Leisure time physical inactivity and self-perception of health status in colombian adults from 18 to 64 years old

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Summary

Objective: To explore the relationship between leisure time physical inactivity (PI) and self-perceived health status in the Colombian population between 18 and 64 years of age reported in the National Nutrition Situation Survey (ENSIN) and National Demography and Health Survey (ENDS) 2010.

Methods: Cross-sectional analytical study to explore the association between physical inactivity and self-perception of the health status of Colombians between 18 and 64 from the National Survey of Nutrition Situation in Colombia (ENSIN) and the National Demographic and Health Survey (ENDS) 2010.

Results: PI explains a regular and poor self-perception of health (OR= 1.37; IC95% 1.10-1.70) in women after adjusting for confounding factors. Other associated variables included: age, educational level, affiliation to the health system, marital status, living in eastern region and Bogota. PI was not associated with self-perception of health status in men (OR=1.04; IC95% 0.85 – 1.29), but age and low educational level did show association.

Conclusion: Low levels of leisure time physical activity were associated with regular and poor self-perceived health status in women, whereas in men this relationship was not observed.

Inactividad física en el tiempo libre y auto percepción del estado de salud de colombianos entre los 18 y 64 años

Resumen

Objetivo: Explorar la relación entre la inactividad física en el tiempo libre y la auto percepción del estado de salud en la población colombiana entre 18 y 64 años de edad reportados en la Encuesta Nacional de la Situación Nutricional (ENSIN) y Encuesta Nacional de Demografía y Salud (ENDS) año 2010.

Metodología: El diseño del estudio es analítico de corte transversal y pretende con los datos de la Encuesta Nacional de Situación Nutricional en Colombia (ENSIN) y la Encuesta Nacional de Demografía y Salud (ENDS) 2010, explorar la asociación entre inactividad física en el tiempo libre y auto percepción del estado de salud de los colombianos entre 18 y 64 años.

Resultados: Para el 2010, en mujeres, la inactividad física explica una regular y mala auto percepción de la salud (OR=1,37; IC95% 1,10–1,70) después de haber ajustado por factores de confusión. Variables como edad, nivel escolar, afiliación al sistema de salud, estado civil, vivir en determinadas regiones como la oriental y Bogotá en mujeres también influyen en la auto percepción de la salud. En el grupo de los hombres no se observó que la inactividad física esté asociada con auto percepción regular o mala del estado de salud (OR=1,04; IC95% 0,85 – 1,29), pero sí la edad y la baja escolaridad.

Conclusión: Niveles bajos de actividad física en el tiempo libre se asocian con regulares y pobres auto percepciones de salud en mujeres, mientras que en hombres no se observó esta relación, lo que hace necesario tener en cuenta otro tipo de variables que pueden modificar esta percepción.

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Introduction

Physical inactivity is related to 21-25% of colon and breast cancer cases, 27% of diabetes cases and almost 30% of ischemic heart disease cases[1]. Physical inactivity is therefore a major risk factor for the development of non-communicable chronic diseases (NCDs), which represent 35 million deaths each year, equivalent to 60% of all deaths in the world, with 80% of them occurring in countries with low and medium income levels[2].

In Colombia, 22.4% of men and 27.3% of women perceive their own health to be average and poor3, and 80% of adults between 18 and 64 years of age are physically inactive in their leisure time4, which could entail an increase in health risks for people in that country. Leisure time physical inactivity contributes to the development of other risk factors, such as excess weight and obesity, which affect 17.5% of young Colombians aged between 5 and 17 years (13.4% are overweight and 4.1% are obese)[4]. A lack of knowledge surrounding the factors associated to physical inactivity among the Colombian population contributes to the growing threat of the development of non-communicable chronic diseases, which characteristically have long latency periods. Clearly establishing the factors that lead to this inactivity in leisure time will not only contribute to improving the population's lifestyle, but also to preventing psycho-social risk behaviour, by maintaining good mental health and overall improved physical health[5].

In turn, the self-perception of health has proven to be a mortality and morbidity predictor in study populations[6]. Having an average and poor self-perception of health has been associated to a low socio-economic level, a low level of schooling, being over 60 years of age and being a woman, among other factors[7]. There is no unanimous explanation behind this predictive power of self-perception of health status, but some authors argue that individuals are able to detect the signs and symptoms related to illness early, even before medical professionals[8]. Knowing the factors associated to a poor self-perception of health status could allow for earlier primary care interventions, before the established onset of chronic illnesses and their complications[9]. On the other hand, assessing the link between a poor self-perception of health and physical inactivity enables the earlier detection of the negative consequences of a sedentary lifestyle.

The aim of this study was to explore the link between leisure time physical inactivity and the self-perception of health status in Colombians aged between 18 and 64 years, in accordance with the National Survey on the Nutritional Situation in Colombia (ENSIN) 4 and the National Demographic and Health Survey (DHS) from 2010[3].

Material and method

Study design

A cross-sectional analytical study was carried out using information collected from the 2010 ENSIN and DHS studies. Both surveys were combined, taking into account that the ENSIN survey was a sub-sample of the DHS survey, and that they were carried out over the same period of time. The ENSIN 2010 study was applied to 50,670 homes, 4,987 segments of 258 municipalities from the 32 provinces and Bogotá[4].

Study group

The study group used for the ENSIN 2010 is probabilistic and representative of the Colombian population, which required a complex composition process and in which stratified multi-staged cluster samples were used[4]. The segments were selected systematically with an interval consistent of the segments list by provinces and municipality of the DHS to ensure coverage of the 258 Primary Sampling Units from 2010 in urban and rural areas across the entire Colombian territory, apart from the rural part of the Amazon and Orinoquia, which represents less than 1% of the population and which is scattered across 500,000 km$^{2(4)}$.

Selection of variables

The subjects chosen for the ENSIN 2010 survey were aged between 18 and 64 years, to whom the international physical activity questionnaire (IPAQ)[10] was applied, and they were asked about their self-perception of their health status (in the DHS)[3]. Other variables were also included, which could be related to these. The files with the corresponding information from the two surveys were provided by the Management Assessment of the *Asociación Pro-bienestar de la Familia Colombiana (Profamilia)* for DHS[3], and by the Colombian Family Welfare Institute (ICBF) for the ENSIN[4]. Once the confidentiality agreements were signed, these entities provided the keys required to access, on a maximum of two occasions, the database download of the surveys. A final file comprised 6,241 men (43.15%) and 8,224 women (56.85%).

The physical activity variables were handled in accordance with the guidelines established in the IPAQ analysis guide[11] and the amount of leisure time was taken into consideration, in accordance with the recommendations for the Latin American context[1].

Statistical analysis

A logistic regression model was applied, recoding the variable depending on the self-perception of health in excellent, very good and good as 1, and average/poor as 0 in men and women. The model was adjusted by age group, physical activity, schooling, affiliation to the social security healthcare system, body mass index, risk of obesity, means of transport, socio-economic level, and civil status. An assessment by confidence intervals at 95% was taken into account to establish significance between the variables. The models were carried out using the IBM SPSS version 20 software.

Results

The frequency at which individuals reported to have a good self-perceived state of health is similar among men and women (53.6% and 52.7% respectively). However, upon adding the positive perceptions (good, very good and excellent state of health), the percentage obtained from men is 77.1% and 68.6% from women (p <0,0001).

In terms of physical activity, the majority of both men and women do not carry out the minimum amount required to maintain a healthy lifestyle – 150 minutes a week of preferably aerobic activity[12] - with

women being less active 93.7% compared to 87.8% of men. In terms of schooling, the differences begin to emerge from secondary level, with the most advantaged group in this category being men.

In the body mass index (BMI) classification, men have proportionally more excess weight, 36.8% compared to 35.1% of women, but in obesity this situation inverts, with the larger proportion being women, with 21.4% compared to 14.5% of men. In abdominal obesity the situation is similar to that of BMI, in the first levels (abdominal obesity and high risk of coronary disease) the prevalence among men is greater, but at the highest level (very high risk of coronary disease), women hold the largest proportion, with 37.3% compared to 14.4% of men.

The distribution in terms of geographical regions was similar between men and women, apart from in the central region, in which there is a larger percentage of men than women (28.3% and 26.4% respectively; p = 0.012) and in national territories, in which there is a larger proportion of men (14.5% and 12% respectively; p < 0.001) (Table 1).

Tables 2 and 3 display the raw and adjusted analysis for an average and poor self-perception of health status. In this model for the results from 2010, the amount of adjustment variables included is greater than in a previous study for results from 2005[13].

When all the variables mentioned in Table 2 are adjusted, women present a greater OR for average and poor self-perception of health status, if their leisure time physical activity is low (OR: 1.30 CI95%: 1.03 – 1.62). This trend was not observed among men in the adjusted analysis (OR: 1.04 CI95%: 0.85 – 1.29) (Table 3).

Figure 1 displays some of the variables that are significantly associated with an average and poor self-perception of health. It reveals that the most strongly associated variables are not having a level of schooling among women, and being over 50 years among men.

Discussion

This study used information from 14,465 people aged between 18 and 64 years, chosen in the 2010 Colombian ENSIN and DHS demographic studies. The results reveal that low levels of leisure time physical activity are associated with a poor and average self-perception of health among the group of women, whilst this relationship was not found among the group of men.

Leisure time physical activity is starting to become an important way of promoting people's health[14]. The health-related benefits associated with physical activity have led to the understanding that there is a positive relationship with other predictive indicators of good health, such as the self-perception of state of health[9,14,15]. However, in this study this association in men has not been found, with this result reiterated with results obtained from 2005[13].

Previously it has been demonstrated that there is a relationship between performing physical activity and the self-perception of the state of health as positive (excellent, very good and good) [9,14,19]. Particularly noteworthy is that in this study no such evidence was found in the group of men (OR = 1.04, CI95% 0.85-1.29; Table 3), despite this demographic

performing proportionally more physical exercise in their leisure time than women (13% compared to 5.8% respectively). It is necessary to investigate and adjust other variables that could influence these results, such as the consumption of alcohol, smoking and dietary habits, which were not included in the analysis either because these variables were not included in the national survey or because they were not obtained for all the subjects from the analysed study group. With regard to this, a study on a demographic from the south of Brazil discovered associations between the consumption of fruit and physical activity with a positive self-perception of health status, whilst the use of tobacco and alcohol abuse did not reveal this relationship[20].

One recommendation for future demographic surveys in Colombia is to include questions regarding the consumption of alcohol in men and women, both adults and adolescents, and regarding the issue of current smoking habits, which is mainly asked of women; this should also be asked of men.

Schooling and economic income levels have revealed connections with positive or negative self-perceptions of health. Previous research has shown that a high level of schooling and better income favour positive self-perceptions of health[6,13,21]. This aspect was consistent with the results of this study in both sexes, and although inquiries were not made into economic income, the fact that individuals were asked about their social-economic level by asking if they owned a home, a bicycle, a motorbike or a car, is a way of categorising the income levels of the Colombian demographic. These variables were entered into the models with the aim of perceiving differences in the self-perception of health, if they got about by bicycle, compared to the other means of transport that did not involve physical effort, but given the specific conditions of a developing country, the fact that a person owns any of these items means that they have the necessary income required to acquire and maintain this kind of vehicle.

Both women and men that were affiliated to a healthcare system perceived their health positively. In the data from the 2005 demographic surveys, this relationship is only found in women[13], whilst a study carried out with a sample group of inhabitants of the city of Bogotá in 2014, which was adjusted by demographic variables of inequality and education, also did not find this connection[7].

Upon analysing the relationship between BMI and the self-perception of health, no association was found in either of the sexes, whilst a study carried out using data from different countries did find this relationship and describes a U-shaped behaviour[22].

In terms of civil status, the results found, particularly among the group of women, were contradictory compared to those found previously in some studies[23,24], as being married is a favourable condition for self-perceiving health as good in countries such as Sweden and Spain. For Colombian women in 2010, being married was a risk factor (OR = 1.16; CI95% 1.00-1.35) for assessing their health as average or poor, whilst no association at all was discovered for men. On the other hand, these results are similar to those found by Onadja, in Ouagadougou, the capital

Table 1. Characteristics of the study demographic of the variables selected from the ENSIN and DHS 2010.

Variables	Women N = 8.224 (56,85%)	Men N = 6.241 (43,15%)	p
Age group			
18 – 29	2679 (32.6%)	2149 (34.4%)	0.019
30 – 49	3741 (45.5%)	2790 (44.7%)	0.356
50 – 64	1804 (21.9%)	1302 (20.9%)	0.124
State of health			
Excellent	604 (7.3%)	755 (12.1%)	<0.001
Very good	709 (8.6%)	713 (11.4%)	<0.001
Good	4333 (52.7%)	3345 (53.6%)	0.284
Average	2403 (29.2%)	1346 (21.6%)	<0.001
Poor	175 (2.1%)	82 (1.3%)	<0.001
Physical activity			
Low	7702 (93.7%)	5477 (87.8%)	<0.001
Moderate	390 (4.7%)	434 (7.0%)	<0.001
Vigorous	132 (1.6%)	330 (5.3%)	<0.001
Level of Schooling			
None/Not known	272 (3.3%)	223 (3.6%)	0.409
Pre/Primary	2223 (27.0%)	1671 (26.8%)	0.745
Secondary	3734 (45.4%)	2957 (47.4%)	0.019
Tech./University	1995 (24.3%)	2390 (22.3%)	<0.001
Affiliated to a healthcare system			
Yes	7354 (89.4%)	5272(84.5%)	<0.001
No/Not known	870 (10.6%)	969 (15.5%)	<0.001
BMI classification	n = 7864	n = 5676	
Thinness	261 (3.3%)	146 (2.6%)	0.013
Normal	3164 (40.2%)	2615 (46.1%)	<0.001
Excess weight	2759 (35.1%)	2091 (36.8%)	0.037
Obesity	1680 (21.4%)	824 (14.5%)	<0.001
Abdominal obesity	n = 7614	n = 5608	
Abdominal obesity	2902 (38.1%)	3080 (54.9%)	<0.001
High risk of CD [+]	1875 (24.6%)	1722 (30.7%)	<0.001
Very high risk of CD [+]	2837 (37.3%)	806 (14.4%)	<0.001
Owns a motorbike	n = 8224	n = 6241	
Yes	2168 (26.4%)	1887 (30.2%)	<0.001
No	6056 (73.6%)	4354 (69.8%)	<0.001
Owns a car	n = 8224	n = 6241	
Yes	1000 (12.2%)	808 (12.9%)	0.163
No	7224 (87.8%)	5433 (87.1%)	0.163
Owns a bicycle	n = 8224	n = 6241	
Yes	3090 (37.6%)	2535 (40.6%)	<0.001
No	5134 (62.4%)	3706 (59.4%)	<0.001
Socio-economic level	n = 8224	n = 6241	
From 0 to 3	7842 (95.4%)	6003 (96.2%)	0.016
From 4 to 6	382 (4.6%)	238 (3.8%)	0.016
Civil status	n = 8224	n = 6241	
Married/Free union	4620 (56.2%)	3811 (61.1%)	<0.001
Separated/Widowed	1758 (21.4%)	570 (9.1%)	<0.001
Single (a)/Not known	1846 (22.4%)	1860 (29.8%)	<0.001
Area			
Municipal capital	8224 (100%)	6241 (100%)	<0.001
Rest (town)			
Rest (disperse)			
Regions			
Atlantic	1770 (21.5%)	1408 (22.6%)	0.140
East	1217 (14.8%)	893 (14.3%)	0.422
Central	2328 (28.3%)	1649 (26.4%)	0.012
Pacific	1172 (14.3%)	843 (13.5%)	0.209
Bogotá	754 (9.2%)	541 (8.7%)	0.310
National territories	983 (12%)	907 (14.5%)	<0.001

[+]CD: coronary disease.

Table 2. Odds ratio (OR) and its confidence interval at 95% for average and poor self-perception of health status regarding all the characteristics considered for this study on women, ENSIN 2010 and DHS 2010.

Variables	n (%)	OR (IC 95%)	
		Raw	Adjusted*
Age group			
18 – 29	520 (19.4%)	1	1
30 – 49	1242 (33.2%)	2.06 (1.83 – 2.32)	1.68 (1.46 – 1.92)
50 – 64	816 (45.2%)	3.42 (3.00 – 3.91)	2.32 (1.96 – 2.74)
Physical activity			
Low	2453 (31.8%)	1.48 (1.20 – 1.82)	1.30 (1.03 – 1.62)
Moderate to vigorous	125 (23.9%)	1	1
Level of schooling			
None/Not known	138 (50.7%)	5.47 (4.19 – 7.14)	2.77 (2.06 – 3.72)
Pre/Primary	1036 (46.6%)	4.63 (4.00 – 5.36)	2.70 (2.29 – 3.19)
Secondary	1088 (29.1%)	2.18 (1.90 – 2.51)	1.70 (1.46 – 1.98)
Tech./University	316 (15.8%)	1	1
BMI classification			
Thinness	79 (30.3%)	0.65 (0.49 – 0.86)	1.28 (0.89 – 1.82)
Normal	827 (26.1%)	0.53 (0.46 – 0.60)	0.91 (0.74 – 1.13)
Excess weight	887 (32.1%)	0.71 (0.62 – 0.80)	0.88 (0.76 - 1.03)
Obesity	672 (40.0%)	1	1
Abdominal obesity			
Abdominal obesity	715 (24.6%)	1	1
High risk of CD [++]	563 (30.0%)	1.31 (1.15 – 1.49)	1.02 (0.87 – 1.21)
Very high risk of CD [++]	1099 (38.7%)	1.93 (1.72 – 2.16)	1.19 (0.97 – 1.46)
Owns a motorbike			
Yes	594 (27.4%)	1	1
No	1984 (32.8%)	1.29 (1.15 – 1.43)	1.20 (1.06 – 1.36)
Owns a car			
Yes	198 (19.8%)	1	1
No	2380 (32.9%)	1.99 (1.69 – 2.34)	1.46 (1.21 – 1.76)
Owns a bicycle			
Yes	851 (27.5%)	1	1
No	1727 (33.6%)	1.33 (1.20 – 1.47)	1.21 (1.08 – 1.34)
Socio-economic level			
From 0 to 3	2520 (32.1%)	2.64 (1.99 – 3.51)	1.98 (1.42 – 2.77)
From 4 to 6	58 (15.2%)	1	1
Civil status			
Married/Free union	1524 (33.0%)	1.78 (1.57 – 2.02)	1.16 (1.00 – 1.35)
Separated/Widowed	655 (37.3%)	2.15 (1.85 – 2.49)	1.07 (0.90 – 1.28)
Single (a)/Not known	399 (21.6)	1	1
Affiliated to a healthcare system			
Yes	2297 (31.2%)	1	
No/Not known	281 (32.3%)	1.05 (0.90 – 1.22)	1.22 (1.03 – 1.44)
Regions			
Atlantic	581 (32.8%)	1.01 (0.85 – 1.19)	0.96 (0.80 – 1.15)
East	358 (29.4%)	0.86 (0.72 – 1.03)	0.81 (0.66 – 0.99)
Central	738 (31.7%)	0.96 (0.82 – 1.12)	0.90 (0.76 – 1.08)
Pacific	406 (34.6%)	1.09 (0.91 – 1.31)	1.07 (0.88 – 1.31)
Bogotá	175 (23.2%)	0.62 (0.50 – 0.77)	0.67 (0.53 – 0.85)
National territories	320 (32.6%)	1	1

*The logistics regression model is adjusted by the variables of age group, physical activity, level of schooling, affiliation to a healthcare system, area, regions, body mass index (BMI) classification, abdominal obesity, owning a motorbike, car or bicycle, socio-economic level and civil status.
[++]CD: Coronary disease.

of Burkina Faso[18], whereby being single did not reveal any connection, with adjustment of the other variables (OR = 0.87; CI95% 0.62-1.21).

Some limitations of this study are related to the use of self-declared information from the study subjects, such as, for example, the self-perception of health, which can lead to bias[24]. However, strong links have been mentioned between this indicator and the prediction of mortality, level of education, age and physical activity, among others[8,14-18]. Despite some of these links not appearing in the male study group, the

Table 3. Odds ratio (OR) and its confidence interval at 95% for average and poor self-perception of health status regarding all the characteristics considered for this study on men, ENSIN 2010 and DHS 2010.

Variables	n (%)	OR (IC 95%)	
		Raw	Adjusted*
Age group			
18 – 29	318 (14.8%)	1	1
30 – 49	638 (22.9%)	1.70 (1.47 – 1.98)	1.61 (1.34 – 1.95)
50 – 64	472 (36.3%)	3.27 (2.77 – 3.85)	2.83 (2.27 – 3.52)
Physical activity			
Low	1281 (23.4%)	1.28 (1.05 – 1.55)	1.04 (0.85 – 1.29)
Moderate to vigorous	147 (19.2%)	1	1
Level of schooling			
None/Not known	87 (39.0%)	4.35 (3.18 – 5.94)	2.34 (1.64 – 3.33)
Pre/Primary	551 (33.0%)	3.35 (2.77 – 4.04)	2.08 (1.68 – 2.58)
Secondary	612 (20.7%)	1.77 (1.48 – 2.12)	1.43 (1.17 – 1.74)
Tech./University	178 (12.8%)	1	1
BMI classification			
Thinness	24 (16.4%)	0.63 (0.39 – 1.01)	0.95 (0.54 – 1.65)
Normal	565 (21.6%)	0.88 (0.73 – 1.07)	1.08 (0.78 – 1.50)
Excess weight	492 (23.5%)	0.99 (0.82 – 1.20)	1.09 (0.84 – 1.43)
Obesity	195 (23.7%)	1	1
Abdominal obesity			
Abdominal obesity	630 (20.5%)	1	1
High risk of CD[++]	409 (23.8%)	1.21 (1.05 – 1.39)	1.00 (0.81 – 1.23)
Very high risk of CD[++]	213 (26.4%)	1.39 (1.16 – 1.67)	1.20 (0.87 – 1.65)
Owns a motorbike			
Yes	354 (18.8%)	1	1
No	1074 (24.7%)	1.41 (1.23 – 1.62)	1.40 (1.20 – 1.63)
Owns a car			
Yes	127 (15.7%)	1	1
No	1301 (23.9%)	1.68 (1.38 – 2.06)	1.40 (1.11 – 1.78)
Owns a bicycle			
Yes	522 (20.6%)	1	1
No	906 (24.4%)	1.24 (1.10 – 1.41)	1.23 (1.07 – 1.40)
Socio-economic level			
From 0 to 3	1403 (23.4%)	2.59 (1.71 – 3.95)	2.16 (1.31 – 3.55)
From 4 to 6	25 (10.5%)	1	1
Civil status			
Married/Free union	961 (25.2%)	1.59 (1.38 – 1.83)	1.03 (0.86 – 1.24)
Separated/Widowed	143 (25.1%)	1.58 (1.26 – 1.98)	0.85 (0.65 – 1.11)
Single (a)/Not known	324 (17.4%)	1	1
Affiliated to a healthcare system			
Yes	1192 (22.6%)	1	1
No/Not known	236 (24.4%)	1.10 (0.93 – 1.29)	1.22 (1.02 – 1.46)
Regions			
Atlantic	345 (24.5%)	0.84 (0.69 – 1.01)	0.77 (0.62 – 0.96)
East	213 (23.9%)	0.81 (0.66 – 1.00)	0.81 (0.64 – 1.03)
Central	350 (21.2%)	0.70 (0.58 – 0.84)	0.63 (0.51 – 0.78)
Pacific	179 (21.2%)	0.70 (0.56 – 0.87)	0.76 (0.60 – 0.98)
Bogotá	89 (16.5%)	0.51 (0.39 – 0.67)	0.55 (0.41 – 0.75)
National territories	252 (27.8)	1	1

*The logistics regression model is adjusted by the variables of age group, physical activity, level of schooling, affiliation to a healthcare system, area, regions, body mass index (BMI) classification, abdominal obesity, owning a motorbike, car or bicycle, socio-economic level and civil status.
[++]CD: Coronary disease.

results allow us to understand the phenomena that are inherent to the Colombian population and that should be taken into considerations when implementing policies, plans and programmes related to the promotion of healthy lifestyles.

Conclusions

In accordance with the information from the 2010 Colombian national demographic and health surveys, among women physical

Figure 1. Graphic comparison of the degree of association of some variables with an average and poor self-perception of health in women (A) and in men (B).
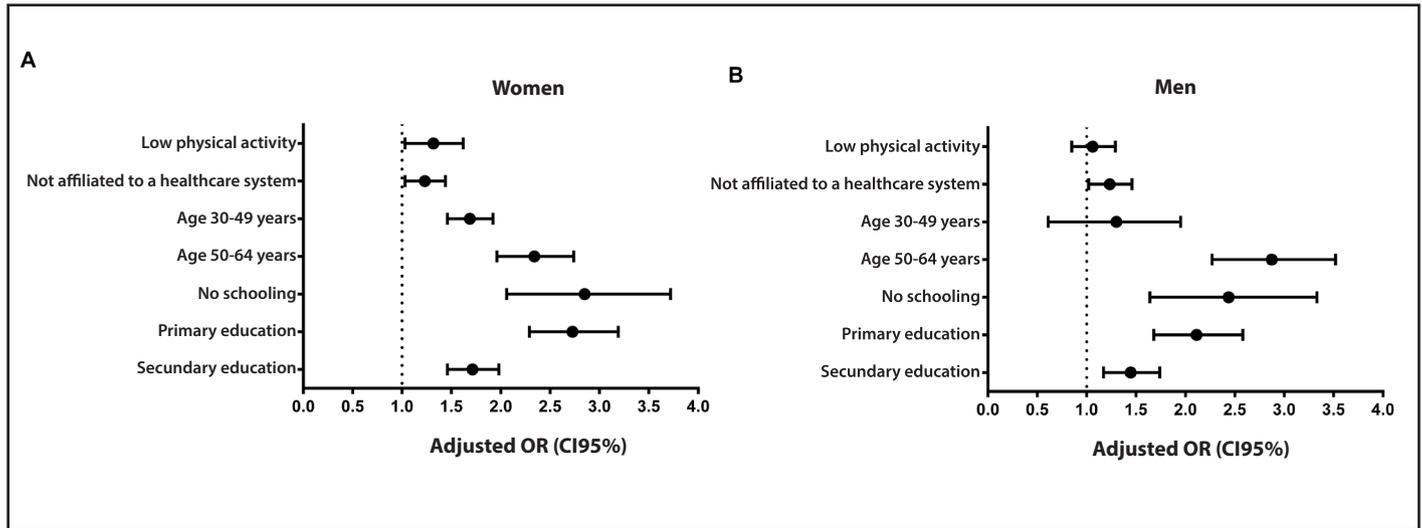
inactivity is linked to an average and poor self-perception of health after adjustment for confounding factors. Age, the level of schooling, affiliation to a healthcare system, civil status, living in the eastern region and in Bogotá also influenced the self-perception of health among women. In contrast, among men there was no indication that physical inactivity is linked to an average or poor self-perception of health, but a link was found with age and low levels of schooling. From the aforementioned, it can be observed that the factors associated with the self-perception of health can be different between men and women, therefore health interventions aimed at improving this indicator should be different and specific.

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