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# Leisure-time physical activity during pregnancy in the 2004 Pelotas Birth Cohort Study

## Atividade física de lazer entre as gestantes da coorte de nascimentos de Pelotas de 2004

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### ABSTRACT

**OBJECTIVE:** Physical activity during pregnancy is a poorly investigated subject on population level. The study aimed to describe duration, type and frequency of leisure-time physical activity during pregnancy, and to explore its associated factors.

**METHODS:** A population-based study was carried out during 2004 in Southern Brazil. A total of 4,471 mothers were interviewed soon after delivery. Physical activity was measured using a questionnaire, developed for the study. Results were obtained by Poisson regression.

**RESULTS:** In the sample, 14.8% of women reported to engage in some type of physical activity prior to pregnancy and 12.9% during pregnancy. In the first trimester, 10.4% of all mothers engaged in some type of physical activity; 8.5% in the second trimester and 6.5% in the third trimester. Only 194 mothers (4.3%) were active during the whole pregnancy. In the adjusted analysis, leisure-time physical activity was positively associated with schooling, physical activity advice during prenatal care, and family income ( $p < 0.001$ ), being employed during pregnancy ( $p = 0.05$ ), and number of pregnancies ( $p = 0.02$ ). Walking was the most frequent activity.

**CONCLUSIONS:** The prevalence of leisure-time physical activity is low among Brazilian pregnant women. Although physical activity is not perceived as being pregnancy-threatening, and current guidelines recommend it, this population's behavior does not seem to be changing. Active lifestyle for both pregnant women and future mothers should be encouraged.

**KEYWORDS:** Exercise. Exertion. Pregnant women. Socioeconomic factors. Epidemiologic studies. Observational studies. Physical activity. Population-based studies. Physical fitness.

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### RESUMO

**OBJETIVO:** A atividade física durante a gestação é pouco estudada em nível populacional. O objetivo do estudo foi descrever a duração, tipo e frequência de atividade física de lazer durante a gravidez e explorar fatores associados.

**MÉTODOS:** Estudo de base populacional, realizado durante o ano de 2004 em Pelotas, RS, Brasil. Logo após o parto, 4.471 mães foram entrevistadas. Utilizou-

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se questionário, desenvolvido para o estudo, para verificar a atividade física de lazer. Os resultados foram obtidos por regressão de Poisson.

**RESULTADOS:** Antes da gravidez, 14,8% das mulheres relataram algum tipo de atividade física de lazer e durante, 12,9%. No primeiro trimestre, 10,4% de todas as mães fizeram alguma atividade física de lazer; no segundo, 8,5% e no terceiro, 6,5%. Apenas 194 mães (4,3%) foram ativas durante toda a gestação. Na análise ajustada, atividade física de lazer esteve positivamente associada com escolaridade, aconselhamento para atividade física durante o pré-natal e renda familiar ( $p < 0,001$ ), estar empregada durante a gestação ( $p = 0,05$ ) e o número de gestações ( $p = 0,02$ ). A caminhada foi a atividade mais freqüente.

**CONCLUSÕES:** A prevalência de atividade física de lazer é baixa entre as grávidas brasileiras. Embora a atividade física não seja percebida como prejudicial à gravidez, e as diretrizes atuais recomendem-na, a população parece não mudar de comportamento. Deve-se encorajar que mulheres grávidas e as que pretendem engravidar tenham estilo de vida ativo.

**DESCRITORES:** Exercício. Esforço físico. Gestantes. Fatores socioeconômicos. Estudos epidemiológicos. Estudos observacionais. Atividade física. Estudos populacionais. Aptidão física.

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## INTRODUCTION

Increased physical activity levels in the population is a current public health priority.<sup>25</sup> The benefits of an active lifestyle are well-documented in the literature.<sup>4</sup> In the past, most pregnant women were advised to stay at home and avoid physical efforts in order not to risk their health and the fetus' life. This perception of pregnancy and physical activity has changed somewhat in recent years, with most active women willing to remain active during pregnancy.

Current guidelines<sup>1,8,23</sup> point out that if an active woman gets pregnant there is no reason to discontinue exercising. However, precautions should be taken and some specific activities should be avoided such as scuba diving and those involving in a risk of falling. There is also no evidence of harm to either the mothers or their fetus for sedentary women starting a physical activity program during pregnancy, as long as the prescribed activity is suitable to their current level of fitness. In terms of the optimal amount of exercise during pregnancy, there is not a strict recommendation. Pregnant women should be encouraged to practice aerobic activities and strength-conditioning exercises.<sup>8</sup> According to the guidelines on aerobic activities, pregnant women should practice them 3–5 times a week for at least 15 minutes, and sedentary women should gradually increase the amount of exercise.<sup>8,23</sup> However, warning signs, such as vaginal bleeding, preterm labor, and decreased fetal movement, should be carefully monitored and the activities performed suitably changed.<sup>1</sup>

Most original studies<sup>6,11,19,20</sup> and reviews<sup>13–15,17,24</sup> on physical activity and pregnancy focus on the effects of exercising through pregnancy, assessing possible risks or benefits to the mother and her baby. There are scarce population-based studies in the literature about patterns and variables associated with physical activity during pregnancy.

Two methodological issues on physical activity during pregnancy are of concern when reviewing the literature on this subject. First, limited data on patterns of physical activity during pregnancy are available in low- and middle-income countries. Second, utilization of different measurement techniques and cutoff points makes it difficult to compare different studies.

The present study aimed at describing the duration, type and frequency of leisure-time physical activity (LTPA) in the three months prior and during each trimester of pregnancy in a population-based study. It also explored factors associated to LTPA and discussed physical activity advice during prenatal care.

## METHODS

Pelotas is a medium-sized (around 320,000 inhabitants) city in Southern Brazil. There are three ongoing birth cohort studies in this city. All children born in 1982, 1993 and 2004 have been followed-up since birth.<sup>3</sup> More than 99% of births take place in five local hospitals, and the remaining children (usually from household births) seek medical care soon after birth

in these same hospitals. From January 1<sup>st</sup> to December 31<sup>st</sup>, 2004, 4,471 mothers from all newborns were interviewed soon after delivery. Only 34 mothers refused to participate in the study (0.76%).

Since this analysis is part of a broader investigation (2004 Pelotas Birth Cohort Study<sup>2,\*</sup>) the sample size actually interviewed was greater than needed, so the study power was maximized. The sample size obtained allowed to estimate the prevalence of any LTPA during pregnancy of 13% within an error margin of one percentage point, using a 95% confidence interval. For assessing variables associated with LTPA during pregnancy, the sample size estimate required a sample of approximately 2,500 individuals using the following parameters: 95% confidence interval, 80% power, exposure prevalence ranging from 5% to 50%, minimum relative risk to be detected of 1.5, additional 10% to accommodate non-response and additional 15% for multivariable analysis. The final sample size of the study provided a confidence interval and a statistical power higher than 95%.

The instrument used to measure LTPA during pregnancy was developed and tested in a pilot-study by the researchers focusing on regular activities. Mothers were inquired about their physical activities during leisure time, and were reminded not to consider activities related to household tasks, occupation, physical education classes, or work rides. Four time periods were investigated: the three-month period prior to pregnancy, and the first, second, and third trimesters of pregnancy. Information collected included type, frequency, and (average) duration of each session of physical activity reported by the mothers on a typical week in each period. Up to three different activities were recorded for each mother. The questions were: "What physical activities did you engage in this period?"; "How many times a week?"; and "How long did each session usually take?". The same questions were repeated for each of the four time periods.

The instrument was tested but not validated by the authors. The study instrument and strategy were similar to Evenson's questionnaire.<sup>10,11</sup> The independent variables studied were age (divided into decades), skin color (as perceived by the interviewer), total family income in the last month, paid job during pregnancy (regardless of duration; yes/no), years of schooling, marital status, pre-pregnancy body mass index (BMI, based on self-reported weight and height), pre-pregnancy smoking habit, physical activity advice during prenatal care, number of pregnancies (including the current one), and planning of the current pregnancy. The reason for not including pre-pregnancy BMI in

the multivariable analysis was the high rate of missing data, of about 30%.

Interviewers were graduates in Nutrition and received special training for questionnaire application. Interviews took place in the hospitals within 24 hours after delivery. Most interviews were carried out within the first 18 hours. The interviewers were blinded to the study objectives and hypotheses. A randomly selected sample of mothers (around 10%) was re-interviewed by a field supervisor who checked whether the mother had answered the whole questionnaire, and repeated a few selected questions. A detailed account of the cohort study methodology is available elsewhere.<sup>2</sup>

Data entry was entered twice using Epi-info 6 (Epi-Info version 6.04b. Atlanta, GA: Centers for Disease Control, 2001). Validation and consistence checks, as well as all analysis, were performed using Stata 8.0 (Stata Statistical Software: Release 8.0. College Station, TX: Stata Corporation, 2003). Descriptive analysis included calculations of means, medians, and standard deviations for the continuous variables, and proportions and 95% confidence intervals for the categorical ones. The crude analysis compared the prevalence of each outcome within groups of the independent variables using Chi-square tests for heterogeneity or linear trend. Multivariable analysis was carried out using Poisson regression. This was based on a hierarchical conceptual model including three levels: 1- age, skin color, family income, work during pregnancy and schooling level; 2- marital status and pre-pregnancy smoking habit; 3- pregnancy planning, number of pregnancies and physical activity advice during prenatal care. This analysis adjusts for the effect of each independent variable on the outcome for variables in the same level or above in the conceptual model. This analysis considered only LTPA during pregnancy, as it was the main goal of this study.

The study was approved by the Ethics Committee of the Faculdade de Medicina of Universidade Federal de Pelotas and was registered in the University's Research and Education Coordination Council under the number 4.06.01.116. Written informed consent was obtained from each mother prior to the interviews.

## RESULTS

Table 1 describes the sample in terms of socioeconomic, demographic, behavioral and pregnancy-related independent variables. Mean age was 26.1 (SD 6.8) years. Three quarters of all mothers were classified as white. Median schooling was 8.0 years; 1.0% of all mothers had never attended school. Mean monthly

\* 2004 Pelotas Birth cohort is a longitudinal study in Southern Brazil sponsored by WHO, CNPq and Pastoral da Criança. Data from perinatal interviews.

**Table 1.** Description of the sample according to demographic, socioeconomic, behavioral and pregnancy-related variables. Pelotas, Southern Brazil, 2004.

Variable	N	%
Age (years) (N=4,469)		
12-19	848	19.0
20-29	2,224	49.8
30-39	1,251	28.0
40-46	146	3.2
Skin color (N=4,470)		
White	3,298	73.8
Non-white	1,172	26.2
Schooling (years) (N=4,428)		
0-4	738	16.7
5-8	1,839	41.5
9-11	1,426	32.2
≥ 12	425	9.6
Employment during pregnancy (N=4,470)		
Yes	1,800	40.3
No	2,670	59.7
Monthly family income (US\$) (N=3,747)		
< 100	591	15.8
100-199	1,217	32.4
200-299	782	20.9
≥ 300	1,157	30.9
Marital status (N=4,470)		
Living with a partner	3,756	84.0
Living without a partner	714	16.0
Pre-pregnancy body mass index (kg/m <sup>2</sup> ) (N=3,023)		
< 18.5	222	7.3
18.5-25.0	1,923	63.6
≥ 25.0	878	29.1
Number of pregnancies (N=4,469)		
1 (primiparae)	1,759	39.4
2	1,169	26.2
3	721	16.1
4	370	8.3
≥ 5	450	10.0
Planned pregnancy (N=4,469)		
Yes	1,560	34.9
No	2,909	65.1
Smoking before pregnancy (N=4,470)		
Yes	1,438	32.2
No	3,032	67.8
Physical activity advice in prenatal care (N=4,470)		
	1,232	28.1

family income was US\$ 330, while the median was US\$ 215. Mean pre-pregnancy BMI was 23.6 kg/m<sup>2</sup> (SD 4.4), with 20.5% in the range 25 to <30 and 8.6% with BMI ≥ 30 (obese). The median number of pregnancies was two; 39.4% were in their first pregnancy. One third of all mothers were smokers prior to pregnancy and almost three quarters reported receiving physical activity advice in prenatal care. Almost all women (98.1%) attended at least one prenatal care visit.

In the three-month period prior to pregnancy, 14.8% (95% CI: 13.7; 15.8) of the mothers reported to engage in LTPA. During pregnancy, 12.9% (95% CI: 11.9; 13.9) reported LTPA at some point. In the first trimester, 10.4% (95% CI: 9.5; 11.3) of the mothers engaged in LTPA, this frequency fell to 8.5% (95% CI: 7.6; 9.3) and 6.5% (95% CI: 5.7; 7.2) in the second and third trimesters, respectively. Only 194 mothers (4.3%) were active during the three trimesters of the pregnancy.

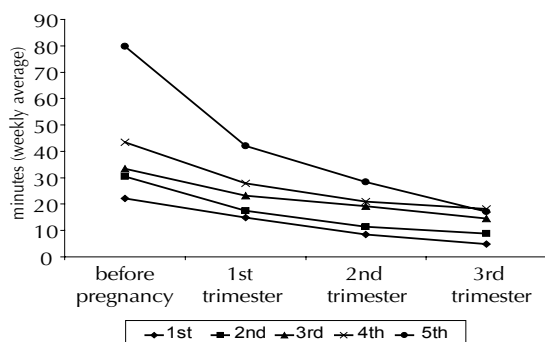
Of 3,810 mothers who reported no LTPA before pregnancy, only 172 (4.5%) started any LTPA during pregnancy. On the other hand, of 660 mothers who reported engaging in LTPA prior to pregnancy, 404 (61.2%) remained active.

Table 2 describes the types of activity women engaged during pregnancy, walking was, by far, the most common one. Among all mothers engaging in LTPA during the first trimester, 70.0% reported walking. This proportion increased to 82.6% and 89.5% in the second and third trimesters, respectively.

Figure shows the average minutes per week of LTPA according to quintiles of family income, including both active and inactive subjects. Women belonging to the better-off group reported an average of almost 80 minutes per week of LTPA in the three months prior to pregnancy. Women in the poorest group reported an average of less than 25 minutes per week. As the pregnancy advanced, all income groups decreased weekly time of LTPA, but the differences among groups remained the same, with a four-fold difference between extreme categories. The better-off group showed the highest decrease on weekly LTPA due to pregnancy.

Restricting analyses to women who reported engaging in any LTPA, the median minutes per week was 180 before pregnancy (mean: 266; SD: 205 minutes) and during the first trimester (mean: 227; SD: 181 minutes), dropping to 160 (mean: 201; SD: 175) and 150 (mean: 192; SD 173) during the second and third trimesters, respectively.

As shown in Table 1, 71.8% of the mothers received some advice about LTPA from health providers during prenatal care. Among them, 79.1% were told to engage in any physical activity, 7.0% were told to reduce or change their physical activity level, and 13.9% were



**Figure.** Average minutes/week of leisure-time physical activity according to quintiles of family income. Pelotas, Southern Brazil, 2004 Pelotas Birth Cohort Study.

told to discontinue their physical activities. Recommendations made by health providers according to the mothers' specific health problems during pregnancy were as follows:

- mothers with hypertensive disorder: 72.2% to engage in any physical activity (PA), 9.0% to reduce or change their PA level, 18.8% to discontinue their PA;
- mothers with diabetes: 75.9% to engage in any PA, 4.6% to reduce or change their PA level, 19.5% to discontinue their PA;
- mothers who have had miscarriage threat: 58.2% to engage in any PA, 9.9% to reduce or change their PA level, 31.9% to discontinue their PA;
- mothers who have had premature labor: 57.6% to engage in any PA, 11.6% to reduce or change their PA level, 30.8% to discontinue their PA;
- mothers that were hospitalized during pregnancy: 61.3% to engage in any PA, 5.1% to reduce or change their PA level, 7.2% to discontinue their PA.

Among mothers who exercised, 43.2% were advised about physical activity by their doctors; 40.3% did not receive any advice, and 16.5% received advice on exercising from other sources, such as relatives, friends or other health providers (including physical education instructors).

Of 660 mothers who engaged in LTPA before pregnancy, 256 (38.8%) discontinued exercising due to pregnancy. Their main reasons were: "I thought I had better stop" (28.9%); "I felt too tired" (26.4%); and "medical advice" (15.6%). Other minor reasons were also reported, accounting for 29.1% of those who discontinued exercising.

In order to investigate mother's beliefs about physical activity during pregnancy, two sentences were read to every mother whether she was active or not. To the first

**Table 2.** Leisure-time physical activities engaged during pregnancy (N=577). Pelotas, Southern Brazil, 2004.

Activity	%
Walking	77.5
Cycling	8.1
Weight lifting	5.9
Team sports	4.0
Water gymnastics	3.8
Floor exercise	3.3
Aerobics	2.6
Yoga/ stretching	2.4
Dancing	1.9
Swimming	1.2
Martial arts	0.5
Running	0.5
Lamaze classes	0.3
Racquet sports	0.2

sentence stating, "Physical activity during pregnancy makes labor easier," 82.8% agreed while 17.2% disagreed or did not know. To the second sentence stating, "The outcome of physical activity during pregnancy is a healthier baby," 75.9% agreed while 24.1% disagreed or did not know.

Table 3 presents the crude prevalence of physical activity for subgroups of mothers according to the study set of predictor variables. In regard to LTPA prior to or during pregnancy, the following groups showed higher activity levels: those aged 30-39 years, white, employed during pregnancy, BMI above 18.5 kg/m<sup>2</sup>, those who planned their pregnancy, were non-smokers and received physical activity advice during prenatal care. Prevalence of LTPA prior to pregnancy was inversely associated with the number of pregnancies, and positively associated with family income and schooling. The variables associated with LTPA during pregnancy were the same as before, except for age.

Discontinuing exercising during pregnancy was not associated with any of the independent variables studied in the crude analysis. The proportion of women who reported engaging in any LTPA in the four studied periods (prior and during the entire pregnancy, 3.2%) showed a borderline association with skin color (p=0.06) and smoking (p=0.07). In addition, it was positively associated (p<0.001) with family income, schooling, employment and physical activity advice during pregnancy. It was negatively associated with number of pregnancies (p<0.001).

The effects of smoking and planned pregnancy on LTPA during pregnancy shown in the crude analysis were not maintained after adjusting for confounders.

**Table 3.** Leisure-time physical activity prior to and during pregnancy according to maternal characteristics. Pelotas, Southern Brazil, 2004.

Variable	Leisure-Time Physical Activity patterns	
	Active	
	Before or during pregnancy (%) N=834	During Pregnancy (%) N=577
Age (years)	p=0.02*	p=0.3*
12-19	15.9	11.7
20-29	18.4	13.0
30-39	21.3	14.0
40-46	15.1	9.6
Skin color	p=0.001**	p=0.001**
White	19.8	13.9
Non-white	15.4	10.1
Family income (quintile)	p<0.001*	p<0.001*
1 <sup>st</sup>	9.6	6.7
2 <sup>nd</sup>	14.3	9.7
3 <sup>rd</sup>	14.8	11.4
4 <sup>th</sup>	22.0	15.5
5 <sup>th</sup>	36.0	23.1
Schooling (years)	p<0.001*	p<0.001*
0-4	7.1	4.7
5-8	14.2	10.2
9-11	22.9	15.7
≥ 12	41.4	27.8
Employment during pregnancy	p<0.001**	p<0.001**
Yes	23.9	16.5
No	15.1	10.5
Marital status	p=0.4**	p=0.8**
Living with a partner	18.9	12.8
Living without a partner	17.5	13.2
Pre-pregnancy body mass index (kg/m <sup>2</sup> )	p=0.003**	p=0.004**
<18.5	13.1	11.4
18.5-25.0	22.9	15.7
≥ 25.0	21.4	13.6
Number of pregnancies	p<0.001*	p<0.001*
1 (primiparae)	24.6	17.9
2	17.0	11.2
3	14.8	8.7
4	14.9	10.8
≥ 5	8.9	6.0
Planned pregnancy	p<0.001**	p=0.001**
Yes	22.2	14.6
No	16.7	12.0
Smoking before pregnancy	p<0.001**	p<0.001**
Yes	13.5	9.5
No	21.1	14.5
PA advice in prenatal care	p<0.001**	p<0.001**
Yes	22.0	15.5
No	11.0	6.8

\* Chi-square test for trend

\*\* Chi-square test for heterogeneity

PA: Physical Activity

**Table 4.** Adjusted analyses of the variables associated with any leisure-time physical activity during pregnancy. Pelotas, Southern Brazil, 2004.

Variable	Adjusted analysis PR (95% CI)
Schooling (years)	p<0.001*
0-4	0.33 (0.21; 0.51)
5-8	0.58 (0.44; 0.78)
9-11	0.70 (0.55; 0.88)
≥ 12	1.00
Employment during pregnancy	p=0.05**
Yes	1.00
No	0.83 (0.69; 1.00)
Family income (quintile)	p<0.001*
1 <sup>st</sup>	0.50 (0.35; 0.72)
2 <sup>nd</sup>	0.62 (0.46; 0.84)
3 <sup>rd</sup>	0.67 (0.51; 0.87)
4 <sup>th</sup>	0.83 (0.66; 1.05)
5 <sup>th</sup>	1.00
Marital status	p=0.04**
Living with a partner	1.00
Living without a partner	0.79 (0.63; 0.99)
Number of pregnancies	p=0.02*
First baby	1.00
Two or more babies	0.70 (0.50; 0.99)
PA advice in prenatal care	p<0.001**
Yes	1.00
No	0.54 (0.43; 0.69)

PR: prevalence ratio

PA: physical activity

\* Wald test for trend

\*\* Wald test for heterogeneity

Predictors of any leisure-time physical activity during pregnancy were further investigated in a multivariable model to control for potential confounding. The results are presented in Table 4. The crude association between skin color and LTPA during pregnancy was not confirmed after adjusting for socioeconomic indicators. In the adjusted analysis, age, skin color, pre-pregnancy BMI, planned pregnancy and smoking lost their statistical significance. This is the case for the variables age, schooling, family income, employment during pregnancy (although the adjusted p-value is of borderline significance), number of pregnancies and physical activity advice during prenatal care. A negative confounding effect was observed for the variable marital status, as it became significant in the adjusted analysis. Women with no partners had their likelihood of being active reduced by 21% compared to those with partners.

## DISCUSSION

The prevalence of LTPA during pregnancy found in the present study sample (12.9%) was markedly lower than that reported in the United States, where approximately two thirds of all women studied engaged in LTPA.<sup>9,14</sup> Consistent with these studies, walking was the most common physical activity.

Pre-pregnancy inactivity in the present study was consistent with the prevalence reported in non-pregnant Brazilian women,<sup>8</sup> the prevalence of physical inactivity (less than 1,000 kcal/week) has been shown to be 89.4%. In the study sample, 85.6% of all women reported no LTPA before pregnancy.

The variables associated with LTPA during pregnancy were consistent with the literature. Poorer and less educated mothers were less likely engage in LTPA during pregnancy.<sup>9,14</sup> A different perception on the benefits of physical activity for health and/or aesthetics is a possible explanation for this finding. Biological issues potentially play a role as the pregnancy advances, and this can help to understand why there is a similarity in LTPA discontinuation rates across income groups as they advance to the end of pregnancy. The decrease in LTPA from first to third trimester is well understood, as mothers-to-be have movement impairments as their body weight increases.

Similarly to other studies,<sup>9,14</sup> the number of pregnancies plays a definite role in LTPA patterns, probably because first-time mothers still have no children at home to occupy their leisure time, allowing women to spend their free hours with other activities, such as physical activity. Mothers who were employed during pregnancy also reported higher prevalence of LTPA, and possible explanations are the ability to better manage time, or having enough money to afford a baby sitter or a maid. Physical activity advice during prenatal care was also a predictor of LTPA during pregnancy, highlighting the importance of suitable advice in prenatal care visits. However, this finding may be in part due to a reverse causality, as pregnant women who were interested in exercising were more likely to discuss it with their doctors.

In the literature review, there were not found studies on physical activity advice during pregnancy, neither for healthy women nor for those with health problems. The present study showed that, at least in this population, there is a good agreement between mother's health status and advice provided by doctors during pregnancy. Apparently women with health problems that contraindicate exercise are being advised to either be more careful or not exercise at all.

When analyzing reasons that made women discontinue exercising, the study results were inconclusive, but it

seems that physical aspects were the reason for changing behaviors. From the reasons mentioned before, medical advice was probably the most specific one, but was not frequently mentioned, possibly because mothers with clinical limitations remained inactive throughout the whole pregnancy. It may be qualitative studies could provide the most appropriate data to further explore this issue.

It seems that, unlike in the past, people nowadays do not see exercising as a threat to the baby or to the mother-to-be, and might even believe that it actually can bring some benefits to both the mother and her fetus, especially maternal psychological benefits.<sup>16</sup> But this perception apparently is not enough to bring about behavioral changes towards the desired direction. Even though exercise is seen as a healthy activity, inactive lifestyles are still highly prevalent among the Brazilian population. A recent literature review<sup>12</sup> showed some long-term health benefits resulting from physical activity during pregnancy, and similar studies could help evidence that the benefits are not limited to the gestational period but have an impact on chronic disease prevention as well.

Some drawbacks of the present study must be noted. The population studied is not representative of the whole country but it can be reasonably considered similar to populations from other middle-sized Brazilian cities. Another aspect is the fact that LTPA measurement relied on an instrument that was not validated against a reference. It does not allow direct comparison to other studies but it was an attempt to measure LTPA retrospectively soon after delivery. Efforts to develop physical activity questionnaires to be used during pregnancy are being made but with different approaches, such as interviewing the mothers-to-be during pregnancy, inquiring about their current levels of physical activity.<sup>5</sup> Though some validation studies have been published<sup>5,18</sup> their instruments were designed to be applied during pregnancy, not retrospectively. Taking into account that there is no validated instrument for retrospective investigation in the postpartum it was believed that the study instrument could be used in this case and whenever data required to be collected on type, frequency and amount of leisure-time physical activity during pregnancy. The drawback of the study instrument is its inability to measure intensity.

On the other hand, the qualities of the present study were the very low refusal rate (below 1%) and the short recall period (interviews were performed soon after delivery).

It seems evident that, like non-pregnant population,<sup>8</sup> Brazilian pregnant women are far from reaching recommended amounts of physical activity during pregnancy. This was anticipated because, as confirmed

by the present study, very few women began exercising after getting pregnant. The decreasing levels of physical activity during pregnancy trimesters, although mostly caused by biological reasons, could be discussed with health agents providing prenatal care and maybe the key to promote increasing levels of activity is through social support.<sup>22</sup>

Corroborating the literature,<sup>14</sup> being active before pregnancy is a strong predictor of physical activity during pregnancy. Thus, an active behavior should be encouraged not only among pregnant women but also among mothers-to-be, because this action is most likely to be the best way of assuring a healthier lifestyle among them.

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