

# PREVALENCE OF PHYSICAL ACTIVITY IN WOMEN

## *Prevalência de atividade física em mulheres*

## *Prevalencia de la actividad física en mujeres*

Original Article

### ABSTRACT

**Objective:** To investigate the prevalence of physical activity (PA) in women from Florianópolis-SC. **Methods:** Quantitative cross-sectional study conducted from 2012 to 2013 with 400 women aged 20-59 years in the urban area of the city of Florianópolis. A self-administered questionnaire containing data on demographics, weight and height was used. The International Physical Activity Questionnaire (IPAQ) was applied. ANOVA was used to compare physical activity variables and the chi-squared test was used to compare the levels of physical activity (insufficiently active, active and very active). Significance level was set at 5% ( $p < 0.05$ ). **Results:** Approximately 58-76% of the women were considered sufficiently active, with a prevalence of moderate physical activity in all age groups, particularly at age 46-59 years (74 min/d). In all, 58.7% ( $n=232$ ) of the women live with their partners, 81.8% ( $n=327$ ) have a higher education degree, 74.5% ( $n=298$ ) belong to socioeconomic class B, 46.8% ( $n=187$ ) do not have children, and 74% ( $n=296$ ) have normal weight. However, such variables do not seem to influence the practice of PA. **Conclusion:** The great number of very active women is highlighted and moderate physical activity is the most prevalent in all age groups. Therefore, they meet the recommendations for physical activity established by health agencies.

**Descriptors:** Motor Activity; Women; Prevalence

### RESUMO

**Objetivo:** Investigar a prevalência de atividade física (AF) em mulheres de Florianópolis-SC. **Métodos:** Estudo quantitativo e transversal, desenvolvido entre 2012 e 2013, realizado com 400 mulheres entre 20 e 59 anos da região urbana da cidade de Florianópolis. Utilizou-se um questionário autoaplicável contendo dados demográficos, peso e altura. Aplicou-se o questionário internacional de atividade física (IPAQ). Para a comparação das variáveis da atividade física, utilizou-se a ANOVA, e para comparação dos níveis (insuficientemente ativo, ativo e muito ativo) de atividade física, o teste do Qui-quadrado. Adotou-se nível de significância de 5% ( $p < 0,05$ ). **Resultados:** Aproximadamente 58-76% das mulheres foram consideradas suficientemente ativas, sendo a atividade física de intensidade moderada a mais prevalente em todos os grupos etários, destacando-se a faixa etária de 46 a 59 anos (74 min/d). Do total, 58,7% ( $n=232$ ) das mulheres moram com seus parceiros, 81,8% ( $n=327$ ) possuem ensino superior, 74,5% ( $n=298$ ) pertencem à classe econômica B, 46,8% ( $n=187$ ) não possuem filhos e 74% ( $n=296$ ) apresentam peso normal. No entanto, essas variáveis parecem não influenciar a prática de AF. **Conclusão:** Ressalta-se o elevado quantitativo de mulheres suficientemente ativas, sendo a atividade física de intensidade moderada mais prevalente em todos os grupos etários. Nesse sentido, elas atendem às recomendações para a prática de atividade física apontadas pelas agências de saúde.

**Descritores:** Atividade Motora; Mulheres; Prevalência.

Vanessa Terezinha Ferrari  
Jonck<sup>(1)</sup>  
Amanda Soares<sup>(2)</sup>  
Camila da Cruz Ramos de  
Araujo<sup>(3)</sup>  
Zenite Machado<sup>(3)</sup>  
Nicolle Martins Reis<sup>(3)</sup>  
Adriana Coutinho de Azevedo  
Guimarães<sup>(3)</sup>

1) Bachelor of Physical Education, Santa Catarina State University (*Universidade do Estado de Santa Catarina - UDESC*) - Florianópolis (SC) - Brazil

2) Higher Education Institution of Grande Florianópolis (*Instituto de Ensino Superior da Grande Florianópolis - IES*) - São José (SC) - Brazil

3) Santa Catarina State University (*Universidade do Estado de Santa Catarina - UDESC*) - Florianópolis (SC) - Brazil

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## RESUMEN

**Objetivo:** Investigar la prevalencia de la actividad física (AF) en mujeres de Florianópolis-SC. **Métodos:** Estudio cuantitativo y transversal desarrollado entre 2012 y 2013 con 400 mujeres entre 20 y 59 años de la zona urbana de la ciudad de Florianópolis. Se utilizó un cuestionario autoadministrado con datos demográficos, peso y altura. Se aplicó el cuestionario internacional de actividad física (IPAQ). Se utilizó la ANOVA para la comparación de las variables de la actividad física y la prueba de Chi-Cuadrado para la comparación de los niveles (insuficientemente activo, activo y muy activo) de la actividad física. Se adoptó el nivel de significancia del 5% ( $p < 0,05$ ). **Resultados:** Aproximadamente el 58-76% de las mujeres fueron consideradas suficientemente activas con prevalencia para la actividad física de intensidad moderada (74 min/d) para todos los grupos etarios, principalmente en la franja de edad de 46 a 59 años. Del total, el 58,7% ( $n=232$ ) de las mujeres viven con sus compañeros, el 81,8% ( $n=327$ ) tienen educación superior, el 74,5% ( $n=298$ ) es de la clase económica B, el 46,8% ( $n=187$ ) no tiene hijos y el 74% ( $n=296$ ) presentan el peso normal. Sin embargo, estas variables parecen no tener influencia en la práctica de la AF. **Conclusión:** Se resalta el elevado número de mujeres suficientemente activas con prevalencia para la actividad física moderada en todos los grupos etarios. En este sentido, las mujeres atienden a las recomendaciones de prácticas de actividad física sugeridas por las agencias de salud.

**Descriptor:** Actividad Motora; Mujeres; Prevalencia.

## INTRODUCTION

Changes in lifestyle over the past years have led an increase in physical inactivity and became a major problem in many cities worldwide<sup>(1,2)</sup>. Data from the World Health Organization (WHO)<sup>(3)</sup> reveal that 17% of the world's population is physically inactive, and 60% do not get the recommended levels of physical activity. A study conducted in Southern Brazil found that 41% of adults of both sexes are physically inactive<sup>(4)</sup>. Another study conducted with women from the same region found a physical inactivity rate of 37%<sup>(5)</sup>.

In the state of Santa Catarina, some municipalities have carried out studies to assess physical inactivity. For example, the rate of global physical inactivity was 57%<sup>(6)</sup> in Joaçaba, 10% in Mafra<sup>(7)</sup>, and 46% in Florianópolis for individuals aged 25-49 years<sup>(8)</sup>.

Published literature shows that individuals who do regular physical activity have a lower risk of developing some types of diseases, such as heart diseases, diabetes, some types of cancer, obesity, anxiety and depression symptoms, and other morbidities; in addition, they also present lower mortality rates<sup>(9,10)</sup>. Given that, adults should

do at least 150 minutes of physical activity throughout the week in order to have health benefits and to be considered physically active<sup>(11-13)</sup>.

Yet, despite the importance of physical activity being presented, it was deemed necessary to assess the prevalence of physical activity in women from the city of Florianópolis due to its location, which favors physical activity for having a structure that encourages its practice. Additionally, the city has some free physical activity programs developed in higher education institutions and municipal government institutions.

## METHODS

This quantitative cross-sectional study was conducted with a nonprobability convenience sample of women aged 20-59 years from the urban area of the city of Florianópolis-SC. The study took place from 2012 to 2013.

Although the study uses nonprobability sampling, the sample size was calculated<sup>(14)</sup> based upon a population of 136,558 women aged 20-59 years of the city of Florianópolis, Santa Catarina, Brazil, according to the last census data from the *Instituto Brasileiro de Geografia e Estatística*<sup>(15)</sup> (Brazilian Institute of Geography and Statistics). The sample size was calculated using a 5% margin of error and a 95% confidence interval, and it included 400 women.

In order to achieve the required sample size, data were collected online and in loco the presence of one of the researchers. A total of 460 questionnaires were distributed (by hand and online), but only 400 duly filled questionnaires were returned (287 online and 113 by hand), with no differences regarding economic level and age. In all, 38 questionnaires were duly filled, and 22 women refused to participate after alleging they were not interested in answering the questionnaire.

Participants were invited to participate as volunteers in the study and were recruited from education, health, sports, religion, and insurance companies and service providers. Housewives were also included.

Demographic characteristics were collected (age, education, marital status, the number of children, skin color, and economic level). Self-reported weight and height were used to calculate body mass index - BMI ( $\text{weight}/\text{height}^2$ ), and physical activity was assessed using the International Physical Activity Questionnaire (IPAQ - short form).

Economic level was determined using the socio-economic classification criteria, which divides the population into socio-economic classes A, B, C, D, and E by assessing women's education level and the number of goods in their house<sup>(16)</sup>.

BMI (weight status) classification was based upon the World Health Organization<sup>(17)</sup> guidelines, namely, underweight (BMI<18.5kg/m<sup>2</sup>), normal range (BMI 18.5-24.9kg/m<sup>2</sup>), overweight (BMI 25.0-29.9kg/m<sup>2</sup>), pre-obese and obese (IMC>30.0kg/m<sup>2</sup>). For statistical purposes, dichotomous variables were regrouped: normal weight (underweight and normal weight) and excess weight (overweight, pre-obese and obese).

Physical activity was assessed using the International Physical Activity Questionnaire (IPAQ - short form), previously validated by the *Centro de Estudos do Laboratório de Aptidão Física de São Caetano do Sul - CELAFISCS* (Center of Studies of the Physical Fitness Research Laboratory from São Caetano do Sul), which is the coordinating center of the IPAQ in Brazil<sup>(18)</sup>. The physical activity assessment using IPAQ estimated the number of times spent in walking, moderate- and vigorous-intensity physical activity of at least 10 min duration over the past week in several domains (occupational, household, leisure, recreational, and sports). Considering that the energy requirement for walking should be at least 3.3METs<sup>(18)</sup>, i.e., it is above the requirements for moderate physical activity (3METs), the total physical activity, which can be computed as the sum of Walking + Moderate physical activity + Vigorous physical activity, shall correspond to at least the moderate intensity physical activity. Physical activity was classified as walking, moderate physical activity, moderate + vigorous physical activity, vigorous physical activity, and total physical activity minutes/day.

Statistical analysis was performed using the Statistical Package for Social Sciences (SPSS) - version 16. Descriptive statistics was used to calculate the mean, standard deviation, and percentage. ANOVA was used to compare physical activity variables and age groups (20-32; 33-45; 46-59 years). The prevalence of physical activity level (insufficiently active, active, and very active) was expressed as percentage estimated by the number of participants at each physical activity level divided by the total number of participants in each age group. The chi-squared test was used to compare physical activity levels among the three age groups. Principal Component Analysis was also used for the following variables: age, education, children, body mass index, marital status, and economic level x physical activity level (insufficiently active, active, and very active). Statistical significance level adopted in the comparison between groups and the association between variables was 5% ( $p < 0.05$ ).

All the participants were informed about the objectives and procedures of the study. They signed a Free Informed

Consent Form, according to Resolution No. 466/12 of the National Health Council. The study was approved by the Human Research Ethics Committee of the *Universidade do Estado de Santa Catarina* (Santa Catarina State University) in March, 2<sup>nd</sup> 2012 under Opinion No. 214/2011.

## RESULTS

Table I shows characteristics of a sample of women aged 20-59 years divided into three age groups (1=20-33, 2=34-45, 3=46-59 years). It was observed that 58.7% (n=232) of women live with their partners, especially those women in the group 2 (75.5%; n=111). Of all the participants, 81.8% (n=327) have a higher education degree, 74.5% (n=298) belong to socio-economic class B, 46.8% (n=187) do not have children, and 74% (n=296) are at normal weight, particularly those in the group 1, with a rate of 82.2% (n=152). Except for higher education, all variables presented significant association between age group and the following variables: marital status ( $p < 0.001$ ), number of children ( $p < 0.001$ ), weight status ( $p < 0.001$ ), and socio-economic class ( $p = 0.032$ ).

Table II shows the physical activities done by participants, namely: walking, moderate physical activity, vigorous physical activity, and total physical activity according to socio-economic class. Although there was no significant difference, moderate physical activity was the most prevalent in all age groups, particularly in the age group 46-59 years, with a total of 74 min/d. As to walking, it was found to be less practiced in minutes/day compared to other activities, with lower levels in the age group 20-32 years, with 42 min/d.

Physical activity level is presented in Table III, which shows a high number of sufficiently active women (active + very active), particularly in the group 3, with 76% (n=40) of very active women. However, there was no significant difference between age groups and physical activity level ( $p = 0.431$ ).

Figure 1 shows that only two variables stood out from the others concerning their relationship (56%) to physical activity level, namely, age and education. This value is considered low, which means that only age and education appear to influence – although weakly – the practice of physical activity.

Table IV shows that no differences were observed in the analysis of equality of variance. The variables presented in the table do not seem to influence the practice of physical activity (increase or decrease).

Table I - Characterization of the sample according to the age group of women participating in the study. Florianópolis, SC, 2012 - 2013.

Variables n(%)	Total	Group 1 (20-32 years)	Group 2 (33-45 years)	Group 3 (46-59 years)	P value
<b>Marital Status (%)</b>					
Living together	232(58.7)	74(41.1)	111(75.5)	47(69.1)	<0.001
Living separate	163(41.3)	106(58.9)	36(24.5)	21(30.9)	
<b>Education (%)</b>					
Elementary education	14(3.5)	5(2.7)	4(2.7)	5(7.4)	0.132
High school education	59(14.7)	28(15.1)	26(17.4)	5(7.4)	
Higher education	327(81.8)	152(82.2)	117(79.6)	58(85.3)	
<b>Socio-economic class (%)</b>					
A	72(18.0)	28(15.1)	25(17)	19(27.9)	0.032
B	298(74.5)	137(74.1)	114(77.6)	47(69.1)	
C	30(7.5)	20(10.8)	8(5.4)	2(2.9)	
<b>Children (%)</b>					
None	187(46.8)	143(77.2)	34(23.1)	10(14.7)	<0.001
1-2 children	183(45.7)	41(22.3)	99(67.3)	33(63.2)	
3-4 children	30(7.5)	1(0.5)	14(9.5)	15(22.1)	
<b>Weight status (%)</b>					
Normal weight	296(74.0)	154(83.2)	104(70.7)	38(55.9)	<0.001
Excess weight	104(26.0)	31(16.8)	43(29.3)	30(44.1)	

P-value: significance level for the comparison between groups using the Chi-squared test ( $p < 0.05$ ).

Table II – Characterization of physical activity of done by women according to age group. Florianópolis, SC, 2012 - 2013.

Variables	Group 1 (20-32 years) Mean±SD	Group 2 (33-45 years) Mean±SD	Group 3 (46-59 years) Mean±SD	P value
Walking (min/d)	42±47	46±47	51±47	0.374
Moderate PA (min/d)	60±49	69±57	74±57	0.133
Vigorous PA (min/d)	49±50	47±56	48±56	0.966
Mod + vig PA (min/d)	109±85	115±89	122±94	0.537
Total PA	151±110	162±111	173±118	0.343

PA: physical activity; min/d: minute/day; mod + vig: moderate + vigorous. P value: ANOVA ( $p < 0.05$ ).

Table III – Physical activity level of women according to age group. Florianópolis, SC, 2012 - 2013.

Variables n(%)	Group 1 (20-32 years)	Group 2 (33-45 years)	Group 3 (46-59 years)	P value
Insuff. Active (%)	34(16,4)	33(17,4)	15(8,0)	0,431
Active (%)	42(24,7)	25(15,2)	13(16,0)	
Very active (%)	109(58,4)	89(67,6)	40(76,0)	

Insuff. Active: insufficiently active; Significance level for the comparison of physical activity between groups using the Chi-squared test ( $p < 0.05$ ).

Table IV - Test for equality of means of groups related to physical activity. Florianópolis,SC, 2012 - 2013.

Variables	Wilks's Lambda	F	df1	df2	Sig.
Age	0.998	0.592	1	393	0.442
Education	1.000	0.020	1	393	0.888
Marital status	0.998	0.749	1	393	0.387
Children	1.000	0.187	1	393	0.665
BMI	1.000	0.001	1	393	0.973
Socio-economic class	0.992	3.191	1	393	0.075

Discriminant Analysis.

Component	Initial eigenvalues			Extraction sums of squared loadings		
	Total	% of variance	Cumulative %	Total	% of variance	Cumulative %
Age	2.063	34.386	34.386	2.063	34.386	34.386
Education	1.327	22.108	56.495	1.327	22.108	56.495
Marital Status	.872	14.541	71.035			
Children	.770	12.832	83.867			
BMI	.608	10.139	94.006			
Socio-economic class	.360	5.994	100.000			

BMI: Body Mass Index; Extraction Method: principal component analysis. Total explained variation of variables (1= age; 2= education; 3= marital status; 4= children; 5= BMI; 6= socio-economic class).

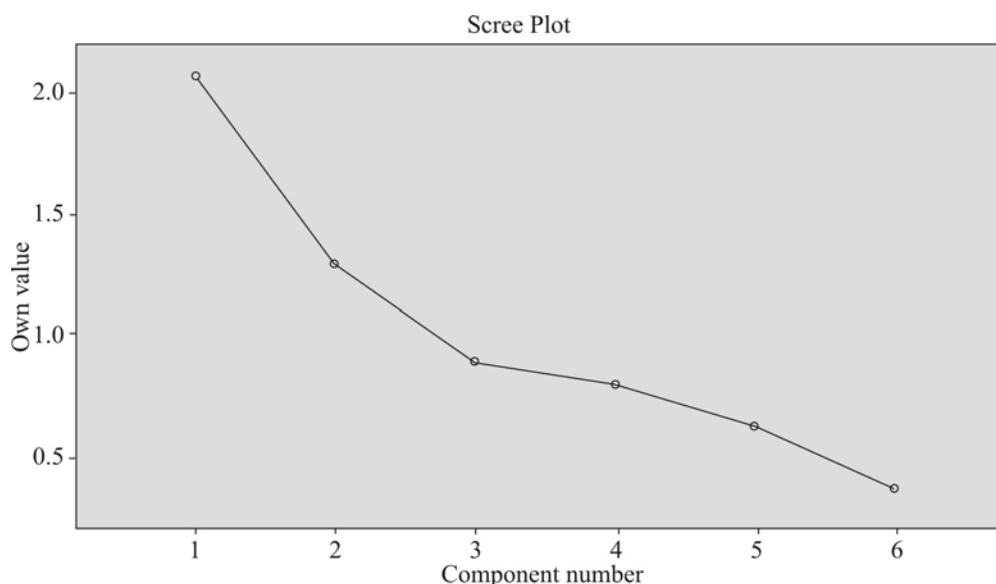


Figure 1 - Total explained variation of variables, age, education, children, body mass index, socio-economic class, and marital status.

## DISCUSSION

Physical activity has been listed as a key factor to maintaining a healthy lifestyle<sup>(19)</sup>, as it can fight off or prevent the onset of some diseases<sup>(20-23)</sup>. Thus, the lack of physical activity is regarded as a population health risk factor<sup>(24)</sup>, accounting for 6% of deaths globally<sup>(13)</sup>.

In the present study, it was found that approximately 58-76% of women are sufficiently active. A survey conducted in the cities of São Caetano do Sul and Pelotas using the same instrument (IPAQ) found that 60% and 71% of women, respectively, were classified as sufficiently active<sup>(25)</sup>. The results of the present study corroborate findings from another study conducted in Brazil to assess

physical activity in 27 cities which showed an increase in leisure physical activity from 14.9% in 2006 to 16.4% in 2008<sup>(26)</sup>. Importantly, physical activity has increased about 12.6% over the past five years among Brazilian individuals. Such increase is mainly related to the search for health prevention and promotion<sup>(27)</sup>.

According to the Global Recommendations on Physical Activity for Health, adults should accumulate at least 30 minutes of moderate physical activity on five days a week, or 20 minutes of vigorous physical activity three times a week, or 150 minutes of leisure-time physical activity, transportation, occupational, or household chores throughout the week<sup>(13)</sup>.

Data from Florianópolis showing a prevalence of relatively higher levels of physical activity compared to other national studies may be related to the fact that it is a coastal city with bike lanes, beaches, parks and nature reserves. Corroborating the aforementioned hypothesis, analyses by region show that individuals living in coastal cities are more active (66.5%) compared to those living in the countryside and metropolitan regions (53.4% and 39.4%, respectively); in addition, these individuals walk or ride the bike for transportation/commuting, which considerably favors the practice of physical activity<sup>(28)</sup>. Furthermore, walking is a natural activity that can be done outdoors, providing health benefits<sup>(29)</sup>.

In the present study, there was a prevalence of moderate physical activity in all age groups, particularly in the age group 46-59 years, with a total of 74 min/d. These results corroborate the findings from published literature that found that the majority of women practiced moderate physical activity<sup>(30)</sup>. An international study conducted in 20 countries found that most of the interviewees practiced moderate physical activity<sup>(31)</sup>. Various intensities (light, moderate and vigorous) of physical activity present positive health aspects, but moderate and vigorous physical activities are the ones with more benefits<sup>(32)</sup>.

Regular moderate physical activity can improve health and reduce the risk of early death<sup>(33)</sup>. Factors such as marital status, the number of children, education, socio-economic status, body composition, health status and physical activity have been listed as determinants of an active lifestyle<sup>(34)</sup>.

The results of the present study verified that the majority of women are married without children. Accordingly, a study found that single women, compared to married women and those with children, have a greater perception of the importance of exercises to health<sup>(35)</sup>. This fact could be observed because these women seek preventive healthcare services and get more information about the risks of accumulating fat in the abdominal region; therefore, they end up taking up physical activity<sup>(2)</sup>.

The majority of the participants had a higher education degree. A cross-sectional study conducted with adult women from São Leopoldo-RS found that lower education levels were associated with higher prevalence of sedentary lifestyle<sup>(36)</sup>. Within this context, another study found that individuals with higher education levels have greater access to knowledge and material living conditions, which favors healthy practices and habits<sup>(4)</sup>.

Socio-economic class B was prevalent in the present study. It is believed that people belonging to this socio-economic class are spared from household chores. Therefore, they have more time to engage in physical activity<sup>(37)</sup>. With regard to body composition, the present study found that 55.9% to 83.2% of women had a normal body mass index. Corroborating these findings, a longitudinal study found that active individuals have an average BMI within the normal range<sup>(38)</sup>. A cross-sectional study found that 72.3% of participants had nutritional status within the normal range, and 63% were classified as active<sup>(39)</sup>.

Promoting more active lifestyles and decreasing physical inactivity appear to be determinant factors to improving population health and costs of health management services<sup>(34)</sup>.

As in most studies on physical activity, the present study was conducted using a questionnaire, which is a limitation of this study, as this assessment method is associated with an estimated error of 35-50%<sup>(40)</sup>. However, the recommendations for the improvement of physical activity are based on epidemiological studies that used the same methodology, i.e., with a similar error.

Finally, attention is drawn to the need for further research to assess aspects worked in the present study, extending them to other populations and socio-cultural contexts in order to check the generalization of such data.

## CONCLUSION

The high number of sufficiently active women is highlighted, and moderate physical activity was the most prevalent form in all age groups. In this sense, women meet the health organization recommendations of physical activity.

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- First author's address:**  
Vanessa Terezinha Ferrari Jonck  
Rua Afonso Pena, 862  
Bairro: Estreito  
CEP 88070-650 - Florianópolis - SC - Brasil  
E-mail: ferrari334@hotmail.com
- Mailing address:**  
Camila da Cruz Ramos de Araujo  
Rua Evaldo Schaeffer, 422 bloco B10 apto 23  
Bairro: Jardim Atlântico  
CEP 88095350 - Florianópolis - SC - Brasil  
E-mail: cami.ramosdearaujo@hotmail.com