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Body dissatisfaction among pregnant women: an integrative review of the literature

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Abstract *The body image of pregnant women is an issue that should be further investigated by professionals in the area, especially in view of the fact that maternal and infant health has gained such prominence. The scope of this integrative review is to analyze the literature relating to body image and body dissatisfaction among pregnant women. Research was based on articles extracted from the Scopus, PubMed, BVS and PsycINFO databases, by cross-referencing "pregnancy" with the keywords "body image" and "body dissatisfaction." Once the inclusion and exclusion criteria had been adopted, forty studies were analyzed. These produced inconclusive data about body dissatisfaction during pregnancy. Symptoms of depression, low self-esteem, an inadequate approach towards healthy eating and weight gain above recommended limits have been associated with a negative body image. The contradictory findings could be related to the different instruments used to measure body image. In view of the possible impact that a negative body image can have on maternal and infant health during pregnancy, it is recommended that further investigations are made, in particular related to the development of a specific tool to evaluate the body image of pregnant women.*

Key words *Body image, Pregnancy, Adult, Health, Review*

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Introduction

Pregnancy is a deeply complex period in a woman's life, since it is considered to be a process when the transformations that occur during pregnancy will have a profound effect on the day-to-day life of the future mother[1]. Pregnancy is a phase when complex physiological and psychological changes take place in a short space of time[2-4], which affect both the mental and physical health of the mother and influence the health of her baby[2,4-6].

According to Skouteris et al.[4] and Reis et al.[7], since the attitudes of the mother will reflect on the development and on the post-partum life of a healthy baby, women in this condition are receptive to information which can be used to benefit their child. Thus, pregnancy represents a favorable phase for actions that promote health, due to the interest a pregnant woman has in adopting and/or changing her habits, since a woman at this particular stage in her life will face a series of issues that can encourage her to seek information and, as a result, adopt new and healthier habits[8]. Thus, according to Skouteris et al.[4], it is extremely important to evaluate a woman's body image during pregnancy, so as to improve the pre-natal assistance she is given while dealing with the body changes that typically occur during this period.

There has been a significant increase in the number of studies published in the international scientific literature[9-11], especially that dealing with a pregnant woman's body image. This is particularly true as a result of concerns related to the possible association that exists between the rapid body changes that occur and the reasons why women feel a profound dissatisfaction with their own bodies during this period. Body dissatisfaction is part of an attitudinal component of body image and refers to a negative evaluation of one's own body[12]. In the case of pregnant women, a poor body image is often linked to an inadequate or restrictive diet[13-15] and to pre and post-partum depression[11,16], which can have serious negative consequences both for the health and well-being of the mother as well as for the foetus[17,18].

In this sense, and in view of the relationship that can be established between pregnancy and between body dissatisfaction and maternal and infant health, it is clear that further research needs to be conducted on these issues, so as to broaden understanding of the subject and, as a result, improve the level of maternal health care provided. Thus, the aim of this study is to analyze bibliographic production related to body image and dissatisfaction among pregnant women by means of an integrative review of the literature.

Methods

An integrative review of the literature was conducted[19] in order to produce a comprehensive overview of studies involving pregnancy, body image and dissatisfaction based on information obtained via the Scopus, PubMed, the Virtual Health Library (*Biblioteca Virtual em Saúde*) (BVS) and PsycINFO databases, during the months of September and October 2013. Thus, a search was performed using the following key words in English: "body image" and "pregnancy" and "body dissatisfaction" and "pregnancy," since "body image" is a key word indexed under the Health Sciences Key Words (DeCS) system and "pregnancy" and "body dissatisfaction" are terms associated with the theme of this study. It should be stressed that an initial search was made using these terms in Portuguese. However, this only produced a limited number of references. So, for the purpose of this integrative review, it was decided to only cross-reference key words in English in all the databases used. Furthermore, in order to trace the greatest number of articles on the subject, no limits were set regarding dates of publication.

The Scopus database was chosen because of its multi-disciplinary character. This was accessed by selecting the "all fields" option. In addition, in the "document type" section, it was decided to include only articles ("article"). The PubMed database was chosen because it is considered to be one of the most relevant sources of research material in the area of health today. The following filters were used in the advanced search phase: "all fields" and, under "article type," only "journal article" was accessed. The Virtual Health Library (BVS) was chosen because of its nationwide coverage. In this case, the search was made by selecting "all indexes," the "integrated method" and "all sources": Medline, Lilacs, CENTRAL – Controlled Clinical Trials Registers database, IBECS (Spain) and Index Psi (Psychology). This filter was only limited to "document type," since only "articles" were selected. And, finally, the PsycINFO was selected since it is considered to be one of the most important databases in the field of Psychology. An advanced search was made and it was decided to choose the following options: "any field" and, in the section "document type," only "journal article" was selected.

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Once the articles that met the above-mentioned criteria had been inserted, two documents for each database were created based on the search results – "body image" and "pregnancy" (Document 1) and "body dissatisfaction" and "pregnancy" (Document 2) – containing the titles and abstracts of all references found. The first phase of the exclusion criteria involved the identification and exclusion of articles that were duplicated on the different databases, in other words the same articles found on Scopus were eliminated from the other databases, and so on successively, so that none of the articles were duplicated on any of the other databases. A comparison was also made between Documents 1 and 2 on the same databases, until only one document from each site was left.

This process was continued during the second stage, which consisted of excluding all articles that did not include an abstract. Once this procedure had been completed, the next phase consisted in reading all titles and/or abstracts. This made it possible to exclude all articles where the main language used was not Portuguese, English or Spanish (stage 3). Also excluded were all articles that were not based on empirical methodology (stage 4) or where the methods used did not include tools that measured body image (stage 5).

The next two stages consisted in excluding all articles based on research study samplings. Thus, all articles were excluded that contained samplings from women who were not pregnant (stage 6) or where the sampling only included pregnant adolescents (stage 7).

Finally, the full texts of the remaining articles were accessed. In addition to their respective databases, the Capes Journal Portal was also used as a resource to access the full texts of these articles. However, all those that were not found in their entire form were excluded during the final phase (stage 8).

After applying the criteria as described above, to include or exclude articles, the full text of each article was read in detail. The analysis of this data made it possible to obtain the following information from the selected studies: 1) author and year of publication; 2) country of publication; 3) methodology used; 4) sampling characteristics; and 5) evaluation tools employed. Furthermore, concomitantly, analysis and interpretation was made of the results of each research study, which were then organized and debated according to three main topics: body satisfaction in pregnant women, body dissatisfaction in pregnant women and variables that influence a pregnant woman's perception of her body image.

Results

A total of 2,501 articles dealing with body image, body dissatisfaction and pregnancy were found on the databases accessed in accordance with the search strategy proposal. Table 1 shows the number of articles identified in each database by using the chosen combination of key words.

Exclusion criteria were established so as to delimit the number of articles identified that were suitable for the requirements established in this review. Thus, although a high number of publications were found, a total of only forty articles were analyzed in all. Table 2 and Figure 1 show details of the publications selected, bearing in mind the established exclusion criteria, for each database and according to the total number of articles found, respectively. It should be stressed that, although this search was conducted by using the word "pregnancy," most of the articles that were excluded did not include samplings of pregnant women.

Based on the articles selected, which evaluated gestational body image and dissatisfaction, a list was made of the names of the authors, year of publication, country of publication, the research methodology used (transversal or longitudinal; quantitative or qualitative), the number of pregnant women evaluated (including, when possible, their gestational period) and the tools used to evaluate the variables of the study (Table

Table 1. Number of publications located in each database.

Series	Scopus	PubMed	BVS	PsycINFO	Total
"*body image*" and "*pregnancy*"	1377	377	349	137	2240
"*body dissatisfaction*" and "*pregnancy*"	220	14	12	15	261
Total	**1597**	**391**	**361**	**152**	**2501**

Table 2. Number of publications excluded per criterion in the databases.

	Scopus	PubMed	BVS	PsycINFO
Initial total in each database	**1597**	**391**	**361**	**152**
Exclusion criteria				
Duplicated articles	163	314	335	110
Abstracts not available	107	9	17	1
Other languages	76	3	0	8
Non-empirical studies	248	19	2	4
Without specific instrument for evaluation of body image	246	14	1	7
Sample of non-pregnant women	679	21	1	15
Pregnant adolescents	23	7	3	1
Not available in full	18	1	2	6
Total for analysis	**37**	**3**	**0**	**0**

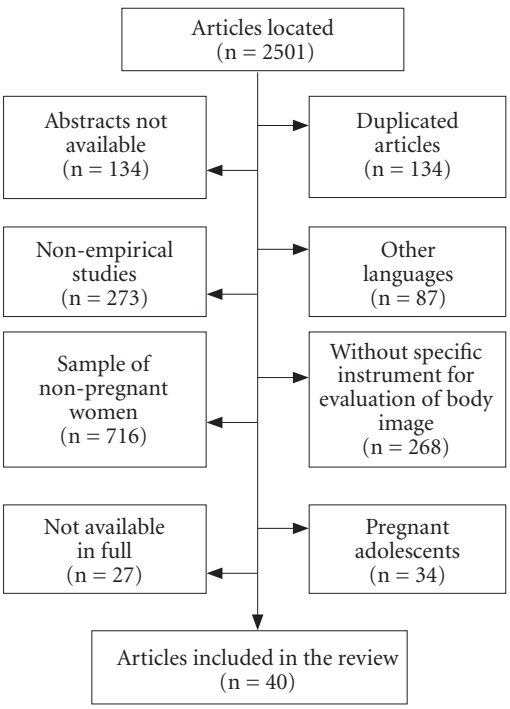

Figure 1. Number of de publications excluded considering the total of articles.

3). It should be said that the information related to the age of the pregnant women is not included in Table 3, since this was considered to be an exclusion criteria for the articles in question. Thus, these studies assessed adult pregnant women and the age of the participants varied between 18 and 49 years old.

With regards to the country and year of publication, the United States (n = 14), followed by Australia (n = 11) were the countries that led in terms of the number of studies made, while 2012 (n = 6) was the year during which the highest number of research studies were produced. As regards the characterization of these studies, most of these publications used quantitative procedures, in their approach; and with respect to their time frame, one-off (cross-sectional) evaluations were made. It should be said that one article used the cross-sectional methodology for the group of non-pregnant women and the longitudinal method for pregnant women[17]. Thus, both methods were used in this research study.

In spite of the fact that not including pregnant women was one of the reasons why articles were excluded, some of these studies evaluated not only pregnant women at different gestational stages, but also during the pre-gestational and post-partum period. Most of the studies analyzed more than one gestational period, however the third trimester period was the one most frequently analyzed.

Discussion

Professionals in the area should give special attention to the gestational period, especially since promoting maternal and, consequently, fetal health care has become such an important issue. Even though pregnancy is a very special time for women and is a period when weight gain is acceptable[2], many become dissatisfied with their appearance and physical shape during pregnancy[10], which can have a negative impact on both mother and child[11,13-16]. Professionals who have a

Table 3. Studies conducted on body image and body dissatisfaction among pregnant women.

Reference (Year)	Country	Method	Sample	Tools
Sui et al.[10] (2013)	Australia	Longitudinal and Quantitative	442 pregnant women (first and third trimester)	Stunkard's figure rating scale; questionnaire with in-built questions.
Sweeney & Fingerhut[11] (2013)	USA	Longitudinal and Quantitative	46 pregnant women (equal to or more than 28 weeks and 2 months post-partum)	*Body Attitudes Questionnaire; Post-partum Depression Predictors Inventory–Revised; Almost Perfect Scale–-Revised; Edinburgh Postnatal Depression Scale.*
Bagheri et al.[9] (2013)	Iran	Cross-sectional and Quantitative	382 pregnant women (retrospective pre-pregnancy; more than 34 weeks)	*Body Image Assessment for Obesity; Pregnancy Physical Activity Questionnaire;* list of portions of food consumed.
Fuller-Tyszkiewicz et al.[17] (2012)	Australia	Longitudinal (pregnant) and Cross-sectional (non-pregnant women); Quantitative	176 pregnant women (16, 24, 32 weeks) and 148 non-pregnant women	*Body Attitudes Questionnaire.*
Nash[3] (2012)	Australia	Longitudinal and Qualitative	38 pregnant women (more than 10 weeks)	Interview.
Hauff & Demerath[32] (2012)	USA	Longitudinal and Quantitative	233 pregnant women (third trimester, 2 weeks post-partum, 4 months post-partum)	Questionnaire with in-built questions; questions adapted from the *Body Attitudes Questionnaire, Body Shape Questionnaire; Eating Disorder Examination.*
Brooten et al.[29] (2012)	USA	Cross-sectional and Quantitative	54 pregnant women (less than 20 weeks)	*Body Image Assessment for Obesity; Food Frequency Questionnaire—Adults;* questionnaire with in-built questions.
Mehta et al.[33] (2012)	USA	Longitudinal and Quantitative	1192 pregnant women (15–20, 17–22, 24–29, 27–30 weeks and post-partum)	Gestational record; *Body Image Assessment for Obesity.*
Loth et al.[34] (2011)	USA	Longitudinal and Quantitative	68 pregnant women and 927 non-pregnant women	Specific questionnaire; Modified version of the *Body Shape Satisfaction Scale.*
Rauff & Downs[35] (2011)	USA	Longitudinal and Quantitative	151 pregnant women (14, 21 and 32 weeks)	*Body Areas Satisfaction Scale; Centers for Epidemiological Studies-Depression scale; Leisure-Time Exercise Questionnaire.*
Kazmierczak & Goodwin[22] (2011)	Poland	Cross-sectional and Quantitative	100 pregnant women (28-39 weeks)	*Body Image Questionnaire; Feminine Gender Role Stress Scale; Psychological Sex Inventory; Rosenberg Self-Esteem Scale.*
Sacomori et al.[36] (2010)	Brazil	Cross-sectional and Quantitative	35 pregnant women (3 = first trimester; 15 = second trimester; 17= third trimester)	*Questionnaire of Human Corporeality;* Gestational record; Vaginal palpation.
Chang et al.[37] (2010)	Taiwan	Cross-sectional and Qualitative	18 pregnant women (29 to 39 weeks)	Interview.
Clark et al.[2] (2009)	Australia	Cross-sectional and Qualitative	20 pregnant women (10 = third trimester and 10 = post-partum)	Semi-structured interview

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Table 3. continuation

Reference (Year	Country	Method	Sample	Instrumentos
Clark et al.[38] (2009)	Australia	Longitudinal and Quantitative	116 pregnant women (retrospective pre-pregnancy, 17-21, 32-35 weeks of pregnancy, 6 weeks, 6 and 12 months post-partum)	*Body Attitudes Questionnaire; Beck Depression Inventory.*
Pauls et al.[34] (2008)	USA	Longitudinal and Quantitative	50 pregnant women (8, 30 weeks of pregnancy and 30 weeks of post-partum)	*Female Sexual Function Index; Body Exposure During Sexual Activities Questionnaire; Urogenital Distress Inventory-short forms; Incontinence Impact Questionnaire; Fecal Incontinence Quality of life Scale.*
Kamysheva et al.[5] (2008)	Australia	Cross-sectional and Quantitative	215 pregnant women (retrospective pre-pregnancy and 15-25 weeks)	*Body Attitudes Questionnaire; Beck Depression Inventory; Rosenberg Self-esteem Scale; Pittsburgh Sleep Quality Index; Pregnancy Discomfort Checklist.*
Herring et al.[15] (2008)	USA	Cross-sectional and Quantitative	1537 pregnant women (less than 22 weeks)	*Physical Activity Scale; Semi-Quantitative Food Frequency Questionnaire;* Medical record; Specific questionnaire.
Duncombe et al.[14] (2008)	Australia	Longitudinal and Quantitative	158 pregnant women (retrospective pre-pregnancy; 16-23; 24-30 and 32-38 weeks)	*Body Attitudes Questionnaire; Contour Drawing Rating Scale; Pregnancy Figure Rating Scales; Dutch Eating Behaviour Questionnaire - Restraint; Beck Depression Inventory.*
Downs et al.[16] (2008)	USA	Longitudinal and Quantitative	230 pregnant women (first, second and third trimester and post-partum)	*Body Areas Satisfaction Scale; Centers for Epidemiological Studies-Depression Scale; Leisure-Time Exercise Questionnaire.*
Haedt & Keel[20] (2007)	USA	Cross-sectional and Quantitative	196 pregnant women (2-40 weeks)	*10 items of the Body Shape Questionnaire; Edinburgh Postnatal Depression Scale Maternal Fetal Attachment Scale.*
Chang et al.[39] (2006)	Taiwan	Cross-sectional and Qualitative	18 pregnant women (29-39 weeks)	Interview.
Skouteris et al.[4] (2005)	Australia	Longitudinal and Quantitative	128 pregnant women (retrospective pre-gestation, 16-23, 24-31 and 32-39 weeks of gestation)	*Body Attitudes Questionnaire; Contour Drawing and Pregnancy Figure Rating Scales; Beck Depression Inventory; Physical Appearance Comparison Scale; Perception of Teasing Scale; Perceived Socio-Cultural Pressure Scale; Public Self-Consciousness Scale.*
Lai et al.[25] (2005)	China	Cross-sectional and Quantitative	359 pregnant women (6 to 40 weeks)	*Eating Disorder Inventory-2; Bem Sex Role Inventory; Maternal Antenatal Attachment Scale; Spousal Support Scale;* Gestational record.
Rocco et al.[26] (2005)	Italy	Longitudinal and Qualitative	97 pregnant women (12, 22, 32 weeks of gestation; 2 days and 4 months post-partum)	*Body Attitude Test; Eating Disorder Inventory-2; EDI-Symptom Checklist.*

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Table 3. continuation

Reference (Year)	Country	Method	Sample	Instrumentos
Johnson et al.[40] (2004)	England	Cross-sectional and Qualitative	6 pregnant women (33 to 39 weeks)	Semi-structured interview.
Huang et al.[41] (2004)	Taiwan	Cross-sectional and Quantitative	195 pregnant women (from 28 weeks onwards)	*Attitude to Body Image Scale; Modified Maternal-Fetal Attachment Scale.*
Earle[42] (2003)	England	Cross-sectional and Qualitative	19 pregnant women (6-14; 36-39 weeks of gestation and 6-14 weeks post-partum)	Interview.
Dipietro et al.[13] (2003)	USA	Cross-sectional and Quantitative	130 pregnant women (28 to 36 weeks)	*Pregnancy and Weight Gain Attitude Scale; Spielberger State Anxiety Inventory; Pregnancy Experience Scale; Daily Stress Inventory; Profile of Moods States; Marlowe-Crowne Social Desirability Scale.*
Boscaglia et al.[27] (2003)	Australia	Longitudinal and Quantitative	71 pregnant women (retrospective pre-gestation, 15-22 and 23-30 weeks and prospective post-partum)	*Body Cathexis Scale*; Specific physical activity questionnaire.
Schmied & Lupton[43] (2001)	Australia	Longitudinal and Qualitative	25 pregnant women (prior to birth; 10 days, 4-8 weeks, 12-14 weeks, 5-6 months after birth)	Interview.
Kendall et al.[44] (2001)	USA	Cross-sectional and Quantitative	622 (22 = first trimester; 423 = second trimester; 177 = third trimester)	Structured questionnaire based on other validated instruments.
Goodwin et al.[28] (2000)	Australia	Longitudinal and Quantitative	65 pregnant women (14-20 and 27-32 weeks)	*Body Cathexis Scale;* Questionnaire for the self-reported exercise record; *General Health Questionnaire*
Clark & Ogden[24] (1999)	England	Cross-sectional and Quantitative	50 pregnant women (24-28 weeks) and 50 non-pregnant women	*Questionnaire with in-built questions; Dutch Eating Behavior Questionnaire; Eating Self-Efficacy Scale; Three Factor Eating Questionnaire; Body Shape Questionnaire.*
Fox & Yamaguchi[31] (1997)	England	Cross-sectional and Qualitative/ Quantitative	76 pregnant women (more than 30 weeks)	*Two open questions; modified Body Shape Questionnaire.*
Foster et al.[45] (1996)	England	Cross-sectional and Quantitative	38 pregnant women (32-38 weeks)	*Body Satisfaction Scale; Maternal Fetal Attachment Scale; Eating Disorders Examination.*

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greater understanding of this issue can alert the women when a condition of risk becomes apparent. This shows the relevance of this study, which seeks to analyze available bibliographical material related to body image and dissatisfaction among pregnant women by means of an integrative review.

Based on these findings, it may be seen that research has been conducted in an attempt to evaluate body image and associate this with a series of variables during this specific period in a woman's life, such as: depression[2,4,5,11,13,14,16,20], self-esteem[5,21-23], eating habits[13,16,24-26], physical activity[27,28], ethnicity[29], Body Mass Index (BMI)[10,13,30-32], weight

Table 3. continuation

Reference (Year)	Country	Method	Sample	Instrumentos
Oyemade et al.[23] (1994)	USA	Longitudinal and Quantitative	467 pregnant women	*Maternal Attitude Toward Pregnancy Instrument; Self-esteem Scale; IPAT Anxiety Scale Questionnaire; Partners Interaction Scale; Social Support Network; Locus of control; Social Readjustment Scale; Daily Hassles Scale; Obstetrical Complications scale; Self-reported alcohol abuse.*
Edwards et al.[21] (1994)	USA	Longitudinal and Quantitative	239 pregnant women	*Food recall list; Maternal Attitude to Pregnancy Instrument; Life Events Inventory; Anxiety Scale Questionnaire; Rosenberg Self-esteem Scale; Locus of control; Sex Role Inventory.*
Davies & Wardle[30] (1994)	England	Cross-sectional and Quantitative	76 pregnant women (third trimester) and 97 non-pregnant women	*Eating Disorder Inventory; Figure Rating Scale; The Restraint Scale of the Dutch Eating Behaviour Questionnaire.*
Ruggieri et al.[47] (1979)	Italy	Cross-sectional and Quantitative	20 pregnant women (third trimester) and 20 non-pregnant women	*Fisher's Body Prominence Test; Body Cathexis Scale.*

USA = United States of America.

gain outside recommended intervals[9,13,15,33,35,46], among others. In addition, this reproductive stage has also been investigated by using cross-sectional methods[2,5,9,13,15,20,22,24,25,29-31,36,37,39-42,44,45,47] as well as longitudinal methods[3,4,10,11,14,16,21,23,26-28,32-35,38,43,46], mixed[17], qualitative[2,3,26,37,39,40,42,43], quantitative[4,5,9-11,13-17,20-25,27-30,32-36,38,41,44-47] and qualitative-quantitative approaches[31], comprising the pre-gestational periods; the first, second and third trimesters; and post-partum.

In order to better understand these findings, it was decided to discuss these results in accordance with their proximity to specific issues. Thus, three categories were created: Body Satisfaction among pregnant women; Body Dissatisfaction among pregnant women, and Variables that Influence Body Image among pregnant women.

Body Satisfaction among pregnant women

Several studies were conducted to compare the level of body satisfaction among pregnant and non-pregnant women, though these produced different results. Davies and Wardle[30] found that pregnant women showed a lower score as regards wanting to lose weight, both by restricting their diet and in the efforts they made to lose weight. Clark and Ogden[24] found that pregnant women were less dissatisfied with the bodies when compared to non-pregnant women, and suggest that pregnancy legitimizes an increase in food consumption as well as eliminates any prior intention a woman may have had to eat less. Loth et al.[34] have recently established that, in spite of gaining weight, body satisfaction was higher among pregnant than among non-pregnant women, which corroborates previous findings. These factors indicate that pregnant women are less concerned about their weight during pregnancy, even when their body size increases.

Other studies have found that weight and body shape dissatisfaction remains stable or is temporarily reduced during pregnancy[4,26,41], in spite of the fact that women gain weight and are, therefore, far from their social ideal of slimness[48,49]. Duncombe et al.[14] found that a woman's body image appears to remain stable during their entire pregnancy, such that women who began by worrying about their bodies continued to do so over the whole gestational period. In a study con-

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ducted in Poland, Kazmierczak and Goodwin[22] found that pregnant women generally had a good body image, which is positively associated with self-esteem. According to investigations conducted by Clark et al.[2], Clark et al.[38] and Boscaglia et al.[27], most Australian women adapted well to the changes in their bodies during pregnancy, while the relevance of their own weight and body shape were reduced during the final months of pregnancy. Based on these findings, it is possible to affirm that pregnancy is a unique period in a woman's life when weight gain is regarded as acceptable[2].

The researchers, whose studies indicate that pregnancy has a positive effect on body image, appreciate that less pressure appears to have been brought to bear on these women to attain the perfect body during this phase[4,5,30,38]. Pregnancy seems to enable women to develop an innermost sense that an increase in body weight and in the shape of their bodies is something that can be tolerated by most, and is something that some women even appreciate[4,30]. According to Clark and Ogden[24], they develop a more positive body image and their desire to lose weight is reduced. In addition, it is suggested that pregnancy appears to go hand-in-hand with a feeling of being free of dietary habits and the usual restraints that are common to Western society today[5,24,50] Thus, it may well be that women have a tendency at this time to prioritize their own health and that of their unborn child, rather than aesthetics[26,39].

Using a qualitative approach, Nash[3] noted that some pregnant women feel they have the freedom to be "fat" for the first time in their lives. On the other hand, others saw weight gain as "frightening," especially because of the social stigma attached to body weight. This duality was also noted in the study conducted by Chang et al.[39] who highlighted two main concerns that prospective mothers have during the final three months of their pregnancy: "My body: where is it heading?" which reflects the standards of beauty used by non-pregnant adults of the female sex to evaluate their pregnant bodies and their hope of recovering their pre-gestational figures after childbirth; and 2) "My body: my baby's body," which reflects how women regard the changes that occur in their bodies as being a sign of good health, that their baby is developing and as a confirmation of their adequacy as mothers. In other words, there is a visible conflict between what is seen as being good for the pregnant woman as a female and what is good for her child, or for the woman as an a mother.

Body dissatisfaction among pregnant women

The prevalence of body dissatisfaction during pregnancy is not a consensus in the literature. The oldest study found during this review, which was conducted in Italy, investigated the body image of pregnant and non-pregnant women[44]. It should be said that the authors used the term "body schema" to refer to body image, unlike other studies found in this review. These findings indicate that pregnant women gave a lower rating when evaluating their own body images in comparison to non-pregnant women. According to Scagliusi and Lourenço[51], between 1970 and 1990, the desire to have an athletic body was combined with the ideal of having a slim figure at a time when supermodels represented the height of beauty. It is worth noting that during this period pregnant women were likely to be influenced by the image of an ideal body, which would probably have provoked the initial interest of the researchers.

The study by Earle[42] indicated that, during pregnancy, women expressed three main concerns in relation to their size and body shape, which are as follows: how they would look when their pregnancy began to show, where the changes in their bodies would occur, and how easy it would be to recuperate their pre-gestational body shape.

Thus, pregnant women are worried about questions related to their body image and weight during the whole process of pregnancy. In view of these concerns, Lai et al.[25] point to the fact that pregnancy can be seen as a vulnerable period for issues involving diet, because of increased pressure to conform to feminine values. In this study conducted in China, the authors show that body dissatisfaction was related to a poor maternal-fetal relationship. In addition, 9.8 % of the participants of the survey stated they ate less during pregnancy, which was linked to health risks for the mother and her baby.

In a research study conducted in England, all the pregnant mothers said they had become less satisfied with their bodies during the course of their pregnancy[40]. Brooten et al.[29], when comparing different American ethnic groups, found that, irrespective of their ethnicity, all the pregnant women desired to have a smaller body size. In studies undertaken by Sui et al.[10] and Hauff and Demerath[32], body dissatisfaction was associated with the nutritional condition of the

pregnant women. In the first case, the authors found a high level of body dissatisfaction (45 %), which was more apparent in women who had a high BMI and greater frequency of childbirth. In the second case, overweight/obese women were significantly more concerned about their body shape and weight and were less confident and less comfortable with their bodies compared to women with more slender figures.

In addition, as well as being linked to BMI, a greater concern with their body image was associated with shorter lactation periods[32]. This last finding is also corroborated by the investigation conducted by Foster et al.[45], where body dissatisfaction and a low level of maternal-fetal attachment can help explain the reason why some women decide to bottle-feed their babies. It should be underlined that body dissatisfaction is also related to depression[11,16] and excessive weight gain[9,15,33,35].

Variables that influence body image in pregnant women

Depression is frequently associated with body dissatisfaction[4,5,38] and can have serious implications for the health and well-being of pregnant women. Recently, Sweeney and Fingerhut[11] showed that body dissatisfaction during the last three months of pregnancy represents a risk factor for post-partum depression. Downs et al.[16] corroborates these findings by establishing that: 1) symptoms of depression, body image dissatisfaction and poor eating habits are linked to the first, second and third trimesters of pregnancy and during the post-partum period; 2) body dissatisfaction as being the main cause of post-partum depression. These points suggest that symptoms of depression and body dissatisfaction are important psychological factors that require intervention so as to improve pregnancy for women and their psychological health in the post-partum period.

Emphasis should be given to the relationship that some researchers have established between body dissatisfaction and weight gain that go beyond gestational guidelines. Bagheri et al.[9] and Mehta et al.[33] found that pregnant women who would like to have a more slender body had a greater tendency to put on excessive weight during their pregnancy compared with women who were initially satisfied with their body image. Herring et al.[15] also highlight that not having a true perception of their pre-pregnancy body weight was associated with excessive gestational weight gain among women of normal weight and those who are overweight/obese, and that there was a greater possibility of those who underestimated their overweight/obesity to gain excessive weight during pregnancy. When assessing socio-demographic issues, Rauff and Downs[35] showed that pregnant women who are dissatisfied with their bodies, and who have lower levels of education and family income, were more at risk of gaining weight outside the recommended intervals. Thus, being able to identify situations that can lead to weight gains outside recommended guidelines, can help to reduce health problems associated with pregnancy[33,35].

Another variable that has been examined in these studies with pregnant women is the practice of physical activities. This practice can positively influence a pregnant woman's body image, as well as prevent excessive weight gain. Goodwin et al.[28] state that women who decide to exercise during pregnancy usually felt more positive about their body image and had a greater sense of psychological well-being when compared with pregnant women who were physically inactive. Furthermore, Boscaglia et al.[27] underline that greater levels of physical activity are related to a pregnant woman's body satisfaction. However, it may be that women who take exercise during pregnancy react more favorably to the changes in their bodies than those who are sedentary.

In the only Brazilian study found, Sacomori et al.[36] set out to examine the relationship that exists between the muscle power of the pelvic floor and variables of body image self-perception among pregnant women. Their findings showed that women who were experiencing their first pregnancy were more satisfied with their bodies. In addition, the multipara participants expressed a greater desire to be slimmer when compared with the women who are pregnant for the first time. As regards the strength of the pelvic floor, the analysis found no differences between the two groups.

Figures obtained in the investigations conducted by DiPietro et al.[13] are worrying: 21 % of North Americans represented in this survey had practiced at least one way to lose weight during pregnancy. Those that mentioned having adopted more than one of these habits felt more anxious, depressed, irritable and highly stressed, as well as having a higher level of dissatisfaction with their body image. Added to which, even pregnant women who had gained weight within the recommended limits showed a negative attitude towards weight gain. In order to treat

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pregnant women, maintaining an adequate BMI reflects not only on the health of the mother, but also of the fetus.

Further recommendations

Lastly, two aspects need to be stressed in relation to the articles used in this survey: the tools used in research studies and the broad range of the sample size. As regards assessing body image, there are currently many ways to interpret, research and evaluate this. Depending on the size of the construct that one wishes to investigate, it is usual to employ a series of figures, interviews, questionnaires and perception tests[12,52]. However, Conti et al.[53] point to the importance of trans-cultural creation and adaptation of tools, bearing in mind the Brazilian reality, so as to guarantee that the information collected expresses that which one wishes to measure.

Possibly, the controversies encountered in the literature stem from the fact that they use tools adapted for other social groups such as, for example, young adults; or even those that do not feature the documented psychometric properties of a sample of pregnant women. Thus, it is necessary to emphasize that, in most cases, these scales may not reflect the specific concerns at this particular time in a woman's life.

In respect to this, Fuller-Tyszkiewicz et al.[17] also add that those conducting such an investigation should be cautious when evaluating body dissatisfaction among pregnant women until an adequate measure has been established for use with this sector of the population. Due to the possible existence of body dissatisfaction during pregnancy and because this can be linked to inadequate behavioral patterns and, consequently, generate a negative impact on both the mother and child[2], developing an appropriate tool to evaluate body image during the perinatal period is clearly justified.

As regards the size of the sample, these investigations were based on samples varying between 6[40] and 1,597[15], with an average of 205 pregnant women. Possibly, the fact of the adoption of qualitative and quantitative methodologies may explain why the first one involved smaller samples in comparison with the second. In addition, the cross-sectional or longitudinal surveys may also be one of the reasons that restricted this sample. Adding together the intrinsic characteristics of the longitudinal studies, in the case of pregnancy, abortion may be a factor that excludes a pregnant woman from this sample and, thereby, reduces the sample size.

It may be concluded that studies were conducted, mainly on an international level, to investigate body image in pregnant women. These findings highlight the controversy and inconclusiveness found in such studies related to body dissatisfaction in pregnant women. Some studies show an improvement in the matter of body dissatisfaction among pregnant women. On the other hand, dissatisfaction with body form and weight among pregnant women was also underlined in other research studies. Furthermore, it should be emphasized that research studies have shown a relationship between a negative body image and other variables, such as depression, self-esteem, eating habits and weight gain outside recommended limits.

It is therefore suggested that, in order to gain a better understanding of the particular concerns of a woman during this stage in her life, specific tools should be created/validated to be used in the case of pregnant women. It might then be possible for future research studies to provide greater knowledge about body image and related contributing factors, which will in turn benefit professionals working directly with groups of pregnant women (doctors, nurses, physical therapists, nutritionists, psychologists) and, particularly the pregnant women themselves, to ensure they receive the necessary healthcare while dealing with the changes that occur in their bodies, which are necessarily associated with pregnancy. This will have a positive effect on both maternal and infant well-being and health.

Collaborations

JF Filgueiras contributed towards the concept of this project, the database research, publication analysis, and the drafting and discussion of the text of this article. CM Neves and MEC Ferreira contributed towards the project concept and a critical review of this article. PHB Carvalho participated in the critical review of this article. All authors have approved this version for publication.

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