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Lifestyle indicators of operational and administrative military police officers: A comparative and correlational study

Indicadores de estilo de vida de policiais militares operacionais e administrativos: Estudo comparativo e correlacional

Indicadores de estilo de vida de policías militares operativos y administrativos: Estudio comparativo y correlacional

Short title: Military police lifestyle indicators.

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ABSTRACT

Military police activity is a dangerous, stressful occupation that poses health risks. Nutritional habits, physical activity, body composition and perceived stress, in addition to being interrelated, influence components of professional performance, such as work motivation, general self-efficacy and absenteeism. The objective was to compare nutritional habits, physical activity, body mass index and perceived stress of military police officers working in operational and administrative services, of both sexes, and to investigate the correlation between these variables. The Mann-Whitney U test was used for the comparative analysis and, for the correlational study, the Pearson correlation coefficient. Perceived stress and physical activity were inversely correlated (r=-0.268; p<0.001). Nutritional habits correlated significantly: with physical activity (r=0.381; p<0.001), directly; and, conversely, body mass index (r=0.256; p<0.001) and perceived stress (r=-0.201; p<0.01). Military police officers from the operational service had significantly higher body mass index (U=3695; p<0.001) and physical activity (U=3776; p<0.001) than their counterparts from the administrative service. Men had significantly higher body mass index (U=1333; p<0.001) and physical activity (U=2205; p<0.01) than women, who had significantly higher stress levels than men (U=1927; p<0.001). The correlations and significant differences observed point to the need to implement personnel and health management policies aimed at improving the lifestyle, body composition and stress of military police officers. Study limitations and future directions are discussed.

Keywords: nutritional habits; physical activity; body composition; stress; military police.

RESUMO

A atividade policial militar é uma ocupação perigosa, estressante e que impõe riscos à saúde. Os hábitos nutricionais, atividade física, composição corporal e estresse percebido, além de relacionarem-se entre si, influenciam componentes do desempenho profissional, tais como motivação para o trabalho, autoeficácia geral e absenteísmo. O objetivo deste estudo foi comparar hábitos nutricionais, atividade física, índice de massa corporal e estresse percebido de policiais militares que atuam no serviço operacional e administrativo, de ambos os sexos, e investigar a correlação entre essas variáveis. Utilizou-se o teste U de Mann-Whitney para a análise comparativa e, para o estudo correlacional, o coeficiente de correlação de Pearson. O estresse percebido e a atividade física correlacionaram-se inversamente (r=-0,268; p<0,001). Os hábitos nutricionais correlacionaram-se significativamente: à atividade física (r=0,381; p<0,001), diretamente; e, inversamente, ao índice de massa corporal (r=0,256; p<0,001) e ao estresse percebido (r=-0,201; p<0,01). Policiais militares do serviço operacional apresentaram índice de massa corporal (U=3695; p<0,001) e atividade física (U=3776; p<0,001) significativamente superiores aos seus congêneres do serviço administrativo. Homens apresentaram índice de massa corporal (U=1333; p<0,001) e atividade física (U=2205; p<0,01) significativamente superiores aos das mulheres, as quais apresentaram níveis de estresse significativamente superiores aos dos homens (U=1927; p<0,001). As correlações e diferenças significativas observadas alertam para a necessidade de implementação de políticas de gestão de pessoal e de saúde voltadas à melhoria do estilo de vida, da composição corporal e do estresse de policiais militares. São discutidas limitações do estudo e direções futuras.

Palavras-chave: hábitos nutricionais; atividade física; composição corporal; estresse; policial militar.

RESUMEN

La actividad de la policía militar es una ocupación peligrosa y estresante que presenta riesgos para la salud. Hábitos alimentarios, actividad física, composición corporal y estrés percibido, además de estar interrelacionados, influyen en componentes del desempeño profesional, como motivación para el trabajo, autoeficacia general y ausentismo. El objetivo fue comparar hábitos nutricionales, actividad física, índice de masa corporal y estrés percibido de policías militares que trabajan en servicios operativos y administrativos, de ambos sexos, e investigar la correlación entre estas variables. Para el análisis comparativo se utilizó la prueba U de Mann-Whitney y, para el estudio correlacional, el coeficiente de correlación de Pearson. Estrés percibido y actividad física se correlacionaron inversamente (r=-0,268; p<0,001). Hábitos nutricionales correlacionaron significativamente: con actividad física (r=0,381; p<0,001), directamente; y, por el contrario, con índice de masa corporal (r=0,256; p<0,001) y estrés percibido (r=-0,201; p<0,01). Los policías militares del servicio operativo presentaron índice de masa corporal (U=3695; p<0,001) y actividad física (U=3776; p<0,001) significativamente mayores que sus homólogos del servicio administrativo. Hombres tenían un índice de masa corporal significativamente mayor (U=1333; p<0,001) y actividad física (U=2205; p<0,01) que las mujeres, quienes tenían niveles de estrés significativamente más altos que los hombres (U=1927; p<0,001). Las correlaciones y diferencias significativas observadas apuntan a necesidad de implementar políticas de gestión de personal y salud dirigidas a mejorar el estilo de vida, composición corporal y estrés de los policías militares. Se discuten limitaciones del estudio y direcciones futuras.

Palabras clave: hábitos nutricionales; actividad física; composición corporal; estrés; policía militar.

Police work can include multiple responsibilities, ranging from physically engaging with violent individuals to sedentary administrative work (Kukic et al., 2020; Vuković et al., 2020). Policing is characterized by situations of risk, stress, and physical demands. These risks include crowd control, physical violence, accidents, robberies, armed confrontations, and the constant state of alertness (Sousa et al., 2021). The main factors that determine the effectiveness and reliability of the operational functions and tasks performed by police officers are good health and the maintenance of a high level of psychophysical fitness (Anyżewska et al., 2022). These depend mainly on adequate nutrition, physical activity, and mental health. Alongside operational police officers, logistical and administrative activities, although less physically demanding, can be stressful and harmful to health (Itacarambi et al., 2019; Kukic et al., 2018; Li et al., 2019).

Police officers have a high prevalence of cardiovascular risk factors, especially associated with indicators of quality of life, such as dietary habits, level of physical activity, body composition, and stress (Almeida & Chaves, 2020; Kukic et al., 2018; Magnavita et al., 2018; Marins et al., 2019; Queirós et al., 2020; Valmari et al., 2022). Recently, the debate on lifestyle and professional performance has intensified, with emphasis on police organizations (Valmari, 2022; Valmari et al., 2022). Government and private campaigns focused on reducing alcohol consumption, anti-smoking, regularity of physical activity, and promoting healthy eating reinforce the relevance of individual lifestyle. In this sense, individual lifestyle is an important factor for maintaining health, preventing diseases, and prolonging longevity (Arena et al., 2017; Dishman et al., 2021; Portes, 2011; Wadden et al., 2020).

According to the World Health Organization, lifestyle is "the set of habits and customs that are influenced, modified, encouraged, or inhibited by the prolonged process of socialization [...] and that cause consequences for health" (Madeira et al., 2018, p. 109). Madeira et al. (2018) adds that a healthy lifestyle is characterized as a set of individual behaviors capable of favoring health, understood as an eminently biological phenomenon. It has long been known that having good health does not mean mere absence of disease but rather a state of complete physical, mental, and social well-being (World Health Organization, 2010). To achieve this state, a balanced diet, regular exercise, reduction of excesses, and rest are essential (World Health Organization, 2010). Thus, this study elected nutritional habits (NH), physical activity (PA), body mass index (BMI), and perceived stress (PS) as indicators of individual lifestyle. To do so, their interrelationship was considered, as well as their influence on quality of life, readiness for work, motivation, and professional performance, especially among public safety professionals.

Proper nutrition improves health and performance, especially in activities with high physical demand, such as police work (Anyżewska et al., 2022). Basic principles of diet, such as balance and diversification, are essential in defining its quality, especially considering the poor habits observed among military police officers (Araújo & Cunha, 2021; Santos et al., 2021). It is known that diet quality, eating styles, and macronutrient balance influence body composition (Hsu et al., 2019; Medina-Remón et al., 2018).

A very low energy intake, for example, can lead to weight loss, especially related to muscle mass and bone density, which can negatively affect psychophysical performance, prolong recovery time, and increase the risk of injuries. On the other hand, an excessively high energy intake can cause weight gain and indirectly increase the risk of obesity, which can result in difficulties in fulfilling more strenuous tasks (Anyżewska et al., 2022). These imbalances can also be the reason for work absences due to health problems.

Public safety agents' activities are becoming increasingly sedentary worldwide, partly due to the increasing rates of cyber-crimes compared to street crimes (Buckingham et al., 2020; Kukic et al., 2020). In addition, police officers are generally more active on their days off than on duty (Marins et al., 2019; Ramey et al., 2014). Components of physical fitness, such as body composition and physical abilities, are of vital importance for police officers to perform their tasks effectively and with reduced risk of injury (Vuković et al., 2020). Sufficient physical activity, planned exercise, and healthy nutrition are related, for example, to reductions in body fat mass and increases in skeletal muscle mass percentage (Kukic et al., 2020).

A physically healthy lifestyle can mitigate health risks associated with police activity. This factor can improve individual well-being and enhance organizational benefits, such as reducing absenteeism and increasing productivity (Buckingham et al., 2020). It is known that poor motor fitness limits police performance and puts individual and collective safety at risk. However, there is increasing evidence that police officers' physical fitness is below the minimum recommendations, even for overall health (Marins et al., 2019; Valmari, 2022; Valmari et al., 2022).

The importance of maintaining an acceptable body composition by military police officers is fundamental. A healthy weight can influence the quality of health, reduce medical absences, and improve the confidence and self-image of police officers (Kukic et al., 2020; Magnavita et al., 2018; Reis et al., 2019). In addition, the activities performed by military police officers can have negative impacts, given the limitations of an obese body for the execution of complex tasks required. Therefore, it is essential that military police institutions establish

policies aimed at controlling and preventing overweight and obesity, as body fat is associated with the incidence of a series of chronic or degenerative diseases (Hsu et al., 2019).

BMI is one of the most widely used anthropometric measures in identifying individuals at metabolic risk. This is due to its ease of application, low cost, and little variation. This index is also widely used by health professionals in assessing nutritional status and risk of mortality, including among police officers (Kukic et al., 2018, 2019, 2020). In addition, the validity of self-reported BMI measures is highlighted, with numerous studies, including reviews and meta-analyses, pointing to high correlations ($r>0.9$) between self-reported and measured BMI (Davies et al., 2020; Ferriani et al., 2019; Hodge et al., 2020; Rubeis et al., 2019; Teixeira et al., 2021).

The absence from work due to illness and long-term incapacity, which was previously predominantly caused by musculoskeletal problems, now mostly originates from mental disorders (Harvey et al., 2017). The majority of mental illnesses observed are due to common psychiatric problems, such as depression, anxiety, and other stress-related conditions, which are usually treatable and, in some cases, preventable (Ermasova et al., 2020; Marinho et al., 2018; Queirós et al., 2020). Among police officers, the unique physical and mental demands resulting from frequent exposure to risk situations accentuate this scenario, making it one of the most stressful professions in developed countries (Purba & Demou, 2019).

Stress is a widely used term today and is a topic of interest for various organizations, including law enforcement agencies (Almeida & Chaves, 2020; Harvey et al., 2017; Morash et al., 2016; Purba & Demou, 2019). According to Tomiyama (2019, p. 704), stress is "a negative emotional experience accompanied by predictable biochemical, physiological, cognitive, and behavioral changes that are aimed at altering the stressful event or accommodating its effects." Some indicators of individual lifestyle are associated with stress, particularly eating habits (Łowiński et al., 2018; Matos & Ferreira, 2021; Tomiyama, 2019), physical activity (Baldwin et al., 2019; Schuch et al., 2019; Violant-Holz et al., 2020), and body composition (Kukic et al., 2018).

There is a vast national and international publication that investigates the lifestyle indicators of PA, HN, BMI, and EP and their influence on the professional performance and health of police officers, including military personnel. Silva et al. (2018), for example, verified the existence of significant differences in body composition and health risk between physically active and inactive military police officers. The study included 42 male military police officers, with a mean age of 42.5 years. BMI and waist, hip, and abdominal circumferences were

measured. The results showed significantly higher values for all measures in physically inactive military police officers.

Barbosa et al. (2018), in turn, evaluated the anthropometric and dietary profile of 94 military police officers. The authors used nutritional evaluation and food frequency questionnaires. It was found that 83% were overweight, and 36.2% presented cardiovascular risk, among which 18 had increased risk. It was found that 73.4% eat fruits up to twice a day, and 59.6% consume up to two servings of vegetables per day. Only 6.5% have more than five meals a day, and 80.4% consumed soft drinks. The authors concluded that the quality-of-life indicators of these military police officers were below the recommended, indicating the need for greater investment in nutritional education.

In another study, Brazilian researchers (Santos et al., 2021) evaluated the nutritional profile and eating habits of military police officers in the city of Uberaba/MG/Brazil. The study included 117 military police officers, of both sexes, from administrative and operational scales. Questionnaires were used to collect socio-economic data, clinical characteristics, physical activity, anthropometric data, and habits. The nutritional profile was evaluated based on BMI and waist circumference (CC) classification ranges. The results showed that 68% of the participants were overweight. There was a higher prevalence of abdominal fat among male military police officers (71.83%). A positive correlation was observed between BMI and CC. The majority of the participants had low consumption of nutritionally adequate foods. In addition, physical activity was insufficient. The researchers concluded that all groups studied need additional health care and guidance.

Itacarambi et al. (2019) investigated the level of physical exercise practice and body composition of military police officers in the state of Goiás/Brazil. Operational (n=15) and administrative (n=15) military police officers participated in the study. A sociodemographic questionnaire was used, which evaluated, among other data, the level of physical activity practiced; bioimpedance, which measured percentages of body fat, muscle mass, and visceral mass; BMI; and waist-to-hip ratio (WHR). In bioimpedance, 36% of administrative military police officers had a bad or very bad percentage of body fat, as opposed to 60% of operational officers. It was found that 80% of operational military police officers had BMI in the overweight or obese range, while 53% of those in the administrative sector had a weight above the recommended level. Between 70 and 80% of the evaluated police officers were in the moderate to high-risk range for coronary diseases regarding their WHR. Regarding the level of physical exercise practice, 80 and 90% of military police officers in both groups reported practicing physical activity. The authors concluded that there is a need for inclusion of physical exercise

programs in both groups, with guidance and monitoring by a physical education professional to prevent overweight and obesity among police officers.

Oliveira and Nascimento (2020) analyzed the sociodemographic, clinical, and anthropometric profile of military police officers in the operational service of the metropolitan region of Belém. The study collected personal, clinical, and anthropometric data, using bioimpedance. 299 military police officers participated in the study. Excessive work hours, low pay, high alcohol consumption (53.67%), difficulty sleeping (28.19%), unhealthy eating habits (47.06%), untreated reported illnesses (72.26%), overweight (50.17%), obesity (27.09%), above-normal body fat percentage (82.27%), and high cardiovascular risk (55.85%) were observed. The authors concluded that there is a need for health prevention and promotion services in the institution to improve the quality of life of police officers.

Gonçalves Oliveira et al. (2021) sought to identify whether occupational stress of specialized military police officers is associated with quality of life. 298 military police officers from three municipalities in Bahia participated, with a mean age of 39.3 (SD=10.6). A sociodemographic questionnaire, a questionnaire on quality of life at work, and psychosocial aspects at work were used. The results showed that 54.4% of the police officers had low psychological demands at work, and 54.0% had low control over their work. Regarding quality of life at work, 41.6% of the military police officers reported dissatisfaction, and in the demand-control model, military police officers with active work, passive work, and high demand had, respectively, 1.88, 2.02, and 2.65 times higher prevalence of job dissatisfaction compared to those with low demand. The researchers concluded that there is an association between occupational stress and quality of life at work, compromising the physical and mental health of police officers, which may interfere with the work of specialized service police officers.

From these reports, it is clear that physical activity (PA), nutritional habits (NH), body mass index (BMI), and perceived stress (PS) are related to the performance of work activities and the health of security professionals. However, despite the extensive literature, no studies were found that, in the context of public safety, correlated PA, NH, BMI, and PS or, in relation to these variables, compared operational service police officers with administrative ones.

Knowledge about the inferences related to PA, NH, BMI, and PS in the military police context can alert to the existence of possible health risk factors for these professionals, as well as assist in the strategic decision-making regarding the best personnel and health management policies. Therefore, the general objective of this research was to compare PA, NH, BMI, and PS of male and female military police officers who work in operational and administrative

services, and investigate the correlation between these dependent variables. To achieve this, three specific objectives were defined, which structure the research design:

Specific Objective 1. Verify the correlation between PA, NH, BMI, and PS of military police officers who work in operational or administrative services.

Specific Objective 2. Verify if there are differences between military police officers who work in operational or administrative services in relation to PA, NH, BMI, and PS.

Specific Objective 3. Verify if there are differences between male and female military police officers in relation to PA, NH, BMI, and PS.

METHOD

Design

This is a quantitative, exploratory, and cross-sectional study (Hernández-Sampieri & Torres, 2018; Shaughnessy et al., 2015). Objective 1 used a correlational design. Objectives 2 and 3 were addressed by a 2x4 factorial design, in which the independent variables were service type (ST; operational and administrative) and gender (female and male). The dependent variables were PA, NH, BMI, and PS.

Participants

The study included 204 military police officers from the Military Police of the Federal District, with 88 (43.14%) serving in operational service and 116 (56.86%) in administrative service. The age of the military police officers ranged from 25 to 54 years (M = 40.66 and SD = 5.22), with the majority being male (n = 168; 82.35%). The participants had between 1 and 33 years of service (M = 14.5 and SD = 7.04). Of the operational area participants, 4 (4.55%) were female and 84 (95.45%) were male, with an average age of 39.72 (SD = 5.32) and average service time of 12.86 (SD = 7.27). Regarding the administrative area participants, 32 (27.59%) were female and 84 (72.41%) were male, with an average age of 40.85 (SD = 5.12) and average service time of 15.78 (SD = 7.26). Of the total, 52 (25.49%) were officers and 152 (74.51%) were enlisted.

Instruments

Three instruments were used: a sociodemographic questionnaire with questions about age, gender, service time, rank, type of service performed (operational or administrative), weight, and height; the AF and HN factors of the Individual Lifestyle Profile Scale (Both et al., 2008); and the Perceived Stress Scale (Machado et al., 2014), adapted for Brazilian university students by Luft et al. (2007).

Individual Lifestyle Profile Scale

Two of the five factors assessed by the ILPS were used: HN, with three items (for example, "Your daily diet includes at least 5 servings of fruits and vegetables"); and AF, with three items (for example, "At least twice a week you perform exercises that involve muscle strength and stretching"). The study that adapted this instrument for the Brazilian adult population (Both et al., 2008) used a sample of 1606 physical education teachers.

The results of the factorial analysis, when considering the five factors, confirmed that: the instrument presents adequate internal consistency (α=0.78), that the questions are associated with their respective components (*r* between 0.45 and 0.57), and that the items address different indicators of the investigated dimensions (explained variability of 58.65%). Therefore, this is a reliable psychometric instrument for evaluating the lifestyle of people who have characteristics similar to the participants in this study.

Perceived Stress Scale

The Perceived Stress Scale (Machado et al., 2014) has 10 items (for example, "Have you been feeling sad because of something unexpected that happened?", "Have you been able to control your irritations in life?" and "Have you been able to control the way you spend your time?") and is one of the most widely used instruments to assess stress perception worldwide, with validation studies in over 20 countries (Remor, 2006).

This scale assesses "the individual's perception of how unpredictable and uncontrollable the life events experienced in the last month seem to them" (Machado et al., 2014, p. 39). Exploratory factorial analysis indicated a unifactorial solution, in which the items have adequate factor loads. The retained factor explains 67% of the common variance of the scores, and the internal consistency was good (α=0.80), providing evidence of the validity of this psychometric instrument (Machado et al., 2014).

Procedures

Initially, the research project was submitted for approval to the command of the Military Police Academy of Brasília. After its approval, contacts were made with military police units from PMDF, with the objective of presenting the project and inviting them to participate. Data collection was carried out virtually, using an online platform (Google Forms), and was preceded by the signing of the Informed Consent Form by the participating military police officers.

Data Analysis

Descriptive and inferential analyses were performed using the SPSS package version 28.0 (Harrison et al., 2021). The Mann-Whitney U test was used for comparative analysis, given the non-parametric nature of the data (Stewart, 2022). The findings of the comparative analysis

were supported by the Student's t-test (Mishra, Singh, et al., 2019). Normality of data was evaluated using Kolmogorov-Smirnov and Shapiro-Wilk tests and the assumption of variance homogeneity was tested using the Levene test (Mishra, Pandey, et al., 2019).

Bootstrap procedures were performed (Dwivedi et al., 2017) in order to obtain greater reliability of results, to correct deviations from normality in the sample distribution and differences in group sizes, and also to provide a 95% confidence interval for the differences between means. The Pearson Correlation Coefficient was used to assess the correlation between the dependent variables in this study (Stewart, 2022).

RESULTS AND DISCUSSION

Focusing on the objectivity and organization of the findings, the presentation of the results and their respective discussion will be carried out in detail, based on the specific objectives designed. Thus, it is expected to provide the reader with a better understanding of the results and conclusions of this research.

Initially, descriptive information about the participants' sociodemographic characteristics, PA, NH, BMI, and PS will be presented. This will provide an overall picture of these data, supporting the interpretation of the inferential results that will follow in the subsequent specific objectives. Table 1 presents the descriptive data (arithmetic mean [*AM*] and standard deviation [*SD*]) related to the variables of age, length of service (LS), BMI, NH, PA, and EP.

Table 1 - General descriptive statistics

Groups	*n*	Age	*LS*	*BMI*	*NH*	*PA*	*EP*
		AM (*SD*)	*AM* (*SD*)	*AM* (*SD*)	*AM* (*SD*)	*AM* (*SD*)	*AM* (*SD*)
General	204	40.4 (5.2)	14.5 (7.0)	26.6 (3.5)	2.51 (0.7)	2.63 (1.1)	1.71 (0.7)
Administrative	116	40.8 (5.1)	15.7 (7.3)	25.9 (3.3)	2.47 (0.75)	2.41 (1.02)	1.76 (0.65)
Operational	88	39.7 (5.3)	12.9 (6.4)	27.6 (3.6)	2.57 (0.71)	2.92 (1.02)	1.65 (0.65)
Female	36	39.1 (5.2)	13.3 (7.1)	23.9 (2.8)	2.69 (0.69)	2.12 (1.33)	2.09 (0.71)
Male	168	40.6 (5.1)	14.8 (7.0)	27.2 (3.4)	2.47 (0.74)	2.74 (1.07)	1.63 (0.62)

Source: Own authorship.

When viewing the results presented in Table 1, we found that the variables age and service time are very similar among the groups defined by type of activity and sex, which minimizes possible sample biases in the comparative and correlational studies that were developed in the subsequent objectives.

The first specific objective of this research was to verify the correlation between PA, NH, BMI, and PS of military police officers who work in operational or administrative service. The results are presented in Table 2. Although the tests did not confirm the assumption of normality, a parametric test was chosen to be used. This decision was motivated by the absence of relevant discrepancies in the results of Spearman's correlation, as well as the greater use of Pearson's correlation in research.

Table 2 - Pearson correlation matrix

	Age	*LS*	*BMI*	*NH*	*PA*	*PS*
Age	—					
LS	0.826*	—				
BMI	0.206**	0.200**	—			
NH	-0.126	-0.117	-0.256*	—		
PA	-0.065	-0.092	-0.164***	0.381*	—	
PS	-0.154***	-0.105	-0.079	-0.201**	-0.268*	—

Note. Significant for *p<0.001; **p<0.01; ***p<0.05.

Source: Own authorship.

Numerous significant correlations were found. In this section, we chose to report and discuss only relationships with a significance level greater than 99.0% and a weak correlation coefficient (r>0.20). Therefore, the following correlations stand out:

Significant Correlation 1. PS and reported physical activity are correlated (r=-0.268; p<0.001), reaffirming the inverse relationship between these variables reported in numerous studies (Chan et al., 2019; Dogra et al., 2018; McDowell et al., 2019; Violant-Holz et al., 2020). That is, the more physical activity, the less PS. Finding this inference in a sample of military police officers emphasizes the importance of police institutions valuing the practice of physical activity for their men and women, not only for the improvement of work capacity but also for the maintenance and improvement of physical and mental health.

Significant Correlation 2. NH are related to physical activity (r=0.381; p<0.001). As expected, higher physical activity is related to better NH. This was the strongest correlation found in the study, which was not surprising given the strong relationship of these two variables with personal choice for healthy habits. After all, it is natural that people who choose a physically austere life begin with these two valences (Borges et al., 2019; Nascimento et al., 2022; Sampaio et al., 2018).

Significant Correlation 3. NH are also related to BMI (r=-0.256; p<0.001). As common sense suggests, better NH indicates lower BMIs. This belief is confirmed in numerous studies (Cena & Calder, 2020; Ma et al., 2020; Medina-Remón et al., 2018). Considering the relationship between high body mass index and the risk of chronic diseases (Tomiyama, 2019), the observation of this correlation in a sample of military police officers raises an alert. Military police institutions, among their health policies and personnel management, should value food education as a policy to improve the quality of their staff.

Significant Correlation 4. NH are inversely related to PS (r=-0.201; p<0.01). The result indicates that, for the investigated sample, better NH are related to lower PS, which is supported by numerous empirical findings (Bremner et al., 2020; Christofaro et al., 2022; Godos et al., 2020; Lang et al., 2015; Ljungberg et al., 2020). In this sense, this inference substantiates an institutional approach to military police stress that considers health policies focused on the troop's food education.

Significant correlation 5. BMI is positively related to age (r=0.206; p<0.01) and length of service (r=0.200; p<0.01). Therefore, higher BMIs are found in older and more experienced military police officers. The positive relationship between BMI and age is widely reported in the literature (Davies et al., 2020; Ferriani et al., 2019; Kukic et al., 2019) and therefore not surprising. In this sense, it is important that the health policies of military police institutions consider the aging factor in the increase of obesity, as well as associated risks.

In summary, this stage of the research provides important information for the health policy of public security institutions, especially in light of the risks associated with sedentary lifestyle, stress, and obesity. It is important to emphasize the relevance of PA, HN, BMI, and PS in the quality of work, as well as the association of these variables with each other. The confirmation of these already recognized inferences in a large sample of military police officers clarifies understanding in the field and provides support for the high-level decisions of police institutions.

The second specific objective of this study was to verify if there are differences between military police officers who work in operational or administrative services regarding PA, NH, BMI, and PS. The results are presented in Table 3. As the data do not assume the normality assumption, a non-parametric comparative test (Mann-Whitney U test) was used. The results of the Student's t-test were also reported in parallel, given its greater use in research, but no relevant discrepancies were observed, except for the violation of the homogeneity assumption observed in the comparative testing of the PA and length of service (LS) variables.

Table 3 - Mann-Whitney U test for operational and administrative military police officers

	U-Test	*p*	*T-Test*	*gl*	*p*
BMI	3695	< .001*	-3.436	202	< .001*
NH	4683	0.309	-0.996	202	0.320
PA	3776	0.001*	-3.248[a]	202	0.001*
PS	4750	0.396	1.147	202	0.253
Age	4568	0.198	1.546	202	0.124
LS	4240	0.036***	2.986[a]	202	0.003**

Note. Significant for *p<0.001; **p<0.01; ***p<0.05. [a] The Levene's test is significant (p < 0.05), suggesting a violation of the assumption of homogeneity of variances.

Source: Author's own work.

To complement this comparative analysis, please refer to Table 3. The two significant differences observed between military police officers in administrative and operational service were:

Significant Difference 1. With a significance level of 99.9%, the body mass index (BMI) of military police officers working in operational service (*AM*=27.55, *SD*=3.561) was significantly higher than those working in administrative service (*AM*=25.89, *SD*=3.309).

Significant Difference 2. With a significance level of 95.0% (99.0% in the Student's t-test), the reported physical activity (PA) by military police officers working in operational service (*AM*=2.92, *SD*=1.022) was significantly higher than those working in administrative service (*AM*=2.41, *SD*=1.186).

It should be noted that although perceived stress was numerically higher among administrative military police officers, it was not significantly different between the groups. No significant difference was also observed in the reported nutritional habits, despite a numerical difference that suggests better quality of diet among military police officers in operational service.

Furthermore, the fact that military police officers in operational service are both more massive and more physically active may seem counterintuitive at first. As no studies with similar designs were found, it is not possible to compare the results of this study with those found in the literature. However, when the reported physical activity of strength training was separately observed, a significant superiority was found for the operational group, which may explain the higher average BMI.

Moreover, distortions related to the distribution of women in the two groups may constitute a sample bias. To clarify this possibility, a new analysis was performed, unrelated to the initially defined objectives, in which women were excluded. The results showed that male officers in operational service maintained higher BMI (p<0.05) and PA (p<0.05) compared to those in administrative service. Additionally, operational officers reported greater strength training exercise practice compared to administrative officers (p<0.10). This eliminated the possibility of the sample bias previously suggested.

In the third specific objective, it was verified whether there are differences between male and female military police officers regarding PA, NH, BMI, and PS. The results are presented in Table 6. The analysis options are the same as reported in the previous subsection.

Table 4 - Mann-Whitney U test for male and female military police officers

	U-Test	*p*	*T-Test*	*gl*	*p*
BMI	1333	< .001*	-5.42	202	< .001*
NH	2505	0.103	1.64	202	0.103
PA	2205	0.010**	-3.02	202	0.003**
PS	1927	< .001*	3.98[a]	202	< .001*
Age	2454	0.075	-1.55	202	0.122
LS	2455	0.073	-1.20	202	0.233

Note. Significant at *p<0.001; **p<0.01; ***p<0.05. The Levene's test is significant (p<0.05), suggesting a violation of the homogeneity of variances assumption.

Source: Own authorship.

Significant differences were observed in three of the investigated variables. These differences are:

Significant Difference 3. With 99.9% significance, the body mass index (BMI) of male military police officers (*AM*=27.19; *SD*=33.385) was significantly higher than that of females (*AM*=23.91; *SD*=2.772). These findings are consistent with the literature (Kukic et al., 2019; Reis et al., 2019), which has observed higher BMIs in male military police officers compared to their female counterparts.

Significant Difference 4. With 99.0% significance, the physical activity reported by male military police officers (*AM*=2.74; *SD*=1.073) was significantly higher than that of females (*AM*=2.12; *SD*=1.331). No empirical reports were found comparing male and female military police officers in terms of physical activity.

Significant Difference 5. With 99.9% significance, the perceived stress of female military police officers (*AM*=2.09; *SD*=0.712) was significantly higher than that of males (*AM*=1.63; *SD*=0.616). This finding contradicts studies that show higher stress among men (Norvell et al., 1993) or that find no differences (Angehrn et al., 2022). However, some studies have found higher levels of stress among women (Bonner & Brimhall, 2021; Marinho et al., 2018). In any case, it is concerning to note that even though they predominantly work in administrative positions, women have higher levels of perceived stress, although they report better health habits (not significant) and BMI.

Although numerically better among female military police officers, nutritional habits did not differ significantly between the groups. The same inference suggested in the previous subsection makes sense when discussing the higher BMI of men, as they practice more strength exercises than women ($p<0.001$). In addition, the low number of women in the sample may have compromised the comparative results between operational and administrative military police officers. This is because the majority of the 36 investigated women are in administrative positions (*n*=32).

FINAL CONSIDERATIONS

The presentation of the main outcomes of this research was divided into three subsections. In the first one, the main conclusions of the study are presented, linking them to the three specific objectives. Then, theoretical, methodological and practical implications are discussed. Finally, future directions are suggested, in which recommendations for new research and management actions for the Military Police of the Federal District are made.

Considering the general objective of this study, it is concluded that the PA, NH, BMI e PS of military police officers are correlated and there are significant differences in these variables between male and female officers and between operational and administrative services. This conclusion can be better understood by structuring it based on the specific objectives designed for this research. The main conclusions related to Specific Objective 1 were:

(a) The PS and self-reported PA have a statistically significant inverse correlation, meaning that higher AF is associated with lower PS. This result highlights the importance of police institutions valuing physical activity for their staff to improve work capacity and maintain and improve physical and mental health.

(b) NH is significantly related to self-reported PA, with higher PA indicating better NH. It is expected that people with physically austere lifestyles would seek out these two valences.

(c) NH is also significantly related to BMI. As high body mass index is associated with an increased risk of chronic diseases (Tomiyama, 2019), this correlation in a sample of military police officers suggests that military police institutions, among their health policies, should include education on quality nutrition for their staff.

(d) NH is inversely related to PS (with statistical significance), meaning that better NH is associated with lower PS. This reaffirms the need for institutional action to address military police stress, which should consider health policies directed at nutritional education.

(e) BMI is positively related to age (r= 0.206) and length of service (r=0.200), with a significance of 99.0%. Therefore, higher BMIs are found in older and longer-serving military police officers. The positive relationship between BMI and age is widely reported in the literature and, therefore, is not surprising. In this sense, it is important that health policies of military police institutions consider the aging factor in the elevation of obesity risk, as well as other associated risks.

Regarding Specific Objective 2, the main conclusions were:

(a) The BMI of military police officers working in operational service was significantly higher than those working in administrative service.

(b) Reported physical activity levels of military police officers working in operational service were significantly higher than those working in administrative service (*AM*=2.41; *SD*=1.186).

(c) Although numerically higher in administrative military police officers, PS did not show significant differences between groups.

(d) No significant difference was observed in reported NH, despite a numerical difference suggesting better food quality among military police officers in operational service.

The conclusions arising from Specific Objective 3 are:

(a) The BMI of male military police officers was significantly higher than that of women.

(b) The reported physical activity of male military police officers was significantly higher than that of women.

(c) The perceived stress level of female military police officers was significantly higher than that of men. It is concerning to note that, even though they predominantly work in administrative roles, women have higher levels of perceived stress, despite having better NH (not significant) and BMI.

(d) Although numerically better among female military police officers, NH did not differ significantly between the groups.

Among the methodological implications of this research, the possible methodological approach for conducting psychological and health research involving the investigation of health variables in military police institutions stands out. Regarding the practical implications of this research, the significant correlations and differences observed suggest that military police forces need to urgently institute personnel and health management policies to improve physical activity (AF), nutrition (HN), body mass index (IMC), and perceived stress (EP).

Despite being a complex, comprehensive, and up-to-date design, there is still much to be done to increase the quality of information on the topic of this research. Thus, among the main limitations associated with this study, the following stand out: (a) a sample size and representativeness lower than intended, although sufficient; (b) the absence of investigation of validity evidence through structural equation modeling or item response theory of the scales used; (c) imbalance between the quantities of military police officers who work in operational and administrative services, as well as between the sample sizes of male and female individuals; (d) the use of a cross-sectional and retrospective design. Given these limitations, it is suggested that future research:

(a) Replicate this study with larger and more representative samples from military police institutions, considering, for example, geographical region, to verify if the inferences found are characteristic of the groups and not of local idiosyncrasies.

(b) Use other psychometric instruments that evaluate the constructs of this research.

(c) Investigate the validity evidence of the scales used for the military police audience.

(d) Conduct qualitative studies on the constructs evaluated in this research, involving interviews with military police officers and observation in their work environments.

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AUTHORSHIP CONTRIBUTION

The authors of this manuscript have made significant contributions to the research presented. We adhere to the guidelines of the Contributor Roles Taxonomy (CReditT) to describe the specific roles of each author in the following categories:

- Conceptualization: Gabriel Jorge, Diogo Aguiar, Thiago Nascimento, and Rebeca Brito contributed to the conception and design of the study.
- Data Curation: Paulo Alves and Francisco Macedo were responsible for managing and curating the data used in the analysis.
- Formal Analysis: Paulo Alves and Francisco Macedo performed the statistical analysis and provided technical support.
- Investigation: Gabriel Jorge, Diogo Aguiar and Rebeca Brito collected the data.
- Methodology: Gabriel Jorge, Diogo Aguiar, Thiago Nascimento and Francisco Macedo developed the methodology used in this study.
- Project Administration: Gabriel Jorge oversaw the overall project administration.
- Supervision: Gabriel Jorge supervised the research activities and provided guidance to all authors.
- Validation: Gabriel Jorge, Thiago Nascimento and Rebeca Brito validated the research findings.
- Writing - Original Draft: Gabriel Jorge wrote the initial draft of the manuscript.

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We confirm that all authors have read and approved the final version of this manuscript, and we believe that each author's contributions have been appropriately recognized and represented.

CONFLICT OF INTERESTS

We declare that we have no conflict of interest regarding the research presented in this manuscript. We confirm that there is no financial or personal relationship with other people or organizations that could inappropriately influence or bias our work. All sources of funding for this research have been disclosed in the manuscript.

We acknowledge that it is our responsibility to disclose any potential conflicts of interest that could be perceived as having an influence on the results or interpretation of my research. We also affirm that the manuscript represents an honest and accurate account of the research and that we have adhered to all ethical guidelines and principles of research.

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