



Revista Internacional de Medicina y  
Ciencias de la Actividad Física y del  
Deporte / International Journal of  
Medicine and Science of Physical Activity  
and Sport

ISSN: 1577-0354

vicente.martinez@uam.es

Herazo-Beltran, Y.; Pinillos-Patiño, Y.; Vidarte-Claros, J.; Suarez-Palacio, D.; Crissien-Quiroz, E.

PERCEPCIÓN DEL AMBIENTE PARA CAMINAR SEGÚN LA LOCALIDAD EN  
BARRANQUILLA, COLOMBIA

Revista Internacional de Medicina y Ciencias de la Actividad Física y del Deporte /  
International Journal of Medicine and Science of Physical Activity and Sport, vol. 17, núm.  
65, marzo, 2017, pp. 153-167

Universidad Autónoma de Madrid  
Madrid, España

Available in: <http://www.redalyc.org/articulo.oa?id=54250121010>

- How to cite
- Complete issue
- More information about this article
- Journal's homepage in redalyc.org

redalyc.org

Scientific Information System  
Network of Scientific Journals from Latin America, the Caribbean, Spain and Portugal  
Non-profit academic project, developed under the open access initiative

Herazo Beltran, Y.; Pinillos Patiño, Y.; Vidarte Claros, J.; Suarez Palacio, D. y Crissien Quiroz, E. (2017). Percepción del ambiente para caminar según la localidad en Barranquilla, Colombia / Perception of the Environment for Walking According the Locality in Barranquilla, Colombia. Revista Internacional de Medicina y Ciencias de la Actividad Física y el Deporte vol. 17 (65) pp. 169-182. <http://cdeporte.rediris.es/revista/revista65/artlocalidad790.htm>  
DOI: <http://dx.doi.org/10.15366/rimcafd2017.65.011>

## ORIGINAL

### PERCEPTION OF THE ENVIRONMENT FOR WALKING IN RELATION TO THE LOCALITY\*, IN BARRANQUILLA, COLOMBIA

### PERCEPCIÓN DEL AMBIENTE PARA CAMINAR SEGÚN LA LOCALIDAD\* EN BARRANQUILLA, COLOMBIA

Herazo-Beltran, Y.<sup>1</sup>, Pinillos-Patiño, Y.<sup>2</sup>, Vidarte-Claros, J.<sup>3</sup>, Suarez-Palacio, D.<sup>4</sup>  
y Crissien-Quiroz, E.<sup>5</sup>

<sup>1</sup> Physiotherapist. MSc Public Health. Universidad Simón Bolívar. Barranquilla, Colombia.  
E-mail: [aherazo4@unisimonbolivar.edu.co](mailto:aherazo4@unisimonbolivar.edu.co)

<sup>2</sup> Physiotherapist. MSc Public Health. Universidad Simón Bolívar. Barranquilla, Colombia.  
E-mail: [ypinillos@unisimonbolivar.edu.co](mailto:ypinillos@unisimonbolivar.edu.co)

<sup>3</sup> Physical Educator. Doctor in Sciences of Physical Activity and Sport. Universidad Autónoma de Manizales, Colombia. E-mail: [jovida@autonoma.edu.co](mailto:jovida@autonoma.edu.co)

<sup>4</sup> Physiotherapist. MSc Public Health. Universidad Simón Bolívar. Barranquilla, Colombia.  
E-mail: [dsuarez3@unisimonbolivar.edu.co](mailto:dsuarez3@unisimonbolivar.edu.co)

<sup>5</sup> Physiotherapist. MSc Education. Universidad Simón Bolívar. Barranquilla, Colombia.  
E-mail: [ecrissien@unisimonbolivar.edu.co](mailto:ecrissien@unisimonbolivar.edu.co)

**Spanish-English translator:** Steve Galache [stevegalache@gmail.com](mailto:stevegalache@gmail.com)

**CÓDIGO UNESCO:** 3212 Salud Pública / Public Health

**Clasificación del Consejo de Europa:** 17 Otras (Actividad física y salud) / Other  
(Physical Activity and Health)

**Recibido** 28 de mayo de 2014 **Received** May 28, 2014

**Aceptado** 30 de agosto de 2014 **Accepted** August 30, 2014

---

\* The locality, according to the Planning Department of the Atlantic Department, Colombia, is assumed as the basic geostatistical areas administratively and politically dividing the city of Barranquilla. For other cities it is synonymous with District.

## ABSTRACT

The objective was to estimate the perception of the neighborhood environment for walking according to the location in the city. A cross-sectional descriptive study was performed in 2103 people aged 15 to 69 years of age. We applied the International Physical Activity Questionnaire (IPAQ) and the Environment Module of the International Physical Activity Study. We estimated the association between perceived attributes of the neighborhood and the locality where the person lives. The residents of the South of the city have a higher risk of perceiving a few supermarkets within walking distance of their homes [OR 1,29 (95% CI 1,10-1,65)], presence of sidewalks in bad condition [OR 1,44 (95% CI 1,10-1,90)], few people physically active [OR 4,13 (95% CI 2,50-6,82)], danger to stroll during the day [OR 3,07 (95% CI 1,96-4,80)] and few interesting things in the neighborhood [OR 3,21 (95% CI 2,05-5,02)].

**KEYWORDS:** Motor activity, environmental and public health, social perception

## RESUMEN

El objetivo fue estimar la percepción del ambiente del barrio para caminar según la localidad de la ciudad. Se realizó un estudio descriptivo transversal en 2103 personas entre 15 y 69 años de edad. Se aplicó el Cuestionario Internacional de Actividad Física (IPAQ), y el Módulo Ambiente del International Physical Activity Study. Se estimó la asociación entre la percepción de los atributos del barrio y la localidad donde reside la persona. Los residentes del sur de la ciudad tienen mayor riesgo de percibir pocos supermercados a poca distancia de sus casas [OR 1,29(IC 95% 1,10-1,65)], aceras en mal estado [OR 1,44(IC 95% 1,10-1,90)], pocas personas físicamente activas [OR 4,13(IC 95% 2,50-6,82)], peligro para pasear durante el día[OR 3,07(IC 95% 1,96-4,80)], y pocas cosas interesantes en el vecindario [OR 3,21(IC 95% 2,05-5,02)].

**PALABRAS CLAVE:** actividad motora, salud pública y ambiente, percepción social.

## INTRODUCTION

Physical inactivity is considered the fourth risk factor in global mortality, with implications for the prevalence of non-communicable chronic diseases<sup>(1)</sup>. Lower levels of physical activity promote increased obesity, cardiovascular disease, and metabolic syndrome, among others, becoming a public health problem<sup>(2)</sup>.

By contrast, the practice of regular physical activity provides important benefits to people's health<sup>(3,4)</sup>. It can be categorized in several ways, depending on the type, intensity, purpose and context in which it occurs. There are several ways to implement physical activity, the SLOTH model [acronym of sleep, leisure-time, occupation, transportation, and home-based activities] explains the domains of physical activity, sleep, free time, work, transportation and household activities, and according to Pratt, each domain is influenced by individual, environmental, physical, and social determinants<sup>(5)</sup>.

Despite the scientific evidence around this key health behavior, the prevalence of physical activity worldwide is of only 31.1%, while the frequency in the Americas is of 43.3%<sup>(6)</sup>. In various studies carried out in several cities in Colombia, the frequency of physical inactivity in adults ranges between 42.6% and 67.7%<sup>(7,8)</sup>, values that coincide with other cities in Latin America<sup>(9)</sup>.

Understanding the determinants of physical activity is important because interventions must be programmed according to the factors associated with physical inactivity. Rapid urbanization, access to natural environments, urban design, green spaces, transport and patterns of use of land, are environmental factors affecting the levels of physical activity of the population<sup>(9)</sup>.

The ecological model allows a broad view of physical activity, by interconnecting multiple levels of individual determinants with the social and physical environment that surrounds the person<sup>(10-12)</sup>. Identifying the determinants at multiple levels such as intrapersonal, sociocultural and physical and social environment, is imperative because it allows establishing combined interventions that include the interaction of the various factors<sup>(13, 14)</sup>.

Other authors have reported that the characteristics of the physical environment that are most often involved for people to be physically active are the availability and accesibility to the recreational facilities, presence of sidewalks, safe streets, good street lighting, aesthetics and good urban design<sup>(15,16)</sup>, especially with walking, a common and accessible form of physical activity. In this sense, the types of physical activity like walking, recreation, transportation and labor, have been regarded as a form of active transport<sup>(6)</sup>and closely linked with everyday life<sup>(8)</sup>.

In this line of thought, physical activity is a healthy lifestyle, which according to Alvarez<sup>(17)</sup> is conditioned by the opportunities of life that provides the context in which individuals develop. Therefore, socioeconomic status (SES) is considered as an important determinant so that people and populations are active, individuals living in neighborhoods with low socioeconomic status are at greater risk of physical inactivity during leisure time, as opposed to individuals who live in higher income neighborhoods<sup>(18,19)</sup>, a fact that makes it necessary to carry out public

health strategies to increase health and reduce social inequities through action on particular locations and scenarios particular to the cultural and social heritage <sup>(20)</sup>. Low SES neighborhoods are associated with reduced levels of physical activity and lower support networks and social commitment based on the neighborhood <sup>(21)</sup>.

The study of the perception of the environment for walking among populations has become a priority for researchers, because physical activity occurs in specific environments, and environments people build and inhabit can become an opportunity or a barrier to participate in a physically active lifestyle<sup>(22)</sup>. Based on the above stated, the objective of this study is to estimate the perception of the neighborhood environment for walking and cycling in relation to the locality in the city.

## **MATERIAL AND METHODS**

A cross-sectional population-based descriptive study was conducted to establish the perception of the environment for walking and biking in the five localities of the city. The town, according to the Department of Planning of the Atlantic, is defined as the basic geo-statistical areas that divide Barranquilla administratively and politically, a city in the north of Colombia. The town is seen as a territory, which is defined as geographical areas where individuals shape their habits and customs <sup>(17)</sup>.

2103 people between 18 and 69 years old participated in the study, a sample that was defined based on a reference population comprised of 827 947 subjects between the ages mentioned; the simple random sampling was probabilistic, proportional to the number of men and women representing each locality. The sampling process was multistage. The five locations were chosen as primary sampling units; neighborhoods as second stage units; streets as third-stage units; and housing as fourth stage units. The unit of analysis for a man or woman between 15 and 69 years old was considered for each chosen home.

The Bioethics Committee of Research at the Universidad Simón Bolívar (Colombia) approved the study, and those who participated in the study did so from acceptance through the processing of the informed consent; a survey was applied that inquired about the variables in gender, age, educational level, socioeconomic status and marital status. Physical activity was self-reported using the International Physical Activity Questionnaire (IPAQ) <sup>(24)</sup> an instrument that measures the overall physical activity done by one person. It was considered to be an active person when they performed at least 150 minutes a week of moderate intensity or 75 minutes a week of vigorous intensity.

Similarly, perceptions of neighborhood characteristics were measured using the Module Environment International Physical Activity Study (IPAS) <sup>(25)</sup>. This scale assesses the environmental factors for walking and cycling in the neighborhood; answers to the 15 questions of the module are based on the type of Likert scale of 4 points, strongly Disagree, Disagree, Agree and totally Agree. It also questions the residential density with the question about the main type of housing in the neighborhood.

For data analysis SPSS version 18.0 (License No. 10138194) was used for categorical variables which are presented as absolute and relative frequencies, continuous variables on measures of central tendency such as the mean and standard deviation. Perceived neighborhood characteristics by locality was performed using the chi2 test. The association between perceived attributes of the neighborhood and the city where the person resides by a logistic regression analysis was estimated. The Odds Ratio (OR) estimates were adjusted for sex, age, socioeconomic status, marital status and educational level.

## RESULTS

Table 1 shows the main results of the sociodemographic characteristics of the study subjects; it is observed that the number of women and men are similar in the five localities, the average age for women was  $35.3 \pm 13.6$  years and  $37.7$  in men  $\pm 14.7$  years.

Higher educational levels are observed in Riomar and Historical North, areas inhabited by more people from higher socioeconomic strata; it was observed that 78% of the inhabitants of Riomar and 54.7% of Historical North belong to strata 4,5 and 6; compared with 58.5%, 53.9% and 51.5% of subjects who inhabit the southwest, southeast and metropolitan locations, respectively, which belong to stratum 1. In relation to the physical activity levels of Table 1 it shows higher levels of physical inactivity in people of the southwestern town.

**Table 1.** Sociodemographic characteristics of adult participants in the study

	Riomar Locality	Historic north Locality	Southwest Locality	Southeast Locality	Metropolitan Locality
	N (%)	N (%)	N (%)	N (%)	N (%)
<b>Gender</b>					
Female	66 (52,0%)	211 (51,5%)	342 (50,5%)	242 (47,5%)	206 (54,4%)
Male	61 (48,0%)	199 (48,5%)	335 (49,5%)	268 (52,5%)	173 (45,6%)
<b>Educational level</b>					
None or incomplete elementary	2 (1,6%)	4 (1,0%)	74 (10,9%)	58 (11,4%)	33 (8,7%)
Elementary	7 (5,5%)	33 (8,0%)	106 (15,7%)	67 (13,1%)	69 (18,2%)
Secondary	40 (31,5%)	115 (28%)	327 (48,3%)	272 (53,3%)	202 (53,3%)
Higher education	64 (50,4)	240 (58,5%)	160 (23,6%)	111 (21,8%)	71 (18,7%)
Postgraduates	14 (11%)	18 (4,4%)	10 (1,5%)	2 (0,4%)	4 (1,1%)
<b>Civil Status</b>					
Single	64 (50,4%)	208 (50,7%)	279 (41,2%)	234 (45,9%)	170 (44,9%)
Married	27 (21,3%)	103 (25,1%)	113 (16,7%)	66 (12,9%)	101 (26,6%)
Free Union	26 (20,5%)	64 (15,6%)	227 (33,5%)	173 (33,9%)	80 (21,1%)
Separated/Divorced	10 (7,9%)	27 (6,6%)	33 (4,9%)	21 (4,1%)	28 (7,4%)
Widower	0 (0,0)	8 (2,0%)	25 (3,7%)	16 (3,1%)	0 (0,0%)
<b>Socioeconomic Strata</b>					
Strata 1	1 (0,8%)	12 (2,9%)	396 (58,5%)	275 (53,9%)	195 (51,5%)
Strata 2	7 (5,5%)	32 (7,8%)	98 (14,5%)	144 (28,2%)	121 (31,9%)
Strata 3	20 (15,7%)	142 (34,6%)	74 (10,9%)	85 (16,7%)	62 (16,4%)
Strata 4	31 (24,4%)	175 (42,7%)	87 (12,9%)	5 (1,0%)	1 (0,3%)
Strata 5	18 (14,2%)	45 (11,0%)	22 (3,2%)	1 (0,2%)	0 (0,0%)
Strata 6	50 (39,4%)	4 (1,0%)	0 (0,0%)	0 (0,0%)	0 (0,0%)
<b>Levels of physical activity</b>					
Inactive	43 (33,9%)	121 (29,5%)	367 (54,2%)	168 (32,9%)	126 (33,2%)
Active	84 (66,1%)	289 (70,5%)	310 (45,8%)	342 (67,1%)	253 (66,8%)
<b>Total</b>	127 (100%)	410 (100%)	677 (100%)	510 (100%)	379 (100%)

Table 2 shows the significant differences between locations in relation to the perception of the neighborhood environment for walking and biking; a greater number of people (78.7%) perceive shops within walking distance of their home in the town of Riomar, compared with 59% of the southeastern town and 65% of the southwest. Regarding the perception of good sidewalks, a greater number of residents of the southwestern city (56.4%) and southeast (61.2%) were in Disagree, while only 23% of people living in Riomar perceived that the sidewalks were in disrepair. It is noteworthy that 76.4 of the inhabitants of Riomar have many people active in the neighborhoods, contrasted with 48.6% of the residents of the southeastern city.

**Table 2.** Perceptions of neighborhood characteristics by location

	<b>Riomar Locality</b>	<b>Historic north Locality</b>	<b>Southwest Locality</b>	<b>Southeast Locality</b>	<b>Metropolit an Locality</b>	<b>P Value</b>
<b>Environment characteristics</b>	<b>N (%)</b>	<b>N (%)</b>	<b>N (%)</b>	<b>N (%)</b>	<b>N (%)</b>	
<b>Close-by shops</b>						
Disagree	27 (21,3)	116 (28,3)	237 (35)	209 (41)	110 (29)	0,000
Agree	100 (78,7)	294 (71,7)	440 (65)	301 (59)	269 (71)	
<b>Bus stop at 10-15 mins distance</b>						
Disagree	37 (29,1)	151 (36,8)	276 (40,8)	247 (48,4)	150 (39,6)	0,002
Agree	90 (70,9)	259 (63,2)	401 (59,2)	263 (51,6)	229 (60,4)	
<b>Sidewalks in good condition</b>						
Disagree	30 (23,6)	134 (32,7)	382 (56,4)	312 (61,2)	182 (48)	0,000
Agree	97 (76,4)	276 (67,3)	295 (43,6)	198 (38,8)	197 (52)	
<b>Presence of bikeways</b>						
Disagree	60 (47,2)	268 (65,4)	502 (74,2)	369 (72,4)	293 (77,3)	0,000
Agree	67 (52,8)	142 (34,6)	175 (25,8)	141 (27,6)	86 (22,7)	
<b>Recreational Facilities</b>						
Disagree	65 (51,2)	243 (59,3)	470 (69,4)	350 (68,6)	280 (73,9)	0,000
Agree	62 (48,8)	167 (40,7)	207 (30,6)	160 (31,4)	99 (26,1)	
<b>Heavy traffic for bicycling</b>						
Disagree	82 (64,6)	273 (66,6)	361 (53,3)	280 (54,9)	202 (53,3)	0,000
Agree	45 (35,4)	137 (33,4)	316 (46,7)	230 (45,1)	177 (46,7)	
<b>Heavy traffic for walking</b>						
Disagree	82 (64,6)	272 (66,3)	355 (52,4)	289 (56,7)	200 (52,8)	0,000
Agree	45 (35,4)	138 (33,7)	322 (47,6)	221 (43,3)	179 (47,2)	
<b>Nighttime insecurity</b>						
Disagree	81 (63,8)	282 (68,8)	436 (64,4)	366 (71,8)	275 (72,6)	0,017
Agree	46 (36,2)	128 (31,2)	241 (35,6)	144 (28,2)	104 (27,4)	
<b>Daytime insecurity</b>						



Disagree	59 (46,5)	248 (60,5)	390 (57,6)	359 (70,4)	229 (60,4)	0,000
Agree	68 (53,5)	162 (39,5)	287 (42,4)	151 (29,6)	150 (39,6)	
<b>Physically active people</b>						
Disagree	30 (23,6)	141 (34,4)	337 (49,8)	262 (51,4)	153 (40,4)	0,000
Agree	97 (76,4)	269 (65,6)	340 (50,2)	248 (48,6)	226 (59,6)	
<b>Neighborhood aesthetic</b>						
Disagree	49 (38,6)	200 (48,8)	435 (64,3)	352 (69)	272 (71,8)	0,000
Agree	78 (61,4)	210 (51,2)	242 (35,7)	158 (31)	107 (28,2)	
<b>Four way intersection</b>						
Disagree	71 (55,9)	203 (49,5)	239 (35,3)	201 (39,4)	139 (36,7)	0,000
Agree	56 (44,1)	207 (50,5)	438 (64,7)	309 (60,6)	240 (63,3)	
<b>Many places close to home</b>						
Disagree	32 (25,2)	154 (37,6)	326 (48,2)	261 (51,2)	193 (50,9)	0,000
Agree	95 (74,8)	256 (62,4)	351 (51,8)	249 (48,8)	186 (49,1)	

Odds ratios of the association between perceived neighborhood attributes to walking and the place where the person resides, are described in Tables 3 and 4. It was found that local people from Southeast perceive few shops, supermarkets or other places to buy things within walking distance of their homes [OR 1.29 (95% CI 1.10-1.65)], bus stop within 10 to 15 minutes [OR 1.39 (95% CI 1.10 -1.76)], presence of sidewalks in disrepair [OR 1.44 (95% CI 1.10 to 1.90)] and few people physically active, walking, jogging, or bicycling [OR 1.63 (95% CI 1.28 to 2.08)].

**Table 3.** Adjusted Odd Ratio if residing in Riomar and Southeast as a determinant factor of perceived neighborhood environment for physical activity

Environment Characteristics	OR*	IC 95%	P Value
<b>Close-by shops</b>	1,29	1,0-1,65	0,04
<b>Bus stop at 10-15 mins distance</b>	1,39	1,10-1,76	0,005
<b>Presence of sidewalks in good condition</b>	1,44	1,10-1,90	0,008
<b>Presence of bikeways</b>	0,60	0,48-0,72	0,000
<b>Recreational Facilities</b>	0,81	0,65-1,01	0,06
<b>Heavy traffic for bicycling</b>	1,17	0,94-1,46	0,15
<b>Nighttime insecurity</b>	0,90	0,71-1,13	0,36
<b>Daytime insecurity</b>	0,67	0,53-0,83	0,000
<b>Physically active people</b>	1,63	1,28-2,08	0,000
<b>Neighborhood aesthetic</b>	0,87	0,78-0,97	0,01
<b>Four-way intersections</b>	1,03	0,92-1,15	0,56
<b>Many places close to home</b>	1,03	0,92-1,14	0,57

\* Adjusted for gender, age, socioeconomic level, marital status and educational level

**Table 4.** Adjusted Odd Ratio if residing in Riomar and Southeast as a determinant factor of perceived neighborhood environment for physical activity

Environment Characteristics	OR*	IC 95%	P Value
Close-by shops	2,16	1,31-3,55	0,002
Bus stop at 10-15 mins distance	2,21	1,39-3,51	0,001
Presence of sidewalks in good condition	3,02	1,72-5,29	0,000
Presence of bikeways	2,24	1,44-3,49	0,000
Recreational Facilities	1,82	1,16-2,86	0,008
Heavy traffic for bicycling	0,76	0,49-1,20	0,25
Nighttime insecurity	1,52	0,96-2,42	0,07
Daytime insecurity	3,07	1,96-4,80	0,000
Physically active people	4,13	2,50-6,82	0,000
Neighborhood aesthetic	3,21	2,05-5,02	0,000
Four-way intersections	1,77	1,14-2,74	0,010
Many places close to home	2,92	1,81-4,71	0,000

\* Adjusted for gender, age, socioeconomic level, marital status and educational level

In addition to the above risks, people residing in the southeastern town feel that their neighborhood is dangerous for walking during the day [OR 3.07 (95% CI 1.96 to 4.80)], few people doing physical activity [OR 4.13 (95% CI 2.50 to 6.82)] and few interesting things in the neighborhood [OR 3.21 (95% CI 2.05 to 5.02)].

## DISCUSSION

The results of the present study confirm the influence of the physical and social environment of the neighborhood in the perception of the subjects for walking and biking, an aspect reported by researchers from different parts of the world<sup>(26-28)</sup>. Evidence suggests that living in low-income neighborhoods confers an increased risk for physical inactivity, independent of individual socioeconomic circumstances<sup>(18)</sup>.

We found that the perception of the bus stop within a distance of 10 minutes from home was higher in the towns south of the city, a result that agrees with the study conducted in a district of Cartagena (Colombia) ESE 2 where residents have 2.7 times higher risk of perceiving bus stops very close to home (OR = 2.74, 95% CI 1.58-4.92)<sup>(29)</sup>. This environment variable of the town is a predictor of the levels of the physical activity of people, since it allows for smaller periods to accumulate in the day to meet the recommendations of 30 minutes or more of moderately intense aerobic activity.

The presence and condition of sidewalks in the neighborhood is a determinant for physical variable activity of the environment as perceived by residents in the southwest and southeast of the city object of study, it does not contribute to an active lifestyle. The results are conflicting, Gomes<sup>(30)</sup>, reported a negative relationship between perceived presence of sidewalks on nearby streets and walk during free time while Hallal<sup>(31)</sup> found that the lack of sidewalks is a predictor of low levels of physical activity. Seeing that the neighborhood does not have sidewalks or are in poor condition, it is considered a barrier for people to undertake physical activity; on the contrary, the presence of sidewalks in good condition is an important contextual factor for subjects to walk, for the sense of security that is experienced from where they live, and that for low-income people it does not represent an additional expense to walk through the neighborhood.

Regarding the presence of free recreational facilities such as parks, the population studied in the towns in the south of the city perceives few scenarios that contribute to physical activity. These results dictate the decisions in relation to the topic of physical activity that take into account differences between neighborhoods with different ESE, since the characteristics of the urban design of low ESE neighborhoods ESE are negatively related to walking behavior and physical activity dependent on the physical and social environment of the neighborhood<sup>(32,33)</sup>. In line with this argument, it has been reported that in cities like Bogotá, people living in neighborhoods with a greater number of parks are more physically active<sup>(27)</sup>.

It was found in this study that the perception of insecurity for walking and biking during the day is determined by the neighborhood in which the individuals live in, which has been documented in several studies<sup>(26)</sup>, when people perceive that the security of their neighborhood is positive, they are more physically active. To this respect, Parra<sup>34</sup> says that personal perception of safety is positively associated with walking as a means of transport. A good perception of safety is related to the proper maintenance of neighborhoods, which allows for better control and greater social sense of security of the residents, a fact that encourages investment in public safety and violence prevention<sup>(26)</sup>.

The aesthetics of the neighborhood, a variable which in this study was defined as things that are interesting in the neighborhood, has been a characteristic related to physical activity, the results show that people living in the northern town with high ESE have a higher perception of better aesthetics of their neighborhoods; These findings are consistent with those reported by Oyeyemi<sup>(28)</sup>, where people living in neighborhoods of low ESE still perceived poor aesthetics in the place of residence, and was significantly related to higher levels of being overweight [OR = 1.35 (1.02 to 1.81)]. It is considered that the presence of litter and material with unpleasant odors are elements that help people perceive a walk around the neighborhood as unpleasant<sup>(28, 35)</sup>.

It was found in this study that the perception of many physically active people in the neighborhood doing things like walking, jogging, biking or playing sports and active games, varies by location of residence, being a risk for individuals who live in the area southeast and southwest of the city. In this regard, De Farias<sup>(36)</sup> showed that subjects who were shown to be less physically active in their neighborhoods, are more likely to be categorized as inactive [OR 1.2 (1.05 to 1.56)]. Thus, we note that for the neighbors performing an activity it plays an important role in modulating the levels of physical activity of people, interaction with other subjects positively influences motivation and a sense of confidence in performing physical activity<sup>(37,38)</sup>.

## CONCLUSION

People living in areas of low socioeconomic Stratas are exposed to negative perceptions of the characteristics of their neighborhood that allow for walking or biking, making them vulnerable to unhealthy behaviors such as physical inactivity, and contribute in generating health inequities .

These findings contribute to designing multilevel interventions to promote physical activity, to be grounded in the socio-ecological model, they will be focused on influencing the socio-cultural environment of individuals, removing barriers and considering its social, cultural, educational, and economic status<sup>38</sup>. The changes brought about in the social and physical environment enable more physically active individuals, because they facilitate access and security of the characteristics of the neighborhood.

The main limitation of this study was the cross-sectional design, which did not allow to estimate a causal relationship between the variables studied; Otherwise, the main strengths are the selection of a sample that is representative of people living in neighborhoods with different environmental and socioeconomic characteristics, and being a pilot study in the city of Barranquilla, which will provide relevant information to decision makers at district and national level.

## REFERENCES

1. World Health Organization. Global recommendations on physical activity for health. Geneva: 2010.
2. Escalante Y. Actividad física, ejercicio físico y condición física en el ámbito de la salud pública. Rev. Esp. Salud Pública 2011; 85(4): 325-328.
3. Lee IM, Shiroma EJ, Lobelo F, Puska P, Blair SN, Katzmarzyk PT. Effect of physical inactivity on major non-communicable diseases worldwide: an analysis of burden of disease and life expectancy. Lancet 2012; 380: 219-229.

4. Haskell W, Lee I, Pate RR, Powell KE, Blair ST, Franklin BA, et al. Physical activity and public health: updated recommendation for adults from the American College of Sports Medicine and the American Heart Association. *Med. Sci. Sports Exerc* 2007; 39(8): 1423-1434.
5. Pratt M, Macera CA, Sallis JF, O'Donnell M, Frank LD. Economic interventions to promote physical activity: applications of the SLOTH model. *Am J Prev Med* 2004; 27 (suppl 3): 136-145.
6. Hallal P, Andersen L, Bull F, Guthold R, Haskell W, Ekelund U. Global physical activity levels: surveillance progress, pitfalls, and prospects. *Lancet*. 2012; 380: 247-257.
7. Arango EF, Patiño FA, Quintero MA, Arenas MM. Levels of physical activity, barriers, and stage of change in an urban population from a municipality in Colombia. *Colomb. Med* 2011; 42(3): 352-361.
8. Gomez LF, Parra D, Buchner D, Brownson RC, Sarmiento O, Pinzón J. Built Environment Attributes and Walking Patterns Among the Elderly Population in Bogotá. *Am J Prev Med* 2010; 38(6): 592-599.
9. Hallal P, Gómez LF, Parra D, Lobelo F, Mosquera J, Florindo A, et al. Lecciones aprendidas después de 10 Años del uso de IPAQ en Brasil y Colombia. *J Phys Act Health* 2010; 7 (Suppl 2): 259-264.
10. Bauman AE, Reis RS, Sallis JF, Wells JC, Loos RF, Martin BW. Correlates of physical activity: why are some people physically active and others not? *Lancet*. 2012; 380: 258-271.
11. Fox KR, Hillsdon M, Sharp D, Cooper AR, Coulson JC, Davis M, et al. Neighbourhood deprivation and physical activity in UK older adults. *Health & Place* 2011; 17: 633-640.
12. Van Dyck, Cerin E, Conway T, Bourdeaudhuij I, Owen N, Kerr J. Perceived Neighborhood environmental attributes associated with adults' transport-related walking and cycling: Findings from the USA, Australia and Belgium. *Int J Behav Nutr Phys Act* 2012; 9:70 doi:10.1186/1479-5868-9-70
13. Van Dyck, Cardon G, Deforche B, Owen N, Sallis J, Bourdeaudhuij I. Neighborhood walkability and sedentary time in Belgian adults. *Am J Prev Med* 2010; 39(1) 25-32.
14. Baker PR, Francis DP, Soares J, Weightman AL, Foster C. Community wide interventions for increasing physical activity. *Cochrane Database of Systematic Reviews* 2011, Issue 4.
15. Yi Pan S, Cameron C, DesMeules M, Morrison H, Craig CL, Jiang X. Individual, social, environmental, and physical environmental correlates with physical activity among Canadians: a cross-sectional study. *BMC Public Health* 2009; 9:21: 1-12.
16. Sallis J, Saelens B, Frank L, Conway T, Slymen D, Cain K, et al. Neighborhood built environment and income: Examining multiple health outcomes. *Social Science & Medicine* 2009; 68: 1285-1293.
17. Álvarez LS. Los estilos de vida en salud: del individuo al contexto. *Rev. Fac. Nac. Salud Pública* 2012; 30(1): 95-101.

18. Cleland V, Ball K, Hume C, Timperio A, King A, Crawford D. Individual, social and environmental correlates of physical activity among women living in socioeconomically disadvantaged neighbourhoods. *Social Science & Medicine* 2010; 70: 2011-2018.
19. Mason P, Kearns A, Bond L. Neighborhood walking and regeneration in deprived communities. *Health & Place* 2011; 17: 727-737.
20. Davey RC, Hurst GL, Smith GR, Grogan SC, Kurth J. The impact and process of a community-led intervention on reducing environmental inequalities related to physical activity and healthy eating - a pilot study. *BMC Public Health* 2011; 11 (697): 2-8.
21. Sisco SM, Marsiske M. Neighborhood influences on late life cognition in the ACTIVE Study. *J Aging Res* 2012; 1-11.
22. Oyeyemi A, Adegoke B, Oyeyemi AY, Fatudimu B. Test-retest reliability of IPAQ environmental- module in an African population. *Int J Behav Nutr Phys Act* 2008; 5 (38): 1-7.
23. Departamento Administrativo Nacional de Estadística (DANE). Censo General 2005. Bogotá. 2005.
24. International Physical Activity Questionnaire. Guidelines for data processing and analysis of the International Physical Activity Questionnaire (IPAQ), in Short and Long Forms; 2005: 1-15.
25. IPS. Physical activity prevalence study environmental survey module. 2002. Available online: <http://www.rohan.sdsu.edu/faculty/sallis/IPAQIPS.pdf>. Consultado Mayo 15 de 2011.
26. Florindo AA, Salvador EP, Reis RS, Guimarães VV. Percepção do ambiente e prática de atividade física em adultos residentes em região de baixo nível socioeconômico. *Rev. Saúde Pública* 2011; 45(2): 302-310.
27. Gómez LF, Sarmiento OL, Parra DC, Schmid TL, Pratt M, Jacoby E, et al. Characteristics of the Built Environment Associated With Leisure-Time Physical Activity Among Adults in Bogotá, Colombia: A Multilevel Study. *J Phys Act Health* 2010; 7 (Suppl 2): 196-203.
28. Oyeyemi AL, Adegoke BO, Oyeyemi AY, Deforche B, Bourdeaudhuij I, Sallis JF. Environmental factors associated with overweight among adults in Nigeria. *Int J Behav Nutr Phys Act* 2012; 9 (32):2-9.
29. Herazo BY, Domínguez AR. Percepción del ambiente y niveles de actividad física en adultos de un barrio de Cartagena. *Rev. salud pública* 2010; 12 (5): 744-753.
30. Gomes G, Reis RS, Parra DC, Ribeiro I, Hino A, Hallal PC, et al. Walking for leisure among adults from three Brazilian cities and its association with perceived environment attributes and personal factors. *Int J Behav Nutr Phys Act* 2011; 8 (111): 1-8.
31. Hallal PC, Reis RS, Parra DC, Hoehner C, Brownson RC, Simões EJ. Association between perceived environmental attributes and physical activity among adults in Recife, Brazil. *J Phys Act Health* 2010; 7 (Suppl 2): 213-222.



32. Jones A, Hillsdon M, Coombes E. Greenspace access, use, and physical activity: Understanding the effects of area deprivation. *Preventive Medicine* 2009; 49: 500-505.
33. Pearce JR, Maddison R. Do enhancements to the urban built environment improve physical activity levels among socially disadvantaged populations? *Int J Equity Health* 2011; 10 (28): 1-8.
34. Parra DC, Hoehner CM, Hallal PC, Ribeiro IC, Reis R, Brownson RC, et al. Perceived environmental correlates of physical activity for leisure and transportation in Curitiba, Brazil. *Preventive Medicine* 2011; 52: 234-238.
35. Corseuil WG, Schneider CI, Corseuil HX, Benedetti TB, d'Orsi E. Atividade física e percepção do ambiente em idosos: estudo populacional em Florianópolis. *Rev. Saúde Pública* 2012; 46 (3): 516-525.
36. De Farias JJ, Silva LA, Mota J, Santos MP, Ribeiro JC, Hallal PC. Perception of the social and built environment and physical activity among Northeastern Brazil adolescents. *Preventive Medicine* 2011; 52: 114-119.
37. Oliveira AJ, Lopes CS, Ponce de Leon A, Rostila M, Griep RH, Werneck GL, et al. Social support and leisure-time physical activity: longitudinal evidence from the Brazilian Pró-Saúde cohort study. *Int J Behav Nutr Phys Act* 2011; 8 (77): 1-10.
38. Cleland CL, Tully MA, Kee F, Cupples ME. The effectiveness of physical activity interventions in socio-economically disadvantaged communities: A systematic review. *Preventive Medicine* 2012; 54: 371-380.

**Número de citas totales / Total references:** 38 (100%)

**Referencias propias de la revista / Journal's own references:** 0 (0%)