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Physical Activity and Self-Esteem during Pregnancy

Atividade física e Auto-estima durante a Gravidez

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Abstract

The aims of this paper are to examine the accomplishment of the recommendations of physical activity (PA) practice in accordance with the recommendations of the American College of Sports Medicine (ACSM); verify if the sociodemographic variables (SDV) influence women's self-esteem; investigate if there are differences in pregnant women's self-esteem who practiced or not structured physical activity (SPA) before pregnancy, and of pregnant women who met the recommendations or not during pregnancy. A sample of 44 pregnant women was evaluated in two stages: between the 10th and 13th week of pregnancy (1st trimester- 1T) and between the 20th and 23rd week of gestation (2nd trimester - 2T). The PA was assessed by accelerometry and self-esteem was assessed using the Rosenberg Self-Esteem Scale. Sociodemographic variables and SPA before pregnancy were assessed through a self-administered questionnaire. Over 60% of the sample did not meet recommendations for PA practice in any of the trimester. There were no significant differences between self-esteem for each of the SDV, with the exception of the higher monthly income (1T) and marital status (2T), associated with better self-esteem. There were significant differences in self-esteem among pregnant women or unstructured PA performed before pregnancy (1T and 2T). The completion, or not, of ACSM recommendations did not seem to impact on self-esteem during pregnancy. Most pregnant women did not met the ACSM recommendations for PA practice. It was found that marital status and higher incomes have influenced positively self-esteem, as well as the practice of SPA, before pregnancy.

Keywords: physical activity, self-esteem, ACSM guidelines, accelerometry

Resumo

Os objetivos deste estudo foram analisar o cumprimento das recomendações da prática de atividade física (AF) de acordo com a *American College of Sports Medicine* (ACSM); verificar se as variáveis sociodemográficas (VSD) influenciam a autoestima de gestantes; investigar se existem diferenças na autoestima de gestantes que realizavam ou não atividade física estruturada (AFE) pré-gestação, e das gestantes que cumprem ou não as recomendações durante a gravidez. Foi avaliada uma amostra de 44 gestantes, em dois momentos: entre a 10^a e a 13^a semana (primeiro trimestre - 1T) e entre a 20^a e 23^a semana de gestação (segundo trimestre - 2T). A AF foi avaliada através de acelerometria, e a autoestima através do Questionário de Autoestima Global de Rosenberg. VSD e a prática de AFE foram obtidas através de um questionário de autopreenchimento. Mais de 60% da amostra não cumpriu as recomendações em nenhum dos trimestres avaliados. Não se verificaram diferenças da autoestima das gestantes para cada uma das VSD, com exceção do rendimento mensal mais elevado (1T) e do estado civil (2T), associados a uma melhor autoestima. Foram encontradas diferenças significativas na autoestima das gestantes que realizaram AFE pré-gestação (1T e 2T). O cumprimento ou não das recomendações da ACSM não teve um impacto na autoestima das grávidas. A maioria das gestantes não cumpre as recomendações da ACSM para a prática de AF. Constatou-se que o estado civil de casada ou união de facto e rendimentos mais elevados influenciam positivamente a autoestima das gestantes, assim como a prática de AFE, antes da gestação.

Palavras-chave: atividade física, autoestima, *guidelines* da ACSM, acelerometria

Introduction

Pregnancy is a period in which the women body suffers many transformations that go beyond the anatomical and physiological dimensions, covering psychological, social and cultural dimensions (Bourgoin et al., 2012; Tendais, Figueiredo, & Mota, 2007). This phase is recognized as a long life event, representing a single opportunity for behavior changes, and the habits acquired during this phase can be perpetuated and affect the women health and the baby for the rest of their life (Artal & O'Toole, 2003). The American College of Sports Medicine (ACSM) recommends, during pregnancy and postpartum period, a 30 minutes or more of moderate intensity physical activity (PA), at least five times for week, ideally all days (Medicine, 2013).

According to the ACSM, the American College of Obstetricians and Gynecologists and the Centers for Disease Control and Prevention, recent studies

have shown low prevalence of PA practice during pregnancy (Amezcu-Prieto et al., 2013; Haakstad et al., 2007; Hegaard et al., 2011; Santos et al., 2014). As pregnancy progresses there is a decline in PA accompanied by an increase in musculoskeletal symptoms, reduced well-being, self-esteem and quality of life (Da Costa et al., 2003; Haas et al., 2005).

Several studies show that depressive symptoms, negative mood, anxiety and low self-esteem during pregnancy have a negative influence in children's health, neonatal outcomes and the development of the mother-baby bond (Bodecs et al., 2011; Macola, Valley, & Carmona, 2010; McVeigh & Smith, 2000). Self-esteem involves feelings of affection for the himself and depends exclusively from internal causes, bringing about the self-assessment skills and attributes, as manifested in interpersonal and private domain. Self-esteem refers to the positive or negative evaluation the subject of himself, becoming a central aspect of the

self and playing a vital role in the identity construction (Fontaine & Jones, 1997; Silva *et al.*, 2010).

Maternal self-esteem is a strong predictor of neonatal outcomes such as length, weight and Apgar score, the quality of mother-infant bond and maternal skills. A low self-esteem during pregnancy is positively associated with poor physical and mental health, and is related with the development of mental disorders, such as depression in the postpartum period. Thus, success in the face of changes of motherhood depends on the emotional state of the mother, which is directly related to her self-esteem and confidence level (Bodecs *et al.*, 2011; Macola *et al.*, 2010; McVeigh & Smith, 2000; Poudevigne & O'Connor, 2006; Silva *et al.*, 2010).

PA practice is a form of socialization, distraction, body awareness and self-efficacy. A physically active woman during pregnancy tends to show more positive mood, greater vitality, less

depressive symptoms, greater self-esteem and greater satisfaction with body image (Da Costa *et al.*, 2003; Goodwin, Astbury, & McMeeken, 2000; Haas *et al.*, 2005; Tendais *et al.*, 2011).

Few studies have established a clear relationship between the practice of PA, according to the ACSM recommendations, and psychological well-being in pregnancy. Considering self-esteem as secondary variable analyzed, and mainly without recourse to valid instruments for the effect and taking into account the well-known psychological benefits of PA practice, raises the hypothesis that during pregnancy it impacts positively on women's self-esteem. It also influences positively some variables that are associated with a greater long-term health.

Considering the literature review, this study aims to: 1) examine compliance with the ACSM recommendations for PA practice in the first and second trimester (1T and 2T); 2) determine if

sociodemographic variables (SDV) influence self-esteem; 3) explore whether there are differences in self-esteem of pregnant women who practiced structured physical activity (SPA) before pregnancy; and 4) to investigate whether there are differences between the self-esteem of women who meet or not the recommendations of the ACSM during pregnancy.

Methods

Study Design and Sample

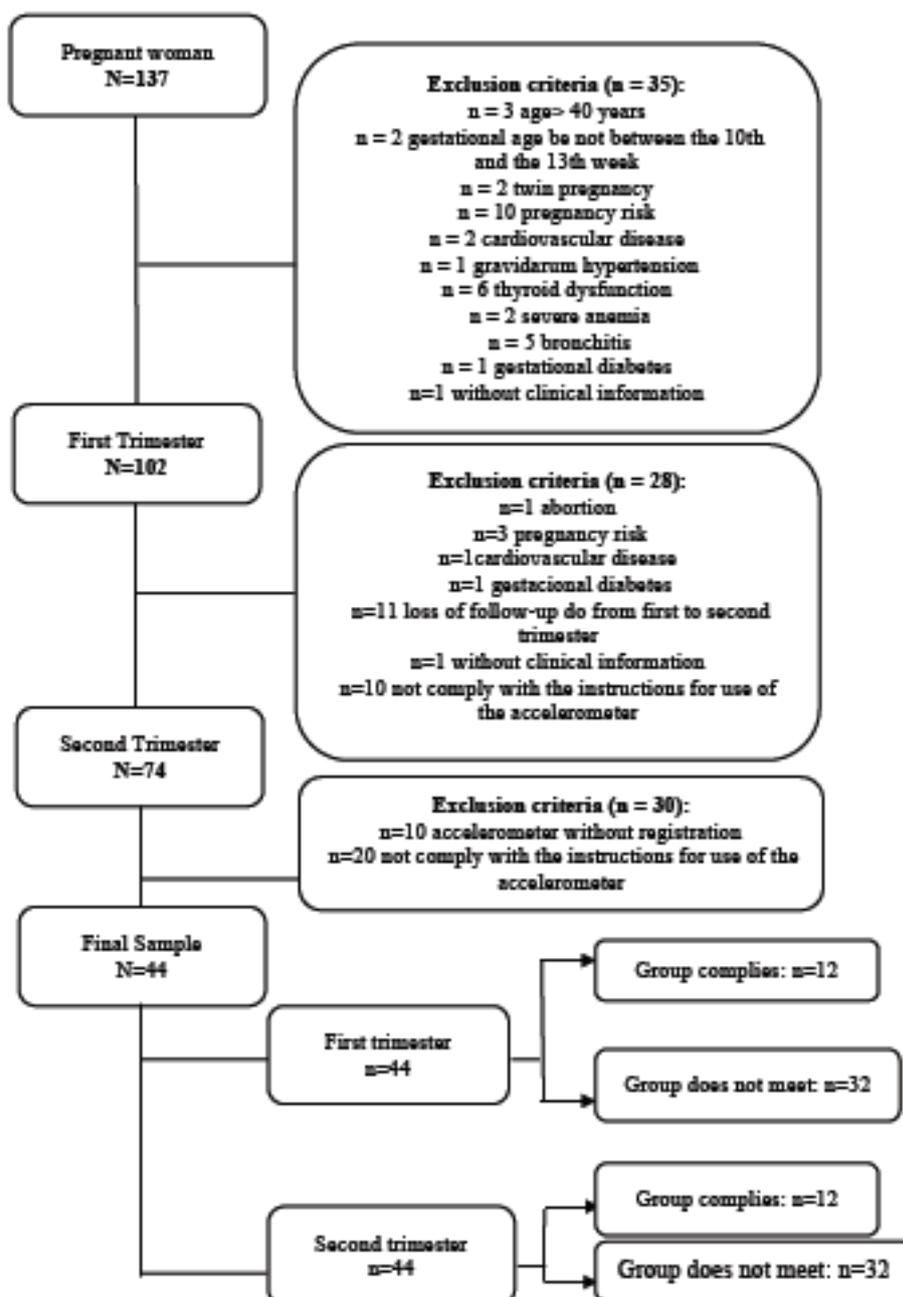
This is a prospective longitudinal study focused on a consecutive sample of pregnant women attending at Hospital de São João, in Oporto, between July 2010 and May 2012. Participants were invited to include the study on the day of their first ultrasound. Data were collected in two stages. The first stage was between the 10th and 13th weeks of gestation (at the time of the first ultrasound) and the second was between the 20th and 23rd weeks (at the Chasan-Taber et al., 2004; Ota et al.,

time of the second ultrasound). Participants were considered eligible if they were pregnant, aged between 18 and 40 years, spontaneous singleton pregnancy, gestational age between 10th and 13th weeks in 1T, and between 20th and 23rd weeks in 2T, confirmed by ultrasound (Artal & O'Toole, 2003; Chasan-Taber et al., 2004; Dera, Breborowick, & Keith, 2007; Ota et al., 2008; Serour et al., 1998). The exclusion criteria defined were as follow: severe heart disease (including symptoms of angina, myocardial infarction or arrhythmia), persistent bleeding after 12 weeks of pregnancy, severe anemia, chronic bronchitis, multiple pregnancy, poorly controlled thyroid disease, hypertension induced by pregnancy or pre-eclampsia, diabetes or gestational diabetes, pregnancy risk, diagnosed mental illness, unable reading/writing in Portuguese and cognitive inability to answer the questionnaires (Artal & O'Toole, 2003; 2008.).

As shown in Figure 1, the final sample comprised 44 pregnant women and all participants were divided according to

the compliance or not with ACSM recommendations in each of the trimesters.

Figure 1: Sample constitution



Assessment

Instruments/Outcome

Data were collected at the time of

Measures

ultrasound by the researchers who

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administered the structured and self-report questionnaires. The sociodemographic and clinical questionnaire was designed to assess personal and socioeconomic aspects, related to lifestyle (including the practice of SPA before pregnancy), health status during pregnancy and gynecological history.

Self-Esteem Measurement: The Rosenberg Self-Esteem Scale (RSES) is a one-dimensional measure that assesses global self-esteem, adapted and validated for the Portuguese population (Faria, 2000). This 10-item instrument consists of statements related to feelings of respect and self-acceptance. Five items are considered indicators of positive attitudes and the other five representative of negative self-attitudes. For each item there are six possible answers, from 6 'strongly agree' to 1 'strongly disagree'. After reversing the negative responses shall be the sum of the results being that higher scores reflect greater self-esteem. In this study we obtained a satisfactory internal

consistency with $\alpha = 0.75$.

Anthropometric Measures: Height was measured with participants standing upright against a Holtain portable stadiometer with 0.1cm precision (Crymych, Pembrokeshire, UK). Weight was measured with participants lightly dressed (underwear and t-shirt) and with the use of a portable digital beam scale (Tanita Inner Scan BC 532, Tokyo, Japan). Pre-pregnancy body mass index (BMI) was estimated from self-reported weight and height, using the formula $BMI = \text{weight (kg)} / \text{height}^2 \text{ (m}^2\text{)}$. BMI was categorized according to the Institute of Medicine guidelines: underweight, normal weight, overweight and obese (Rasmussen & Yaktine, 2009).

PA measurement: The accelerometer GTx3 M[®] Actigraph (Actigraph, Florida, USA) was used to obtain information about daily PA during 7 consecutive days. This device records the movements in the three orthogonal planes (vertical, anterior-posterior and

medial-lateral), being the latest model at the time of data collection. Register variations of acceleration magnitudes whose cover approximately 0.05 and 2.5 Gs, in a frequency range from 0.25 to 2.5 Hz (AntiGraph, 2009; Sasaki, John, & Freedson, 2011). The accelerometer was placed by the research team on the right anterior superior iliac crest, with the groove facing up, and pregnant instructed to use it for 7 consecutive days in waking hours (removed only for water activities and sleep). Were considered valid only accelerometers that recorded at least 480 minutes of daily use and registration of three-day week and at least one end-of-week. The accelerometers were programmed with epoch 5 seconds to allow a more detailed estimate of the intensity of AF. Periods of 60 minutes of consecutive zeros were detected and flagged as times where the monitor was not used (Kinnunen et al., 2011; Ward et al., 2005).

For the programming of the devices

and analysis of the records Actilife software (V6.1.2 © 2009-2012 actigraph, LLC) was used. After the screening, to check whether the participants had followed the recommended use of the instrument instruction, the activity count was processed to determine the execution time of AF of different intensities. Activity levels were expressed in counts.min-1 and grouped into specific levels of intensity according to protocol Freedson (1998). Between 100 -1952 counts.min AF-1 is considered 'mild', between 1953-5724 counts.min-1 is considered 'moderate' and above 5724 counts.min-1 'vigorous'. Below the threshold of 100 counts.min-1 is defined as 'sedentary' (Harrison et al., 2011; Kinnunen et al., 2011). To verify that the participant has fulfilled the recommendations proposed by the ACSM information was processed in AF of moderate and vigorous intensity, and the results arising from accumulated intensities during the day and not for specific periods of time.

Ethics

This study was subjected to the approval of the Ethics Committee of the São João Hospital in Porto (reference number 09988) and after participants were informed about the aims and of the voluntary, anonymous and confidential nature of the study, they signed an informed consent conformed to the requirements stipulated in the Declaration of Helsinki.

Statistical Analyses

For data analysis was used the IBM SPSS Statistics (Statistical Package for Social Sciences®, version 20.0, USA). “A significance level of 0.05 was defined and also a 95% confidence level. To characterize the sample descriptive statistics was used, using the mean and standard deviation for quantitative

variables. Statistical tests One-Way ANOVA and Student T- Test were used for two independent samples. When there were no assumptions of applying parametric tests Kruskal-Wallis, Mann-Whitney or Welch test were applied. To analyze data normality Shapiro-Wilk test was used and Levene test was applied to verify variance uniformity (Maroco, 2010; Pereira, 2008).

Results

Participants’ average age was 28.8 ± 4.71 years and 70.5% were above compulsory education qualification level. About 80% of participants were married or cohabiting with a partner and 81.8% were employed / students. Three quarters of the sample were primiparous and 43.1% were overweight or obese before pregnancy (Table 1).

Table 1. Description of the sociodemographic variables of the sample

	N	(%)
Age		
[18, 29]	22	50,0
[30, 40]	22	50,0
Educational level		
Mandatory or less (≤ 9 years)	13	29,5
Secondary (10-12 years)	12	27,3
College/university (> 12 years)	19	43,2
Marital status		
Married/cohabitating	35	79,5
Single/divorced	9	20,5
Professional status		
Employed/student	36	81,8
Unemployed	8	18,2
Monthly income ¹		
<500€	9	20,5
[500 – 1250€]	19	43,2
≥ 1250 €	13	29,5
Parity		
Primigest		
Multigest	33	75,0
	11	25,0
Pre-pregnancy weight status		
Normal	25	56,8
Overweight/obese	19	43,1

Note: ¹, 41, three pregnant women did not answer the question.

Regarding PA practice, it was found that 27.3% of women met the ACSM recommendations in 1T, while maintaining the same percentage in 2T. Only 15.9% of women met the recommendations for PA practice in both trimesters and more than half of the sample, 61.7%, did not meet the recommendations posited in any of the trimesters.

Women's self-esteem in 1T (score of RSES) has averaged 51.1 ± 7.33 . There were no significant differences between

the mean scores of the groups defined for each SDV (age, educational level, marital status, employment status, monthly income, weight gain and preoccupation with weight) with the exception of monthly income (KW = 12.828, $p = 0.002$). Women's self-esteem in 2T averaged 52.1 ± 6.37). There was only a significant difference in the score for marital status ($t = 237.1$, $p = 0.022$) (Table 2).

Table 2. Relationship between sociodemographic variables and self-esteem in the first and second trimesters

	Self-esteem (RSES score)			
	First trimester $\bar{X} \pm S$	<i>p</i> value ¹	Second trimester $\bar{X} \pm S$	<i>p</i> value ¹
Age		0,919		0,444
[18-29]	51,0 (6,38)		51,5 (6,28)	
[30-40]	51,2 (8,31)		52,8 (6,54)	
Educational level		0,119		0,345
Mandatory or less (<9 Years)	47,2 (8,62)		50,4 (6,02)	
Secondary (10-12 Years)	53,6 (4,03)		53,0 (6,72)	
College/university (> 12 Years)	52,2 (7,24)		52,8 (6,48)	
Marital status		0,547		0,022
Married/cohabitating	50,8 (7,85)		53,6 (5,93)	
Single/divorced	52,4 (4,93)		47,9 (6,55)	
Professional status		0,345		0,139
Employed/student	51,6 (7,72)		52,8 (6,06)	
Unemployed	48,9 (4,97)		49,1 (7,28)	
Monthly income ²		0,002	n.a.	
<500€	50,6 (7,25)			
[500 – 1250€]	47,3 (7,66)			
≥ 1250 €	56,5 (3,07)			
Weight gain		0,908 ³		0,172
Low	---		54,3 (5,42)	
Appropriate	50,5 (8,92)		49,8 (7,22)	
Above	51,2 (6,39)		52,5 (5,27)	
Preoccupation with weight gain				0,415
Yes				
No			51,6 (6,87)	
Reason: Image			53,4 (5,04)	
Yes				0,466 ⁴
No			53,8 (4,96)	
			50,6 (7,50)	

Note. n.a., not applicable because <500 € = 6, 1, analyzed by t-test, Welch, Kruskal-Wallis and Mann-Whitney, 2, n = 41, 3, n = 42, excluding two outliers (one pregnant woman with normal pre-pregnancy BMI lost weight for various periods of malaise and another pregnant woman only had a weight gain of 400 grams), 4, n = 31, 13 pregnant women did not answer the question.

We have observed significant differences in self-esteem among women who practiced or not PA before pregnancy in 1T ($U = 117.00$, $p = 0.029$) and in 2T ($U = 105.00$, $p = 0.013$) – Table 3.

No significant differences were found in self-esteem among pregnant women who have or have not complied with the ACSM recommendations of PA practice nor in 1T ($p = 0.822$) nor in 2T ($p = 0.535$).

Table 3. Relationship between the practice of structured physical activity before pregnancy and self-esteem (score of RSES) in the first and second trimesters of pregnancy

	Self-esteem (score do QAGR)			
	First trimester $\bar{X} \pm S$	<i>P</i>	Second trimester $\bar{X} \pm S$	<i>P</i>
Structured physical activity before pregnancy		.029		.013
Yes	54,7 (6,06)		55,0 (6,78)	
No	49,7 (8,31)		51,0 (5,91)	

Discussion

This study has showed a low compliance for PA with the ACSM recommendations in both trimesters. In this case PA remained constant, in contrast to other studies where there was a sharp decrease during pregnancy (Amezcuaprieto et al., 2013; Haakstad et al., 2007; Santos et al., 2014; Walsh et al., 2011). Low compliance with recommendations may come from the lack of PA habits even before pregnancy. In Portugal 90% of women between 20 and 49 years, do not practice a regular and SPA (Camões & Lopes, 2008; Santos et al., 2014.). The reduction of PA during pregnancy, by one-tenth of the participants, may be related to a cultural trend that protects pregnant women from domestic PA or from the suitability of the workplace during pregnancy, enforced by labor laws (Poudevigne & O'Connor, 2006; Tendais, Figueiredo, & Mota, 2007). However, as this study has not analyzed occupational or domestic PA specifically, this hypothesis

cannot be taken for granted.

The increase of PA in 2T by 11.4% of the sample could be explained by a greater number of health professionals recommending the PA practice in this trimester (53.9% in 1T versus 70.4% in 2T). Simultaneously, there is a quiet period of uncomfortable symptoms associated with the 1T and after this phase; pregnant women begin PA practice with confidence (Prapavessis & Gaston, 2013; Santos, 2012).

We observed a difference in self-esteem of pregnant women according to marital status. However, it is significant only in the 2T. Being married to or living in cohabitation pregnant women experience higher self-esteem. One possible explanation may lie in the fact that the companion acts as a facilitator to help her accepting her own body, since it is at this stage that woman's body undergoes physical transformations. Bourgoin and colleagues conducted a study (2012) using the Self-Esteem Scale

Toulouse, and they have found that the scores of "social body" and "social esteem" were lower, leading to question the impact of the social environment on women's perception of themselves during pregnancy. Authors argue that negative verbal comments can have an impact on body image and, consequently, self-esteem, and the absence of a partner can make a pregnant woman more susceptible to these comments.

Haas and colleagues (2005) observed that women who reported not having money for expenses related to housing and nutrition, before, during or after pregnancy showed a poorer health status, lower physical function and more depressive symptoms compared with women with higher incomes. This allows concluding that household incomes have impact on physical and mental health of pregnant women. Our research has observed that women whose household has less than 1250 € monthly income have a significantly lower self-esteem rather than

those who receive a monthly income equal to or greater than that amount in 1T. Taking into account the current situation and the economic impact of a child in the household it may reflect a sense of uncertainty and powerlessness to provide the child the care, thus affecting pregnant women's self-esteem.

Although not significant, during 2T pregnant women whose weight gain was adequate revealed a lower self-esteem and pregnant women whose weight gain was below the recommended for gestational age, were those who presented a higher score. The anatomical changes related to pregnancy are associated with a reduction in physical and global self-esteem; this result would eventually meet the expected (Poudevigne & O'Connor, 2006). Bourgoin and colleagues (2012), in a qualitative study found that of the 12 women interviewed, a large majority recognized the transformations undergone by the body and only a third feel comfortable about it, although all women

have achieved a score indicative of good body image and good self-esteem.

This attitude towards weight gain and preoccupation with it can be seen on a provisional basis by pregnant women. Although no significant results were found, pregnant women who reported weight gain as a concern registered lower self-esteem (Bourgoin et al., 2012; Kazmierczak & Goodwin, 2011).

To our knowledge, only one study whose sample has similar characteristics to ours, analyses the relationship between aerobic exercise and self-esteem and, despite, severe methodological flaws, Wallace and colleagues (1986) reported that the practice of SPA is associated with higher self-esteem during pregnancy. Faria and Silva (2000, 2001) confirmed in two studies the existence of a direct relationship between SPA and self-esteem and body image. The authors also concluded that there was a directly proportional relationship between the variables, with a greater number of years

of practice associated with higher self-esteem.

A significant relationship between the practice of SPA before pregnancy and self-esteem was obtained in our research, but, there is no significant relationship between PA according to the standards recommended by the ACSM and self-esteem. These results may be linked to the four mechanisms that explain the psychological benefits of SPA: distraction, self-efficacy, mastery and social interaction (Crone-Grant, Smith, & Gough, 2003; Demissie et al, 2013).

Demissie and colleagues (2013) have found that women who practiced moderate to vigorous PA outside home have a substantially lower risk of depressive symptoms in the postpartum period, suggesting the mechanism of distraction as responsible for the antidepressant effect of an acute session exercise. Prapavessis and Gaston (2013) and Da Costa and colleagues (2003) suggest that the distraction provided by PA

has a major effect on the psychological well-being during pregnancy. Since PA type has not been measured it is likely that it has been done, especially in household and work activities, and not in leisure time.

Literature suggests that self-esteem can be enhanced mastering skills and interacting with the environment, thus increasing feelings of competence and self-efficacy (Da Costa et al., 2003; Poudevigne & O'Connor, 2006). Barros and Iaochite (2012) analyzed extensively the relationship between self-efficacy and PA practice and concluded that positive and secure feedback on the effectiveness is directly and proportionally related to the effort, persistence and competence in performing PA. Thus, PA classes in aerobic exercise provide an acknowledgment that PA is not possible in free-living, while highlighting the component of instruction and encouragement performed by a qualified professional.

The above example holds a close

relationship with dominance, since overcoming a challenge (such as SPA) is related to a feeling of independence, success and competence directly affecting individual's self-esteem (Barros & Iaochite 2012; Crone-Grant et al. 2003; Da Costa et al. 2003; Poudevigne & O'Connor, 2006). Believing that the total PA was mostly related to domestic or work tasks this SPA "challenging" effect can be ultimately diluted without manifesting self-esteem.

Wallace and colleagues (1986) based on social interaction; relationships and mutual support explain that a higher self-esteem in pregnant women who attended the classes of aerobic exercise can be found. Also Kazmierczak and Goodwin (2011) refer to socialization as an important component to creating the schema and body image, which mediates the relationship with self-esteem. Taking this assumption into account is expected that SPA classes have a more significant component of socialization with more significant impact on self-esteem.

Goodwin and colleagues (2000) found that women who practice SPA seem to adapt better to structural changes that happen in their body. However no significant differences were found with regard to body image of SPA non-practitioners and practitioners. The interaction with the environment through the practice of PA is a form of body awareness and is associated with a positive attitude towards the body and consequent changes in self-esteem (Goodwin *et al.*, 2000; Poudevigne & O'Connor, 2006). Studies in non-pregnant women show a relationship between SPA, self-esteem and body image. However physical and neurohormonal changes of pregnancy do not allow such a clear connection and require further investigation (Faria & Silva, 2000; Shivakumar *et al.*, 2011).

In addition to the mechanisms listed, muscular, cardiovascular and respiratory adaptations caused by PA in accordance with the recommendations of the ACSM allow easing pregnancy

discomforts, increasing exercise tolerance and decreasing fatigue (Artal & O'Toole, 2003). Knowing that the decline in physical functioning that occurs during pregnancy has a close relationship with pregnant woman's mental health; PA may indirectly be a way to influence self-esteem. To draw any conclusions on this subject would require a larger sample as well as the use of an instrument that measures fatigue more consistently (e.g., the Fatigue Impact Scale) (Poudevigne & O'Connor, 2005).

The strengths of this study include: To our knowledge this is the first study to assess PA levels recommended for pregnant women with objective methods (accelerometry) and to quantify PA of pregnant women in free-living and not only in leisure as most the available evidence. It is also the first study to objectively evaluate compliance with the recommendations of the ACSM with Portuguese pregnant women and the first study that sought to establish a relationship

between PA in free-living and self-esteem of women throughout pregnancy.

The main limitations relate to the use of cut-points proposed by Freedson used in the evaluation of PA, which are not specific to pregnant women. Moreover the practice of SPA (pre-pregnancy) has been measured subjectively and the instrument used to measure self-esteem, although validated for the population, does not have a specific validation for a group of pregnant women.

Conclusion

Most pregnant women do not meet the ACSM recommendations for PA practice nor in 1T or 2T. It was found that to be married and the high monthly income positively influence pregnant women's self-esteem. The practice of SPA before pregnancy is positively associated with self-esteem during pregnancy. No differences between the self-esteem of women who meet or not the recommendations of the ACSM were

observed.

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The authors declare that they have no conflict of interests.

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