

## Physical activity and medication in Brazilians suffering with non-communicable diseases in quarantine by COVID-19

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### Abstract

This study aimed to compare the practice of physical activity in groups of people with chronic diseases with and without medication, before and during the pandemic. 298 Brazilian individuals with chronic non-communicable diseases such as cardiovascular, metabolic / endocrine, respiratory, orthopedic, gastrointestinal diseases, anxiety and depression were separated into two groups: with and without medication. A questionnaire with 14 questions was applied, tracing the behavioral profile in relation to physical exercises before and during isolation, interpreted through descriptive analysis, and the groups were compared through Mann-Whitman's statistics. The drop in the percentage of active individuals with or without medication occurred when comparing the scenarios before and during quarantine. However, the difference in the prevalence of active individuals between the groups was significant, showing that the group with medication remained more active. The fear of contamination, the measures of distance and the lack of adherence of the population to classes by videoconference reduced the frequency of physical activities in the general sample population. However, people who used medication showed greater concern about the practice of physical activity to optimize treatment. The isolation period had a negative impact on the practice of physical activity, regardless of the presence of some chronic disease or the use of medication.

**Key Words:** Medication; social isolation; physical exercise; COVID-19.

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The new virus SARS-CoV-2, responsible of coronavirus disease (COVID-19), has been disseminated through all continents in short time, provoking changes of habit and a pandemic according to Tedros Adhanom Ghebreyesus, Director-General of the World Health Organization (WHO).<sup>1</sup> The interactions between the virus and social and environmental contexts has transformed the situation into a world syndemic because aggravations of the public health have increased the damaging effects of the disease.<sup>2</sup> As a strategy to contain the dissemination of the new virus the governments have opted for isolation and social distancing – the quarantine – to diminish the number of people susceptible to developing the symptoms and propagating the virus.<sup>3</sup> With this landscape, people who have any chronic illness became a risk group, being more susceptible to

contracting the disease, having their clinical state worsen by the problems to having needed treatments.

The group of people with non-communicable disease (NCD) has been affected in higher proportions, specifically when it comes to physical activity, due to negative effects of social isolation. With the temporary closing of in-person physical activities, it is conceivable that the level of physical activity practice has decreased and, as a consequence, the risk of hypokinetic diseases and comorbidities associated with obesity has increased.<sup>4</sup> Countless papers have attested the problems associated with low level physical activity, including higher mortality risk.<sup>4</sup> Despite the decrease in practice of physical activity during isolation, there were people who remained active, but on a lower degree, and there were yet people who initiated physical activity during the pandemic. Some evidence shows that people who already

practiced physical activity felt more motivated to continue with the practice and, therefore, have noted the positive effects of maintaining the habit, while people who started to practice have presented some negative side effects such as increased malaise.<sup>5</sup>

The search in the Google<sup>®</sup> platform and in social media, mainly Instagram<sup>®</sup>, for at home workouts has increased substantially, in virtue of the shift in the global population's behaviour.<sup>6</sup> It is worth emphasizing the recommendation to maintain the level of practice the individual was already used to.<sup>6</sup> Especially during the pandemic, monitoring of a health professional for the programmed practice of physical activity is important.<sup>7</sup> However, people affected by comorbidities who make use of pharmacological treatments, despite needing more attention, possibly, feel more wary of online assistance, which makes adhering to physical exercise during social isolation harder.

There were debates over whether people with chronic diseases who do not make use of pharmacological treatments have become or maintained themselves physically active, and if the people who have kept themselves active are the same who don't make use of medication. Therefore, the present study has focused on comparing the practice of physical activity in the groups with and without medication before and after the COVID-19 pandemic.

### Materials and Methods

#### *Type of study and sample*

The present study shows a sample from a bigger compilation of data, which is cross-sectional study with data collection, quantitative with descriptive and comparative aim. The sample is non-probabilistic by convenience composed of 298 subjects for the present study, with ages higher than 18 years old (average=48,51±12,01), with non-communicable diseases (NCD) that were cardiovascular, metabolic / endocrine, respiratory, orthopedic and gastrointestinal diseases, anxiety and depression. The study protocol was approved by the research ethics committee of Universidade São Judas Tadeu under number CAEE 79510017.1.0000.5510, and of the Faculty of Medicine of Universidade de São Paulo, Brazil (Process nº 383/17). A questionnaire was developed with items that address data divided by domains: 1) socio-demographic: sex, age and region where you live; 2) level of physical activity: already practiced physical activity before or after the pandemic, started to practice during the pandemic, weekly frequency, intensity of the practice; 3) type of physical exercise: cardiovascular exercises, strength exercises, resistance exercises, flexibility exercises; 4) source of information on the practice of exercise: social media, official media of physical entities such as applications, tips with bloggers through digital media or with a specialized and accredited physical education professor) perception of health through their body

composition: perceived the increase in weight or realized that they have more localized fat.

#### *Inclusion and exclusion criteria*

Criteria for inclusion were:

Being over 18 years old; Having access to any means of electronic communication and capacity of interacting with the Google Forms platform; Declaring awareness in the first page of the Informed Consent Form

Exclusion criteria were:

Presenting comprehension difficulties that impair the understanding of the performed evaluations (in this case, the data from the subjects was collected, but not used in the study) or that have induced errors while completing the instrument and that could not, for the method's sake, be corrected by the conductor.

#### *Study Design*

For the duration one week, in the height of social isolation in Brazil between May 22 and 29 of 2020, the individuals answered a survey written by the authors of the study. For the present study, from a total population of 1.065 subjects those who have NCD were selected (cardiovascular, metabolic/endocrine, respiratory, orthopedic, gastrointestinal diseases, anxiety and depression), totalizing a sample of 298 individuals. These individuals were separated into two main groups: with and without medication. After outlining the groups, the matters of the practice of physical activity were observed during the quarantine.

#### *Collection procedure*

The survey was composed of 14 questions listed in 5 domains (socio-demographic, level of physical activity, type of exercise, means of information for exercise, visual changes in the body) that mapped a profile of the behavior regarding physical exercise before and during the confinement period. Sedentary individuals were those who performed physical activities below 150 minutes of physical activity per week. The individuals considered active were those who practiced more than 150 minutes of physical activity per week.<sup>8,9</sup> The survey also found that subjects who had NCD were considered part of the risk group for COVID-19, as well as the knowledge of the population regarding the importance of staying active to strengthen the immune system. After the surveys were answered, only those that addressed the individuals with previous diseases, use of medicine or not and who practiced physical activity were observed. From those results, two groups were created (with and without medication). The survey was linked to the Google platform, though the Forms tool and was open for answers for seven days. The promoting of the available survey was done through social media and groups of communication through apps.

#### *Statistical analyses*

For the interpretation of data, a descriptive analysis by the program SPSS (IBM) 20.0 was used to characterize

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**Table 1.** Descriptives variables from with medication group and without medication group.

		Total	With Medication	Without Medication
		N (%)	N (%)	N (%)
Sex	Male	169.00	99 (58.5)	70 (41.5)
	Female	129.00	50 (38.7)	79 (61.3)
Age	18 to 59	211.00	89 (42.1)	122 (37.9)
	60 to 79	83.00	48 (58.0)	35 (42.0)
	Above 80	4.00	4 (100.0)	0 (0)
Geografic region	South	12.00	6 (50.0)	6 (50.0)
	Southeastern	262.00	149 (57.0)	113 (43.0)
	Midwest	9.00	6 (66.6)	3 (33.4)
	Northeast	9.00	6 (66.6)	3 (33.4)
	North	6.00	3 (50.0)	3 (50.0)

the sample and present sample frequencies. After that the U Mann-Whitmann was used to compare groups with and without medication regarding the practice of physical activity.

### Results

The descriptive data, shown in table 1, show a higher frequency of men with CNCs aged between 18 and 59 years and from the Southeast region of Brazil. This region is the one with the highest per capita income in the country. Female individuals had a lower incidence of using medication compared to men. As for age, the frequency of medication use increases in both men and women (Table 1). However, the smaller percentage drop

of active individuals in comparing the scenario before and during the pandemic of COVID-19 occurred in the group with use of medication (10.10% and 15.94% for the groups with medication and without respectively). This difference was significant ( $p < 0.05$ ) when compared to groups with medication and without medication, both in the active time and sedentary time (Table 2). In other words, the drop in the percentage of active individuals with or without medication occurred while comparing the scenery before and during the quarantine. However, the difference in the prevalence of active individuals between the groups has been presented as significant in showing that even with the drop occurring in both groups

**Table 2.** Sample frequency regarding practicing physical activity

N = 298	Active before quarantine (N)	Active during quarantine (N)	$\Delta\%$	Sedentary before quarantine (N)	Sedentary during quarantine (N)	$\Delta\%$
With medication (N=197)	141.00	127.00	-10.10%	56.00	70.00	25.00%
Without medication (N=101)	69.00*	58.00*	-15.94%	32.00#	44.00#	37.50%

\*= $p < 0,05$  between with medication group and without medication group in active time

#= between with medication group and without medication group in sedentary time.

the group with medication still showed to be more active in the landscape of the COVID-19 quarantine.

### Discussion

Results of the study that are worth of discussion are 1) there was a drop in physical activity practice during the COVID-19 quarantine; 2) the group that makes use of medication as part of their pathologies' treatment tends to present a higher amount of physical activity practice both before and during the quarantine. This data is an important bearing in mind that physical activity in many cases is prescribed as part of the treatment and even without in-person check-ups the individuals affected realized the importance and continued to practice physical activities. Studies show that there was a decrease in the practice of physical activity for leisure all over the world.<sup>10-13</sup> In the current national landscape, a study carried out with Brazilian families has shown the increased time spent in secondary tasks, mainly in the computer and/or cell phone, at the expense of the time designated to the practice of physical activity,<sup>10</sup> and beyond that the lockdown measures applied to places dedicated to the practice of physical activity have decreased the options of practice, becoming a challenge to the population.<sup>13</sup> Social isolation, used as a preventive measure to contain the dissemination of COVID-19, has changed the dynamics of physical exercise practice in general for the whole population. The fear of contamination associated with distancing measures reduce the frequency of outdoor practice, usually the most common type.<sup>14</sup> Moreover, the lack of adherence of the population to classes via videoconferences as well as the professionals' lack of preparation to deal with the situation contribute to the scenery of larger scale physical inactivity.<sup>6</sup> On the other hand, people who made use of medication before and during quarantine have remained or started practicing physical activity showing that this population possibly sees physical activity as a protective factor when used in conjunction with the medication. Use of medication by people with pre-existing pathologies shows two possible perspectives, the first being that perhaps needing medicine makes the presence of the disease feel more concrete, highlighting for this individual the importance of physical activity for their health as part of the treatment, while the second perspective presents the fact that not taking medicine makes the individual believe they're healthy even if it isn't true and therefore the need to practice physical activity is seen as superficial, however the inactivity can trigger many diseases. The fact that the drop-in physical activity practice happened may have been caused by: 1) Lack of access to information on which activities to practice; 2) Lack of specific place for practice; 3) Insecurity in practicing without being monitored by a Physical Education professional because of being "sick"; 4) Lack of motivation to keep practicing, due to depression or anxiety generated by the social isolation; 5) Lack of access to specialized information. Many studies

present physical activity as a complementary tool in the pharmacological treatment of many chronic diseases of various origins, as already evidenced.<sup>15,16</sup> However, the literature was shown to be short on studies about the relationship between use of medication and practice of physical education, causing the justification of the data presented only through hypotheses, as it pertains to a specific period such as the pandemic. As evidenced in the present study, people who make use of medication present a bigger concern regarding the practice of PA to optimize their treatment and therefore have sought to stay active. It is worth mentioning that some factors have shown themselves to be limiting in the present study, which are sample majority of active people and the lack of studies about the relationship between use of medication and practice of physical education during the pandemic. Another limiting factor is the questionnaire that, despite not having been validated internationally, presents a high level of confidence demonstrated through statistics. However, factors such as the considerable sample n and the current theme and the rare approach have strengthened the research. It can be concluded that, the social isolation period during the COVID-19 pandemic has had a negative impact in the practice of physical activity, regardless of the presence of a chronic disease or even the use of medication. The practice of physical exercises through digital means has presented an increase in the market evidencing the importance this approach being acquired by Physical Education professionals. Therefore, the digital platforms that offer a streaming service such as Instagram®, Youtube® and Facebook®, fitness app with the aim of promoting physical activity and the classes taught by physical education teachers through online applications such as the Zoom® where students connect via the internet and vigorously use physical exercise.<sup>17</sup> The strategy of using digital media and applications has been successful according to the participation of participants in their research during the COVID-19 pandemic at the beginning of the month April and May 2020. However, as noted, digital platforms have a great performance in helping and assisting in the practice of physical activity at home.<sup>17</sup> This research highlights the importance of physical activity for people who have any NCD, as they belong to the risk group for COVID-19 and, as evidenced, the utmost importance of fighting sedentariness and strengthening the immune system through regular physical activity practice. In conclusion the result of people who use medicine pills probably understand better the need of physical activity and dropped out less than their counterparts who doesn't use medication.

### List of acronyms

NCD - non-communicable disease  
WHO - World Health Organization

### Authors contributions

The authors MRD, ECC and DLP were responsible for study design, data collection and final review. The authors YFM, HFCL and WOC were responsible for the article design and final review. The authors AAON and DOA were responsible for the literature survey and final review.

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### Conflict of Interest

The authors declare no competing interests.

### Ethical Publication Statement

We confirm that we have read the Journal's position on issues involved in ethical publication and affirm that this report is consistent with those guidelines.

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