

Table 2. Cont.

Unemployment in municipality						
Low	1			1		
Medium	1.11	(0.99-1.26)	NS	1.16	(1.03-1.30)	0.02
High	1.08	(0.96-1.22)		1.17	(1.04-1.32)	
Illiteracy in municipality						
Low	1			1		
Medium	1.27	(1.12-1.43)	*	1.26	(1.12-1.42)	*
High	1.33	(1.18-1.51)		1.18	(1.04-1.33)	

NS: Not significant (>0.05); ** p < 0.05; *: P < 0.001.

Table 3 shows three multivariate models based on the three major groups of characteristics: individual, and physical and social environment. In the first group of variables (model 1), educational level and social class have been used as indicators of social status. Employment status, the presence of children under the age of 15 and all health variables continue to be significant influencing factors on rates of sedentariness in men. In women, in addition to marital status, having children is not linked to sedentariness. Thus, for both sexes, poor health and smoking are both linked to a higher probability of sedentariness, as well as working and not having academic qualifications. The latter variable is particularly important in the case of women (OR = 2.71; 95% CI = 2.07, 3.55).

Table 3. Multivariate Analysis. Odds ratio for sedentariness and variables related to characteristics of individuals and their physical.

Model 1.Characteristics of Individuals	OR	Men			Women		
		95% CI	P	OR	95% CI	P	
Educational Level							
Graduate	1			1			
Secondary	1.16	(0.95-1.42)		1.25	(1.02-1.53)		
Primary	1.83	(1.51-2.21)		1.50	(1.23-1.84)		
No studies	2.46	(1.90-3.17)	*	2.71	(2.07-3.55)	*	
Occupational Class							
Class I (highest)							
Class II	1.04	(0.86-1.25)	NS	1.03	(0.86-1.25)	0.01	
Class III	1.17	(0.98-1.39)		1.25	(1.05-1.48)		
Class IV (lowest)	1.17	(0.91-1.50)		1.32	(1.03-1.68)		
Employment status							
Student	1			1			
Employed	1.82	(1.43-2.30)	*	1.50	(1.18-1.89)	0.01	
Unemployed	1.45	(1.11-1.90)		1.18	(0.91-1.53)		
Retired / disabled	1.11	(0.80-1.53)		1.27	(0.87-1.84)		
Homemaker				1.33	(1.01-1.75)		
Children ≤ 15 years							
No	1			1			
Yes	1.16	(0.99-1.36)	NS	1.10	(0.94-1.29)	NS	

Table 3. Cont.

Marital status						
Single	1			1		
Married / couple	1.16	(0.97-1.40)	NS	0.91	(0.74-1.11)	NS
Separated, divorced, widowed	1.19	(0.88-1.62)		0.87	(0.65-1.16)	
Obesity						
No (<30)	1			1		
Yes (≥30)	1.54	(1.31-1.80)	*	1.19	(1.00-1.41)	NS
Smoking status						
Non-smoker	1			1		
Smoker	1.75	(1.54-1.99)	*	1.19	(1.04-1.36)	0.03
Ex-smoker	1.01	(0.85-1.18)		0.96	(0.76-1.20)	
Self-rated Health						
Good	1			1		
Less than good	1.54	(1.32-1.79)	*	1.36	(1.18-1.57)	*
Model 2. Characteristics of the Physical Environment						
In your neighbourhood there are: sufficient green spaces						
A lot or some	1			1		
None	1.37	(1.24-1.52)	*	1.19	(1.08-1.32)	*
Bad smells come into your house from outside						
None	1			1		
A lot or some	1.09	(0.93-1.27)	NS	1.09	(0.95-1.26)	NS
The air is highly polluted in your neighbourhood						
None	1			1		
A lot or some	0.86	(0.72-1.03)	NS	0.80	(0.68-0.94)	0.01
Your neighbourhood is affected by an industry						
None	1			1		
A lot or some	0.94	(0.76-1.17)	NS	1.11	(0.90-1.36)	NS
Noise from outdoors annoys you						
None	1			1		
A lot or some	1.02	(0.90-1.14)	NS	1.05	(0.93-1.17)	NS
Quality of your neighbourhood environment						
Good	1			1		
Bad	0.94	(0.82-1.08)	NS	1.04	(0.91-1.18)	NS
Model 3. Characteristics of the Social Environment						
Size of municipality						
<10,000	1			1		
10,000-100,000	0.93	(0.81-1.08)	NS	1.03	(0.90-1.19)	NS
>100,000	0.85	(0.72-1.02)		1.03	(0.87-1.23)	
Economic level of municipality						
Low	1			1		
Medium	1.22	(1.00-1.49)	NS	1.12	(0.92-1.36)	NS
High	1.11	(0.97-1.27)		1.10	(0.96-1.26)	

Table 3. Cont.

Unemployment in municipality						
Low	1			1		
Medium	1.29	(1.12-1.49)	*	1.18	(1.02-1.36)	NS
High	1.02	(0.88-1.18)		1.11	(0.96-1.28)	
Illiteracy in municipality						
Low	1			1		
Medium	1.35	(1.19-1.54)	*	1.29	(1.13-1.46)	*
High	1.39	(1.21-1.59)		1.22	(1.07-1.40)	

NS: Not significant (>0.05); ** p < 0.05; *: P < 0.001.

In the physical environment dataset (model 2), the presence of green spaces is of note. Men who perceive that there are no green spaces in their neighbourhood are 37% more likely to be sedentary than those who perceive the opposite. In the case of women, this probability stands at 19% (OR = 1.37; 95% CI = 1.24, 1.52 and OR = 1.19; 95% CI = 1.08, 1.32 respectively).

With regard to the social environment (model 3), the illiteracy and unemployment rates of a municipality have a negative effect on the rates of physical activity for both sexes, and higher rates of sedentariness are observed in municipalities with medium and high levels of illiteracy and unemployment. This is the same case for municipalities with a low economic level, although it is not statistically significant.

After analysing the different groups of variables separately, and in order to further the analysis, a final multi-variate model was drawn up (Table 4), which incorporates the characteristics of the individuals as well as those of their physical and social environment. All of these variables were significant in the earlier analyses because of their links with sedentariness. By entering these variables into this final model it is apparent that the same trends and similar values continue to exist. This serves to prove the importance of using frameworks which take into account a number of factors which can influence the behaviour of individuals. The most important factors which influence sedentariness are the educational level and social status of individuals (especially in the case of women), the presence of green spaces, and the socio-economic level of the municipality in which they live. The results show evidence of disparities and demonstrate the major influence of the living environment on the behaviour of individuals.

Table 4. Multivariate model. Factors influencing sedentariness in the adult population, age-adjusted.

	Men			Women		
	OR	95% CI	P	OR	95% CI	P
Educational Level						
University	1			1		
Secondary	1.19	(0.97-1.46)	*	1.24	(1.01-1.53)	*
Primary	1.88	(1.55-2.28)		1.48	(1.21-1.81)	
No studies	2.47	(1.91-3.21)		2.68	(2.04-3.52)	

Table 4. Cont.

Occupational Class						
Class I (highest)	1			1		
Class II	1.05	(0.86-1.26)	NS	1.05	(0.87-1.27)	0.01
Class III	1.20	(1.00-1.43)		1.26	(1.06-1.49)	
Class IV (lowest)	1.19	(0.92-1.53)		1.39	(1.09-1.78)	
Employment status						
Student	1			1		
Employed	1.93	(1.52-2.45)	*	1.47	(1.17-1.85)	0.02
Unemployed	1.52	(1.15-2.00)		1.19	(0.92-1.54)	
Retired / disabled	1.10	(0.79-1.53)		1.31	(0.90-1.91)	
Homemaker				1.31	(1.01-1.70)	
Children <15 years						
No	1			1		
Yes	1.23	(1.07-1.42)	*	1.05	(0.91-1.21)	NS
Obesity						
No (<30)	1			1		
Yes (≥30)	1.52	(1.30-1.79)	*	1.18	(0.99-1.40)	NS
Smoking status						
Non-smoker	1			1		
Smoker	1.77	(1.55-2.01)	*	1.19	(1.04-1.37)	0.02
Ex-smoker	1.02	(0.87-1.21)		0.94	(0.75-1.19)	
Self-rated Health						
Good	1			1		
Less than good	1.55	(1.33-1.81)	*	1.36	(1.17-1.58)	*
In your neighbourhood there are sufficient green spaces						
A lot or some	1			1		
None	1.26	(1.13-1.41)	*	1.26	(1.13-1.41)	*
Unemployment in municipality						
Low	1			1		
Medium	1.01	(0.88-1.16)	NS	0.99	(0.86-1.14)	NS
High	0.86	(0.74-0.99)		0.88	(0.76-1.02)	
Illiteracy in municipality						
Low	1			1		
Medium	1.42	(1.23-1.64)	*	1.25	(1.08-1.45)	0.01
High	1.45	(1.25-1.69)		1.13	(0.97-1.31)	

NS: Not significant (>0.05); ** p < 0.05; *: P < 0.001.

4. Discussion

Research into rates of physical activity has traditionally been focused on individual factors, and this is partly because of the difficulties involved in examining social and structural influences. Over recent years, studies have been carried out which examine the influence of environmental factors on the engagement of individuals in physical activity [27]. This study provides data regarding Andalusia, a

large region in the south of Spain, and identifies the individual, social and physical environmental factors which have an influence on physical activity. The importance of this study lies in its emphasis on the role of the social and physical environment as a key factor influencing rates of physical activity, given that Andalusia is one of the regions with the lowest socio-economic levels in Spain and where the least physical activity is carried out [28,29].

We found that there were higher rates of sedentariness amongst women, smokers, obese people, and those who perceive their health as poor, and that age also has a negative effect on rates of physical activity. These results are consistent with those of other studies [10,30,31]. The most disadvantaged social classes and people with the lowest educational level are more sedentary. On the one hand, reduced economic resources may impose a limit on paying gym membership fees or playing sports during free time, and on the other hand, high levels of physical activity during the working day (in the case of labourers) may prevent these people from taking exercise in their free time [13]. Another explanation for the reduced level of exercise in these groups is that it is less likely that they understand and heed messages regarding the negative effects of sedentariness, as shown in studies on other health-related behaviours, such as smoking [32].

Furthermore, both men and women's perception of green spaces in their neighbourhood has an influence on rates of physical activity. With regard to physical activity, social class is still prevalent in the physical context, since people from higher social classes and with higher qualifications who consider that their neighbourhoods have many green spaces engage in more physical activities (data not shown).

Some studies reveal that the most disadvantaged groups have a more marked perception that their neighbourhoods are not attractive, have more traffic and are more stressful for physical activity [9]. Physical environmental factors such as perception of safety in a neighbourhood, its attractiveness, the presence of passable pavements, open public spaces, leisure centres and green spaces, have been found to have a major influence on rates of physical activity in other studies, after adjustment according to socio-demographical variables such as age, educational level, ethnic groups, *etc.* [15,16,33]. These studies suggest that action taken based on environmental innovations could favor more active lifestyles [17,19] and that in order to increase physical activity, it is necessary to consider the way in which space is used [5,34].

Services and activities organised in "informal spaces" (open spaces, green zones, *etc.*) should be considered important components of a neighbourhood's facilities that can help to promote physical activity. The reason for considering this paradigm is that neighbourhood and environmental actions can target a higher number of people at a potentially lower cost per person than actions which target individuals or groups, thus reaping a greater benefit for public health [6,33]. Furthermore, the available space could be multi-functional e.g., in the different life-stage of the population, the local needs, *etc.* Such actions are therefore necessary and we should study how to strengthen their appeal, security, accessibility and nearness. However, they are not sufficient in themselves to increase the recommended levels of physical activity in a neighbourhood. Healthy environments are directly related to the development of public policies and these policies should not be exclusive to the health sector [2,35].

In our study we incorporated the socio-economic, unemployment and illiteracy indicators of municipalities, and found that the most deprived municipalities have the highest levels of sedentariness. Individuals who live in depressed areas are more likely to be physically inactive than those who live in more advantaged areas [27]. This is partly due to a reduced social expenditure in programmes and services, and also to a series of processes that arise and trigger a vicious circle in the neighbourhood. This theory explains the positive link between the socio-economic level of a person's environment and his or her level of physical activity [36]. A recent study in Spain showed that, after adjustments had been made for socio-economic and other individual characteristics, the effect of the economic situation of a province no longer influences the rates of physical activity in men, although this is not so in the case of women [10].

The use of specific aspects of activity, such as activity type, where it takes place and how it is measured, may affect the distribution of disparities, as well as the environmental characteristics that play a part in the link between the socio-economic level of the area and rates of physical activity [34].

In this study we have used statistics based on the perception of participants with regard to physical activity and the existence of green spaces in the neighbourhood. The validity of such methods has been proved by other studies that have also used this type of measurement [17]. Furthermore, concepts such as "neighbourhood" and "green space" can be ambiguous, as they are constructs [37] which may be interpreted differently according to the social and cultural beliefs of individuals. As a result, qualitative studies could help us to gain a better understanding of factors that influence rates of physical activity [7].

Regarding the analysis, we have explored multilevel models too, for the multivariate final model (data not shown). The values of rho coefficient, which measures the percentage of total variability explained by the second level, were low for all the models. The percentage of variability explained by the aggregation level (municipalities) was less than 6% of the total variability in all cases. In addition, the changes in the OR were not important, and the significances found did not change, so our conclusions do not vary when considering the multilevel structure.

4. Conclusions

In conclusion, rates of physical activity in Spain are influenced by our social and physical environment. The influence of social class means that members of disadvantaged groups are less likely to engage in physical activity. Furthermore, women are less active than men. The presence of green spaces in neighbourhoods is an influencing factor. We need to improve our knowledge of the mechanisms which affect the most disadvantaged groups, incorporating a gender perspective in view of the lower rates of physical activity amongst women, and a physical and social environment perspective, so that actions and interventions to promote physical activity and healthy lifestyles that are carried out in any area do not result in the same disparities as before or create further disparities.

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