar los hallazgos más trascendentes sobre insatisfacción corporal y percepción del propio tamaño corporal en niños de 3 a 6 años (segundo ciclo de Educación Infantil). A tal fin, se usaron las bases de datos de Medline, SportDiscus, Scopus, ScienceDirect, Dialnet, ProQuest y EBSCO, de las cuales se seleccionaron 22 estudios, en base a criterios de exclusión como el idioma, la revisión por pares y la medición objetiva del Índice de Masa Corporal (IMC) de los niños. Los resultados son diversos en cuanto a los niveles de insatisfacción, lo cual hace imposible establecer conclusiones acertadas sobre las características y prevalencia de dicha variable a estas edades. Entre las principales razones de esta dificultad destaca el tipo de instrumento empleado y las dificultades de los niños para percibir su cuerpo con exactitud.

**Palabras clave:** Imagen corporal; Educación Infantil; insatisfacción corporal; percepción corporal; niños.

**Abstract:** Body image is a construct that has been widely studied, particularly with regard to image perception and dissatisfaction. Though most research studies focus on adolescence and adulthood, dissatisfaction problems are manifesting themselves at increasingly early ages. The aim of this study was, therefore, to analyse the most significant findings on body dissatisfaction and body-size perception among children aged 3 to 6 (second cycle of pre-school education). To this end the Medline, SportDiscus, Scopus, ScienceDirect, Dialnet, ProQuest and EBSCO databases were used, and from which a total of 22 studies were selected in accordance with exclusion criteria such as language, peer review and the objective measurement of the body mass index (BMI) of children. In terms of levels of dissatisfaction, results vary widely, making it impossible to draw sound conclusions on the nature and prevalence of this variable at these ages. The main reasons for this include the type of instrument used and the difficulties children had in perceiving their bodies correctly.

**Keywords:** Body image; pre-school education; body dissatisfaction; body perception; children.

### Introduction

Body image is a construct that arouses a great deal of interest and no little concern. In response, a number of researchers are studying body image with young participants, the aim being to ascertain the exact point at which they begin to have certain negative thoughts or concerns about their bodies (Harriger, 2014).

The main reason for assessing this construct in children of such young ages is that a negative body image can lead to problems in later life. It is well known that body dissatisfaction can trigger low self-esteem and an increase in depressive symptoms, which are in turn linked to psychological problems (Ferreiro, Seoane, & Senra, 2014; Raich, 2001; Sarwer, Dilks, & Spitzer, 2012) such as interpersonal anxiety. As a result, anyone who rejects themselves is likely to think that they will be rejected by others (Raich, 2001).

Other problems may also arise, such as Body Dysmorphic Disorder (BDD), which is understood as a “preoccupation with one or more perceived defects or flaws in physical appearance that are not observable or appear slight to others” (American Psychiatric Association, 2014, p. 148).

Linked to dissatisfaction and BDD are eating disorders (such as bulimia nervosa and/or anorexia nervosa), muscle dysmorphia and mood disorders, among other conditions (Ferreiro et al., 2014; González-Martí, Fernández, Hernán-

dez-Martínez, & Contreras, 2014). These disorders are common in older children, however.

Body image is a construct defined by Schilder (1983) as the “mental representation we create of our body” (p. 15). Schilder advocates a biopsychosocial approach that takes the following into consideration: biological aspects such as age, gender and BMI; psychological aspects such as body satisfaction/dissatisfaction; and sociocultural aspects such as socio-economic status, the weight of one’s peers, parents’ preoccupations with their children’s weight and dissatisfaction with one’s own body. This approach observes how the relationship between these aspects impacts on body image (Fredrickson, Kremer, Swinburn, Silva-Sanigorski, & McCabe, 2013), which is variable and is influenced by interactions with society, peers, family, culture and the media.

Given that body image comprises a perceptive, cognitive/emotional and behavioural component (Thompson, 1990), it encompasses perception of the body and parts of the body, its movements and limits, the subjective experience of our attitudes, thoughts, feelings and the assessments we make, and, finally, the way in which we act (Raich, 2001). As a result, body image is closely linked to self-esteem (Dohnt & Tiggemann, 2006a, 2006b; Sarwer et al., 2012), as it is a construct that involves the perception that we have of ourselves. Body image is also linked to perceived competence (Méndez-Giménez, Cecchini-Estrada, & Fernández-Río, 2014), physical condition (Borrego, López-Sánchez, & Díaz-Suárez, 2012) and physical attraction and physical self-concept (Fernández-Bustos, González-Martí, Contreras, & Cuevas, 2015), which are regarded as aspects forming part of self-concept.

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### Body image in the second cycle of pre-school education

The development of body image begins in early childhood. Many children start to become aware of themselves at around the age of two, when they begin to recognise themselves in photos or in the mirror (Palacios, Marchesi, & Coll, 1990; Raich, 2001; Smolak, 2012) and identify parts of their body, which is fundamental in the creation of their body image (Schilder, 1983). At a later stage, children begin to internalise cultural concepts and develop images of how they ought to be (Raich, 2001), in other words the physical appearance they need to have in order to conform to society's idea of beauty, which they acquire through the media or through interaction with their surroundings. At the same time, they begin to discover their body through external information, conversations and the observations of others. For example, a child's interest in their body can be aroused by them hearing their parents talk about another person's body (Schilder, 1983). Society and the media therefore play an important role in children's internalisation of beauty ideals at an early age. With regard to body image, these ideals are viewed as an extremely important aspect by the tripartite influence model, which points to three factors (the media, parents and peers) which, along with the internalisation of ideals and the excessive comparison of one's appearance to others, present a risk in terms of the development of dissatisfaction and eating disorders (Shroff & Thompson, 2006). This is particularly true in girls, who are under more pressure than boys to achieve a certain ideal from an early age (Smolak, 2004).

Body image has been assessed at these ages by taking into consideration the child's perception of their body size and their dissatisfaction in terms of shape and size, with the aim of concluding if they prefer larger or smaller bodies than their own.

In analysing body dissatisfaction, some studies use interviews or abbreviated questionnaires (Birbeck & Drummond, 2005, 2006a, 2006b; Hayes & Tantleff-Dunn, 2010), although the most widely used instruments are silhouette scales or body figures of the same height and ranging from very thin to very obese (Collins, 1991). Using this instrument, children select both the figure they identify most closely with and the one they would like to be, with body dissatisfaction being determined by the discrepancy between their current perceived body size and their desired size. As Tatangelo, McCabe, Mellor and Mealey (2016) suggest, however, this means of assessing body dissatisfaction may be incorrect, as in order to affirm that someone is unhappy with their body, the extent to which their level of dissatisfaction impacts on their life must be identified.

Furthermore, in evaluating perception these scales are also mainly used for the purpose of finding out if the child perceives the figure that corresponds with their weight status.

The evaluation of body image in children of such a

young age is problematic in that some experts regard these children as having cognitive limitations that prevent them from estimating their body size accurately (Burgess & Broome, 2012; Dunphy-Lelii, Hooley, McGivern, Skouteris, & Cox, 2014; Meers et al., 2011; Musher-Eizenman, Holub, Edwards-Leeper, Persson, & Goldstein, 2003). One of the main limitations is that children of this age think in a specific way, namely that they think about what they see and hear (about what is real), which makes it impossible for them to distinguish between and compare their real and ideal selves (Dunphy-Lelii, Hooley, McGivern, Guha, & Skouteris, 2014; Mancilla, Vázquez, Mancilla, Amaya, & Álvarez, 2012; Papalia, Wendkos, & Duskin, 2010). This abstract way of thinking starts to occur from the age of 11. It allows children to think more logically and develop images of ideal circumstances. In other words, they are able to think about the ideal qualities they wish for themselves or others. They can, for example, picture their ideal father and compare him with their actual father, i.e. they are able to think about the future and what they might become (Santrock, 2007).

Another possible shortcoming in children of these ages is the lack of competence in self-representation, which could be attributable to sudden and disproportionate body growth, which makes it harder for the perceptual system to assimilate body changes quickly (Dunphy-Lelii, Hooley, McGivern, Guha et al., 2014). Another characteristic of very young children is that they have a limited ability to categorise, i.e. they categorise things based on the two extremes of a single dimension. In their eyes, things and people are either "big" or "small", "good" or "bad", "nice" or "mean" (Papalia et al., 2010). As a result, they may have difficulty understanding the average values represented by body figures used in scales.

Finally, another aspect of cognitive development is centration (Papalia et al., 2010), which refers to the tendency of children to focus their attention on a single aspect and neglect all the others. When they are shown body figure scales, they may focus, therefore, on a single characteristic in making a comparison with their body. In this respect, Dunphy-Lelii, Hooley, McGivern, Guha et al. (2014) noted that children have difficulty in assessing the various dimensions of the size of a figure at the same time.

However, despite the fact that some authors attribute cognitive limitations to body perception problems, others argue that it is due to the inadequate nature of the instruments used (Holub, 2008) and to the internalisation of society's negative attitudes towards obesity (Cramer & Steinwert, 1998).

To conclude, given the range of results on body image and its importance in the development of self-esteem, there is a need for more studies providing a more in-depth assessment of the body image of children aged 3 to 6. It is for these reasons that this study sought to review the most significant findings in relation to the way in which children of these ages assess body image, the purpose being to reach more accurate conclusions on their perception and body dissatisfaction, and identify their cause.

## Method

### Search procedure

A systematic search was conducted of the Medline, SportDiscus, Scopus, ScienceDirect, Dialnet, ProQuest and EBSCO databases between September 2015 and October 2016. The following key words were used in the search, as well as their Spanish translations: *body dissatisfaction, body satisfaction, pre-school, body perception, body image, body size, young children* and *negative body image*.

### Selection criteria and process

The search and selection process were split into two phases. The first took a general approach to body image, and the second focused on children in the second cycle of pre-school education.

The period for evaluation ran from 1998 to 2016, as it was from the first of those dates that studies on body image in this age group began to be carried out in greater numbers. The following criteria were taken into consideration in selecting articles:

#### Inclusion criteria

- Participants aged between 3 and 6.

- Studies on body dissatisfaction and perception of participants' own body size.
- Cross-sectional, longitudinal, qualitative and quantitative studies.

#### Exclusion criteria

- Languages other than Spanish and English.
- Articles included in journals without peer review.
- Studies in which BMI is not measured objectively on the basis of height and weight. Studies in which the children's heights and weights were provided by their families were excluded.

Owing to the heterogeneity of the results encountered, a meta-analysis –which was the main intention– could not be carried out. A systematic review was carried out as a result, this review being complemented by a chi-square test with a view to providing more detailed data on the body dissatisfaction of children of these ages.

## Results

### Search for articles

A total of 144 studies were identified, of which 113 were selected and only 22 fulfilled the aforementioned inclusion criteria (Figure 1).

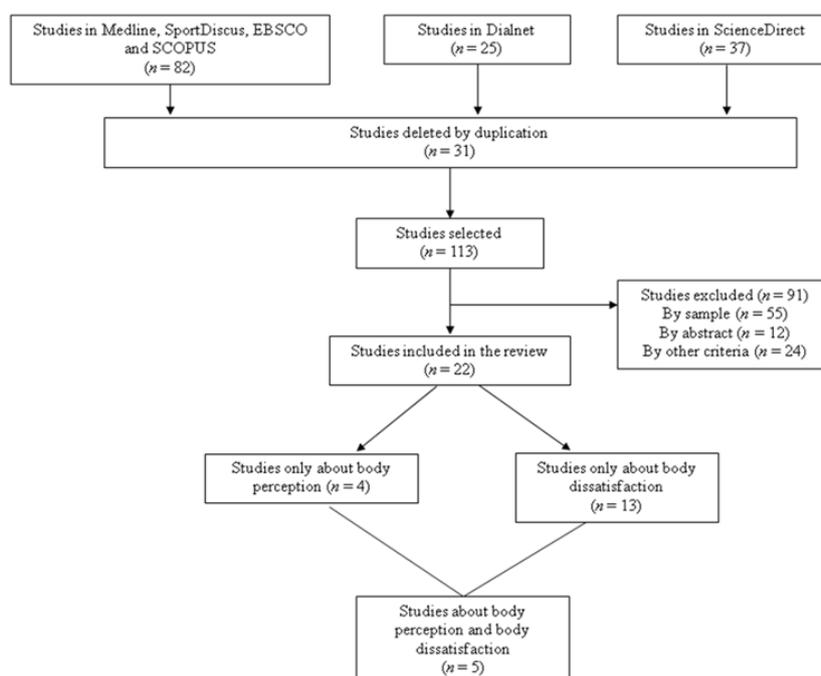


Figure 1. PRISMA flow diagram depicting the exclusion and inclusion of articles.

Analysis of the studies included reveals meaningful results with regard to participants' dissatisfaction with and per-

ception of their body size. These results are detailed in Table 1, along with the characteristics of these studies.

Table 1. Characteristics and results of the studies selected for systematic review

Author(s) and Year	Country/ies	Total sample	Subgroups	Type of study	Variables	Instruments	Results
*Ambrosi-Rándic and Tokuda (2004)	Japan and Croatia	N = 237 children	n = 129 Croatsians (45.7% girls and 54.3% boys) aged 4 to 6  n = 108 Japanese (48.1% girls and 51.9% boys) aged 4 to 6	Quantitative	Body perception and dissatisfaction	Collins' Figure Drawing (seven silhouettes, Collins, 1991)	- Little or no significant correlation between BMI and perceived body size. - Japanese girls prefer thinner figures than the boys, and Japanese boys prefer larger figures than the Croatsians. - Girls satisfied with their bodies (8% Japanese and 29% Croatsians), girls who want to be thinner (46% Japanese and 39% Croatsians) and larger (46% Japanese and 32% Croatsians). - Boys satisfied with their bodies (15% Japanese and 37% Croatsians), boys who want to be thinner (29% Japanese and 36% Croatsians) and larger (55% Japanese and 27% Croatsians).
Birbeck and Drummond (2005, 2006a, 2006b)	Australia	N = 47 children	n = 25 boys and 22 girls aged 5 and 6	Qualitative	Body dissatisfaction	- Tiggemann and Pennington's silhouette scale (1990) - Interview	The girls prefer thinner figures than their current perceived size, while the boys prefer larger sizes.
Burgess and Broome (2012)	USA	N = 17 children	n = six boys and 11 girls aged 5	Quantitative	Body perception and dissatisfaction	- Collin's scale - Questionnaire	- 58.8% of the boys chose the body shape corresponding to their BMI. - None of the overweight or obese children identified themselves as such. - All participants were satisfied with their appearance. - 53% of the boys did not correctly identify the body shape of low-weight people.
Cramer and Steinwert (1998)	USA	N = 83 children	n = 39 boys and 44 girls aged 3 to 5	Quantitative	Body perception	Three-silhouette method	- Some participants did not correctly identify their body size. - Thin and medium-weight boys identified themselves as such, but most of the obese boys saw themselves as thin.
*Damiano et al. (2015)	Australia	N = 17 children	n = 127 boys and 152 girls, all aged 4  n = 205 fathers and 270 mothers	Quantitative	Body dissatisfaction	- Children's Body Size Attitudes Scale - Five silhouettes from Tiggemann and Pennington's scale	- 27.8% of the boys wanted a different body shape (22.9% of them wanted to be thinner and 77.1% of them larger). - 37.7% of the girls wanted a different body shape (35.1% of them wanted to be thinner and 64.9% of them larger).

*Davison, Markey and Birch (2000)	USA	N = 197 girls and their parents	n = 197 5-year-old girls	Quantitative	Body dissatisfaction and weight concern	Body Esteem Scale (BES)	- 9% of the girls were dissatisfied. - 21% were concerned about their weight. - Among the girls, there was a significant relationship between BMI and dissatisfaction and between it and concern with weight.
Davison et al. (2003)	USA	N = 182 girls	n = 182 girls when aged 5, 7 and 9	Quantitative	Weight concern and body dissatisfaction at ages 5, 7 and 9 and their relation with eating habits at age 9	- Weight Concerns Scale - BES - Children's Eating Attitude Test - Eating Behaviour Questionnaire - Dieting Status	- Body and weight concern at the age of 5 leads to concern at the ages of 7 and 9. - Girls who are most dissatisfied at the ages of 5 and 7 are most likely to go on a diet at the age of 9.
*Dohnt and Tiggemann (2005)	Australia	N = 53 girls	n = 28 girls aged 5 and 25 girls aged 6.	Quantitative	Body dissatisfaction	Children Figure Rating Scale (nine silhouettes, Tiggemann & Wilson-Barrett, 1998)	- 28.6% of the girls aged 5 and 41.7% of those aged six wanted to be thinner than they were. - The discrepancy between the actual and ideal figure is -0.18 (1.63) at the age of 5, reflecting a desire to have a larger body.
*Dohnt and Tiggemann (2006a)	Australia	N = 61 girls	n = 31 girls aged 5 and 30 girls aged 6	Quantitative	Body dissatisfaction	Children Figure Rating Scale	- At the age of 5, respectively 48.4% and 32.3% wanted to be larger and thinner than they actually were. - At the age of 6, 16.7% wanted to be larger and 46.7% to be thinner.
*Dohnt and Tiggemann (2006b)	Australia	N = 17 girls	n = 17 girls aged 5	Quantitative	Body dissatisfaction	Children Figure Rating Scale	- 58.8% wanted to be larger than they actually were.
Dunphy-Lehi, Hooley, McGivern, Skoutens et al. (2014)	Australia	N = 98 children	n = 47 boys and 51 girls aged between 3 and 5.	Quantitative	Body perception	- Doors of differing size - Length-adjustable paper tube and cloth pond	There was an 82% accuracy rate in the height tasks and a 75% accuracy rate in the width tasks.

*Hayes and Tantleff-Dunn (2010)	USA	N = 121 girls and their mothers	n = 121 girls aged between 3 and 6	Quantitative	Body dissatisfaction, weight and appearance concern	Body figures to which were added the girls' faces	- 24.8% of the girls were dissatisfied with their appearance, 10.8% with their clothes and 1.5% with something unrelated to their appearance. - Almost a third of the girls in the pre-test and a quarter in the post-test wanted to change their appearance in some way (skin colour, hair or weight). - In the post-test: 50.8% of the girls had never been concerned about being obese, 21.5% sometimes and 13.8% always. - 24.6% of the participants wanted to be thinner. - At the ages of 5 and 6, girls chose thinner figures as their ideal than they did at ages 3 or 4.
Holub (2008)	USA	N = 69 children	n = 27 boys and 42 girls aged between 4 and 6	Quantitative	Body perception	Collin's scale	There is no relationship between the perceived and actual figure, although the boys are more accurate in perceiving their bodies than the girls.
*Li, Hu, Ma, Wu and Ma (2005)	China	N = 1,340 children	n = 699 boys and 641 girls aged 5 to 6	Quantitative	Body perception and dissatisfaction	Adapted Collin's scale	- 73.1% and 78.2% of the boys respectively expressed dissatisfaction at the ages of 5 and 6. - 73.2% and 76.7% of the girls respectively expressed dissatisfaction at the ages of 5 and 6.
McCabe et al. (2007)	Australia	N = 53 children, their mothers and teachers	n = 24 boys and 29 girls aged 3 and 4	Qualitative	Weight concern	Interview	- The girls were more concerned with their clothes and hair than their body. - The girls were concerned about their weight and the boys about their muscles.
Meers et al. (2011)	USA	N = 32 children	n = 16 boys and 16 girls aged between 4.3 and 5.9 years	Quantitative	Body perception	Figures A and G of the Children's Body Image Scale (Truby & Paxton, 2002) and two silhouettes of these figures (outline)	Lack of accuracy in the perception of body size. 64.3% of the children (with the images) and 71.4% of them (with the silhouettes) saw themselves as thinner than they actually were.
Musher-Eizenman et al. (2003)	USA	N = 42 children and 28 mothers	n = 24 boys and 18 girls aged between 4 and 6	Quantitative	Body dissatisfaction	Adapted Collins's scale	- 26% of the boys saw the thinnest figure as their ideal, 24% the second thinnest and 5% the two fattest. - 31% of the boys wanted to be thinner, 33% wanted to stay the same and 36% to be larger. - The boys were not accurate in indicating their actual body size.

*Pallan, Ham, Duda and Adab (2011)	United Kingdom	<i>N</i> = 571 children	<i>n</i> = 294 boys and 277 girls aged 5 and 6.	Quantitative	Body dissatisfaction	Collins' scale adapted by Rand and Resnick (nine silhouettes)	-79% of the boys and girls aged 5 were dissatisfied, while the percentage among 6 years old was 84.5%.
Ra et al. (2016)	Corea del Sur	<i>N</i> = 388 children, 388 mothers and 23 teachers	<i>n</i> = 180 boys and 208 girls aged between 3 and 6	Quantitative	Body perception and dissatisfaction		- Boys: 42% overestimated their weight, 39.7% underestimated it and 18.3% perceived it correctly. - 47.7% of the boys were satisfied, 30.1% wanted to be thinner and 22.2% larger.
Stunk and Burch (2004)	USA	<i>N</i> = 153 girls	<i>n</i> = 153 girls assessed at the ages of 5, 7 and 9	Quantitative	Weight concern and body dissatisfaction	- Dutch Eating Behaviours Questionnaire - Eating in the Absence of Hunger Protocol - Weight Concern Scale - BES	- The girls at risk of being overweight at the age of 5 were more concerned about weight and had greater body dissatisfaction at the age of 9. - At the ages of 5 and 7 there were no significant differences in body dissatisfaction between girls at risk and not at risk of being overweight, but there were at the age of nine.
*Tremblay et al. (2011)	Canada	<i>N</i> = 144 children and 132 mothers	<i>n</i> = 76 boys and 68 girls aged between 3 and 5	Quantitative	Body perception and dissatisfaction	Three-silhouette method	- Most of the girls did not accurately estimate their body size. 42% of those of normal weight correctly perceived their size, while only 15% of those who were overweight were able to estimate it. - The girls of medium weight were more dissatisfied with their bodies than those who were overweight (64% vs 33%). - 63% of the girls were dissatisfied with their bodies. They expressed more dissatisfaction than the boys.
Wong, Chand and Lin (2013)	China	<i>N</i> = 699 children and 699 legal guardians and teachers	<i>n</i> = 323 boys and 376 girls aged between 4 and 6 <i>n</i> = 566 mothers, 121 fathers, 101 grandparents and two aunts	Quantitative	Influence of legal guardians on children's body dissatisfaction	Collin's scale	- There is a relationship between parents' satisfaction with their children's bodies and the children's dissatisfaction. - Positive correlation between teachers' assessment of body size and dissatisfaction among children. - 35.7% of the boys wanted to be thinner, 28.8% larger and 35.5% to stay the same. The rate of dissatisfaction is 64.5%, therefore.

NB: Studies included in the chi-square test (\*) (see Table 2)

### Characteristics of the articles

Of the 22 studies selected, 13 analysed body dissatisfaction, four body perception and five both variables. The total sample of children was 4,883 participants aged between three and six, 2,033 of which were boys (41.6%) and 2,850 girls (58.4%), who were in the majority. In eight of the studies, the children's fathers, mothers, legal guardians or teachers also took part. These research studies were conducted in different countries, 18 of them in the western world and four in the Far East, with USA and Australia accounting for the largest number of studies included.

### Body dissatisfaction

Some studies recorded dissatisfaction levels in excess of 50% (Ambrosi-Randic & Tokuda, 2004; Dohnt & Tiggemann, 2006a, 2006b; Li et al., 2005; Musher-Eizenman et al., 2003; Pallan et al., 2011; Ra et al., 2016; Tremblay et al., 2011, Wong et al., 2013), while others revealed satisfaction levels of over 60% (63-100%) (Burgess & Broome, 2012; Damiano et al., 2015; Davison et al., 2000; Hayes & Tantleff-Dunn, 2010).

As regards body size, both genders prefer thinner bodies than their own (Ambrosi-Randic, & Tokuda, 2004; Birbeck & Drummond, 2005, 2006a, 2006b; Hayes & Tantleff-Dunn, 2010). It was noted that the preference for thinness increases with age (Dohnt & Tiggemann, 2005; Dohnt & Tiggeman, 2006a; Hayes & Tantleff-Dunn, 2010), as children aged 5 and 6 choose thinner figures as their ideal body shape than children aged 3 and 4. Furthermore, this desire is greater among females (Ambrosi-Randic & Tokuda, 2004; Birbeck

& Drummond, 2005, 2006a, 2006b; Damiano et al., 2015). Hayes and Tantleff-Dunn (2010) found that 24.6% wanted thinner bodies, while Ambrosi-Randic and Tokuda (2004) found that 42.5% of girls and 32.5% of boys wanted to be thinner, although a considerable number of participants also chose bodies that were larger than theirs (an average of 39% of girls and 41% of boys). Similarly, Damiano et al. (2015) discovered that 64.9% and 77.1% of girls and boys respectively wanted to larger bodies, which was also the finding of Musher-Eizenman et al. (2003), who revealed that 36% of children, both boys and girls, wanted a larger figure.

This body dissatisfaction is related to BMI, as children who are overweight or obese have higher levels of dissatisfaction than those of normal weight (Davison et al., 2000; Shunk & Birch, 2004; Tremblay et al., 2011).

In view of the range of results relating to dissatisfaction, the studies were collated and compared to check if any differences in dissatisfaction could be linked to gender, country or the instrument used. Chi-square tests (Table 2) were carried out for this purpose. The studies included in this test show that it is western girls who manifest greater body dissatisfaction ( $\chi^2 = 34.19$ ;  $p < .001$ ), while there is no gender-related difference in Far Eastern countries ( $\chi^2 = 0.41$ ;  $p = .52$ ). Furthermore, Far Eastern boys and girls were significantly more dissatisfied than their western peers ( $\chi^2 = 321.86$ ;  $p < .001$ ). Levels of dissatisfaction also varied according to the instrument used. Studies using scales of seven or nine silhouettes yielded a significantly higher percentage of dissatisfaction (65.54%) ( $\chi^2 = 332.70$ ;  $p < .001$ ) in comparison to scales of three or five silhouettes (29.35%) and to the percentage revealed by other instruments (13.84%).

**Table 2.** Differences in satisfaction-body dissatisfaction according to gender, country and evaluation instrument.

		SATISFIED		DISSATISFIED			Chi-square test		
		N	%	N	%	%	<i>p</i>	$\chi^2$	
Gender	USA, Canada, Australia and Croatia	Boys	251	44.27	316	55.73	39.6	.000 (***)	34.19
		Girls	698	59.15	482	40.85	60.4		
		Total	949		798				
Country	China and Japan	Boys	169	22.38	586	77.62	52.6	.52	0.41
		Girls	165	23.81	528	76.19	47.4		
		Total	334		1114				
Country	China, Japan Rest	China, Japan	334	23.1	1114	76.9	58.26	.000 (***)	321.86
		Rest	949	54.32	798	45.68	41.74		
		Total	1283		1912				
Instruments	3 and 5 silhouette 7 and 9 silhouette Others	3 and 5 silhouette	313	70.65	130	29.35	14.56	.000 (***)	332.70
		7 and 9 silhouette	395	35.46	719	64.54	80.51		
		Others	274	86.16	44	13.84	4.93		
		Total	982		893				

\* $p < .05$  \*\* $p < .001$

### Perception of body size

Most authors hold that children do not perceive their body size correctly (Ambrosi-Randic & Tokuda, 2004; Burgess & Broome, 2012; Holub, 2008; Meers et al., 2011;

Musher-Eizenman et al., 2003; Ra et al., 2016; Tremblay et al., 2011). Between 41% and 85% of them incorrectly identified their weight status with their perceived body size. However, Dunphy-Lelii, McGivern, Skouteris et al. (2016) found that 74% of children estimated their size correctly.

It was also found that most obese or overweight children do not perceive their weight status correctly (Burgess & Broome, 2012; Cramer & Steinwert, 1998; Tremblay et al., 2011). There are also errors, however, in the identification made by thin children (Cramer & Steinwert, 1998). In terms of gender, boys were more accurate than girls in estimating their body size (Holub, 2008) and, in general terms, children were better at perceiving height than width (Dunphy-Lelii, Hooley, McGivern, Skouteris et al., 2014).

## Discussion

The aim of this review was to provide a synthesis of the results obtained in body image research studies conducted with children aged 3 to 6, with the variables of dissatisfaction with and perception of their own body size being taken into account for this purpose.

With regard to dissatisfaction, the analysis shows that it is very prevalent at these ages. Prevalence varies significantly across the research studies, however, with percentages ranging between 9% and 84%. One possible explanation for this very significant difference in dissatisfaction levels could lie in the evaluation instruments used. Studies using scales of seven or nine silhouettes reveal much higher levels of dissatisfaction than those using scales with fewer silhouettes (three or five) or which opt for other instruments (Table 2). As a result of this, it could be inferred that the greater the number of silhouettes, the greater the probability that children select a different silhouette as their ideal. It may also be the case that they believe they have to choose a different figure for each question (an actual and an ideal figure) (Tatangelo et al., 2016), which would give rise to high levels of discontent.

As Table 1 shows, dissatisfaction can lead to a desire for both thin and large bodies. At these ages, some children want to be bigger and stronger in terms of their weight (Smolak, 2012), as they believe that the word *strong* is associated with overweight figures (Rich et al., 2008). As a result, they associate thinness with weakness (Cramer & Steinwert, 1998). Males reveal more of a desire to be physically bigger, which perhaps explains why boys are anxious to grow. It is perhaps for this reason that they choose obese figures more often, as they can represent strong and muscular bodies (Birbeck & Drummond, 2006b). Such a choice may also show the importance boys attach to body functionality and physical performance (Tatangelo et al., 2016), in the belief that a large body is better able to achieve this.

There are also boys, however, who prefer thinner figures, as they see them as being taller (Birbeck & Drummond, 2005). Some studies reveal that the preference for thin figures increases with age (Hayes & Tantleff-Dunn, 2010; Li et al., 2005). Dohnt and Tiggemann (2006a) found that 48.5% of five-year-old girls wanted to be bigger, whereas girls aged 6, 7 and 8 wanted to have thinner bodies. These authors also noted that 58.8% of five-year-old girls wanted to be bigger, whereas only 29.4% of girls aged 6 expressed this desire (Dohnt & Tiggemann, 2006b). Heron et al. (2013) found that five-

and six-year-old boys and girls wanted a bigger and stronger body (in terms of weight), while boys aged between 7 and 11 preferred a thinner body. However, in selecting a thinner or larger ideal figure than their own, children may choose to do so for reasons relating to body fat and musculature or the desire for an adult figure, which should not necessarily cause them to be concerned with their current perceived size (Mancilla et al., 2012). With regard to this type of dissatisfaction, Smolak (2012) holds that the preoccupation of children of these ages with body image is not based on weight and shape, but on clothes and hair. Some parents of children aged between 1 and 6 reported that their offspring began to become aware of their own image at the age of 3 or 4 (Hart, Damiano, Cornell, & Paxton, 2015), manifesting certain preferences with regard to clothes and a desire to dress themselves or to look like someone else, while also making comments about their bodies or those of others and imitating what they see and hear, though not necessarily in a negative manner.

Dissatisfaction can be influenced by sociocultural factors. It has been shown that dissatisfaction is more prevalent in Far Eastern cultures than western ones (Table 2), in both genders, though it is usually channelled towards a desire for larger bodies, perhaps because obesity is associated with wealth in oriental culture (Li et al., 2005; Ra et al., 2016). Among western children, levels of dissatisfaction are slightly higher in boys than they are in girls. This piece of data contradicts other results that conclude that females are more dissatisfied about their bodies (Damiano et al., 2015; Tremblay et al., 2011).

The growing desire for thinness may be related to increased media exposure and the subsequent interiorisation of western society's concepts of beauty, which are focused on thinness and slenderness in women and on muscularity in men (Harriger et al., 2010; Ra et al., 2016; Raich, 2001).

With regard to obesity, it was noted that it is a significant risk factor in the development of a negative body image in children (Smolak, 2012), with a relationship between BMI and dissatisfaction in five-year-old girls (Davison et al., 2000) and girls aged between five and eight (Lowes & Tiggemann, 2003) being revealed. It was also noted that older girls want thinner figures (Dohnt & Tiggemann, 2006a) and that this relationship between BMI and body dissatisfaction grows stronger the older children become (Davison et al., 2003; Pallan et al., 2011), appearing earlier in girls than boys (Smolak, 2012).

In relation to body perception, Ambrosi-Randic and Takunda (2004) hold that children of these ages are too young to estimate their body size correctly. It is perhaps for that reason that a number of studies do not find any correlation between the BMI of children and perceived size (Ambrosi-Randic & Tokuda, 2004; Burgess & Broome, 2012; Holub, 2008; Meers et al., 2011; Musher-Eizenman et al., 2003; Ra et al., 2016; Tremblay et al., 2011). This gap in perception may vary depending on age, as Cramer and Steinwert (1998) found that children aged 5 are more accurate in ascer-

taining their body size than three-year-olds, although Tremblay et al. (2011) did not note that age had any influence on accuracy.

As is the case with dissatisfaction, it was also noted with regard to perception that children's weight influences how they see their body, as most obese people do not usually perceive themselves as such (Burgess & Broome, 2012; Cramer & Steinwert, 1998, Tremblay et al., 2011). However, Pallan et al. (2011) found that nearly half of overweight or obese children aged between five and seven see themselves as being too fat.

This range of results, particularly in terms of dissatisfaction, can be attributed to the cognitive limitations of children (Dunphy-Lelii, Hooley, McGivern, Guha et al., 2014), to prejudice about obesity (Cramer & Steinwert, 1998) or the unsuitability of the instruments (Holub, 2008). As regards this last point, Pallan et al. (2011) argue that the lack of consistency in instruments and the lack of validated measurements pose a problem when it comes to assessing the body image of children of such young ages.

This explains the need for new studies that focus their efforts primarily on the design of instruments and the use of methodologies in keeping with the cognitive abilities of children. Nevertheless, in addition to future research studies, there is a need in the educational environment to develop body image intervention programmes promoting individual characteristics that help create a positive body image. This could be achieved, for example, through physical exercise programmes (López-Sánchez, López-Sánchez, & Díaz-Suárez, 2015), as an active lifestyle is linked to a suitable body image.

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## Conclusions

The study of body image in the second cycle of pre-school yields varying and largely inconclusive results with regard to children's dissatisfaction with and perception of their own bodies. This could be due to the cognitive development of the children, their prejudice with regard to obesity or to the fact that the instruments or methodologies are not appropriate for them. One suitable instrument would perhaps involve the use of scales featuring silhouettes of children of their ages and the asking of questions to ascertain the reasons for their choice.

Certain limitations preventing a more exhaustive analysis from being carried out were encountered. Some of these limitations arise from the heterogeneous nature of the studies, the instruments used and the data presented, which make it impossible to make an objective comparison through a meta-analysis, which would otherwise provide valid results. Another limitation was the fact that age-related results could not be established, as many research studies provide general results, without specifying age and/or gender. As regards the number of articles included in the review, while it is true that they are not great in number due to the various exclusion criteria, we believe that this study adequately represents the literature at a global level, given that research studies from a number of countries are included.

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