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IMPACT OF RESTRICTIVE MEASURES DUE TO THE COVID-19 PANDEMIC ON THE BODY MASS INDEX OF ADOLESCENTS OF THE FEDERAL DISTRICT

Henrique Ramalho de Araújo Lemos Vieira
Centro Universitário de Brasília - UniCEUB
Brasília - DF
http://lattes.cnpq.br/6150218353034849
https://orcid.org/0000-0003-4800-7730

Eduardo Salloum Filho
Centro Universitário de Brasília - UniCEUB
Brasília - DF
http://lattes.cnpq.br/1477546370917210
https://orcid.org/0000-0002-6726-9675

Andrea Duarte Nascimento Jácomo
Centro Universitário de Brasília - UniCEUB
Brasília - DF
http://lattes.cnpq.br/6478285996621234

Abstract: Adolescence is a period of life in which changes occur, not only bodily, but also psychologically, socially, behaviorally and culturally. This is a population at risk for several pathologies, including obesity, of which it is estimated that 32% to 59% are overweight or obese. In 2019, with the appearance of the Sars-Cov-2 virus, a new risk factor for the development of obesity in this public emerged, as there were important changes in lifestyle, resulting from social isolation, such as diet, exercise practices physical activity, hours of sleep, substance use and psychiatric disorders. The objective of this study was to analyze the increase in the prevalence of obesity in adolescence induced by factors related to social isolation during the COVID-19 pandemic period through quantitative and comparative analyzes in the studied population, in order to identify the main risk factors for obesity related to this period. This study was carried out by completing electronic forms by adolescents aged 10 to 19 years, which were disseminated through the placement of banners in public places with a large flow of adolescents, in addition to active search, and the results were analyzed through of worksheets and graphs. Among the results found, the participants in 2020 were 20.7% overweight, 8.7% obese and 2% severely obese. overweight, 6% obesity and 1.3% severe obesity. It is concluded that, despite the high prevalence of overweight in the evaluated population, in this research there was no considerable increase due to the conditions of the COVID-19 pandemic, and a slight reduction in these rates was even observed. However, there have been significant lifestyle changes that can lead to future health problems.

Keywords: Teenagers; Body mass index; Obesity; COVID-19; Federal District;

INTRODUCTION

Adolescence is comprised between the ages of 10 and 19 years according to the Ministry of Health (MS) and the World Health Organization (WHO)[1,2,3]. It consists of a period of life in which changes occur, not only bodily, but also psychological, social, behavioral and cultural[2,4]. For this reason, it becomes a heterogeneous social group that must have comprehensive and differentiated health care[4].

In Brazil, according to a survey by the National Health Surveillance Agency (ANVISA), carried out in 2017, it was estimated that about 32% to 59% of the adult population is overweight or obese[5]. In 2021, among young people, about 22 to 25% have such characteristics and between 5 and 19 years old, the prevalence of overweight ranged from 8.4% to 21.8% in the female public and from 8.7% to 21, 8% in male[6].

Obesity is a global health concern due to its alarming incidence and its evolution in non-transmissible chronic degenerative diseases (NCDs), such as arterial hypertension, cardiovascular diseases, type 2 diabetes mellitus, negative impact on the immune response due to inflammation, in addition to increase the risk for cardio metabolic pathologies in adult life[2,7]. Its etiology is multifactorial and may be associated with genetic, prenatal, metabolic, nutritional, psychosocial, environmental, informational, economic and lifestyle factors[2,8,9,10,11].

Adding to the increase in the worldwide incidence of obesity, there was the emergence of the new variant of the coronavirus, SARS-COV-2, in 2019. One of the complications of COVID-19 is the severe and acute forms of respiratory distress syndrome. Even with containment measures, the virus has spread globally. In March 2020, WHO declared a pandemic, advised countries on containment measures such as active surveillance,

early detection, isolation and contact management[1,12,13,14,15,16]. Decrees and laws were created in each country to prevent the spread of the virus, non-essential services were closed and social isolation was proposed. However, such measures had consequences, not only for the economy, but also abrupt changes in the traditional lifestyle of the population[17,18] in terms of physical and psychological well-being[19,20.]

As a result of such measures, a worsening of eating habits was observed[21,22,23], increase in sedentary rates[24,25,26], worsens in social relationships[19,20], in sleep habits[13] and increased use of alcohol and tobacco[17,21,27]. These alterations were related to a reduction in the performance of daily activities, higher rates of obesity, chronic non-communicable diseases, anxiety disorder and depression[4,19,29,30,31,32,33,34].

This way, the period of the pandemic has had an impact on the health of society in general, but mainly on the younger public, such as adolescents, who need social contact and routine for their healthy development to occur in this age group. critical phase of building physical and socio-emotional characters as they make the transition from childhood to adulthood[19,20,28].

METHOD

The research was carried out by the Scientific Initiation Program by medical students after being accepted by the Research Ethics Committee (CAAE 51344121.6.0000.0023) approved on November 4, 2021.

This is a descriptive, observational, quantitative, cross-sectional study carried out from August 2021 to July 2022, using a digital form made on the google forms platform and containing the free and informed consent form for parents and guardians and the term of assent for adolescents. The way of dissemination was done by the researchers themselves through a banner in public places near public and private schools in different regions of the Federal District, for greater variability of samples.

The sample was of convenience, that is, the maximum number of adolescents willing to participate and who met the inclusion criteria, individuals between 10 and 19 years old and residents of the Federal District and exclusion, under 10 years old or over 19, people declared unable to complete the form, people with obesity or other chronic diseases before the pandemic, and those who did not know their anthropometric measurements.

The questionnaire was structured based on questions created by researchers from ``Universidade de Pavia``, Italy17 and by the study from the city of Sobral, Brazil[35]. All participants were informed about the study objectives, procedures, possible risks, as well as the benefits of the study, and were only included after agreeing to the Free and Informed Consent Form (TCLE).

Analyzes were performed using the Statistical Package for the Social Sciences (IBM SPSS, IBM Corporation, Armonk, NY, USA, 25.0). The Shapiro-Wilk test was used to verify the normal distribution of data. Descriptive analysis was used to calculate descriptive measures (mean, standard deviation, minimum and maximum values), absolute and relative frequency. To compare the variables according to the moment (Before Pandemic x Currently), the Wilcoxon test was used (numerical variables, the McNemar test (dichotomous categorical variables), the Friedman ANOVA test for ranks of related samples (non-dichotomous categorical variables). For comparison between genders (Female x Male), the chi-square test or Fisher's exact test / likelihood ratio (count < 5) was used. Bonferroni post-hoc was applied to variables with significant difference: 05) as significance.

RESULTS

150 adolescents participated in this study, 103 female and 47 male. Most of the sample had completed high school (31.3%), do not currently work (92.0%) and did not test positive for COVID-19 (75.3%). There was a higher prevalence of males with complete secondary education (p = 0.006) and a lower prevalence of incomplete secondary education (p = 0.005) in relation to females. For proportions of work and COVID testing, no significant differences were demonstrated between genders.

		Gender		
	Total (n=150)	**Female (n=103)**	**Male (n=47)**	
	n (%)	**n (%)**	**n (%)**	**p-value**
Schooling				**0,011**
Complete primary education	15 (10,0)	11 (10,7)	4 (8,5)	
Incomplete Elementary School	26 (17,3)	20 (19,4)	6 (12,8)	
Complete high school	47 (31,3)	25 (24,3)	22 (46,8)*	
Incomplete high school	38 (25,3)	33 (32,0)	5 (10,6) *	
Incomplete Higher Education	23 (15,3)	14 (13,6)	9 (19,1)	
No schooling	1 (0,7)	0 (0)	1 (2,1)	
Currently working				0,343[b]
Yes	12 (8,0)	10 (9,7)	2 (4,3)	
Not	138 (92,0)	93 (90,3)	45 (95,7)	
Tested positive COVID				0,515[a]
Yes	37 (24,7)	27 (26,2)	10 (21,3)	
Not	113 (75,3)	76 (73,8)	37 (78,7)	

Table 1. Characterization of education, work and COVID test of the sample by gender (n=150).

Notes: data are presented in absolute and relative frequencies.

[a] Chi-square

[b] Fisher's Exact

* (p < 0.05) in relation to females – *post hoc by* Bonferroni.

A significant increase in age, weight and height (p < 0.001) was observed in relation to the moment before the pandemic. It was also observed in females, with greater age, height (p < 0.001) and weight (p = 0.009) in relation to the moment before the pandemic and in males, with greater age, weight and height (p < 0.001) in compared to the moment before the pandemic (Table 2). No statistically significant differences were identified for BMI (p > 0.05).

	Pandemic		
	Before	**Current**	
	Mean ± SD (Min-Max)	**Mean ± SD (Min-Max)**	**P-value**
Total (n=150)			
Age (years)	14,1 ± 2,5 (8,0 – 17,0)	16,1 ± 2,5 (10,0 – 19,0)	**<0,001**
Weight (Kg)	56,4 ± 12,7 (25,0 – 97,0)	59,0 ± 13,3 (30,0 – 102,0)	**<0,001**
Height (m)	1,6 ± 0,1 (1,3 – 1,9)	1,7 ± 0,1 (1,3 – 1,9)	**<0,001**
BMI (Kg/m²)	21,2 ± 3,8 (13,3 – 36,1)	21,3 ± 3,7 (12,4 – 37,7)	0,436
Female (n=103)			
Idade (anos)	13,9 ± 2,5 (8,0 – 17,0)	15,9 ± 2,5 (10,0 – 19,0)	**<0,001**
Peso (Kg)	52,9 ± 11,4 (25,0 – 97,0)	54,7 ± 11,2 (30,0 – 99,0)	**0,009**
Estatura (m)	1,6 ± 0,1 (1,3 – 1,8)	1,6 ± 0,1 (1,4 – 1,8)	**<0,001**
IMC (Kg/m²)	20,7 ± 3,9 (13,3 – 36,1)	20,7 ± 3,8 (12,4 – 37,7)	0,912
Male (n=47)			
Age (years)	14,5 ± 2,6 (9,0 – 17,0)	16,5 ± 2,6 (11,0 – 19,0)	**<0,001**
Weight (Kg)	63,9 ± 12,4 (43,0 – 89,0)	68,4 ± 12,9 (43,2 – 102,0)	**<0,001**
Stature (m)	1,7 ± 0,1 (1,5 – 1,9)	1,7 ± 0,1 (1,6 – 1,9)	**<0,001**
BMI (Kg/m²)	22,2 ± 3,4 (15,6 – 31,1)	22,5 ± 3,4 (16,1 – 33,8)	0,400

Table 2. Comparison of age and anthropometric characteristics according to the moment of the pandemic (n=150).

Notes: data are presented as mean, standard deviation, minimum and maximum values.

Abbreviations: BMI = body mass index.

P-value obtained by Wilcoxon test.

Before the pandemic, 4.0% were thin, 64.7% eutrophic, 20.7% overweight, 8.7% obese and 2.0% severely obese. During the pandemic, 0.7% were extremely thin, 4.7% were thin, 72.0% were eutrophic, 15.3% were overweight, 6.0% were obese, and 1.3% were severely obese.

Regarding the practice of sports, before the pandemic, 30.7% indicated that they did not perform any type of activity, 34.7% practiced team sports, 17.3% bodybuilding/gym, 12.0% individual sports and 5.3% other sports. During the pandemic, 22.7% indicated that they did not perform any type of activity, 22.7% practiced team sports, 32.0% bodybuilding/gym, 13.0% individual sports and 9.3% other sports.

Comparing habits and health, there was a higher percentage of adolescents with BMI classified as eutrophic during the pandemic (72.00% vs. 64.7%), representing a significant change in proportions ($p = 0.005$), as well as most started to present a prevalence of work/study at home (54.0%) compared to the previous period (19.3%) ($p < 0.001$). Regarding hours of sleep, most volunteers (49.3%) slept more than 8 hours a night, at the time of the research, most (50.7%) slept between 6 and 7 hours a night ($p = 0.044$). Previously, 31.3% of the sample used alcohol, increasing to 43.3% currently ($p < 0.001$), as shown in Table 3.

When divided by gender, girls showed an increase in the ratio of study/work at home ($p < 0.001$), increasing from 18.4% to 52.4%, a decrease in hours of sleep per night ($p = 0.001$), where most slept more than 8 hours a night (57.3%) before the pandemic, with most sleeping between 6 and 7 hours (50.5%), with a significant difference for the proportion of alcohol use ($p = 0.004$), where 25.2% used it before the pandemic, rising to 36.9%. In males, a significant change was observed in the BMI classification ($p = 0.011$), where most (55.3%) were overweight/obese before the pandemic, and, at the moment, most presented a profile eutrophic (61.7%), as well as an increase in the proportion of adolescents studying/working at home during the pandemic ($p < 0.001$), from 21.3% to 57.4%, as shown in Table 3.

No significant differences were observed for sports practice, weekly frequency of physical activity, tobacco use and health perception in the comparison before and during the pandemic in the sample, as well as when divided by gender. However, it is noteworthy that, both before and now, the majority practiced sports (69.3%; 77.3%), between 1 and 4 days of physical activity per week (50.0%; 56.7%), did not use/uses tobacco (96.7%; 95.3%) and with regular health perception (54.0%; 47.3%), respectively.

As for the BMI classification during the pandemic, 8.0% of the sample went up the classification, 70.7% maintained it and 21.3% went down the classification, with no significant difference between females and males ($p > 0.05$). The majority reported a worsening of the dietary pattern during the pandemic (54.7%), with 37.3% reducing the consumption of fruits and vegetables during isolation and 52.75 reporting a greater consumption of industrialized products and fast foods now than before. Most reported eating more during this time (59.3%) and having a worse habit of eating, even when not hungry (53.3%). Between females and males, no significant differences were observed for the proportions of change in BMI and eating habits ($p > 0.05$).

		Total (n=150)			Gender					
					Female (n=103)			Male (n=47)		
		Before	Actual		Before	Actual		Before	Actual	
		n (%)	n (%)	P-value	n (%)	n (%)	P-value	n (%)	n (%)	P-Value
BMI classification[b]	Thinness	6 (4,0)	8 (5,3)	**0,005**	4 (3,9)	7 (6,8)	0,108	2 (4,3)	1 (2,1)	**0,011**
	Eutrophy	97 (64,7)	108 (72,0)		78 (75,7)	79 (76,7)		19 (40,4)	29 (61,7)	
	Over weight/ Obesity	47 (31,3)	34 (22,7)		21 (20,4)	17 (16,5)		26 (55,3)	17 (36,2)	
Place of study/work at home [a]	Yes	29 (19,3)	81 (54,0)	**<0,001**	19 (18,4)	54 (52,4)	**<0,001**	10 (21,3)	27 (57,4)	**<0,001**
	No	121 (80,7)	69 (46,0)		84 (81,5)	49 (47,6)		37 (78,7)	20 (42,6)	
Sports practice[a]	Yes	104 (69,3)	116 (77,3)	0,097	67 (67,0)	77 (74,8)	0,134	37 (78,7)	39 (83,0)	0,727
	No	46 (30,7)	34 (22,7)		36 (35,0)	26 (25,2)		10 (21,3)	8 (17,0)	
Frequency of physical activity[b]	No day	46 (30,7)	34 (22,7)	0,178	36 (35,0)	26 (25,2)	0,151	10 (21,3)	8 (17,0)	0,746
	1 to 4 days	75 (50,0)	85 (56,7)		52 (50,5)	60 (58,3)		23 (48,9)	25 (53,2)	
	≥ 5 days	29 (19,3)	31 (20,7)		15 (14,6)	17 (16,5)		14 (29,8)	14 (29,8)	
Hours of sleep [b]	< 5 hours	15 (10,0)	18 (12,0)	**0,044**	11 (10,7)	16 (15,5)	**0,001**	4 (8,5)	2 (4,3)	0,117
	6 to 7 hours	61 (40,7)	76 (50,7)		33 (32,0)	52 (50,5)		28 (59,6)	24 (51,1)	
	≥ 8 hours	74 (49,3)	56 (37,3)		59 (57,3)	35 (34,0)		15 (31,9)	21 (44,7)	
Alcohol use[a]	Yes	47 (31,3)	65 (43,3)	**<0,001**	26 (25,2)	38 (36,9)	**0,004**	21 (44,7)	27 (57,4)	0,070
	Not	103 (68,7)	85 (56,7)		77 (74,8)	65 (63,1)		26 (55,3)	20 (42,6)	
Use of Tobacco[a]	Yes	5 (3,3)	7 (4,7)	0,727	3 (2,9)	2 (1,9)	0,989	2 (4,3)	5 (10,6)	0,375
	Not	145 (96,7)	143 (95,3)		100 (97,1)	101 (98,1)		45 (95,7)	42 (89,4)	
Perception of your health[b]	Bad	9 (6,0)	18 (12,0)	0,529	9 (8,7)	14 (13,6)	0,546	0 (0)	4 (8,5)	0,819
	Regular	81 (54,0)	71 (47,3)		55 (53,4)	51 (49,5)		26 (55,3)	20 (42,6)	
	Excellent	60 (40,0)	61 (40,7)		39 (37,9)	38 (36,9)		21 (44,7)	23 (48,9)	

Table 3. Comparison of BMI proportions and characteristics of life and health habits before and after the pandemic according to gender (n=150).

Notes: data are presented in absolute and relative frequencies.

Abbreviations: BMI = body mass index

[a] McNemar test of related samples

[b] Friedman rank ANOVA test for related samples.

			Gender		
		Total (n=150)	Feminine (n=103)	Total (n=150)	
		n (%)	n (%)	n (%)	p-value
Time spent on activities physical during the week	< 30 min	40 (26,7)	30 (29,1)	10 (21,3)	**0,005[b]**
	30 a 90 min	25 (16,7)	22 (21,4)	3 (6,4)*	
	90 a 150 min	23 (15,3)	18 (17,5)	5 (10,6)	
	≥ 150 min	62 (41,3)	33 (32,0)	29 (61,7) *	
physical conditioning during the pandemic	got worse	66 (44,0)	50 (48,5)	16 (34,0)	0,208[a]
	kept	36 (24,0)	24 (23,3)	12 (25,5)	
	Improved	48 (32,0)	29 (28,2)	19 (40,4)	

Quarantine affected how long currently sit or lie down	More time sitting or lying	135 (90,0)	93 (90,3)	42 (89,4)	0,860[a]
	More time moving	15 (10,0)	10 (9,7)	5 (10,6)	
Sleep quality currently: worse or better before of the pandemic	Worse	91 (60,7)	71 (68,9)	20 (42,6)	**0,002**[a]
	Better	59 (39,3)	32 (31,1)	27 (57,4)	
Suffered from anxiety disorders or depression before the pandemic	Both	13 (8,7)	12 (11,7)	1 (2,1)	**0,001**[b]
	Anxiety	30 (20,0)	27 (26,2)	3 (6,4) *	
	Depression	1 (0,7)	0 (0)	1 (2,1)	
	Others disorders	5 (3,3)	3 (2,9)	2 (4,3)	
	None	101 (67,3)	61 (59,2)	40 (85,1) *	
consider more looking forward currently	Yes	108 (72,0)	83 (80,6)	25 (53,2)	**0,001**[a]
	No	42 (28,0)	20 (19,4)	22 (46,8)	
Alcohol consumption Or tobacco increased since the beginning of the pandemic	Both	4 (2,7)	3 (2,9)	1 (2,1)	0,170[b]
	Alcohol	29 (19,3)	19 (18,4)	10 (21,3)	
	Tobacco	2 (1,3)	0 (0)	2 (4,3)	
	No	115 (76,7)	81 (78,6)	34 (72,3)	
Since the start of the pandemic, Do you consider your health:	It got a lot worse	10 (6,7)	9 (8,7)	1 (2,1)	0,429[b]
	It got a little worse	41 (27,3)	26 (25,2)	15 (31,9)	
	kept up	47 (31,3)	31 (30,1)	16 (34,0)	
	Little improved	38 (25,3)	28 (27,2)	10 (21,3)	
	Much better	14 (9,3)	9 (8,7)	5 (10,6)	

Table 5. Perception of health and physical activity habits according to gender (n=150).

Notes: data are presented in absolute and relative frequencies.

[a] Chi-square

[b] Fisher's exact / likelihood ratio

*($p < 0.05$) in relation to females

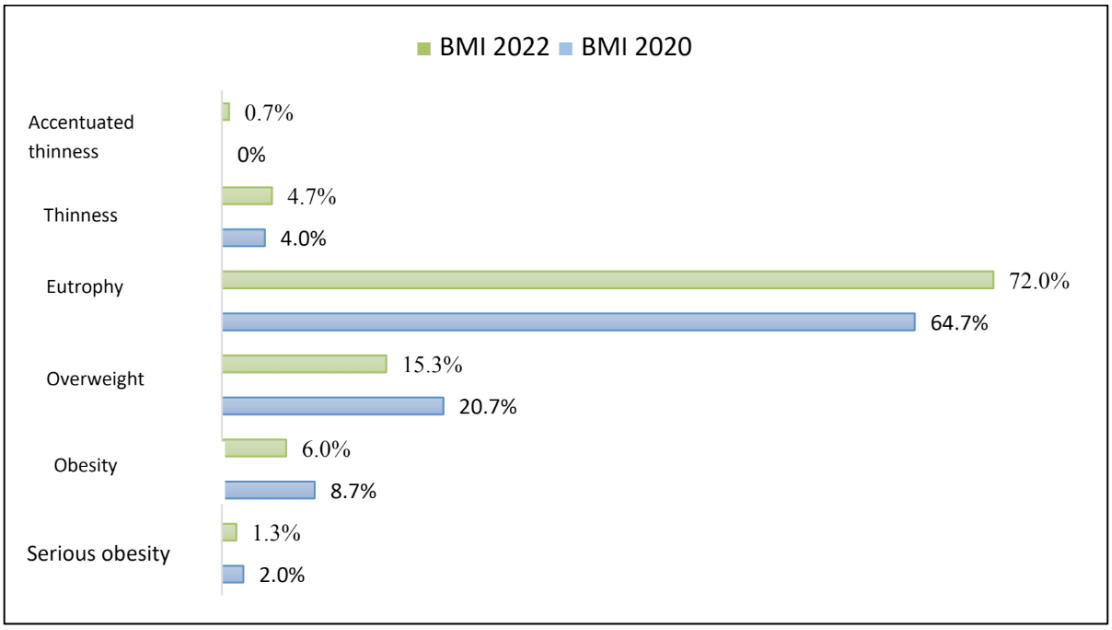

Figure 1. Descriptive analysis of BMI classification proportions before (2020) and after the pandemic (2022).

			Gender		
		Total (n=150)	**Feminine (n=103)**	**Masculine (n=47)**	
		n (%)	**n (%)**	**n (%)**	**p-value**
BMI 2022 / 2020	went up	12 (8,0)	9 (8,7)	3 (6,4)	0,432
	kept	106 (70,7)	75 (72,8)	31 (66,0)	
	Got down	32 (21,3)	19 (48,4)	13 (27,7)	
Worsening dietary pattern during pandemic	Yes	82 (54,7)	58 (56,3)	24 (51,1)	0,516
	No	62 (41,3)	40 (38,8)	22 (46,8)	
	I don't know	6 (4,0)	5 (4,9)	1 (2,1)	
Reducing consumption of fruits and vegetables during quarantine	Yes	49 (32,7)	36 (35,0)	13 (27,7)	0,643
	No	94 (62,7)	62 (60,2)	32 (68,1)	
	I don't know	7 (4,7)	5 (4,9)	2 (4,3)	
Higher consumption of products currently industrialized or fast foods	Yes	68 (45,3)	44 (42,7)	24 (51,1)	0,457
	No	71 (47,3)	50 (48,5)	21 (44,7)	
	I don't know	11 (7,3)	9 (8,7)	2 (4,3)	
Eaten more during the pandemic	Yes	89 (59,3)	58 (56,3)	31 (66,0)	0,416
	No	56 (37,3)	42 (40,8)	14 (29,8)	
	I don't know	5 (3,3)	3 (2,9)	2 (4,3)	
Tends to eat even when not are you hungry	Yes	61 (40,7)	47 (45,6)	14 (29,8)	0,174
	No	80 (53,3)	50 (48,5)	30 (63,8)	
	I don't know	9 (6,0)	6 (5,8)	3 (6,4)	

Table 4. Modification of BMI and perception of eating habits according to gender (n=150).

Notes: data are presented in absolute and relative frequencies.

Abbreviations: BMI = body mass index.

P-value obtained by Fisher's exact test / likelihood ratio

Most of the sample performed more than 150 minutes of physical activity per week (41.3%), with a lower percentage of activity between 30 and 90 minutes being observed in males compared to females (6.4% vs. 21.4%; p = 0.022) respectively, while a higher percentage for more than 150 min of activity per week was observed in males (61.7% vs. 32.0%) in relation to females (p = 0.001). Most point to a worsening of physical conditioning during the pandemic (44%), followed by 32.0% who consider that there has been an improvement. Most report that isolation affected the time they currently spend sitting or lying down (90.0%), 60.7% currently consider the quality of sleep worse, with this prevalence being higher in females (68.9%) in relation to males (42.6%) (p = 0.002), as shown in Table 5.

As for anxiety disorders or depression before the pandemic, most reported not having any (67.3%), with the difference in prevalence between genders observed for anxiety being greater in females (26.2% vs. 6. 4%) compared to males (p = 0.005) and higher prevalence for no disorder (p = 0.002) in males compared to females (85.1% vs. 59.2%) respectively. However, most of the sample currently considers themselves more anxious (72.0%), with a higher prevalence observed for females (80.6%) compared to males (53.2%) (p = 0.001). Most consider that they have not increased their consumption of alcohol or tobacco since the beginning of the pandemic (76.7%). Regarding the perception of health, most participants consider that since the beginning of the pandemic, health has remained the same (31.3%), while 27.3% consider it to have deteriorated a little and 6.7% to have worsened a lot, according to the Table 5.

When asked about when they get anxiety, how they deal with it, most report consuming food (28.7%), followed by those who practice physical activities (20.0%), some do

meditation, breathing practices or drink water to calm down (17.3%).

DISCUSSION

Although there was no significant change in BMI between periods, it is observed that approximately one fifth of adolescents are overweight, a fraction similar to that found in a 2015 study with Brazilians in general[18]. In addition, a result similar to an analysis carried out in 2008 and 2009 is also shown, in which 20.5% were overweight and 4.9% were obese, in the public aged 10 to 19 years[36] and in Goiânia, where 21.2% of the adolescents in the survey were overweight, with 14.1% being overweight and 7.1% being obese, with a relatively lower prevalence among females than males[37].

It was found in the research that boys are more above their eutrophy than girls, the same relationship was seen by the IBGE analysis between 2008 and 2009, in which excess weight in males was 21.7% and in females of 19.4%[38], but to a lesser extent. Such results corroborate with other statistical research in the Brazilian population, in which a change in the nutritional status of adolescents is perceived with a decrease in malnutrition and an increase in obesity[4,22].

There were significant changes in lifestyle due to social isolation, with other studies showing a worsening of the quality of life of the population addressed[39]. It was observed, according to an online questionnaire carried out in Brazil in 2020, that adolescents replaced, during the pandemic, important meals with snacks[40]. What may be related to the increase in body adipose mass, as demonstrated in a study carried out in Chile with adolescents aged 16 to 18 years, where the habit of snacking, eating small amounts of food several times throughout the day, proved to be capable of increasing in 47.6% the proposed calories for the participants' meals[41].

In addition, there was a higher consumption of fast food and less fruit and vegetables. Children are increasingly used as a target audience for ultra-processed advertisements[42] this may be one of the factors related to this significant increase in the consumption of fast foods, these ultra-processed foods are extremely negative since they have an unbalanced nutritional composition, favor excessive calorie consumption and negatively affect social culture.

In a survey carried out with adults over 18 years old in the DF, 80% of the participants reported constant use of fast food delivery apps and the most consumed were pizza and hamburger[43]. Since eating is also a community, social and cultural practice, family influences have great relevance regarding this habit in young people[42].

Disorders regarding body image, anxiety and depression affect the amount and mode of food consumption, which may increase compulsive disorders or cause symptoms of anorexia[44] the event was observed in the research, in which 28.7% of the participants reported eating as a way of dealing with anxiety, this being the response with the highest incidence found. This picture can give rise to a picture of Binge Eating Disorder (BED), which, according to The Diagnostic and Statistical Manual of Mental Disorders - DSM-5 is defined as a complex case, since it involves the psychological and physical part of the individual [45]. In addition, a literature review study also pointed to culture as an important factor in this process[46].

As for factors related to physical activity, it must be noted that the minimum recommended amount of physical activity per week is 150 to 300 minutes[47]. However, in the study, the majority did not reach this goal and 44% of the total sample considered that their physical conditioning had worsened.

Isolation measures have led to an increase in

home-based jobs, which tend to spend several hours sitting in front of a computer[17], being pointed out that 95% of the population of the United States presented a more sedentary life due to the style of work[25]. Similar results in the survey, in which 90% of respondents say they spend more hours sitting or lying down.

Regarding sleep quality, 60.7% consider it to have worsened with the pandemic. Result similar to the study carried out in 2020 with university students, in which they lost sleep quality, mainly due to loss of routine and use of electronic devices[19].

Another problem found in the research among the public of adolescents was the presence of anxiety and depression disorders before the pandemic, and how they worsened during the pandemic, a relationship that is present, in studies carried out in China[34,48].

Regarding the abusive use of drugs, it usually begins in adolescence and has a great impact throughout the adult lives of users[49]. The influences for drug use can be categorized into three classes: individual, family and community, among these classes, family influence with user relatives is found as the greatest risk factor for developing abuse[50]. But also, there is a very relevant relationship between increased consumption and depression or anxiety, indices that were sharply increased, with 72% of respondents considering themselves more anxious in the pandemic, with a higher prevalence in females.

In the consumption of alcoholic beverages or tobacco, most consider that it has not increased since the beginning of the pandemic, however, 23.3% claim this increase.

CONCLUSION

In the population evaluated by this research, a high prevalence of overweight was observed, being 31.4% before the pandemic, in early 2020, and 22.6% in the period from the pandemic to early 2022, making it possible to observe a higher prevalence in males. Contrary to expectations, there was no negative effect of the pandemic on the BMI of the participants, due to social isolation. It is important to emphasize that among the changes related to lifestyle during the pandemic, in the evaluated sample, there was also a positive increase in the practice of physical activities, with 30.7% of respondents not practicing any type before the pandemic, for 22, 7% during the pandemic.

Despite the research presenting a diverse population in terms of place of residence, with participants from almost all regions of the Federal District, there was no guidance regarding personal and family income, and it is also important to highlight the economic impact that families had over the course of the year. period in our country with an impact even on food security. This is interesting data that can directly influence some of the parameters used in the research, but it could be low reliability data due to the age of the participants.

Thus, it must also be taken into consideration, that the research was carried out based on a form and by measures referred to by the participant himself, with no longitudinal study or verification of measures for the veracity of the data offered.

In addition, through other questions, important changes were observed in the lifestyle of individuals aged 10 to 19 years, such as the issue of food, physical exercise, hours of sleep, substance use and psychiatric disorders, which can cause future problems.

In view of this situation, further studies in this area are needed, especially with adolescents, in order to be able to verify the effects caused during the pandemic period and the future consequences, whether immediate or late. Therefore, longitudinal follow-up studies or through medical records

and verification of the child's handbook can provide more veracity in the anthropometric data of the participants. Thus, the research aims to assist in the implementation of preventive programs in primary care that aim to improve the quality of life of adolescents.

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