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Original article

Correlation between training frequency and mood status of street runners: transversal study

Correlação entre a frequência de treinamento e o estado humor de corredores de rua: estudo transversal

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ABSTRACT

Introduction: This study investigates the correlation between training frequency and mood in street runners. It highlights the growing popularity of street running and its benefits for physical and mental health. **Methods:** A cross-sectional study was carried out using an online questionnaire to collect socio-demographic data, information on sports practice and mood assessment using the Brunel Mood Scale (BRUMS). Statistical analysis, conducted in SPSS 25, with data described as mean ± standard deviation. **Results:** The results of the research indicate that the frequency of training showed no significant correlation with improvement in mood. **Conclusion:** This study highlights the importance of mental health care to optimize sports performance and suggests the need for further studies to gain a more comprehensive understanding of these dynamics.

Keywords: street running; sport; mood.

RESUMO

Introdução: Este estudo investiga a correlação entre frequência de treinamento e o estado de humor em praticantes de corrida de rua. Destaca-se a crescente popularidade da corrida de rua e seus benefícios para a saúde física e mental. **Métodos:** Foi realizado um estudo de natureza transversal, empregando questionário online para coletar dados sociodemográficos, informações sobre a prática esportiva e avaliação do estado de humor por meio da Escala de Humor de Brunel (BRUMS). A análise estatística, conduzida no SPSS 25, tendo os dados descritos como média ± desvio padrão. **Resultados:** Os resultados da pesquisa apontam que a frequência de treinamento não demonstrou correlação significativa com a melhoria no estado de humor. **Conclusão:** Destaca-se a importância do cuidado com a saúde mental para otimizar o desempenho esportivo e sugere-se a necessidade de estudos adicionais para uma compreensão mais abrangente dessas dinâmicas.

Palavras-chave: corrida de rua; esporte; humor.

Introduction

Human beings are inherently active creatures, adapted both biomechanically and physiologically for engaging in physical movement [1] and in current contemporary society, physical activity is increasingly recognized for its numerous health benefits, evident in the gyms, squares, parks, clubs, avenues and people from all ages exercising [2]. Published studies have established the efficacy of physical education in preventing and promoting health by reducing the incidence of chronic degenerative disease (CCD) [3] such as heart disease, high blood pressure [5], non-insulin-dependent diabetes (NIDDM) [6], among others.

According to World Athletics the street race - Pedestrianism events - are defined as these contested on street, avenues and roads circuits, with official distances ranging from 5 km to 100 km. Street racing has gained an increasing number of enthusiasts and practitioners worldwide. According to data from the Brazilian Confederation of Athletics (CBAt) it has shown significant growth in Brazil in recent years. In 2019, approximately 6 thousand road races were held in the country, with over 5.5 million participants, transforming it into one of the most practiced sports in the country, with million people participating [7].

Street running has been associated with a variety of mood-related benefits, improving self-esteem, weight control and stress reduction, reinforces the relevance of physical activity while improving quality of life, along with improvements in mental health [8]. One of the main reasons in which the road race can have a positive impact on the state of humor is due to the release of endorphins, chemical substances produced by the brain which help reduce the pain and increase well-being [9]. Additionally, physical exercise can also help reduce the stress hormones produced, such as cortisol, and increase neurotransmitters, including serotonin, which are associated with happiness [10].

Training with the correct frequency is crucial for the development of physical and technical skills, such as maintaining physical fitness, considering that the effectiveness of the training process is intrinsically associated with detailed observation of internal load. Various indicators can be used to analyze this load, such as hormonal profile (specifically testosterone/cortisol ratio), concentration of metabolites (lactate and ammonia), heart rate patterns (HR) and subjective perception of effort (SPE) [11].

Humor represents a transit emotional or affective state, subject to temporary and non-lastings variations, resulting from the experiences and individual emotions [12]. Concerning to elements as tension, depression, anger, strength, fatigue and confusion, mood plays a significant role in the performance of runners, since the specific characteristics of the are intrinsically linked to each of these factors.

The choice of the topic was due to the possible relevance between the frequency of regular street running and mood status of these runners. The understating and analysis of these humor status turns into an useful tool for predicting the influence

on street running practice. Hence, the purpose of this research is to analyze the correlation of the training frequency and the humor status of street runners, taking into debate training characteristics, such as the practical frequency and distance covered.

Methods

A cross-section study was conducted using an online platform (Google Forms), from May 22nd to August 20th, 2023. After formillation the online form, the research was promoted by the social media platforms(Facebook, Instagram e WhatsApp), communities and running groups, inviting street runners from all over Brazil who met the inclusion criteria to participate. Before filling out the form, a short instruction was provided containing information about the research objective, benefits, contributions and the estimated time required to complete the form (approximately 10 minutes).

Individuals who expressed interests in participating in the research provided online informed "I agree with the terms" . To gather data, a sociodemographic questionnaire was developed by the authors, which includes questions about age, gender, education, height, weight (used to calculate each individual's body mass index [IMC]); street running practice profile (training duration, experience time, daily and weekly distance covered); questions regarding to strength training practices (if performed and in with frequency). Additionally, the Brunel Mood Scale (BRUMS) was employed, containing inquiries about the mood state of the participants.

Participants

The participants were selected through non-probabilistic and convenience sampling. The population consisted of both men and women. The eligibility criteria for the study included individuals who started sport practice more than six months ago, with a weekly frequency of at least or superior to 3 times a week, and a minimum age of 18 years old, for both genders. The exclusion criteria included individuals who practiced the sport for less than 6 months or had a weekly frequency of less than 3 times a week, those using medications for anxiety and stress control and those who did not agree to respond to the questionnaire .

Instruments

The method employed for data collection consisted of using the Brunel Mood Scale (BRUMS), in its Brazilian adaptation called Brazil Mood Scale (BDM). The BRUMS, as validated in a previous study [13], has been recognized as an appropriate instrument to evaluate humor profiles, standing out the conciseness of the scale, which facilitates the data collection in research contexts. This assessment tool is destined to measure the emotional state of individuals in various situations. The BRUMS consists of 24 items and subscales, each representing a word or sentence describing a specific emotional state [14]. Each subscale includes 4 items with a Likert scale (Nothing = 0; A little = 1; Moderately = 2; Quite a bit = 3; Extremely = 4). After filling all the

blanks, these variables become a set of items in six assessment subscales, covering *anger (7,11,19,22), fatigue (4,8,10,21), depression (5,6,12,16), tension (1,13,14,18) and mental confusion (3,9,17,24)* are categorized as a negative mood, while vigor is considered a positive factor (2,15,20,23), with the sum of each factor's response yielding a score that can range from 0 to 16 [15].

Statistical analysis

Characterizing the sample, descriptive statistics (average and standard deviation) were employed. The statistical analysis was conducted by the SPSS (Statistical Package for Social Science), version 25. After assessing the normality of the data through the Shapiro-Wilk test, a Spearman test was used to correlate the variables. The level of statistical significance was set at 5%.

Ethical considerations

The current study was approved by the Research Ethics Committee (CEP) of the State University of Minas Gerais (UEMG) - Divinópolis Unit (opinion 6.019.997). Participants agreed with the terms of the Free and Informed Consent Form (FICF) according to the National Health Council (NHC) 466/12 for research involving human subjects.

Results

Information regarding the participant selection process of the research, including inclusion criteria, confirmed eligibility, and final analysis value are presented in Figure 1.
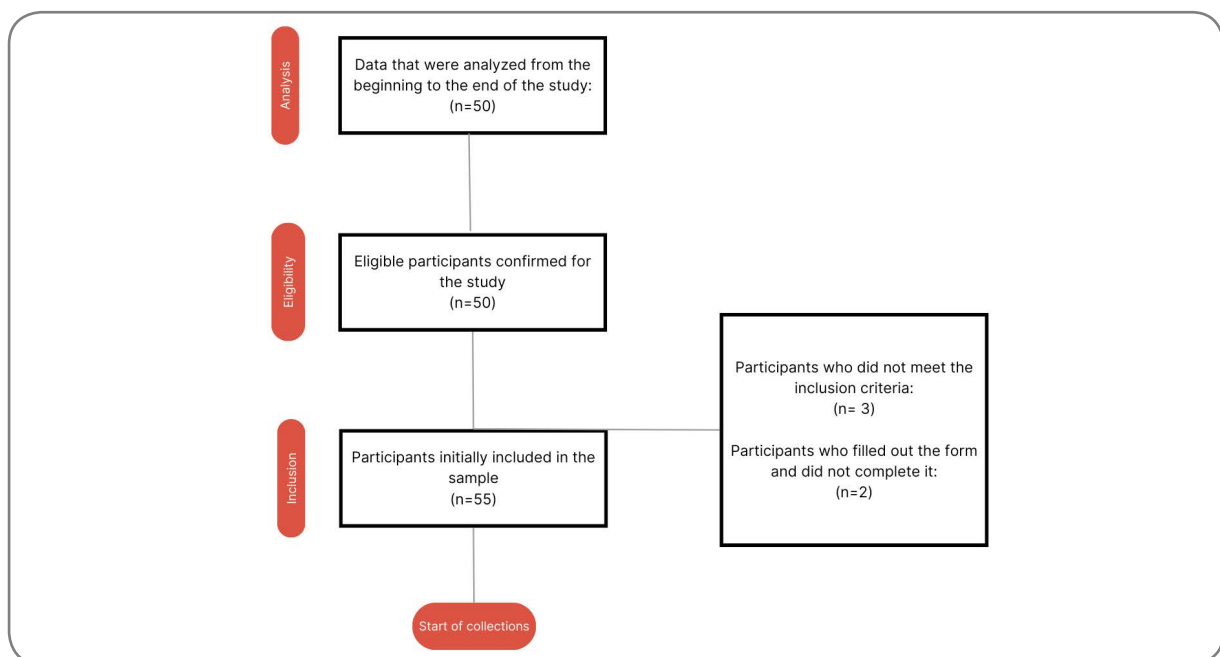
Source: Authors based on the result of the research.
Figure 1 - Flowchart (adapted) of the participant selection process

Considering the sociodemographic data collected in the present study, mean values ± standard deviations of the main characteristics of the participants were obtained. The sample consisted of the voluntary participation of a total 50 road streets, with 32 (64%) men and 18 (36%) women. The mean age of the sample was 39.22 (± 10.98) years, with their characteristic described in Table I. The participants have a high level of education, with (74%) having completed higher education and (26%) completing high school.

Table I - Profile characterization of the participant's profile

Characteristics	Female Mean ± SD	Male Mean ± SD	Total Mean ± SD
Age (years)	41 ± 11	38 ± 10.84	39 ± 10.98
Hight (cm)	162.5 ± 7	175 ± 6.25	1.71 ± 0.09
Wheight (kg)	57.5 ± 7	77.25 ± 10	70 ± 13.10
BMI (kg/m²)	21 ± 2	24.4 ± 3.15	23.81 ± 3.12
Exercise per week (n)	3.2 ± 0.95	3.9 ± 1.34	3.7 ± 1.24
Daily range (km)	7.3 ± 3.3	7.87 ± 4.1	7.6 ± 3.8
Weekly range (km)	23.8 ± 9.53	32.46 ± 14.25	29.3 ± 13
Training average duration (min)	201 ± 96.94	188 ± 117.48	193 ± 109.67

Source: authors based on the result of the research; BMI = body mass index; SD= standard deviation.

In table II it can be observed from the results obtained in the research that the subscale "vigor" stands out among others, presenting higher values (9,66 ± 3,39). This subscale characterizes states of energy, alertness, enthusiasm and willingness. Manifesting through feelings of excitement, willingness and physical energy, the vigor inverse relationship with other factors [14].

Table II - Relative values to Brunel Mood Scale (BRUMS)

	Mean	SD
Tension	3.26	2.99
Depression	2.0	2.68
Anger	2.12	2.66
Vigor	9.66	3.39
Fatigue	4.6	3.37
Confusion	2.18	2.50

Source: Authors based on the result of the research; SD= standard deviation.

In general, there is a low level of depression and anger, and slightly elevated levels of tension and fatigue. The vigor, the only positive variable, was high, as shown in the graph in Figure 2.
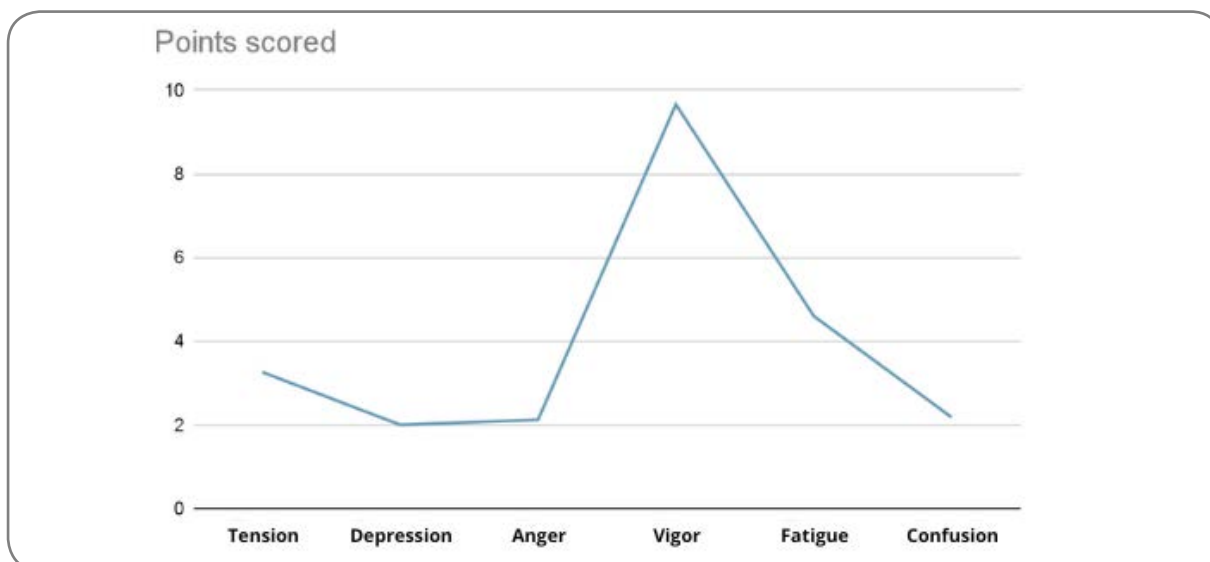
Source: Authors based on the result of the research
Figure 2 - Graphical Profile of the Mood State in the sample

As for the analysis in Table III, which shows the correlation between the humor status of participants and the frequency of training, no statistically significant results were identified ($p > 0,05$). This finding suggests that there is no statistically significant difference between the humor status of the participants and the frequency of their treatment sessions.

Table III - Correlation between the training frequency and the humor status

Scale	Spearman rho	p
Tension	0.197	0.171
Depression	0.127	0.378
Anger	0.105	0.467
Vigor	0.167	0.245
Fatigue	-0.087	0.546
Confusion	0.192	0.181

Source: Authors based on the result of the research

Discussion

The objective of the current study was to analyze the correlation between training frequency and the mood state of street runners. However, statistically significant correlations were not found between mood scales and the frequency of training sessions ($p > 0,05$). The results obtained in this present study indicate that the training load component "frequency" does not influence the mood states when analyzed separately from the other training load components (intensity, duration, volume, and density).

According to Rohlfs *et al.* [14] studies on the use of the Brunel Mood Scale (BRUMS) to estimate the mood state of athletes, they found that the BRUMS was sensitive and reliable in assessing mood states related to sports performance.

When analyzed individually, the variables of the Brunel Mood Scale (BRUMS) present significant data for the analysis of the mood state of the research participants. The results obtained indicate a profile characterized by a high lever of vigor and low levels in the other dimensions. These findings align with the literature, as studies conducted with athletes have shown higher value factors for the Vigor compared to other aspects.

Morgan *et al.* [16] and Morgan [17] found that, in general, athletes tend to show higher levels of vigor compared to other mood dimensions (tension, depression, confusion, fatigue, and anger).

The analysis presented emphasizes that the mood profile described in the literature, such as the concept of the "iceberg profile," referring to a mood state characterized by high vigor and low levels of other variables, is considered ideal for an athlete to achieve optimal sports performance [18]. For runners, maintaining a positive mood marked by high vigor and low levels of fatigue and tension can be beneficial during training [9]. On the other hand, a profile opposite to the iceberg, characterized by low vigor and high levels of fatigue, tension, anger, confusion, and depression, is considered a "depressed mood state" [19,20].

A previous study conducted by Rotta *et al.* [21] aimed to evaluate the applicability of the BRUMS instrument in analyzing mood states in high-performance athletes. The research involved the participation of 128 athletes. The results indicated that the "Vigor" factor stood out compared to the other factors, revealing a positive mood profile. These findings are in line with the results of the present study.

The relationship between overweight/obesity and elevated body mass index (BMI) values, of which 34% of the sample exhibits, may influence greater adherence to street running and the mood state of practitioners. According to Salgado and Mikhail [22], engaging in street running can be motivated by various interests, ranging from the pursuit of health and body aesthetics to social integration, the need to escape the stress of modern life, and the desire to engage in enjoyable or competitive activities. It is relevant to highlight that regular physical activity, combined with a healthy diet, becomes a powerful ally in the weight loss process [23].

Elements associated with effective mental preparation, such as self-confidence, attention, positive visualization, and concentration, play a crucial role in maintaining appropriate emotional states during training. The individuality of each athlete, along with factors like personality, coping style, and emotional preferences, plays an important role in determining which emotional profile is most suitable. As a result, it is essential to tailor the approach to the specific needs of each runner and the demands of different phases of training and competition. Considering the impact of training on mood, coaches can design training programs that optimize both physical and psychological well-being. Additionally, runners may be more aware of the potential benefits of regular training for mood and use running as a tool to enhance overall mood and mental health.

Conclusion

Based on the results obtained in this research, it can be concluded that the variable vigor maintains a direct relationship with a positive mood status in athletes. The attention for the mental and emotional health of these road runners has the potential of influencing the sports performance, leading to both positive and negative impacts. Regular monitoring of the mood state can be valuable in the identification of athletes whose need breaks or professional assistance, particularly those exhibiting songs of severe depression, extreme fatigue and low levels of vigor.

Therefore, the need for further studies on the topic is considered relevant, which explores the relationship between mood and distinctive profiles of road runners and their respective training methods, to provide a more comprehensive and innovative interpretation of different results obtained.

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