

# Behavior of the Community's Older Adults During 12 Months of COVID-19 Social Restriction.

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## Research Article

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# Abstract

**BACKGROUND:** In a short time, COVID-19 adopted the proportions of a pandemic. Consequently, measures as social distancing were adopted to try to slow down the spread of the disease. The objective of this study was to understand the behavior of the Brazilian older adults during a period of social restriction by Covid-19.

**METHODS:** 61 healthy older adults participated in this study. A questionnaire was applied over 12 months from the beginning of the social restriction recommendations using only telephone contact. The questionnaire included the profile of falls during the evaluation period and 4 questions based on fear and risk of infection by Covid-19, the practice of physical activity and compliance with measures of social restriction. The chi-square test ( $\chi^2$ ) was used to observe the possible associations between the independent and dependent variables.

**RESULTS:** Most participants were female (90.2%), with mean age of 67 years and secondary education level. 78.7% adopted social restriction measures in the first month while in the last six months 54.1% of the participants complied with restrictive measures. The analysis of the chi-square test showed significant association between the evaluation period and social restriction [ $\chi^2 (2) = 22.072$ ;  $p = 0.000$ ] and the risk of being infected [ $\chi^2 (2) = 17.561$ ;  $p = 0.000$ ].

**CONCLUSION:** There was a reduction in the number of older adults who complied with social restriction over time and a decrease in the practice of physical exercises in the sample evaluated.

## Background

In December 2019, a virus responsible for causing an acute respiratory syndrome emerged in Hubei, a region of China, causing a disease outbreak in the city of Wuhan [1, 2]. With a fast spread throughout the world [3], the New Coronavirus achieved proportions of a pandemic and created a global challenge for public health, in the same way as other emerging and reemerging pathogens before it [4]. Thus, some measures were necessary to try to slow down the spread of the disease [5].

Social distancing (which included the cancellation of many events, social activities and meetings, closing of schools, gyms and public parks, restrictions on the public transportation, limitation of the capacity of people in supermarkets and pharmacies) was one of the public health measures adopted by several countries trying to control the spread of the infection [6, 7].

With the aim of protecting the most vulnerable population from the risk of getting infected, these measures were also established in Brazil [8]. Nonetheless, some authors have reported the negative effects of social distancing on the physical and emotional health of the older adults population [9, 10]. Recent data showed that adopting social restriction measures, the older adults reduced the level of physical activity or increased sedentary behavior, as they remained almost exclusively inside their homes

[11]. Besides, prolonged periods of social restriction can contribute to an increase in the frailty and, consequently, fractures resulting from fall accidents with this population [12].

A fact observed in several countries since the beginning of the pandemic was the decrease in the accomplishment of the social restriction measures [13, 14]. In Italy, for example, researchers have identified a low disposition of the population to comply with social distancing due to the prolongation of restrictions [13]. Brazilian studies have indicated that compliance of the measures varies according to sex, education, income and type of labor [15]. However, only few studies seek to understand the older adult's behavior during the first year of the Covid-19 pandemic [16] and the description of this behavior can give us subsidies to better understand the health of the older adults population.

Watching the impact that social restriction has in Brazil and worldwide [15, 17, 18], in which adherence to the restriction measures has decreased [19, 14], our aim was to understand the behavior of the Brazilian older adults over 12 months of social restriction due to Covid-19.

## Methods

### Study design and sample

This is a descriptive and longitudinal study. The chosen sample consisted of participants who underwent an evaluation protocol before the social distancing measures and consented to participate in the research. The recruitment of all participants (n = 70) was through telephone contact, which was carried out by a team composed of 6 researchers duly trained on the research procedures.

### Study protocol

The evaluations took place from March 2020 to March 2021, using only telephone contact to assess the behavior of the older adults aged 60 to 81 years during 12 months of pandemic. The evaluation protocol had been applied one month before the start of the social distance measures and the research team obtained the characteristics of the sample (age, sex), number of comorbidities (self-report), history of falls in the 6 months prior to the call, physical activity, social activity and leisure activity (self-report). The older adults who answered all the questionnaires along 12 months were included; therefore, the participants who did not answer the calls or had cognitive deficit evaluated through the 10-Point Cognitive Screener (10-CS), according to the level of education (< 8 points) [20], were excluded.

Participants were previously informed by telephone about the research procedures and subsequently read and signed the Form of Consent through the free *Google Forms* tool. A semi-structured questionnaire was developed by the researchers to obtain the older adults' behavior information along 12 months of social restriction.

The questionnaire included the profile of falls during the evaluation period (number of falls; how the fall happened; whether the fall occurred at home or outside home; whether there were any sequelae resulting from the fall) and 4 questions based on fear and risk of infection by Covid-19, the practice of physical

activity and compliance with measures of social restriction. Older adults could answer “yes” or “no” to the four questions: “Are you afraid of being infected?”, “Do you think you are at risk of being infected?”, “Do you adopt any strategy to keep physically active?” and “Did you comply with social distancing measures?”.

## Data analysis

Data from the questionnaires were double typed in a coded EXCEL for Windows spreadsheet to ensure data consistency. Next, the data were analyzed using absolute and relative frequencies with the Statistical Package for the Social Sciences -SPSS program (Version 17.0 - SPSS Inc.). The Chi-Square test ( $\chi^2$ ) was used to verify possible associations between the dependent (social restriction, falls, risk of being infected, fear of being infected and physical exercise) and independent variables (period evaluated). The significance level adopted was  $p < 0.05$ .

### Ethical aspects

The study is conformed with all national and international standards of research with human beings and was approved by the Research Ethics Committee of the Clinical Hospital, Ribeirão Preto Medical School, University of São Paulo (FMRP-USP) (CAAE nº 30948520.2.0000.5440). The participants read the free and informed consent form online and then signed it, thereby indicating their agreement with the proposed objectives and willingness to participate in the study. The participants without formal education were previously informed by telephone about the research procedures and the signature of these participants was obtained by their legal representative. This consent was applied and obtained online.

## Results

Among the 70 older adults who had been invited to participate in this study, 9 refused, being 2 male and 7 female. Hence, the sample consisted of 61 participants, who were characterized according to the data of the evaluation protocol applied before the start of the social distance measures (Table 1).

Table 1  
 Sample characteristics (n = 61). Values expressed as  
 mean  $\pm$  standard deviation and frequency.

<b>Variables</b>	<b>Sample (61)</b>
Age (mean $\pm$ SD) Years	67.34 $\pm$ 5.54
<b>Sex N (%)</b>	
Women	55 (90.2)
Men	6 (9.8)
<b>Education (years of study) N (%)</b>	
Without formal education	10 (16.4)
Primary education (elementary school)	11 (18)
Secondary education (middle school)	26 (42.6)
Higher education	14 (23)
<b>Income (minimum wage) N (%)</b>	
1 to 2	32 (52.5)
3 to 4	29 (47.5)
<b>Number of comorbidities N (%)</b>	
0	5 (8.2)
1 to 2	47 (77.1)
>3	9 (14.7)
<b>Previous physical exercise N (%)</b>	
Yes	47 (77)
No	14 (23)
<b>Previous social activity N (%)</b>	
Yes	49 (80.3)
No	12 (19.7)
<b>Previous leisure activity N (%)</b>	
Yes	50 (82)
No	11 (18)
<b>Previous Fallers (n =9) N (%)</b>	

<b>Variables</b>	<b>Sample (61)</b>
<i>Total number of fallers</i>	9 (14.8)
<i>Single fallers</i>	5 (55.5)
<i>Recurrent fallers</i>	4 (44.5)

The sample consisted of participants with an average age of  $67.34 \pm 5.54$  years old, 90.2% being women, with 72.1% having intermediate and higher levels of education, 14.7% with more than 3 comorbidities, 52.5% with income from 1 to 2 minimum wages and 77% having been practicing physical exercise before recommendations of social restrictions. The occurrence of falls 6 months before the beginning of social restriction was reported by 14.8% of the total sample and 44.5% (n = 4) of individuals who fell had multiples falls.

The analysis of the questions related to the behavior of older adults along 12 months revealed a reduction in the number of older adults who have complied with social distance over time (Table 2).

Table 2  
Older adults' behavior along 12 months of social restriction (n=61).

QUESTIONS	1st month N (%)	6th month N (%)	12th month N (%)
<i>Are you afraid of being infected? N (%)</i>			
Yes	32 (52.5)	33 (54.1)	37 (60.7)
No	29 (47.5)	28 (45.9)	24 (39.3)
<i>Do you think you are at risk of being infected? N (%)</i>			
Yes	14 (23)	29 (47.5)	36 (59)
No	47 (77)	32 (52.5)	25 (40.1)
<i>Do you adopt any strategy to keep physically active? N (%)</i>			
Yes	41 (67.2)	40 (65.6)	32 (52.5)
No	20 (32.8)	21 (34.4)	29 (47.5)
<i>Did you comply with social distancing measures? N (%)</i>			
Yes	48 (78.7)	23 (37.7)	33 (54.1)
No	13 (21.3)	38 (62.3)	28 (45.9)
<i>Number of fallers in 3 periods N (%)</i>			
Single fallers	5 (55.5)	8 (72.7)	6 (75)
Recurrent fallers	4 (44.5)	3 (27.2)	2 (25)
<i>Total number of fallers in the period of 1 year N (%)</i>			15 (24.6)

Among the 61 participants, the majority (78.7%) adopted social restriction measures in the first month, 14.8% reported fall (including the falls reported in the 6 months preceding the restriction measures), 23% reported risk of becoming infected with Covid-19, 52.5% were afraid of being infected and 67.2% performed physical exercises. In the first six months, there was a reduction in the participants' compliance with social restriction measures (37.7%), 18% reported falls, 47.5% reported risk of becoming infected, 54.1 were afraid of being infected and 65.6% performed physical exercises. In the last six months, 54.1% of the participants complied with restrictive measures, 13.1% reported falls, 59% reported risk of becoming infected, 60.7% were afraid of being infected and 52.5% performed physical exercises. The inferential analysis of the chi-square test showed that there is no evidence of the association between the evaluation period and falls [ $\chi^2(2) = 0.584$ ;  $p = 0.747$ ], fear of being infected [ $\chi^2(2) = 0.935$ ;  $p = 0.627$ ] and the practice of physical activity [ $\chi^2(2) = 3.346$ ;  $p = 0.188$ ]. However, there was a significant

association between the evaluation period and social restriction [ $X^2(2) = 22.072$ ;  $p = 0.000$ ] and the risk of being infected [ $X^2(2) = 17.561$ ;  $p = 0.000$ ] (Figure 1).

## Discussion

Social distancing was the strategy adopted by several countries to slow down the spread of Covid-19 [18]. After the number of cases in Brazil escalated, the real fear of a little-known virus facilitated the compliance with measures that involved the reduction of personal interactions within the community at the beginning of the pandemic. However, there was a clear decrease in adherence over time, since the percentage of older adults who fulfilled the recommendations in the first month (78.7%) decreased significantly compared to the first six months (37.7%) and the last six months (54.1%), corroborating with studies that demonstrate a reduction in containment measures all over the world [21, 14]. Furthermore, the results of the present study showed an association between the evaluation period and social restriction [ $p = 0.000$ ].

The study sample demonstrated a considerable percentage of older adults (16.4%) with no formal education and 18% with only elementary education. The low level of education can be considered as an aggravating factor for the non-adherence to compliance with social restriction measures, as revealed in a study [15]. However, the level of education is not the only factor observed in research responsible for interfering with adherence to measures of social distancing. The individual's sex and income can also influence adherence to restrictive measures [17, 22]. 47.5% of the participants in this study received from 3 to 4 minimum wages while 52.5% received from 1 to 2 minimum wages. This fact is likely to justify the decrease in adherence to measurements over time in the evaluated sample, since the fear around the economic risk has pressured a large parcel of the population to continue many of their activities [23].

Another important result is that 80.3% of the participants performed physical activity before the initiation of social restriction measures. In the first month, 67.2% of the older adults performed physical exercises, in the first six months 65.6% whereas in the last six months only 52.5% reported the practice of physical exercises. Among the exercises mentioned were gymnastics with guidance, exercises in the pool, walking in the yard, Pilates, stretching and muscle strengthening with professional guidance.

Considering that the vaccination against COVID-19 did not start in the first month of evaluation and that there are no effective pharmacological therapies available for Covid-19 yet, healthy habits are essential (for example, healthy eating and exercise) and beneficial for vulnerable populations, such as the older adults [24, 11]. Studies published in 2020 showed the importance of physical exercise for the older adults during the pandemic period, which can help to maintain muscle function and improve the immune response promoted by exercise [11, 25]. That means that an active lifestyle during social restriction is indispensable to prevent physical problems and even psychological impacts, especially in this population [26, 27, 28]. However, it is important to highlight that the reduction of physical activity and the increase in sedentary behavior in the older adults can cause greater risk of frailty and fractures resulting from falls [12, 29].

We observed that the proportion of older adult people who fell in the 12-month period was 24.6%, with an absolute number of 15 fallers, of which 3 presented a fall in the six months preceding the evaluations. 72% of these falls happened at home while 28% outside home. In total, there were 25 falls and the main causes were: imbalance (60%), stumbling (28%) and dizziness (12%). In this context, studies have demonstrated that exposure to falls is not associated only with the aging process, but also with the environment in which the older adults are inserted [29]. In addition, the pandemic scenario can intensify the effects of several factors, such as physical inactivity [30], which increases the risk of falls in the older adults. Studies have already indicated the importance of physical exercise to prevent falls in this population [31].

Although self-reported fear of being infected did not show much difference in percentage when we observed the three periods in the graph (first month 67.2%, first six months 54.1% and last six months 60.7%), it is possible to identify a significant increase in self-reported risk of infection by study participants over time (first month 23%, first six months 47.5 % and last six months 59%). In addition, there was a significant association between the evaluation period and the risk of being infected [ $p = 0.000$ ].

It is likely that the increase in the participant's perception level of contamination risk after 6 months could have some relationship with the decrease in compliance with measures of social restriction, due to the increased social exposure, and consequently the feeling of greater risk. Furthermore, knowing close people who were infected may also have contributed to this increase. In the last 6 months, the participant's perception level of contamination risk kept elevated and the compliance of social restriction also increased, which may be associated with the discovery of a new COVID-19 virus variant.

A recent cross-sectional study carried out with 756 participants has shown the prevalence and associated factors with the fear perception of being infected by the new coronavirus [32]. This study has identified that 64% of the total sample reported feeling very afraid of being contaminated. In addition to the self-perception of the risk of being infected, other elements were associated with the perception of fear, such as the perception of health and the adoption of preventive measures against Covid-19 [32]. In our results, more than half of the participants indicated fear of being infected, although the objective assessment of fear is difficult to perform because the feeling of fear is a subjective and adaptive characteristic [33].

It is important to highlight that the difference observed in the accomplishment of the social distancing measures over time may be related to the existence of a decentralized process of adopting these measures in Brazil and also to the absence of a national social distancing policy. In addition, it is possible that long periods of isolation lead to "fatigue" of the population and non-accomplishment of these measures [34]. Additionally, the risk of developing emotional problems such as depression, anxiety, cognitive damage and also physical problems resulting from the prolonged period of social restriction [35, 36] may have influenced the reduction of the social restriction compliance. However, further studies are needed to confirm this hypothesis. Therefore, it is necessary to address the pros and cons regarding the offering of supervised physical exercise to the older population, following the biosecurity protocols

(limited number of participants, social distancing, outdoor activities in a large space, mask use, clean hands and objects and surfaces frequently disinfected) and also whether it should be a public health strategy to keep the population active and minimize the virus contamination.

## Conclusion

The present study indicates a change in the behavior of older adults over the 12 months. Initially, we observed high compliance with the restriction measures, which decreased after 6 months. In the last 6 months, we observed again an increase in the compliance of social restriction, yet not reaching the levels recorded in the first month of assessment. In addition, we can observe a reduction over time in the practice of physical exercise.

## Declarations

Ethics approval and consent to participate

Participants were previously informed by telephone about the research procedures and subsequently read and signed the Form of Consent through the free *Google Forms* tool. The study is conformed with all national and international standards of research with human beings and was approved by the Research Ethics Committee of the Clinical Hospital, Ribeirão Preto Medical School, University of São Paulo (FMRP-USP) (CAAE nº 30948520.2.0000.5440).

Consent for publication

Not applicable

Availability of data and materials

The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

Competing interests

The authors declare that there is no conflict of interest.

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Authors' contributions

All authors of the manuscript "Behavior of the community's older adults during 12 months of COVID-19 social restriction." were fully involved in the study and preparation of the manuscript.

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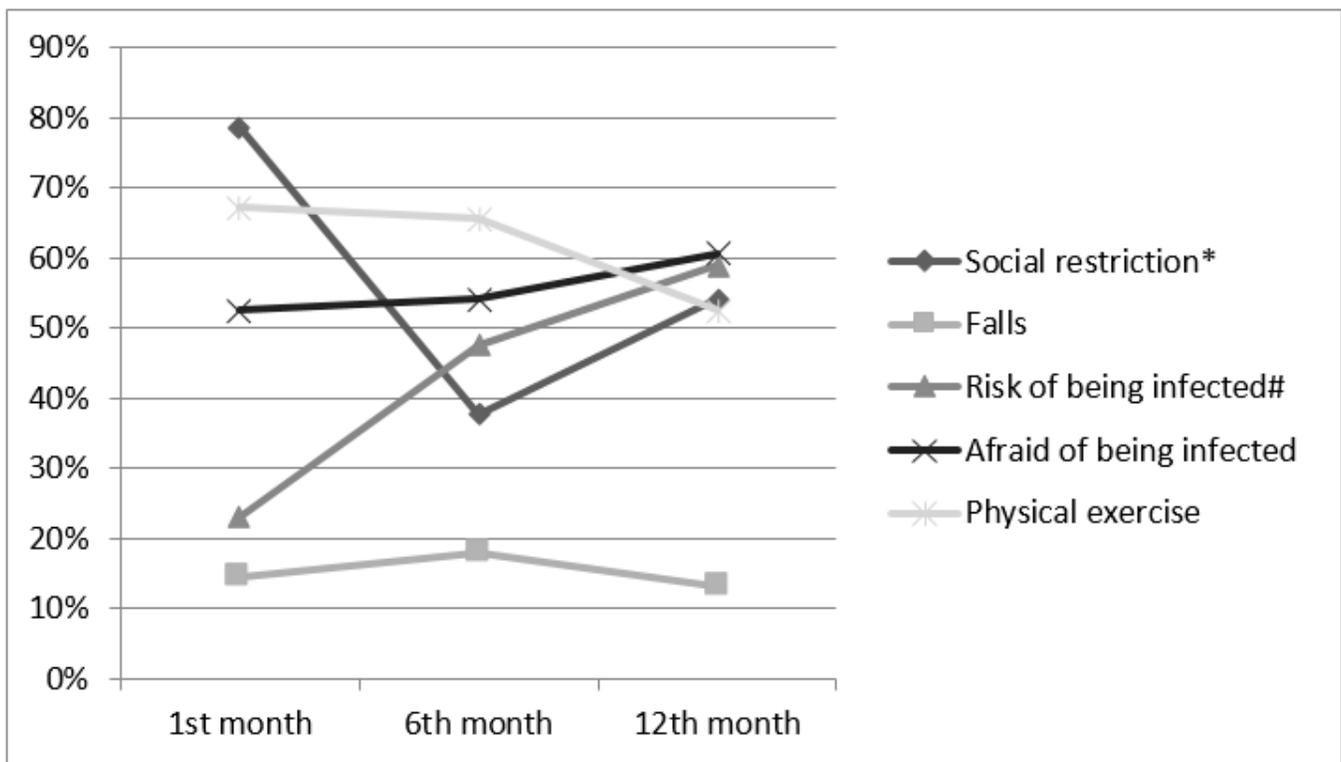
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## Figures



**Figure 1**

Comparative graph of the different evaluation periods. \*p < 0.05 with an association found between the 1st and the 6th month period; #p < 0.05 with an association found between the 1st and the 12th month period.