Cogitare Enfermagem

ORIGINAL ARTICLE

Sociodemographic factors and level of physical activity in military police officers at work*

HIGHLIGHTS

1. The work of the military police requires good physical performance.
2. There was a predominance of females with insufficiently active behavior.
3. Gender was statistically associated with physical activity at work.
4. Males gender had higher chances of physical fitness.

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ABSTRACT

Objective: To identify sociodemographic factors associated with the level of activity of military police officers at work. **Method:** From August to December 2022, a cross-sectional, analytical study was carried out with 432 military police officers working in a city in the interior of Bahia, Brazil. Data was collected using a Google® Forms form containing sociodemographic and clinical information and a validated instrument on physical activity. Data were analyzed using descriptive statistics, association tests, and ordinal logistic regression. **Results:** There was a predominance of males, 355 (82.35%), black race/color, 376 (87.04%), complete higher education, 206 (47.69%), and with a partner, 354 (81.94%). Gender was statistically associated with the International Physical Activity Questionnaire classification in the work section (p< 0.001) and showed higher odds in the active and very active categories. **Conclusion:** The study could contribute data to new public policies that address gender issues, social factors, and lifestyles of this vital group of workers.

DESCRIPTORS: Police; Exercise; Work; Risk Factors; Socioeconomic Factors.

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INTRODUCTION

Military police officers perform physical activity (PA) at work that ranges from an inactive state, such as sitting in a vehicle for long periods, attending meetings, or carrying out administrative tasks, to maximum physical effort, such as pursuits on foot. Thus, physical fitness is fundamental to the demands of law enforcement[1].

National and world literature[1-4] has a wealth of studies showing the importance of PA for people's active lives in society, highlighting that physical and psychological health can be compromised when the minimum recommended standards are not met. There have also been studies pointing out the complexity of the PA phenomenon in groups of workers such as military police officers who take a physical fitness test for their profession, and, when they join the corps, there are few investments in maintaining this health behavior. It should be noted that the work of the military police requires good physical, mental, and cognitive performance, which will lead to better levels of self-confidence and motivation. Allied to this, sociodemographic factors can influence the performance and follow-up of this behavior pattern, which is essential for the organic, psychological, and professional concreteness of police officers.

Concerning the state of the art, through an electronic search for articles published in the last ten years, in any language, in the databases *Cochrane Central Register of Controlled Trials*, *PubMed/Medical Literature Analysis and Retrieval System Online* (MEDLINE), Virtual Health Library (LILACS, MEDLINE e SciELO), Information Center for Educational Resources and National Platform for Comprehensive Workers' Health Care from the scientific and biomedical literature, only three studies were found[5-7], in the scientific and biomedical literature, one national and two international, which dealt with the association between some sociodemographic factors and low activity/physical fitness among military police officers. However, they did not focus on the association of this behavior in the work section aimed at this professional category, as well as the incipience of educational interventions to minimize the findings found in the research.

Identifying and understanding the sociodemographic factors associated with the level of PA of military police officers is essential for directing policies and intervention programs to improve their work performance.

Considering the above, this study aims to identify the sociodemographic factors associated with the activity level of military police officers at work.

METHOD

The Strengthening guides this cross-sectional, analytical study *using the Reporting of Observational Studies in Epidemiology* (STROBE) tool. The study included 432 military police officers working in all the units of the Regional Policing Command - East (CPR - East) of the Bahia Military Police (PMBA, in Portuguese), based in the city of Feira de Santana, including the ranks of soldiers (soldier, cable, sergeant and sub-lieutenant) and officers ("Aspirant", "Lieutenant", "Captain", "Major", "Lieutenant Colonel", and "Colonel"), from August to December 2022. All categories had a minimum workload of 40 hours a week.

It should be noted that military police officers are instructed to perform some PA during their working day, but their adherence to it is not supervised. Periodically, all corps professionals from both categories undergo a physical fitness test.

The sample size was calculated considering a sampling error of 5% (α = 0.05), a 95% confidence interval (1-β = 0.95), and a prevalence of sedentary lifestyles of 37.25% [10], according to previously published studies. This sample size was adopted when considering that the sample was not collected in a single location, i.e., a conglomerate study design, in which police officers from different CPRs participated in the survey. The following formula was adopted: $n = N.Z^2.p.(1-p) / Z^2.p.(1-p) + e^2.N-1$, where n: calculated sample, N: population, Z: standard variable, p: real probability of the event, e: sampling error. Thus, a sample of 428 participants was estimated.

Participants were invited to participate in the research after obtaining permission from the Military Police Command. Once they had agreed, the *Google Forms* form was sent to the participants' *WhatsApp* application. The study was conducted by the lead researcher, who visited the police units during the week to explain the aim and ethical issues of the study, clarify any doubts about signing the Informed Consent Form, and fill in the information. The confidentiality of the participants and the information regarding the right to freely and voluntarily participate in the research were guaranteed, as was the possibility of withdrawing at any time. Just so you know, the participants were very receptive, and there were no refusals.

The data was collected using a *Google Forms* form made up of sociodemographic variables (age, gender, self-declared race/color, schooling, marital status, income, number of people who depend on the income and monthly expenditure) and questions from the International Physical Activity Questionnaire (IPAQ)[8], recommended by the World Health Organization for assessing physical activity in adults aged 15 to 69. Questions related to the frequency, duration, and intensity of physical activity carried out at work, in transport, at home, during leisure time, and time spent sitting were used.

The IPAQ classifications were determined according to the following recommendation: "very active": a) perform vigorous activity for more than 5 days/week and > 30 minutes/session or b) perform vigorous activity for more than 3 days/week and > 20 minutes/session and moderate activity and/or walking for a period of > 5 days/week and > 30 minutes/session; "active" a) perform vigorous physical activity for more than 3 days/week and 20 minutes/session; b) moderate activity or walking for more than 5 days/week and 30 minutes/session; c) any activity whose sum exceeds 5 days/week and 150 minutes/week; "insufficiently active" individuals who practice physical activity for at least 10 continuous minutes a week and do not fit into the "very active" or "active" classifications and individuals who do not perform any physical activity for at least 10 continuous minutes a week are classified as "sedentary".

For the time spent sitting section, time spent sitting during the week in minutes x 5 + time spent sitting during the weekend x 2. Individuals who sat for ≥ 180 minutes/day were classified as sedentary.

The data was compiled and analyzed using R *software* version 4.1.0. All the variables collected were subjected to descriptive analysis. Absolute (n) and relative (%) frequencies were calculated for categorical variables. The mean, median, standard deviation, quartiles 1 and 3 (equivalent to the 25th and 75th percentiles, respectively), and minimum and maximum values were calculated for numerical variables.

Hypothesis tests were carried out to assess the association between the IPAQ work section and sociodemographic variables. For nominal categorical sociodemographic

variables, the chi-square test of independence was used since the data met the assumptions of this test (expected frequencies greater than 5 in at least 80% of the cells and 100% of the cells with expected frequencies greater than 1)[9]. Statistically significant chi-square or Fisher's exact tests were followed by analysis of the adjusted standardized residuals (Pearson's r residuals) to identify in which categories the observed frequencies differed from the expected ones. Residuals outside the interval [-1.96; 1.96] were considered statistically significant[10]. The Mann-Whitney test was used for numerical or ordinal sociodemographic variables.

Given the impact of sample size on the p-value[11], effect size measures were calculated for all the tests. For the Mann-Whitney test, the effect size r was calculated, which can be classified as small ($r > 0.1$), medium ($r > 0.3$), or large ($r > 0.5$)[12].

To multivariate assess the factors associated with the IPAQ work classification, an ordinal categorical variable, we first evaluated whether the data met the assumptions of the ordinal logistic regression model: *proportional odds* and absence of multicollinearity. Multicollinearity was considered absent when all the VIF (variance inflation factor) values calculated for the model were less than 5[13].

The proportional odds assumption was assessed using the test proposed by [Brant14]. Once these assumptions were met, ordinal logistic regression models were applied. These models included the IPAQ work score as the dependent variable and age and gender as independent variables. When exponentiated, the ordinal logistic regression models' coefficients result in *odds* ratios (ORs). ORs that do not differ statistically from 1 (which therefore include 1 in their 95% confidence interval) indicate that the independent variable does not impact the chances of the outcome, in this case, the IPAQ score. Since this is an ordinal logistic regression, ORs statistically greater than 1 indicate an increased chance of having a higher classification in the outcome; therefore, an increased chance of belonging to a higher category in the IPAQ classification. On the other hand, ORs statistically lower than 1 indicate a decreased chance of having a higher classification in the outcome. For numerical independent variables, the OR indicates the expected change in this chance for every one-unit increase in the independent variable. For categorical independent variables, the OR should be interpreted based on the reference category: the OR indicates the change observed in the chance when the participant belongs to that category *versus* when they belong to the reference category.

The Teaching Unit's Research Ethics Committee approved the project, opinion no. 5.55577.350 of August 11, 2022, which was conducted following the national and international ethics standards and resolutions guiding research with human beings.

RESULTS

Of the 432 participants, 355 (82.35%) were male, 376 (87.04%) self-declared black, 206 (47.69%) had completed higher education, and 354 (81.94%) lived with a partner. The averages were 39.31 years old, a monthly income of 6.09 minimum wages, 3.28 people surviving on this monthly income, and R$4,596.41 (US$882.2) in monthly expenditures.

According to the IPAQ classification, in the section on physical activity at work, active behavior predominated 149 (34.49%), followed by insufficiently active 160 (37.04%). In the section on physical activity as a means of transportation, there was

a higher proportion of police officers classified as insufficiently active, 183 (42.36%), followed by sedentary officers, 181 (41.90%).

Concerning physical activity at home, 167 (38.66%) were active, followed by 111 (25.69%) insufficiently active. In the leisure, sport, and exercise section, police officers were proportionally classified as active 125 (28.94%), followed by insufficiently active 123 (28.47%).

The indicator with the highest proportion of police officers classified as sedentary was time spent sitting: 357 (82.64%). Table 1 shows the physical activity indicators of military police officers according to the cut-off point established by the IPAQ.

Table 1. Classification of physical activity, according to the IPAQ Questionnaire, in different everyday situations. n = 432. Feira de Santana, BA, Brazil, 2022

Variable	n (%)
IPAQ Work (n = 432)	
Sedentary	86 (19.91)
Insufficiently active	160 (37.04)
Active	149 (34.49)
Very active	37 (8.56)
IPAQ Transportation (n = 432)*	
Sedentary	181 (c)
Insufficiently active	183 (42.36)
Active	68 (15.74)
IPAQ Home (n = 432)	
Sedentary	82 (18.98)
Insufficiently active	111 (25.69)
Active	167 (38.66)
Very active	72 (16.67)
IPAQ Leisure (n = 432)	
Sedentary	111 (25.69)
Insufficiently active	123 (28.47)
Active	125 (28.94)
Very active	73 (16.90)
Time spent sitting (n = 432)	
Sedentary	357 (82.64)
Non-sedentary	75 (17.36)

Legend: *There were no classified as very active in this section.
Source: The authors (2022).

Table 2 shows the factors associated with the IPAQ in the work section, where there was a predominance of females with insufficiently active behavior, 29 (40.85%), and this relationship was statistically significant (< 0.001).

The median age for sedentary behavior was 41,50 years. As for race/color, non-black participants were 24 (42.86%) active. The education level of the head of the household had a median of 5.00 (4.00–5.00) for sedentary behavior. As for marital status, participants without a partner were classified as insufficiently active, 33 (42.31%).

Table 2. Factors associated with IPAQ Work. n = 432. Feira de Santana, BA, Brazil, 2022

Variable independent	Sedentary (n = 86)	Active insufficiency (n = 160)	Active (n = 149)	Very active (n = 37)	P	ES
Gender					< 0.001[1]	-0.226
Female	27 (38.03)	29 (40.85)	12 (16.90)	3 (4.23)		
Male	59 (16.34)	131 (36.29)	137 (37.95)	34 (9.42)		
Age					0.008[2]	-0.127
Median (Q1 - Q3)	41.50 (37.00 - 46.00)	39.00 (34.00 - 44.00)	39.00 (33.00 - 45.00)	38.00 (30.00 - 42.00)		
Race/color					0.835[1]	0.010
Non-black	10 (17.86)	20 (35.71)	24 (42.86)	2 (3.57)		
Black	76 (20.21)	140 (37.23)	125 (33.24)	35 (9.31)		
Education level of the family head					0.559[2]	-0.028
Median (Q1 - Q3)	5.00 (4.00 - 5.00)	4.00 (4.00 - 5.00)	4.00 (4.00 - 5.00)	4.00 (4.00 - 5.00)		
Monthly family income					0.775[2]	0.014
Median (Q1 - Q3)	5.00 (4.00 - 7.75)	5.00 (4.00 - 7.00)	5.00 (4.00 - 6.00)	5.00 (4.00 - 8.00)		
Number of people who depend on income					0.860[2]	0.009
Median (Q1 - Q3)	3.00 (2.00 - 4.00)	3.00 (2.00 - 4.00)	3.00 (2.00 - 4.00)	3.00 (2.00 - 4.00)		
Monthly expenses					0.559[2]	0.028
Median (Q1 - Q3)	4000.00 (3000.00 - 5000.00)	4000.00 (3000.00 - 5000.00)	4000.00 (3000.00 - 5500.00)	4000.00 (3000.00 - 5000.00)		
Marital status					0.560[1]	0.028
With a partner	71 (20.06)	127 (35.88)	125 (35.31)	31 (8.76)		
Without a partner	15 (19.23)	33 (42.31)	24 (30.77)	6 (7.69)		

Legend: 1. Mann-Whitney test; 2. Spearman correlation test; 3. Kruskal-Wallis test; ES = Effect size. The effect sizes were calculated: r, for the Mann-Whitney test; $\eta^2_{[H]}$, for the Kruskal-Wallis test; Correlation coefficient (ρ), for the Spearman correlation test.
Source: The authors (2022).

The ordinal logistic regression model indicated that only gender was a factor statistically associated with the IPAQ Work classification. Since the odds ratio (OR) for males exceeded 1, these results suggest that individuals in this group were more likely than females to belong to IPAQ categories, in other words, to fall into the active and very active classifications. These results are detailed in Table 3.

Table 3. Ordinal logistic regression model with IPAQ Work as the dependent variable. n = 432. Feira de Santana, BA, Brazil, 2022

Independent variable	OR	95%CI	P
Gender			
Female	-----	-----	
Male	3,111	1,901; 5,133	< 0,001
Age	0,984	0,958; 1,010	0,219

Legend: OR = Odds Ratio. CI = confidence interval.
Source: The authors (2022).

DISCUSSION

The investigation's results indicated that the gender variable was statistically significant for the outcome, considering that men were classified as more active than women. A study carried out in Paraíba with military police officers also found a predominance of men in the group investigated, pointing to a lack of equality between women and men in the military's operational service, whether due to the demand for or supply of local competition vacancies[3].

An experimental, single-group educational intervention study carried out with 58 police officers in Iran showed significant results for men. Almost 25.0% of the participants who were not physically active at the start of the study increased their physical activity above or beyond the healthy threshold after the 5-week intervention and follow-up three months after the end of the intervention[6].

Considering these data, it is essential to highlight the reduced opportunity for operational service for female military personnel. Most of them are responsible for administrative services within the corps, spending most of their time in front of computers. In addition, there has always been a considerable difference in the number of vacancies between the sexes in police competitions. Men are entitled to most of the vacancies[2].

This domination of men in filling vacancies in the military police force is a historical and characteristic aspect. Therefore, a long journey is needed to rebuild new paradigms that allow for the equal distribution of vacancies between men and women in competitive examinations, not only for administrative services but also for operational ones[3].

The exhaustion caused by the routine activities of military police officers can compromise their mental and physical health, and, in general, women are more prone to professional stress. All the devaluation that women suffer worldwide influences the stressed behavior of this target audience, leaving them constantly alert to the risks and threats in their professional performance, causing threats to physical activity and maintaining active behavior at different times of the service, transportation, and leisure. This aspect can influence less active behavior in the work environment[3].

Another point is the social roles imposed on men and women, plus the low value and pay in the profession. Many police officers resort to double shifts as an extra income option for their families. When they get home, women are faced with being mothers and housewives, and dedication to the family contributes to care(less) and improving their lifestyle[15].

Military corporations require police troops to be physically fit for their missions. Still, the work environment involves a lot of physical and mental tension due to long shifts, rigorous discipline within a hierarchical system, high stress caused by professional involvement in risky police interventions, and the habit of sitting for long periods in work vehicles. All these aspects of military police work contribute to physical inactivity. Police officers who do not exercise are very susceptible to health risk factors arising from a lifestyle incompatible with a healthy one[16-17].

In a cross-sectional study of 108 military police officers in Acre, 59.3% of the participants were classified as inactive or insufficiently active[16]. In another survey of military police officers in Cuiabá, 47.3% were considered insufficiently active[16-17]. These findings are similar to those observed in the present study and concern scholars looking into this issue, as they commonly show that military police officers have a deficit in physical activity and are inactive or insufficiently active[16].

It should be emphasized that the results should be interpreted with caution, limiting the extrapolation of data that tends to overestimate or underestimate the sample. This is a vulnerable group, with data collected in a single Regional Policing Command in a city in the interior of Bahia, in northeastern Brazil.

At the same time, the originality of this research is noteworthy, as it is the first to verify the association between sociodemographic variables and the IPAQ in military police officers. There is still a lack of literature directly related to the objective of this study, which did not allow for greater depth and comparison with other realities. The results of this research should be interpreted with caution, as they only present the local characteristics of the military police officers studied, limiting the extrapolation of the data.

CONCLUSION

Analysis of the results indicated that gender was the only factor statistically associated with the IPAQ classification in the work section. Males had higher chances of physical fitness than females in the IPAQ work category.

Hopefully, this study will contribute to a new look at public policies to propose health education strategies to encourage active and more active physical activity, as well as new research that addresses gender issues, sociodemographic factors, and lifestyles of this critical group of workers.

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Role of Authors:
Substantial contributions to the conception or design of the work; or the acquisition, analysis, or interpretation of data for the work - **Oliveira CCRB, Coelho ACC, Pires CGS.** Drafting the work or revising it critically for important intellectual content - **Oliveira CCRB, Carneiro BR, Santos ISC, Marinho CS, Silva EP, Coelho ACC, Pires CGS.** Agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved - **Oliveira CCRB, Pires CGS.** All authors approved the final version of the text.

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The authors have no conflicts of interest to declare.