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Prevalence of physical inactivity and associated cardiometabolic risk factors: A cross-sectional study

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SUMMARY

Background: *Physical inactivity represents a public health problem associated with non-communicable diseases. This study aimed to determine both general and domain-specific prevalence of physical inactivity as well as its association with cardiometabolic factors.* **Methods:** *A cross-sectional study was performed, including 2 230 adult individuals from both sexes from Maracaibo city. Physical activity was assessed by the long-form of the International Physical Activity Questionnaire. A value<600 MET-minutes/week was defined as a cut-off for physical inactivity. A multivariant logistic regression analysis was performed for each IPAQ domain.* **Results:** *The highest prevalence of physical inactivity was in the transportation (80.3 %), followed by work (79.9 %), leisure (76.8 %), and household (47.9 %) domain. In the first three domains, physical inactivity was more frequent in women, and the majority of subjects were inactive in three or four domains simultaneously. Being a woman, being >30 years old, Asian-Middle Eastern ethnicity, and former smoker status were variables associated with leisure-time physical inactivity. In the transportation domain, associated variables were being a woman, being overweight, and being obese. In the work domain, being a woman, age >50 years old, high school studies, employed work status, and type 2 diabetes mellitus were the associated variables. Lastly, in the household domain, an association was seen with males, II-IV socioeconomic status, and employed work status.* **Conclusion:** *There is a high prevalence of physical inactivity in residents of Maracaibo city, which is why the implementation of plans promoting physical activity is necessary.*

Key words: *Sedentary, physical inactivity, risk factor, leisure time, transportation.*

RESUMEN

Introducción: *La inactividad física es un problema de salud pública asociado a enfermedades crónicas no transmisibles. Determinar la prevalencia general*

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y por esferas de inactividad física, y su asociación con factores cardiometabólicos. **Métodos:** *Estudio transversal que incluyó 2 230 individuos adultos de ambos sexos de la ciudad de Maracaibo. Para la evaluación de la actividad física se aplicó la versión larga del Cuestionario internacional de actividad física, definiéndose la inactividad física como <600 MET-minutos/semana, se realizó un análisis de regresión logística multivariante para cada dominio.* **Resultados:** *La mayor prevalencia de inactividad física fue en la esfera de transporte (80,3 %), seguida de la esfera de trabajo (79,9 %), ocio (76,8 %) y hogar (47,9 %). En las 3 primeras esferas la inactividad física fue más frecuente en mujeres y la mayoría de sujetos fueron inactivos en 3 o 4 esferas simultáneamente. Las variables asociadas con inactividad física en ocio fueron el sexo femenino, edad >30 años, grupo étnico arábigo-asiático y estatus de exfumador; en la esfera transporte fueron el sexo femenino, sobrepeso y obesidad; en la esfera trabajo fueron el sexo femenino, edad ≥50 años, estatus educativo de secundaria, condición laboral de empleado y diabetes mellitus tipo 2; en la esfera hogar fueron el sexo masculino, estrato socioeconómico II-IV y la condición laboral de empleado.* **Conclusión:** *Existe una alta prevalencia de inactividad física en los habitantes de la ciudad de Maracaibo, por lo que es necesaria la promoción del ejercicio.*

Palabras clave: *Sedentarismo, inactividad física, factor de riesgo, actividades de ocio, transporte.*

INTRODUCTION

Cardiovascular disease (CVD) is the most common and one of the most preventable causes of death in the world. Rapid changes in lifestyle and environmental drives to increased exposure to several well-studied risk factors (modifiable or non modifiable) that increase the burden CVD. Regarding modifiable factors, physical activity has an essential preventive role in the development of various pathologies (1) including vasculopathic diseases such as coronary artery disease, stroke, type 2 diabetes, and obesity. Additionally, increased physical activity has been proposed as a therapy to improve musculoskeletal health; however, there are conflicting reports about physical activity potentially leading to degenerative musculoskeletal disease, especially osteoarthritis (OA. There has been a history of inconsistencies regarding the terminology used throughout the years. In 2012, the term 'physical inactivity' was described by the Sedentary Behavior Research Network (SBRN) as performing insufficient amounts of physical activity, which implied not meeting specified thresholds suggested in official guidelines (2).

The World Health Organization recommends that adults aged 18–64 engage in at least 150 minutes of moderate to vigorous-intensity aerobic activity per week. At the same time, muscle-strengthening activity is recommended twice a week to promote the health benefits of being active (3). Based on these values, physical inactivity is one of the biggest public health problems of the 21st century (4), with approximately one-third of adults worldwide being inactive and a higher physical inactivity prevalence among women and older adults (5) conducted between 2002 and 2004, which investigated the prevalence of physical inactivity in 76 countries, and comprised almost 300 000 individuals aged 15 years or older. Each study used the International Physical Activity Questionnaire to assess physical inactivity. The level of development of each country was analyzed by the Human Development Index (HDI. Furthermore, it has been determined that physical inactivity is responsible for an estimated 5 million deaths worldwide (6), and further evidence shows that physical inactivity is also determinant for health costs, representing 3.7 % of the overall health care costs in Canada. Besides, in China, more than 15 % of both medical and non-medical annual costs are attributable to physical inactivity (7).

According to preliminary analysis in the city of Maracaibo performed our team, current levels of physical activity are influenced by insufficient participation in physical activity during leisure time and an increase in sedentary behavior during work and household activities (8). Sedentarism refers to very low energy expenditure, where sitting or lying is the dominant mode of posture. Reports in Venezuela that describe patterns of physical activity are scarce or limited to specific groups population, especially children and adolescents or young adults as well as university students (9,10), this makes it impossible to extrapolate the results to large cities. Therefore, this study aimed to determine the prevalence of overall and domain-specific physical inactivity and its association with cardiometabolic factors.

MATERIALS AND METHODS

Study design and sample selection

This report is a sub-study of the Maracaibo City Metabolic Syndrome Prevalence Study, a cross-sectional and randomized study aimed to identify the prevalence of metabolic syndrome (MS) and cardiovascular risk factors in the adult population of Maracaibo city. The sample (2 230 individuals) was calculated based on estimations of the city's population by the National Institute of Statistics 2010's census (1 428 043 inhabitants). The sampling process was carried out during 2007-2010, further details have been previously published elsewhere (11).

Ethical considerations

All participants signed a written consent before undergoing the physical examination and blood sample collection. This project was approved by the Ethics Committee of the Endocrine and Metabolic Diseases Research Center of The University of Zulia, Maracaibo, Venezuela.

Subjects' evaluation

All participants were subject to a complete physical examination, physical evaluation, and anthropometric measurements. The information that was obtained from anamnesis and included socioeconomic data, education and working status, ethnicity, and smoking, and drinking habit. Subjects were asked about the smoking habits presence and its duration, which were categorized as a) Current smoker, any subject who had smoked more than 100 cigarettes in his/her lifetime, is currently smoking, or less than one year had passed after he/she quit smoking; b) Former Smoker: any subject who has quit smoking for more than one year; c) Non-smoker, any subject who has never smoked or had smoked less than 100 cigarettes in his/her lifetime as stated by the National Health Interview Survey (NHIS) adult tobacco use questions (12). Assessment of blood pressure was done using a calibrated mercury sphygmomanometer, with patients previously rested (during at least 15 minutes) in a sitting position with both feet touching the floor; the arm was positioned at the heart level, and the proper sized cuff was used for the procedure. The Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC 7) criteria on blood pressure were used to classify this variable as normal BP <120/80 mmHg, prehypertension in those with systolic blood pressure (SBP) 120-139 mmHg and/or diastolic blood pressure (PAD) between 80–89 mmHg, and hypertension when BP is ≥140/90 mmHg (13). Anthropometric measures were taken using a height rod, previously calibrated and placed on a flat surface. Weight was measured using a digital weighing scale (Tanita, TBF-310 GS Body Composition Analyzer, Tokyo – Japan), with the patient using light clothes and shoeless. Body mass index (BMI) was calculated applying the Quetelet´s equation [Weight/Height2], and the participants were classified according to WHO classification in Normal Weight (<25 kg/m^2), Overweight (25.0-29.9 kg/m2), Obese (≥30.0 kg/m^2) (14). Waist circumference (WC) was measured using calibrated measuring tapes by the anatomical landmarks proposed by the USA National Institutes of Health protocol (15).

Physical activity Aasessment

The International Physical Activity Questionnaire-Long Form (IPAQ-LF), which has been validated in over 12 other countries was used for the evaluation of PA (16). Its design allows for the assessment of PA in four domains: Work, transportation, household, and leisure activity. It includes items corresponding to the frequency and duration of walks; and the frequency and duration of vigorous or high-intensity activities of at least 10 minutes of duration, in the 7 days before application. Minutes/week of walking and vigorous activities was converted to metabolic equivalents (MET) to estimate energy exertion. Data were calculated according to the average MET result for each activity, and from the sum of these, four continuous scores were formulated, defined as follows (17):

- Walking MET-minutes/week= 3.3 x minutes walked x days walked.

- Moderate MET-minutes/week= 4.0 x minutes of moderate-intensity activities x days of moderate-intensity activities.
- Vigorous MET-minutes/week= 8.0 x minutes of vigorous activity x days of vigorous activity.
- Total Physical Activity MET-minutes/week= Walking + Moderate + Vigorous MET-minutes/week.

A cut-off point of < 600 MET-minutes / week for domains was used to define the individuals with physical inactivity (18).

Laboratory analysis

Overnight fasting determination of glucose, total cholesterol, triacylglycerides (TAG), and HDL-C was performed with an automated analyzer (Human Gesellschaftfür Biochemica und DiagnosticambH, Germany). The intra-assay variation coefficients for total cholesterol, TAG, and HDL-C were 3 %, 5 %, and 5 %, respectively. LDL-C and VLDL-C levels were calculated, applying Friedewald's formula when TAG levels were <400 mg/Dl (19). When TAG levels were above this cut-off, LDL-C serum concentration was measured through lipoprotein electrophoresis and densitometry with BioRad GS-800 (BioRad).

Definitions

Fasting glycaemic status was classified according to the ADA 2019 criteria in normal fasting blood glucose (Basal glucose ≥ 60 mg/dL and <100 mg/dL-), impaired fasting glucose (fasting blood glucose between 100-125 mg/dL), and type 2 diabetes mellitus (T2DM) (≥126 mg/dL) (20). Main dyslipidemias were high TAG levels (≥150 mg/dL) and low HDL-C (<40 mg/dL for men or <50 mg/dL for women). Elevated WC cut-off was set at ≥80 cm in females or ≥90 cm in males (21)which occur together more often than by chance alone, have become known as the metabolic syndrome. The risk factors include raised blood pressure, dyslipidemia (raised triglycerides and lowered high-density lipoprotein cholesterol.

Statistical analysis

Qualitative variables were expressed as absolute and relative frequencies, evaluating association through Pearson's Chi-squared (χ^2) test. Domain-specific multiple logistic regression models were constructed to estimate odds ratios (CI95 %) for leisure, transport, work, and household physical inactivity, adjusted for sex, age groups, ethnic groups, socioeconomic, educational and work status, smoking, and alcohol habit, elevated WC, high TAG, low HDL, glycemic status, BP and BMI classification. SPSS v.19 software (SPSS IBM Chicago, IL) was used to build and audit the database, and to perform all statistical analyses in this study. The results were considered statistically significant when P<0.05.

RESULTS

General characteristics of the sample

A total of 2 230 subjects were included in the study, of which 52.6 % (n=1,172) were female. The mean population age was 39.3 ± 15.4. Socio-demographic and clinical variables´ behavior are shown in **Table 1.**

Physical inactivity according to IPAQ domains

In **Table 2,** the prevalence of physical inactivity, according to the IPAQ domains, is presented. Women had a higher frequency of physical inactivity when compared with men in the work (women: 84.1 % vs men: 75.2 %; χ^2=27.395, P<0.001), transportation (women: 84.0 % vs men: 76.1 %; χ^2=22.231, P<0.001), and leisure time domains (women: 85.6 % vs men: 67.1 %;χ^2=106.542, P<0.001). The opposite was found in the household domain (women: 36.9 % vs men: 60 %, χ^2=118.623, P<0.001). The majority of individuals were inactive in 3 or 4 IPAQ domains (3 domains: 42.3 %, and 4 domains: 26.6 %), glycemic status was the only variable that showed an association with the number of physical inactivity domains.

Factors associated with physical inactivity by domains

- **Leisure time sphere**: Men (OR: 0.33; CI95.%:

0.26-0.43; P<0.001), subjects of Asian-Middle Eastern origin (OR: 0.16; CI95 %: 0.05-0.53; P=0.002) and former smokers (OR: 0.61; CI95.%: 0.41-0.90; P=0.014) showed a lower risk of physical inactivity compared to women, subjects of mixed ethnicity, and smokers, respectively. Regarding age groups, older age was associated with the presence of physical inactivity **(Figure 1)**.

Table 1

General features of the sample from Maracaibo City

	Women		Men		Total	
	n	%	n	%	n	%
Age groups (years)						
<30	349	29.8	413	39.0	762	34.2
30-49	467	39.8	391	37.0	858	38.5
≥50	356	30.4	254	24.0	610	27.4
Socioeconomic Status						
Stratum V: Extreme poverty	66	5.6	39	3.7	105	4.7
Stratum IV: Working class	449	38.3	349	33.0	798	35.8
Stratum III: Middle class	432	36.9	446	42.2	878	39.4
Stratum II: Upper-middle class	208	17.7	205	19.4	413	18.5
Stratum I: Upper class	17	1.5	19	1.8	36	1.6
Educational status						
College/university	382	32.6	402	38.0	784	35.2
High school	517	44.1	524	49.5	1041	46.7
Primary school	240	20.5	113	10.7	353	15.8
Illiterate	33	2.8	19	1.8	52	2.3
Ethnicity						
Asian- Middle Eastern	13	1.1	1	0.1	14	0.6
Amerindians	62	5.3	44	4.2	106	4.8
Afro-Venezuelans	30	2.6	36	3.4	66	3.0
White Hispanic	191	16.3	161	15.2	352	15.8
Mixed	876	74.7	816	77.1	1692	75.9
Work Status						
Unemployed	642	54.8	291	27.5	933	41.8
Employed	530	45.2	767	72.5	1297	58.2
Smoking						
Current smokers	119	10.2	192	18.1	311	13.9
Non-smokers	878	74.9	667	63.0	1545	69.3
Former smokers	175	14.9	199	18.8	374	16.8
Body mass index (BMI)						
Classification						
Normal weight	420	35.8	275	26.0	695	31.2
Overweight	371	31.7	415	39.2	786	35.2
Obese	381	32.5	368	34.8	749	33.6
Glycemic status						
Normoglycemic	871	74.3	736	69.6	1607	72.1
Impaired fasting glucose	202	17.2	233	2.,0	435	19.5
Type 2 Diabetes Mellitus	99	8.4	89	8.4	188	8.4
Total	1172	5.,6	1058	47.4	2230	100

Table 2

Physical inactivity prevalence and its association by sex according IPAQ domains

	Women		Men		Total		χ2 (p*)
	n	%	n	%	n	%	
Work¶							**27.395(<0.001)**
Active	186	15.,9	262	24.8	448	20.1	
Inactive	986	84.1	796	75.2	1782	79.9	
Transportation¶							**22.231(<0.001)**
Active	187	16.0	253	23.9	440	19.7	
Inactive	985	84.0	805	76.1	1790	80.3	
Household¶							**118.623(<0.001)**
Active	739	63.1	423	40.0	1162	52.1	
Inactive	433	36.9	635	60.0	1068	47.9	
Leisure time¶							**106.542(<0.001)**
Active	169	14.4	348	32.9	517	23.2	
Inactive	1003	85.6	710	67.1	1713	76.8	

¶Inactive: <600 METs/min/week

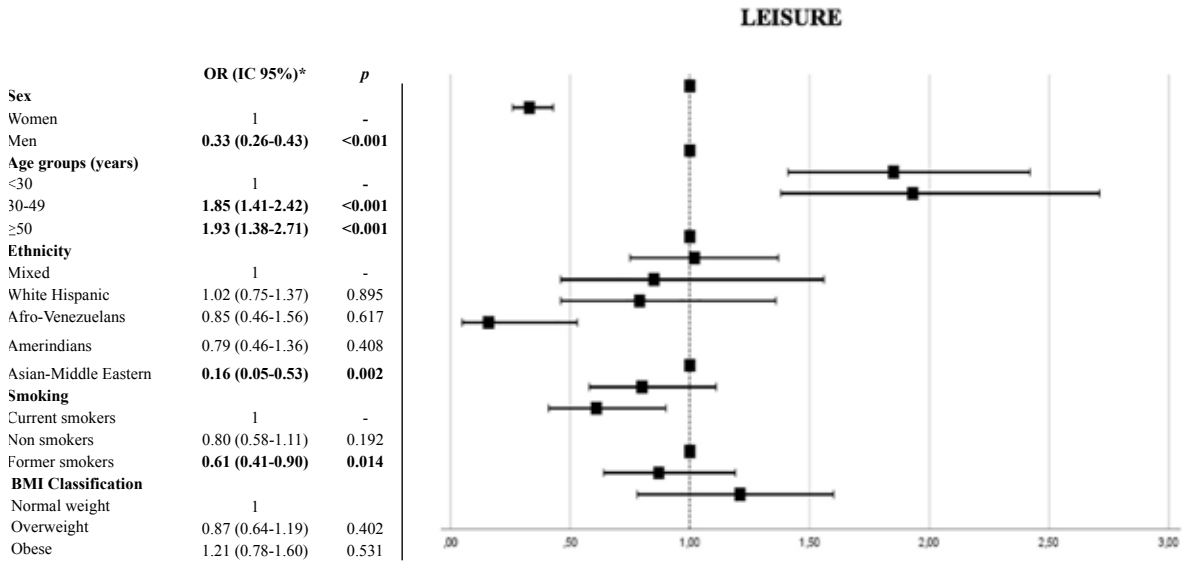

Figure 1. Associated factors with physical inactivity in leisure domain.
* Ajusted model to: sex, age groups, ethnic groups, socioeconomic, educational and work status, smoking and alcohol habit, elevated WC, high TAG, low HDL, glycemic status, BP, and BMI classification.

- **Transportation sphere**: Similarly, men presented a lower risk of physical inactivity compared to women (OR: 0.54; CI95 %: 0.42-0.70; P<0.001). Regarding BMI, obese (OR: 1.53; CI95 %: 1.08-2.16; P=0.016) and overweight individuals (OR: 1.42; CI95 %: 1.94; P=0.025) had a higher risk of physical inactivity in this domain **(Figure 2)**.
- **Work sphere**: Subject who were≥50 years old (OR: 1.55; CI95 %: 1.10-2.18; P=0.012), with high school education (OR: 5.65; CI95 %: 1.28-24.97; P=0.022), and T2DM (OR: 1.68; CI95 %: 1.03-2.76; P=0.038) had

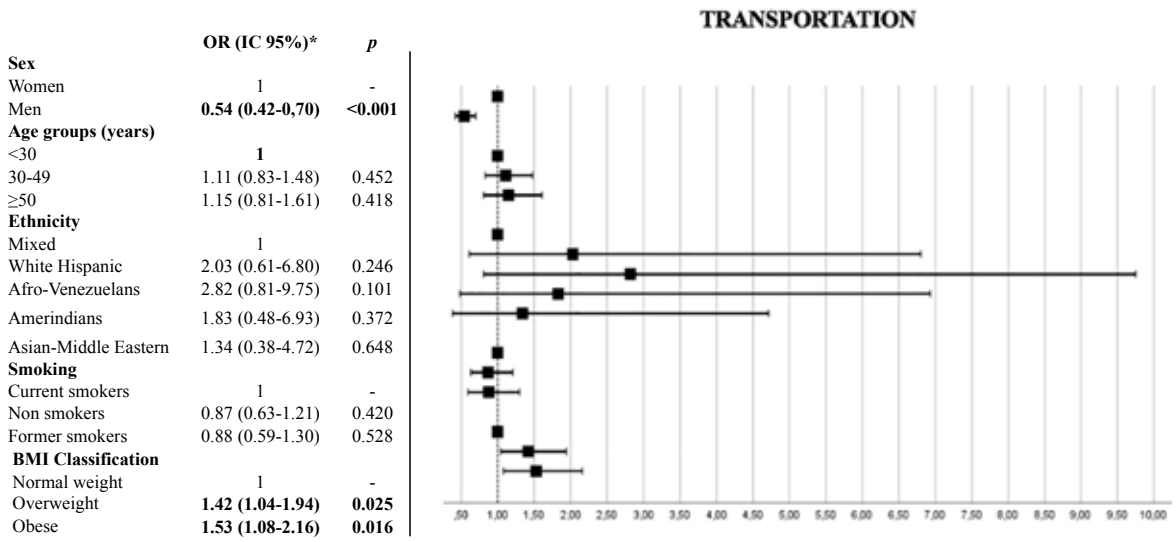

Figure 2. Associated factors with physical inactivity in transport domain.
* Ajusted model to: sex, age groups, ethnic groups, socioeconomic, educational and work status, smoking and alcohol habit, elevated WC, high TAG, low HDL, glycemic status, BP, and BMI classification.

a higher risk of physical inactivity compared to those <30 years old, with higher studies, and normoglycemic, respectively. While men (OR: 0.74; CI95 %: 0.58-0.95; P=0.021) and employed subjects (OR: 0.48; CI95 %: 0.37-0.62; P<0.001) had a lower risk compared to women and unemployed subjects, respectively **(Figure 3)**.

- **Household sphere**: Men(OR: 2.51; CI95.%: 2.05-3.08; P<0.001), individuals in the IV (OR:3.40; CI95 %: 1.43-8.07; P=0.005), III (OR:3.35; CI95 %; 1.92-5.83; P<0.001), or II socioeconomic status (OR: 2.12; CI95 %: 1.26-3.58; P=0.004) had a lower risk of physical inactivity. Similar results were

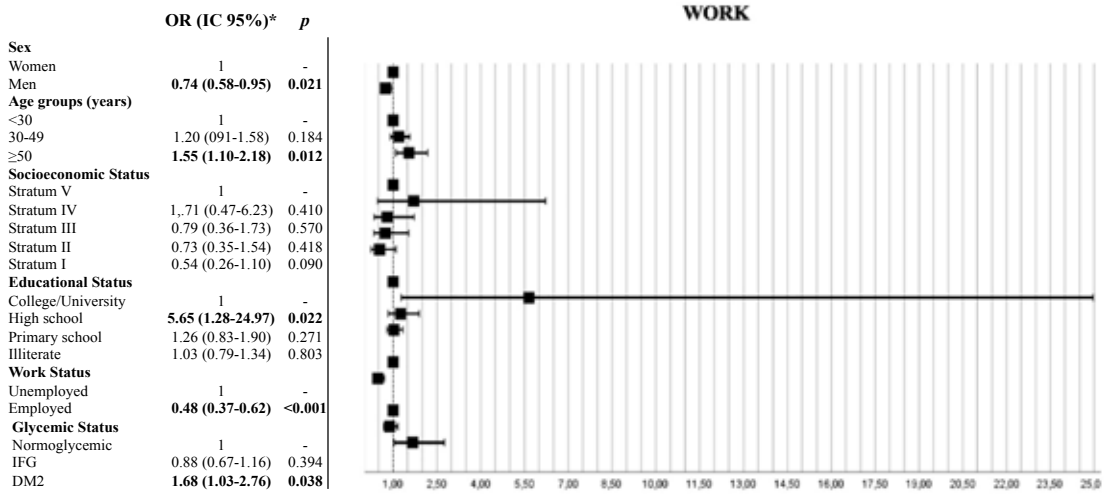

Figure 3. Associated factors with physical inactivity in work domain.
* Ajusted model to: sex, age groups, ethnic groups, socioeconomic, educational and work status, smoking and alcohol habit, elevated WC, high TAG, low HDL, glycemic status, BP, and BMI classification.

found for those with high school education (OR: 2.20; CI95 %: 1,14-4.26; P=0.019), and employed individuals (OR:1.23; CI95 %; 1.01-1.50; P=0.040) when compared to women, individuals in the I or V socioeconomic status, higher education, and those unemployed, respectively **(Figure 4)**.

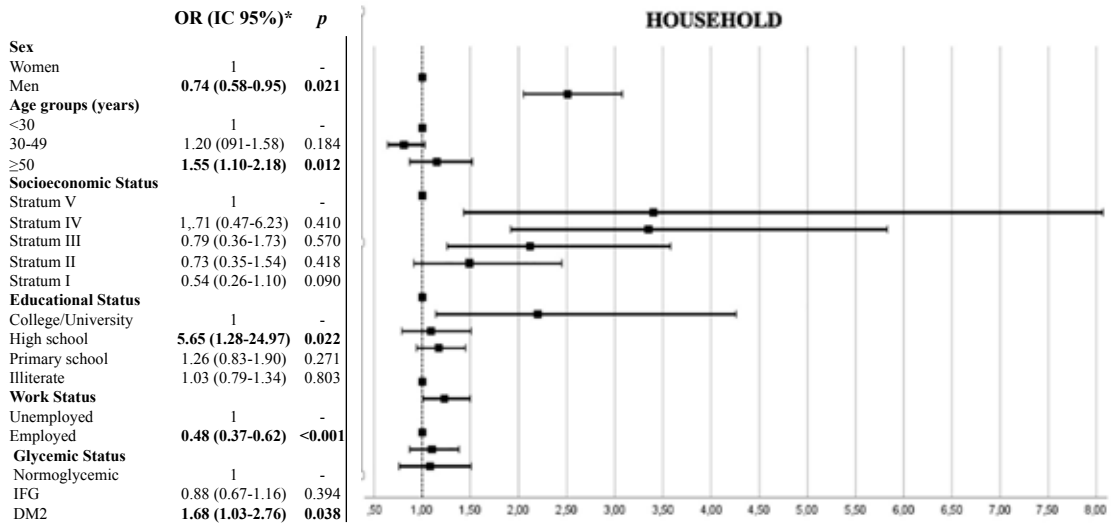

Figure 4. Associated factors with physical inactivity in household domain.
* Ajusted model to: sex, age groups, ethnic groups, socioeconomic, educational and work status, smoking and alcohol habit, elevated WC, high TAG, low HDL, glycemic status, BP, and BMI classification.

Factors associated with physical inactivity across all dimensions

Subjects ≥50 years of age (OR: 1.59; CI95.%: 1.71-2.16; P=0.003), with T2DM (OR: 1.44; CI95 %: 1.01-2.03; P=0.039), and who were part of the IV and III socioeconomic strata had a higher risk being physically inactive across all dimensions **(Table 3)**.

Table 3

Associated factors to physical inactivity across all domains

	Physical inactivity in all domains	
	OR (IC 95%)*	P
Age groups (years)		
<30	1	.
30-49	1.09 (0.83-1.42)	0.532
≥50	1.59 (1.71-2.16)	0.003
Socioeconomic Status		
Stratum V	1	.
Stratum IV	3.84 (1.59-9.28)	0.003
Stratum III	2.18 (1.18-4.02)	0.012
Stratum II	1.57 (0.88-2.81)	0.121
Stratum I	1.09 (0.63-1.89)	0.742
Glycemic status		
Normoglycemic	1	.
IFG	0.88 (0.68-1.14)	0.361
T2DM	1.44 (1.01-2.03)	0.039

*Ajusted model to: sex, age groups, ethnic groups, socioeconomic, educational and workstatus, smoking and alcohol habit, elevated WC, high TAG, low HDL, glycemic status, BP, and BMI classification.

DISCUSSION

During the last years, different reports have shown a high prevalence of cardiometabolic risks in Maracaibo city (22,23). However, factors related to psychobiologic habits and lifestyle have been underreported in Venezuela, a country with scarce large-scale regional or national epidemiologic studies. Therefore, this study aimed to show the prevalence of physical inactivity in Maracaibo city, a risk factor that is frequently underestimated in the clinical evaluation of the adult patient. Besides, this risk factor has been associated with cardiovascular diseases as well as other chronic diseases (24).

There is limited data related to the study of a sedentary lifestyle in low and middle-income countries. This fact is especially actual for Latin America. The South American Physical Activity and Sedentary Behavior Network (SAPASEN) is one of the central studies that have analyzed physical inactivity patterns with data from Argentina, Peru, Ecuador, Brazil, Suriname, and Chile. However, there is no available data from Uruguay, Paraguay, and Venezuela (25). SAPASEN data reported that Latin America has high ranges of total physical inactivity, with frequencies ranging from 60.4.% (Brazil) to 82.9 % (Chile) among men, and between 49.4.% (Ecuador) and 74.9 % (Chile) in women. Furthermore, differences between countries were also seen when studying domain-specific physical inactivity. The prevalence of physical inactivity during leisure time ranged from 29.2.% in Argentina to 8.6 % in Peru, while in the transportation sphere Peru showed a prevalence of 69.7 %, considerably higher than Ecuador (8.8.%). Lastly, in the work sphere, Chile showed a prevalence of 60.4 %, while Brazil only reported a prevalence of 18.3 %.

On the other hand, data from the Latin American Study of Nutrition and Health (ELANS) in which Venezuela is included, showed that the overall prevalence of insufficient physical activity (IPA) in the transport and leisure domains were 69.9 % (95 % CI: 68.9-70.8) and 72.8 (95.% CI: 72.0-73.7), respectively. Our country showed the highest IPA of all analyzed countries (transportation: 81 % and leisure: 83,8 %) (26). Besides, López et al, reported a prevalence of sedentary lifestyle of 60.7 % in hypertensive individuals from three Venezuelan cities, without specifying the method used to classify physical activity levels (27). These results, as well as those found in the four IPAQ domains in our study, show the need to develop new policies promoting physical activity in adults. Education about the benefits of regular physical activity is a must as well as the use of strategies that include activities during work, leisure time, and even transportation.

As for the distribution, according to sex, the highest risk of sedentarism observed in women, especially in the leisure time sphere, has been documented in previous reports (28). These differences between men and women can be due to cultural characteristics, time availability, and daily activities performed. This behavior has an impact on psychobiologic habits and, therefore, in their overall health. In this way, policies of physical activity promotion must focus on improving the health of women by promoting spaces, time, and perhaps more importantly, changes in the sociocultural perspectives regarding access and time availability for healthy habits (29).

Regarding physical inactivity during leisure time, this was associated with women and individuals older than 30 years of age, while individuals of Asian and Middle Eastern origin and former smokers had a lower risk compared to other groups. These findings coincide with reports made by Meseguer et al, who performed a cross-sectional study in Madrid finding that women, older adults, and people with lower education levels as well as obese individuals were those with the lowest adherence to recommendations made for physical activity during leisure time[&](30). It is essential to consider the influence that daily household activities can have on-time availability in the case of women. Similarly, these considerations should be made regarding the work activities and time availability of individuals over 30 years.

Meanwhile, physical inactivity in the transportation domain was associated with being female, overweight, and obese. This pattern is similar to what was found by Florindo et al, in a Brazilian population, reporting that women exhibited both insufficient levels of physical activity in this sphere and the highest level of

overall physical inactivity (31). Active mobility (walking or cycling as a method of transportation) has been established as an important way to perform routine physical activity affordably, and as an initial therapeutic strategy for chronic diseases such as obesity, hypertension, and T2DM (32).

In our work, physical inactivity in the work domain was associated with both T2DM and a high school education level. This finding is the opposite of what was reported by Medina et al, in a prospective study performed in Mexico City. They reported that occupational, physical inactivity increased the risk of hypertension instead of T2DM (33). Meanwhile, Díaz et al, showed that physically inactive individuals had a higher probability of developing diabetes (OR: 2.47; CI: 95 %; 1.80-3.38; P<0.001). This fact is likely because exercise increases glucose metabolism as well as insulin sensitivity (34). It is essential to consider in future studies the influence of the type of work and the energy consumption of the worker at risk of suffering this disease.

Finally, in the household domain, men, individuals with high school education, employed, and those in the II and IV social strata showed a higher risk of being inactive. These findings partially coincide with those reported in the aforementioned Brazilian study, in which men, widowed or separated civil status, and high educational level were the factors associated with physical inactivity in the household sphere[&](31). These differences can be attributed to the time availability of these groups in each region. In our case, subjects spend less time at home, possibly due to work reasons, reporting lower METS/min/week in this sphere.

Overall, there is a high percentage of physical inactivity across all domains. Even in the household sphere, in which the frequency of sedentarism was lowest, almost half of the subjects were inactive. These high frequencies made it necessary to evaluate the profile of factors associated with each domain. This way, the most affected groups can be identified to establish specific intervention measures. The evaluation of global physical activity, meaning, across all domains showed that subjects who are 50 years old or older, T2DM subjects, and those in the II and IV socioeconomic strata are groups that need to be considered by primary health attention centers. Their physical activity levels need to be evaluated, and plans that allow for a sustained and progressive start of activities that improve their overall health need to be implemented.

Among the limitations of this study, it is vital to mention its cross-sectional design; this makes it impossible to establish causality relationships between the variables. Similarly, the use of a questionnaire as an instrument of physical activity data collection is also a limitation as it is an indirect measurement method, which can be influenced by factors inherent to the subjects. Also, the results reported come from the analysis of a database obtained years ago. Since then, important socioeconomic changes have taken place in Venezuelan society, which means our results might not be a reflection of the current reality of our city. However, there are current projects in our research center that have the goal of evaluating the modifications these epidemiologic patterns have suffered over time.

CONCLUSIONS

There is a high prevalence of physical inactivity in adult subjects in Maracaibo city, especially in transportation, work, and leisure time domains. Also, there was a significant percentage of physically inactive subjects in several domains simultaneously. The factors associated with physical inactivity vary between spheres, which is why the specific analysis of each domain is recommended to establish more specific preventive strategies for different population groups. Future studies should seek to apply objective methods of physical activity levels, intensity, and time to collect accurate data in this population. Following this recommendation, future studies in Latin American populations might contribute to a deeper understanding of the factors that may influence physical activity and their consequences, to develop strategies to mitigate this problem.

DISCLOSURE

The authors have no conflicts of interest to disclose.

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