NORMATIVE VALUES OF STRENGTH IN ADULTS AGED 18 TO 24 YEARS

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SUMMARY

Objective: The study aims to establish normative values for handgrip strength in the right and left hands of Brazilian adults of both sexes aged between 18 and 24 years. Material and Methods: A total of 41,591 subjects were evaluated, with a frequency of 23,931 women and 17,660 men, with an average age of 21.33 ± 1.99 years, a body mass of 69.38 ± 15.97 kg, and a height of 168.5 ± 9.2 cm, respectively; they were subjected to the manual pressure strength test using the hydraulic dynamometer "Force" provided by Tera Science, through secondary data provided by the aforementioned company. Results: The results show that women had a strength of 24.24 ± 5.44 kgf in the left hand and 25.99 ± 5.56 kgf in the right hand, while men obtained 39.68 ± 8.96 kgf in the left hand and 41.95 ± 9.29 kgf in the right hand. Conclusion: This study provides an initial contribution to the normative values of handgrip strength in the Brazilian population aged between 18 and 24 years.

Keywords: Brazilian population; strength; dynamometry.

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Introduction

Handgrip strength (HGS) is an essential indicator of muscular health and can reflect an individual's overall health status (AMARAL et al., 2019). Studies have shown that handgrip strength is associated with various factors, such as: body composition, bone mineral density (BMD), laboratory indicators (total cholesterol and triglycerides), better athletic performance, as well as quality of life in different populations (BASSO, 2023; BENASSI et al., 2020; DAVEBIDA et al., 2022; SILVA et al., 2021). Moreover, handgrip strength has been used as a parameter to assess overall muscle strength, being correlated with the strength of the lower and upper limbs (CASTRO, 2021; SANTOS et al., 2019; TAVARES et al., 2020). FPM has been the subject of research among various populations (MUTALIB et al., 2024; WANG et al., 2018), of different ages (TAVARES et al., 2020), and between genders (DODDS et al., 2022). However, there is no consensus on the values of the Brazilian population, and the studies do not have a robust sample that can demonstrate the real values of this society.

Finally, the normative values of a population are essential, as they allow for the comparison and evaluation of an individual's performance or condition in relation to the average of the group to which they belong (MUTALIB et al., 2024). Therefore, the study aims to establish normative values for grip strength in the right and left hands of Brazilian adults of both sexes aged between 18 and 24 years.

Methodology

The present study, characterized by the cross-sectional analysis of secondary data, is provided in partnership between the Evangelical University of Goiás and the company Tera Science. The data ensure ethical guidelines and the integrity of the research, as well as the protection of participants' rights, who are identified only by numerical codes.

The Manual Pressure Force (MPF) data were measured by the Portable Digital Force Dynamometer in kilograms force (Kgf) with a force precision of 90 kgf. The Force device receives the data that is sent via Bluetooth to the computer or cell phone screen, and its data is stored in the company's data clouds.

The sample consisted of 41,591 subjects, aged between 18 and 24 years. Of this total, 23,931 are female and 17,660 are male. In percentages, it represents 57.5%

women and 42.5% men. Detailed description of ages and frequency. Table 1 presents the quality of subjects by sex, age, and dominant side of strength.

Table 1. Number of subjects by sex, age, and dominance; absolute frequency and percentages

		Frequencia absoluta (n)	Porcentagem (%)
Sexo	Feminino	23931	57,5%
	Masculino	17660	42,5%
	Total	41591	100,0%
Idade	18	4661	11,2%
	19	4883	11,7%
	20	5418	13,0%
	21	5862	14,1%
	22	6131	14,7%
	23	7006	16,8%
	24	7630	18,3%
	Total	41591	100,0%
Dominância	Esquerdo	3259	7,8%
	Direito	38332	92,2%
	Total	41591	100,0%

Results

The characteristics of the sample are presented in Table 2.

Table 2. Characterizations of subjects aged between 18 and 24 years, mean and standard deviation.

Idade		Estatura		Massa Corporal	
Média	Desvio padrão	Média	Desvio padrão	Média	Desvio padrão
21	2	168,5	9,2	69,38	15,97

The characteristics of the sample, and their respective manual grip strengths of the left and right hands stratified by sex, according to Table 3.

Table 3. Characterization and stratification of left and right hand strength by sex.

Idade		Estatura		Massa Corporal	
Média	Desvio padrão	Média	Desvio padrão	Média	Desvio padrão
21	2	168,5	9,2	69,38	15,97

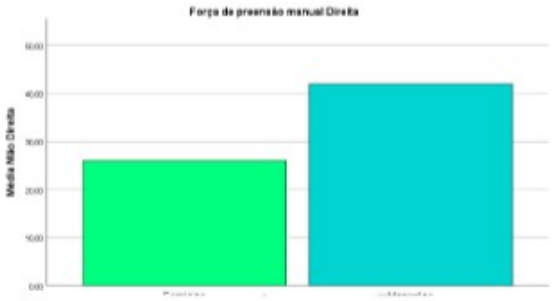
Results of left and right hand strength, with average values and standard deviation, determining the reference values for the Brazilian population aged between 18 and 24 years. As shown in Table 4.

Table 4. Normative values of left and right hand strength of the Brazilian population aged between 18 and 24 years.

		Mão Esquerda		Mão Direita	
		Média	Desvio padrão	Média	Desvio padrão
sex	F	24,24	5,44	25,99	5,56
	M	39,68	8,96	41,95	9,29

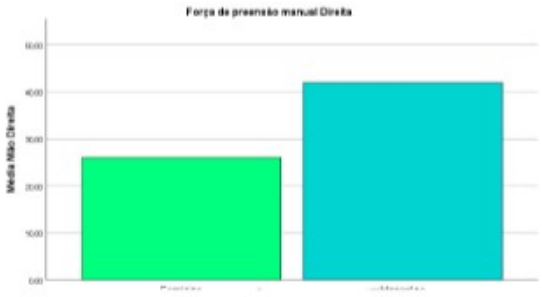
Next, the data is presented in graphs with the absolute results of left-hand strength by sex. I followed Graph 1.

Graph 1. Left hand grip strength.



Presentation of the data in graphs with the absolute results of right-hand strength by sex. I followed Graph 2.

Graph 2. Handgrip strength right hand.



Conclusion

This study provided a contribution with the normative values of FMP for the Brazilian population aged 18 to 24, being relevant for health professionals, as it allows for comparison and evaluation of the performance of the individual condition or the population to which the research group belongs.

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