

COMPARISON OF BODY MASS INDEX (BMI), BEFORE AND POST COVID-19, ACROSS DIFFERENT AGE GROUPS IN THE POPULATION OF NORTHEAST PORTUGAL

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INTRODUCTION

Over the last few decades, there has been a significant increase in obesity levels, particularly developed countries. This rise primarily reflects changes in dietary patterns, the rise of sedentary lifestyles, and socioeconomic factors. The Body Mass Index (BMI) has been a widely used parameter with the intention of evaluating body fat at any age (1,2). Although it's not the most rigorous method (3), it has the advantage of being easy to calculate and having many records available. In Portugal, there has also been an increase in the prevalence of obesity and overweight in recent years (4). The pandemic period (COVID-19), which lasted approximately 2 years (2020 and 2021), led to lifestyle changes for many people, often resulting in a notable decrease in physical activity. How has this period affected the BMI of these specific population?

AIM

• Aim: The aim of the study was to assess the progress of BMI across different age groups and compare BMI values obtained in the year 2019 (pre-COVID-19) with the year 2022 (post-COVID-19).

• Research Questions:

- Was a widespread increase in BMI observed across different age groups of the Portuguese population, associated with the "COVID period"? In which age groups were the most significant changes observed? Are there pronounced differences in BMI values among different age groups?

RESULTS

The comparison of BMI values between 2019 and 2022 in different age groups showed no significant changes, except for under 10 years old group ($t = 2.88$; $\Delta = 0.34$; $p = 0.004$).

Therefore, we analysed the distribution of BMI values in 2022. There was a significant progressive increase for young individuals in 2022 [$F(3) = 79.60$, $p > 0.001$, $\eta^2 = 0.33$]. Also, a significant increase was verified for adults up to 80 years in 2022 [$F(3) = 55.60$, $p > 0.001$, $\eta^2 = 0.02$] (Table 1). The age group of over 79 years showed a decrease in the average BMI compared to the previous age group ($\Delta = -1.35$ kg/m²). In young individuals, BMI values were within the normal range, while in adults, they were above 25 and below 30 (overweight). BMI increased continuously across different age groups up to 79 years, and from 80 years, there was a decrease compared to the previous age group.

Table 1. The BMI values, for the year 2022, demonstrate a significant increase across all age groups from 10 years old to 79 years old. It's interesting to note that from the age of 80 onwards, the BMI decreases compared to the previous age group, approaching the values found for the 20 to 39 years old age group.

Age group (years old)	n by group	BMI - average (kg/m ²)	sd	
< 10	1050	16.7	2.9	
Young	10~13	20.5	4.6	
	14~16	20.9	5.2	
	17~19	175	22.9	4.5
Adults	20~39	1338	26.0	5.4
	40~59	2363	27.5	4.2
	60~79	3276	27.8	4.5
	80 or +	870	26.4	4.3

Subtitles: BMI – Body Mass Index.; n – number; sd – standard deviation.

METHOD

The data were collected from patients' clinical records of 22,911 individuals of both sexes (0-98 years) from two healthcare centres. The age groups were as follows: under 10 years old, 10-13 years old, 14-16 years old, 17-19 years old, 20-39 years old, 40-59 years old, 60-79 years old, and 80 years old. BMI values were interpreted underweight (<18.5 kg/m²), normal (18–25 kg/m²), overweight (25–30 kg/m²), and obesity (≥ 30 kg/m²). For statistical analysis, a one-way analysis of variance (ANOVA) were tested to identify differences between age groups. Eta square (η^2) were computed for effect size and interpreted as: $0 < \eta^2 \leq 0.04$, without effect; $0.04 < \eta^2 \leq 0.25$, minimum; $0.25 < \eta^2 \leq 0.64$, moderate; and $\eta^2 > 0.64$, strong (Hopkins et al., 2009). Data was presented as the mean \pm one standard deviation (SD). All statistical analyses were conducted using SPSS for Windows Version 22.0 (SPSS Inc., Chicago, IL, USA).

CONCLUSIONS

- We did not find significant changes in BMI values in the studied population when comparing the year 2019 with the year 2022. Therefore, it seems that the Covid-19 pandemic period did not affect those values.
- The comparison of BMI values across different age groups revealed that the average values increase significantly with age, up to 80 years old. Beyond 80 years of age, there was a decrease in BMI, approaching values similar to the age group of 20 to 39 years old.
- Despite BMI values increasing across age groups, they do not exceed 27.5 kg/m². These figures are close to others found in the Portuguese population.

ACKNOWLEDGEMENT

This study is a result of the project "GreenHealth - Digital strategies in biological assets to improve well-being and promote green health" (Norte-01-0145-FEDER-000042), supported by North Portugal Regional Operational Programme (NORTE 2020), under the PORTUGAL 2020 Partnership Agreement, through the European Regional Development Fund (ERDF)".

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