Short Communication

Impact of COVID-19 pandemic on physical activity level and screen time is associated with decreased mental health in Brazilian adults: a cross-sectional epidemiological study

The COVID-19 pandemic has deeply impacted human relationships and lifestyle habits worldwide (Upton et al., 2021; Zhu et al., 2021). Studies have shown that important lifestyle habits decreased during the pandemic, such as physical activity (Diniz et al. 2020). In addition, there was a substantial increase in screen-based behaviors (TV and computer use), as "stay at home" messages and social isolation measures, effective for controlling the pandemic, resulted in more time spent in low-energy activities (Werneck et al. 2020), as well as greater demand for information related to COVID-19, since the Internet was one of the main channels of information for the general public (Wang et al. 2020).

In this sense, changes in lifestyle caused by the pandemic can impact some domains of quality of life (Tran et al. 2020), as well as initial signs and symptoms of anxiety and depression (Le et al., 2020; Wang et al. 2020). Besides that, some confounding variables could influence the mental health in this critical period, such as social isolation, alcoholic consumption and smoking (Robb et al., 2020; Stanton et al., 2020).

Therefore, this study aimed to verify whether the impact of COVID-19 pandemic in physical activity and screen time was associated with impact on quality of life and symptoms of anxiety and depression in a large sample of Brazilian adults, independently of confounding factors.

METHODS

This cross-sectional study involved Brazilian participants with 18 and more years of age, which were invited through social media to answer an electronic survey about the impact of COVID-19 pandemic in lifestyle habits and health. The data collection was performed between May 05th and 17th 2020 and all the research procedures were conducted according to Declaration of Helsinki and national laws. The participant responses were only included in the analysis under their authorization, presented in the Informed Consent Form at first page of survey. This study was previously approved by the Ethical in Research Committee of Universidade Nove de Julho, under protocol CAAE #30890220.4.0000.5511

Mental health

This study considered the quality of life and symptoms of anxiety and depression as indicators of mental health in the sample. The impact of COVID-19 pandemic on quality of life were assessed by the following question: "Due to the COVID-19, are you feeling lower quality of life?" The response options were: i. no; ii. a little; iii. sometimes; iv. very often; and v. always. Participants who reported the items iv and v were classified as “decreased quality of life”. Anxiety symptoms were assessed by the question: “Due to the COVID-19, are you feeling more anxious?” and symptoms of depression were assessed by the question “Due to the COVID-19, are you feeling more depressed?”. The options of response for each question were based on a Likert scale: i. no; ii. a little; iii. sometimes; iv. very often; v. always. Participants who reported the items iv and v were classified as “increased symptoms” for anxiety and for depression separately.

Physical activity

The impact of COVID-19 pandemic on physical activity was assessed by the question: "How much has the COVID-19 pandemic interfered with your daily physical activity habits?". The options of response were: i. none; ii. a little; iii. a lot; and iv. I do not practice physical activity. Participants who answered “a lot” were classified as “decreased physical activity”.

Screen time

The impact of COVID-19 pandemic on the screen time was assessed in different screen devices through independent questions, as follows: "With the COVID-19 pandemic, have your time on TV viewing (or computer use; or smartphone use) increased?" Responses were “yes” and “no” for each screen device. Participants who reported “yes” were classified as “increased TV viewing”, “increased computer use”, and “increased smartphone use” separately.

Covariates

Variables of sex, age, educational level, social isolation, alcoholic consumption, and smoking were considered as covariates. Educational level was assessed by the question: “What is your educational level?”, responses were: i. Elementary school; ii. High school; iii. Undergraduate; and iv. Graduate. Social isolation was assessed by the question: “How long have you experienced social isolation?”, with open responses computed in days. Alcohol consumption was assessed by the question: “Do you drink alcohol?”, with responses “yes” or “no”. Smoking habit was assessed by the question: “Do you smoke”, with dichotomous response “yes” or “no” (Diniz et al., 2020).

Statistical analysis

The sample characterization is presented as mean and standard deviation for continuous variables and in frequency for categorical variables. The association of the impact of COVID-19 pandemic on decreased physical activity and increased screen time with decreased quality of life, and increased anxiety and depressive symptoms was analyzed by Binary Logistic Regression, simultaneously adjusted by covariates. The statistical significance used was 5% and the confidence interval adopted was 95%.

RESULTS

The sample was composed of 1871 participants, being 1096 women (58.4%). The mean age of sample was 37 ±3.2 years. Approximately 30% of participants reported that quality of life decreased during COVID-19. Increased anxiety and depression during COVID-19 were reported by 30.9% and 13.3% of participants, respectively. It was observed a substantial impact of COVID-19 pandemic on the decrease of physical activity and increase in screen time in the sample.

The impact of the COVID-19 pandemic on physical activity was associated with decreased quality of life and with increased anxiety and depression symptoms. Participants with increased TV viewing were 35% more likely to report decreased quality of life (OR=0.35, p=0.010). Adults with increased smartphone use were more than twice as higher to have decreased quality of life (OR=2.32, p<0.001) and increased anxiety (OR=2.10, p<0.001) and depression symptoms (OR=2.49, p=0.007). Increased computer use was associated with decreased quality of life (OR=1.49, p=0.002) and increased depressive symptoms (OR=1.71, p=0.004).

*****Insert table 1*****

DISCUSSION

The present study observed that COVID-19 pandemic negatively impact physical activity and quality of life, as well as increased screen time and symptoms of anxiety and depression in a large sample of Brazilian adults. Furthermore, the decreased physical activity and increased screen time was associated with decreased quality of life and increased symptoms of anxiety and depression, independently of sex, age, educational level, alcohol consumption, and smoking.

Convergently with this study findings, the study by Meiling et al. (2020) developed between February and March in China, one of the first epicenters of COVID-19 in the world, observed impairment in the quality of life and mental health, as well as increase in sedentary behavior. Amini et al. (2020), in a study of Iranian adults, observed a significant decrease on physical activity levels during COVID-19 pandemic.

The physical activity practice is able to release a series of pleasurable substances in the human body, as endorphin and serotonin, and also to act on neurotransmitters capable of providing feelings of well-being (Basso & Suzuki, 2017). The different types of physical activity (including practices in green areas) can offset the negative neuropsychological impact of busy urban environments (Olszewska-Guizzo et al. 2021). With the sudden change in physical activities and daily routines during prolonged stay-at-home requests, these benefits seem to be more mitigated, even more in situations of uncertainty and worries experienced in times of pandemic. (Fitzpatrick et al., 2020).

The increase in the time spent in TV viewing, and smartphone and computer use was also associated with decreased quality of life and increased anxiety and depression in the present study. In relation to TV, the large number of negative news and the emphasis of the news on the COVID-19 pandemic may contributes to mental distress (Riehm et al., 2020). About computer use, the larger demand of home-office tasks and

online classes due social distancing policies may compromise other daily activities, mainly among leisure time, which may increase boredom and sadness (Droit-Volet et al., 2020). In regard of smartphone, the large number of shares in social media about pandemic aggravated by excessive fake news and quick dissemination of information, may negatively impact mental health (Gao et al., 2020). It is important to highlight that sedentary behavior activities has been associated with higher plasma glucose, insulin, and cortisol concentrations, resulting in physiological and psychological stress, mainly in mentally active tasks, as working and studying, once the brain depends on serum glucose for energy supply while physical activities uses skeletal muscle and, in majority, relies of fat metabolism (Panahi & Tremblay, 2018).

In conclusion, the impact of COVID-19 pandemic in lifestyle habits was associated with decreased quality of life and increased symptoms of anxiety and depression in Brazilian adults. Strategies to promote physically active habits during pandemic are suggested to minimize mental health impairment in adult population, such as the return to physical activity, with priority to regions of green areas for lower risk of psychological tension after COVID-19.

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Table 1. Association of the impact of COVID-19 pandemic on physical activity and screen time with decreased quality of life and increased anxiety and depression symptoms (n=1871).

	Impact of COVID-19 pandemic								
	Decreased quality of life			Increased anxiety symptoms			Increased depression symptoms		
	OR	95% CI	p-value	OR	95% CI	p-value	OR	95% CI	p-value
Impact of COVID-19 in PA									
No decrease in PA	1.00	Reference	-	1.00	Reference	-	1.00	Reference	-
Decreased PA	2.53	1.65-3.87	<0.001	2.00	1.34-3.00	0.001	2.68	1.59-4.50	<0.001
Impact of COVID-19 in TV viewing									
No increase in TV use	1.00	Reference	-	1.00	Reference	-	1.00	Reference	-
Increased TV use	1.35	1.08-1.71	0.010	1.21	0.97-1.51	0.098	1.10	0.81-1.49	0.518
Impact of COVID-19 in smartphone use									
No increase in smartphone use	1.00	Reference	-	1.00	Reference	-	1.00	Reference	-
Increased smartphone use	2.32	1.51-3.55	<0.001	2.10	1.40-2.14	<0.001	2.49	1.29-2.84	0.007
Impact of COVID-19 in computer use									
No increase in computer use	1.00	Reference	-	1.00	Reference	-	1.00	Reference	-
Increased computer use	1.49	1.15-1.93	0.002	1.20	0.94-1.54	0.144	1.71	1.18-2.47	0.004

Adjusted by sex, age, educational level, social isolation, alcoholic consumption, and smoking. OR= Odds ratio; CI= Confidence interval; PA= Physical activity.