

PREVALENCE OF BEHAVIORAL RISK FACTORS ASSOCIATED WITH NONCOMMUNICABLE DISEASES IN COLOMBIAN HIKERS

Jhon Sebastián Camacho Niño¹

Santo Tomás University, Bucaramanga, Colombia
jhonsebastian.camacho@ustabuca.edu.co
<https://orcid.org/0000-0001-7412-9286>

Sebastián Jaramillo Ordoñez²

Santo Tomás University, Bucaramanga, Colombia.
sebastian.jaramillo@ustabuca.edu.co
<https://orcid.org/0000-0001-5057-5644>

Juan Braulio González Carreño³

Santo Tomás University, Bucaramanga, Colombia.
juanbraulio.gonzalez@ustabuca.edu.co
<https://orcid.org/0000-0002-6441-315X>

Alba Liliana Murillo López⁴

Santo Tomás University, Bucaramanga, Colombia.
albamurillo@ustabuca.edu.co
<https://orcid.org/0000-0003-3773-1256>

Luis Gabriel Rangel Caballero⁵

Santo Tomás University, Bucaramanga, Colombia.
dcultu@ustabuca.edu.co
<https://orcid.org/0000-0001-9904-3008>

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ABSTRACT

Physical inactivity, harmful alcohol consumption, smoking and an unhealthy diet are behavioral risk factors that increase the risk of non-communicable diseases. Hiking is a type of physical activity in nature and its practice evidences health benefits. The aim of the study was to analyze the prevalence of behavioral risk factors associated with noncommunicable diseases in hikers in Colombia. The methodology was an analytical cross-sectional study carried out in 118 hikers in Colombia.

¹ Professional in Physical Culture, Sport and Recreation.

² Professional in Physical Culture, Sport and Recreation

³ Professional in Physical Culture, Sport and Recreation

⁴ Master's Degree in Integral Intervention for Athletes

⁵ Master's Degree in Physical Activity: Training and Sport Management

The variables were analyzed as measures of central tendency or frequencies according to their nature. Fischer's exact test, Student's t-test and Mann-Whitney U-test were used to determine a statistically significant difference according to sex. The significance level was $p \leq 0.05$. The Basic Questionnaire of the STEPs Instrument was used for data collection. The prevalence of physical inactivity was 0%. Men reported a higher median number of minutes of physical activity per week than women ($p=0.003$). The prevalences of smoking and harmful alcohol consumption were 10.17% and 11.86%, respectively. The prevalence of harmful alcohol consumption was higher in men than in women ($p=0.034$). The median number of drinks/month of men was higher than that of women ($p=0.004$). 88.98% of participants reported low consumption of fruits and vegetables. The mean of the total behavioral risk factors of the participating hikers was 1.11 (DE:0.05), this figure was higher in men than in women ($p=0.048$). Among the findings are that all participants are physically active, one tenth of the hikers reported regular tobacco use and harmful alcohol consumption, and most of the hikers have a low consumption of fruits and vegetables. Men have higher levels of physical activity and harmful alcohol consumption than women.

Keywords: Non-Communicable Diseases, Risk Factors, Physical Activity, Nature, Smoking, Alcohol Consumption, Diet.

INTRODUCTION

Non-communicable diseases (NCDs) such as cancer, cardiovascular diseases, respiratory diseases and diabetes are responsible for 41 million deaths each year, equivalent to 74% of all deaths globally. NCDs are the result of a combination of different environmental, genetic, physiological and behavioral factors¹.

The World Health Organization (WHO) identifies physical inactivity, harmful alcohol consumption, smoking and unhealthy diet as modifiable behavioral risk factors that increase the risk of NCDs. Globally, each year, tobacco use claims the lives of more than 8 million people, harmful alcohol consumption is responsible for approximately 3 million deaths, 1.8 million deaths are attributable to excessive salt consumption, and 830,000 deaths are related to low levels of physical activity¹.

According to the WHO, it is essential to implement a global approach involving all sectors to promote interventions that guarantee the reduction of risk factors¹. In this sense, in recent years, outdoor activities have become a trend and an excellent strategy for physical activity in leisure time

2-4.

Hiking is a physical activity in nature that involves walking along marked trails or paths⁵. According to the scientific literature, this type of physical activity is an excellent strategy for promoting healthy lifestyle habits because it is an exercise that is usually performed at low to moderate intensity, is of long duration, does not require a specific technique, simply walking, and has demonstrated its positive impact on physical and mental health⁶⁻⁹.

In Colombia, there are few or no studies that analyze the prevalence of behavioral risk factors in hikers. In the local context, in the city of Bucaramanga, a study was conducted that determined these prevalences and concluded that the prevalences of behavioral risk factors in this population are lower than those of the general population in the local, national and global context¹⁰.

Considering the above, the objective of this study was to determine the prevalences of behavioral risk factors in hikers in Colombia. This information is fundamental, in the first place, because there are no or scarce antecedents in the national context for this population and secondly to establish whether or not the study population evidences a healthy lifestyle, and in case it does, it can be, in this sense, the starting point to promote hiking as a strategy for the acquisition of healthy life habits.

METHODOLOGY

Analytical cross-sectional study carried out on 118 hikers (45 men, 73 women), from 15 cities in Colombia, participants of the XIX National Meeting of Hikers, Socorro, Santander held from July 1 to 5, 2021¹¹. Hikers of legal age, who were not pregnant and who had been hiking for more than six months, were included in this study. A non-probabilistic sampling by convenience was implemented, in this sense, during the Encounter, hikers were invited to participate and those who accepted to be part of the research were included.

For the collection of information for this research, the Basic Questionnaire of the WHO STEPS Instrument¹² was applied. This instrument is designed to obtain information about the four behavioral risk factors associated with NCDs. Two professionals in physical culture, sport and recreation and three students in their last semester of physical culture, sport and recreation, through the direct interview method, trained for the application of the instrument taking into account the WHO STEPS Surveillance Manual, were responsible for the collection of information¹².

Harmful alcohol consumption was stipulated when episodic heavy drinking was recorded, which refers to drinking 60 grams or more of pure alcohol or five standard drinks, in a single day, at least once in the last 30 days; harmful alcohol consumption was also established when the hiker reported drinking more than 30 standard drinks in the last month¹³.

Low consumption of fruits and vegetables was determined when the participant's intake was less than five servings or 400 grams per day¹⁴. On the other hand, regular tobacco consumption refers to the consumption of at least one cigarette in the last month¹⁵.

Sedentary behavior and physical activity in the different domains (occupational, leisure time and transportation or travel) were assessed using the Global Physical Activity Questionnaire (GPAQ), which is part of the STEPS instrument and is considered an appropriate and valid questionnaire according to the scientific literature¹⁶ and additionally, the GPAQ proved to be adequate for assessing physical activity in Colombian adults¹⁷. Following the indications of the GPAQ Data Analysis Guide, physical inactivity was determined when a walker reported, in one week, less than 150 minutes of moderate intensity physical activity, or less than 75 minutes of vigorous intensity physical activity, product of the sum of minutes of physical activity in the three domains¹⁸.

Other variables analyzed were sex, socioeconomic level, marital status, academic level academic level, age, and time and frequency of hiking.

In accordance with Resolution 8430 of the Colombian Ministry of Health, this study was classified in the “*No risk*” category, therefore, written informed consent was requested from the study participants, the informed consent presented the information required by the resolution. This research was approved by the Research Committee of the Faculty of Physical Culture, Sports and Recreation.

Regarding data analysis, categorical variables were described through frequencies and percentages. The evaluation of the distribution of the continuous variables was carried out through the Shapiro-Wilk test. These variables were presented as mean and standard deviation when they showed normal distribution. Otherwise, they were described as median and interquartile range. Fischer's exact test, Student's t-test and Mann-Whitney U test were used to determine a statistically

significant difference according to sex. The significance level was $p \leq 0.05$. All analyses were performed in the Stata version 12.1/IC program (Statistics Data Analysis. STATA/ICq 12.1).

RESULTS

The mean age was 53.14 years (SD: 12.29), 59.32% and 60.68% of the participants reported a single/divorced/widowed marital status and a medium socioeconomic level. Regarding academic level, 61.02% are professionals or have postgraduate training. Regarding the frequency of hiking, most of the participants hiked at least once a week (67.80%) (see Table 1).

Table 1. General characteristics, time of practice and frequency of hiking of the study population.

Characteristic	Total n (%)	Female n (%)	Male n (%)	p Value
Socioeconomic level				
Low	13 (11,11)	9 (12,33)	4 (9,09)	0,752
Medium	71 (60,68)	45 (61,64)	26 (59,09)	
High	33 (28,21)	19 (26,03)	14 (31,82)	
Marital Status				
Single/divorced/widowed	70 (59,32)	49 (67,12)	21 (46,67)	0,023
Married/unmarried	48 (40,68)	24 (32,88)	24 (53,33)	
Academic Level				
Elementary	5 (4,24)	4 (5,48)	1 (2,22)	0,575
High School	18 (15,25)	12 (16,44)	6 (13,33)	
Technician - technologist	23 (19,49)	12 (16,44)	11 (24,44)	
Professional	53 (44,92)	31 (42,47)	22 (48,89)	
Postgraduate	19 (16,10)	14 (19,18)	5 (11,11)	
Frequency of Hiking				
Weekly	80 (67,80)	50 (68,49)	30 (66,67)	0,957
Biweekly	13 (11,02)	8 (10,96)	5 (11,11)	
Monthly	25 (21,19)	15 (20,55)	10 (22,22)	
Characteristics	Total Mean (SD)	Female Mean (SD)	Male Mean (SD)	
Age	53,14 (1,13)	51,84 (1,42)	55,24 (1,86)	0,147
Time of hiking (months)	84 (42 – 240)	72 (36 – 234)	132 (48 – 246)	

SD: Standard deviation. Source: Own elaboration

Regarding physical activity, all participants met the WHO worldwide physical activity recommendations. Men reported a higher median total minutes of physical activity per week than

women, with a statistically significant difference ($p=0.003$). According to the domains in which physical activity is performed, hikers report a higher number of minutes in leisure time, followed by occupational physical activity and transportation-related physical activity.

Regarding harmful alcohol consumption, the prevalence was higher in men (20%) than in women (6.85%) with a statistically significant difference ($p=0.034$). Similarly, the median number of drinks/month of men was higher than that of women, with a statistically significant difference ($p=0.004$).

Regarding smoking, 10.17% of the participants reported this risk factor, no statistically significant difference was found when analyzing this variable according to sex (8.22% women, 13.33% men).

Regarding low consumption of fruits and vegetables, 88.98% (87.67% women, 91.11% men) presented this unhealthy behavior. No statistically significant difference was found in relation to total servings of fruits and vegetables per week.

Finally, when analyzing the mean of the total behavioral risk factors of the participating hikers, the figure was higher in men than in women with a statistically significant difference ($p=0.048$). (See table 2).

Table 2. Prevalence of behavioral risk factors associated with NCDs in the study population.

Characteristic	Total n (%)	Female n (%)	Male n (%)	p Value
Physical inactivity				
Yes	0 (0,0)	0 (0,0)	0 (0,0)	----
No	118 (100)	73 (100)	45 (100)	
Harmful use of alcohol				
Yes	14 (11,86)	5 (6,85)	9 (20,00)	0,034
No	104 (88,14)	68 (93,15)	36 (80,00)	
Regular use of tobacco				
Yes	12 (10,17)	6 (8,22)	6 (13,33)	0,277
No	106 (89,83)	67 (91,78)	39 (86,67)	
Low consumption of fruits and vegetables				
Yes	105 (88,98)	64 (87,67)	41 (91,11)	0.398
No	13 (11,02)	9 (12,33)	4 (8,89)	

Sedentary behavior				
More than 8 hours/day	15 (12,71)	9 (12,33)	6 (13,33)	0,543
Less than 8 hours/day	103 (87,29)	64 (87,67)	39 (86,67)	
Characteristics	Total Median (RI)/Mean (SD)*	Female Median (RI)/Mean (SD)*	Male Median (RI)/Mean (SD)*	p Value
Total risk factors	1,11 (0,05) *	1,02 (0,05) *	1,24 (0,10) *	0,048
Total minutes AF/ week	720 (360 – 1350)	600 (315 – 920)	1080 8655 – 1680)	0,003
Total minutes AF free time/week	290 (180 – 450)	240 (120 – 360)	360 (180 – 600)	0,071
Total AF transport minutes/week	120 (0 – 300)	105 (0 – 280)	120 (0 – 600)	0,122
Total occupational AF minutes/week	120 (0 – 420)	0 (0 – 360)	180 (0 – 600)	0,141
Total drinks/month	0 (0 – 10)	0 (0 – 4)	4 (0 – 14)	0,004
Total hours rest/day	3 (2 – 5)	4 (2 – 5,5)	3 (2 – 5)	0,987
Total servings of fruits and vegetables/ week	16 (11 – 26)	16 (12 – 26)	14 (11 – 24)	0,535

IR: Interquartile range, SD: Standard deviation Source: Own elaboration

DISCUSSION

Through this study, it was possible to establish the prevalence of behavioral risk factors in the study population and a statistically significant difference was determined when analyzing the levels of physical activity, harmful alcohol consumption and total risk factors according to sex.

With regard to physical activity, the results of this study show that all the participants are physically active. These results are the same as those recorded in a study conducted among hikers in a city of Bucaramanga¹⁰. When comparing the null prevalence of physical inactivity of the study population with the general population, the results are clearly lower than the prevalence stipulated globally (23%)¹⁹ and in Colombia (49.9%)²⁰. It is important to highlight that this prevalence of 0% of physical inactivity is similar in university students of Physical Culture or Physical Education, who report high levels of physical activity due to their lifestyle and the nature of the academic activities they perform²¹⁻²³.

When physical activity was analyzed according to sex, men reported a higher median total minutes of physical activity per week than women, with a statistically significant difference (p=0.003). This corresponds to the scientific literature consulted, which determines that both in the

global and national context, in the general population^{19,20} and in the university population, women have lower levels of physical activity than men.²⁴

Regarding harmful alcohol consumption, the results of this study established that the prevalence was higher in men than in women, with a statistically significant difference ($p=0.034$). Similarly, the median number of drinks/month of men was higher than that of women, also with a statistically significant difference ($p=0.004$). This corresponds to the scientific literature consulted, which establishes that men have a higher prevalence of this harmful habit than women.^{19, 24–26}

When smoking and low fruit and vegetable consumption were analyzed according to sex, no statistically significant difference was found. Regarding smoking, 10.17% of the participants reported this risk factor (8.22% women, 13.04% men). This result is lower than the world prevalence that, according to WHO, in 2020, was established at 22.3% (36.7% men, 7.8% women)²⁷, and slightly higher than the prevalence in Colombia that was determined in 2019 at 9.8% (13% men, 5% women)²⁸. When analyzing smoking according to sex, although no statistically significant difference was found, the results of this study confirm a higher prevalence in men, an aspect that is in line with reports in the world²⁷, and in Colombia²⁸.

According to the results of this study, low consumption of fruits and vegetables was the highest prevalence of all the behavioral risk factors evaluated with 88.98% (87.67% women, 91.11% men), the results of this study are in line with the scientific literature that establishes prevalences of this unhealthy behavior in different countries above 80%.^{29, 30}

The mean total number of risk factors in the study population was 1.11. This figure is lower than that recorded in Colombian university students who reported an average of 2.71 risk factors³¹. The lower average recorded by the hikers in this study is explained by the fact that all of them are physically active and show lower prevalences of smoking and harmful alcohol consumption than those of the general population.

One of the strengths of this research is the implementation of the Basic Questionnaire of the WHO STEPS instrument, which allows the application of criteria established by the WHO to determine the prevalence of the different behavioral risk factors analyzed in this study. Additionally, the use of the Global Physical Activity Questionnaire (GPAQ), which is a component of the STEPS Instrument, has been validated internationally, especially in the Colombian context.

It is recommended that the prevalence of biological risk factors associated with NEC be analyzed for future studies. Additionally, it would be very important to assess the physical fitness of this population, with the aim of determining whether the high levels of physical activity evidenced in this study are a reflection of optimal levels of muscular strength, aerobic capacity, balance, agility, body composition and flexibility.

When analyzed by sex, a higher prevalence of harmful alcohol consumption was found in men with a statistically significant difference. The implementation of strategies that promote a higher consumption of fruits and vegetables in hikers is recommended.

In conclusion, all participating hikers meet the WHO global physical activity recommendations for health, one tenth of the study population report regular tobacco use and harmful alcohol consumption, and almost 9 out of 10 hikers have a low consumption of fruits and vegetables. The prevalences of the behavioral risk factors analyzed in this study are lower than those reported by the general population in the global context. When analyzed by sex, men present higher levels of physical activity and harmful alcohol consumption than women, with a statistically significant difference. The implementation of strategies to promote greater consumption of fruits and vegetables in hikers is recommended.

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