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Predictors of adherence to the COVID-19 pandemic control guidelines

Preditores de adesão às orientações de controle da pandemia de COVID-19

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Abstract

During the Coronavirus Disease 2019 (COVID-19) pandemic, governments adopted measures to contain the disease, whose adherence is determined by multiple factors. In order to guide more effective prevention strategies, the present study aimed to identify predictors of adherence behavior to the COVID-19 pandemic control guidelines. A survey was conducted with a non-probabilistic sample composed of 2,705 Brazilians, who answered an instrument with six questionnaires (adherence to the pandemic control measures, emotions, empathy, altruism, coping, and biodemographic), whose data were analyzed using descriptive and analytical statistics. It was found that the agreement with the guidelines of the World Health Organization for pandemic control, disagreement with the position of the country's president, altruism, coping capacity, belonging to the risk group, and having close contact (at home) with people from the risk group are predictors of adherence behavior. It is concluded that preventive actions must consider these variables for greater effectiveness.

Keywords: Communicable disease control; Coronavirus infections; Public health surveillance; Treatment adherence and compliance.

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Resumo

Durante a pandemia da doença causada pelo novo coronavírus (COVID-19), os governos adotaram medidas de contenção a adesão é determinada por múltiplos fatores. Para orientar estratégias mais eficazes de prevenção, o presente estudo objetiva identificar preditores do comportamento de adesão às orientações de controle da pandemia. Realizou-se uma pesquisa de levantamento com amostra não probabilistica composta por 2.705 brasileiros, os quais responderam a um instrumento com seis questionários (adesão às medidas de contenção da pandemia, emoções, empatia, altruísmo, enfrentamento e biodemografico); os dados obtidos foram analisados por meio de estatística descritiva e analítica. Verificou-se que os seguintes fatores são variáveis preditoras do comportamento de adesão: a concordância com as orientações da Organização Mundial da Saúde de controle da pandemia; a discordância com o posicionamento do presidente do país; o altruísmo; a capacidade de enfrentamento; a pertença ao grupo de risco; a convivência domiciliar com pessoas do grupo de risco. Conclui-se que ações de prevenção devem considerar essas variáveis para maior eficácia.

Palavras-chave: *Controle de doenças transmissíveis; Cooperação e adesão ao tratamento; Infecções por coronavírus; Vigilância em saúde pública.*

The global scenario in early 2020 was impacted by a pandemic alert made by the World Health Organization (WHO), due to the outbreak of a new coronavirus. This, called Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2), was identified as the cause of Coronavirus Disease 2019 (COVID-19) (Bhagavathula et al., 2020; Oliveira, Lucas, et al., 2020).

The new disease has a remarkably high rate of dispersion and transmission, compared to other recent pandemics (Aquino et al., 2020; Oliveira, Duarte, et al., 2020), as it manages to balance contagion and lethality (Aquino et al., 2020), and may infect anyone without discriminating against groups. There are, however, more vulnerable people, the so-called risk groups, who are more likely to develop more severe reactions to the disease (Williamson et al., 2020), and who need medical services.

Although 80% of people infected by the virus do not need to go to hospital to recover from the disease (Aquino et al., 2020), its rapid spread challenges healthcare systems around the world (Oliveira, Deuarte, et al., 2020). In Brazil, this picture is aggravated by the country's political and economic scenario and the enormous vulnerability of the Brazilian population, with great inequality in the social determinants of health (Borghi et al., 2018).

Due to the insufficient number of vaccines for everyone and uncertainties about effective treatments, the WHO instituted different non-pharmacological measures to fight and prevent the disease that began to be implemented by several countries (World Health Organization [WHO], 2020a, 2020b, 2020c). The main strategies created were the recommendations for the adherence to hygiene etiquette rules (washing hands, using hand sanitizer, masks, etc.), the adoption of isolation measures by infected people (quarantine) or those who had contact with patients (social isolation), respect for social distance – for the population in general, who have not had contact with the infected or are not sick – and a broad awareness to keep the population at home, to avoid large public gatherings and decrease the risk of infection. In more extreme situations, the government decreed lockdowns, with a full ban on the circulation of people on the streets, only allowing people to leave their homes to buy food and medicine or seek health care. These measures were implemented differently in each country, depending on the intensity of the disease at the location (Aquino et al., 2020).

In Brazil, these measures proved necessary to mitigate the negative impacts caused by COVID-19 and to control the pandemic, with the main one being social distancing, commonly called, indiscriminately, social isolation or quarantine by the population and the media (Bezerra et al., 2020). Its adherence by the population can be influenced by several factors, namely: the impact on mental health (Bezerra et al., 2020; Biondi & Iannitelli, 2020; Guo et al., 2020; Van Bavel et al., 2020; Wei et al., 2020) and their ability to cope with problems (Brooks et al., 2020; Carvalho et al., 2019; Pereira et al., 2020; WHO, 2020b), empathy and

altruism levels (Biondi & Iannitelli, 2020; Brooks et al., 2020; Do Bú et al., 2020; Van Bavel et al., 2020; WHO, 2020b), the agreement with the social isolation/distance guided by the WHO and with the position of the country's administration on these measures (Chatterjee & Chauhan, 2020; Do Bú et al., 2020; Van Bavel et al., 2020), the disease infection history and belonging to the risk group, or residing with people with greater vulnerability (Williamson et al., 2020), tested in the present study and discussed below.

COVID-19 and social distancing changed people's daily lives and affected the mental health of part of the population (Bezerra et al., 2020; Biondi & Iannitelli, 2020; Guo et al., 2020; Wei et al., 2020). One possible issue is pandemic stress, which differs from other traumatic reactions in that it occurs from a persistent and mysterious situation that affects the present and the future (Biondi & Iannitelli, 2020). In these circumstances, many individuals, at first, experience a kind of disbelief and underestimation of the problem, as if they were in a very distant and abstract reality in which they live. However, when they accept the reality of the severity of the pandemic, if associated with pandemic stress, emotions of worry, boredom, anguish, and a feeling of loss of freedom can arise (Biondi & Iannitelli, 2020), depression and anxiety symptoms, and sleep disorders (Bezerra et al., 2020; Wei et al., 2020) or family conflicts due to intense coexistence. They generate emotional reactions that affect adherence to pandemic containment measures, such as dysfunctional stocking of food and hygiene products or a defensive strategy of unrealistic optimism, which can result in individuals disregarding prevention measures (Van Bavel et al., 2020). Thus, the higher the stress level, the less comfortable people feel about staying home (Bezerra et al., 2020).

Over time, the subject's active functions maintain fear and anguish. However, as a defensive way of dealing with these reactions and with the entire context that surrounds them, individuals seek to satisfy their vital needs for safety, housing, and food, and begin to create strategies to face this new reality (Guo et al., 2020). Coping in the context of a pandemic, according to the interactive model of stress, refers to a set of cognitive and behavioral strategies used to manage internal or external demands that overload the individual's personal resources (Carvalho et al., 2019). These strategies have a mediating role between the individual, health and disease and mitigate the psychological impacts caused by the pandemic, necessary for adherence to measures to contain the disease (Brooks et al., 2020; Ho et al., 2020; Pereira et al., 2020; WHO, 2020b).

New ways of thinking, acting, responding to situations, and solving problems strengthen individual resilience (behaviors aimed at self-care) and community (behaviors aimed at collective actions, such as confinement) (Biondi & Iannitelli, 2020). Factors such as altruism and empathy can be associated with adherence to measures to contain the disease. Through them, by recognizing the virus as a real threat, people are afraid to leave their homes, not only because of the possibility of becoming infected, but also of transmitting the disease to other people. This fear is intensified when it is related to the family, which can be the most directly affected by the individual's infection (Bezerra et al., 2020; Brooks et al., 2020). In addition, individuals start to respond with care, help, and solidarity to others, strengthening support networks (Biondi & Iannitelli, 2020). This is because fighting a global pandemic requires large-scale cooperation (Van Bavel et al., 2020; WHO 2020b). On the other hand, the lack of empathy and altruism, both by the population and the government, can interfere with the adoption of preventive measures (Do Bú et al., 2020).

The population's awareness about the potential risk of the disease is another factor related to adherence to prevention strategies (Oliveira, Duarte, et al., 2020). Its central strategy is based on the credibility of the information transmitted by the government and by the institutions responsible for controlling the disease. Therefore, the actions of the WHO and public health agencies (represented in Brazil by the Ministry of Health and state and municipal health secretariats) and the public government (presidents, governors, and mayors) have a strong impact on the population. Therefore, inconsistency in data or recommendations and the transmission of the idea of exaggeration associated with the problem, minimizing it, can reduce adherence to measures to contain the pandemic (Brooks et al., 2020; Do Bú et al., 2020; Van Bavel et al., 2020).

Another cultural barrier to coordinated pandemic prevention action within countries is political polarization. This can diminish trust or generate an adherence response in line with the political party of the individual, turning a global public health problem into a political issue. Leaders considered prototypical of their group and who act according to the interests of all tend to have greater influence and adherence to sanitary measures by the population. Therefore, the agreement with the position of international institutions such as the WHO and with governments and their representatives can influence the population's adherence to COVID-19 prevention measures (Van Bavel et al., 2020).

As explained above, based on experience with other pandemics, it is possible to detect several factors that may be related to adherence to COVID-19 containment measures. Although there are still limitations on this topic in the current pandemic, it is urgent to identify them, to enter research data into national and international scientific databases, and to offer subsidies to governments and health institutions on aspects that should be considered in the creation of proposals for disease prevention intervention. This is because the effectiveness of public health instructions to contain the spread of the pandemic depends on public adherence. In response to this demand, this research aimed to identify predictors of adherence behavior to the COVID-19 pandemic control guidelines. Based on the above literature review, it was hypothesized that agreement with the WHO, agreement with the current president of the country, altruism, empathy, coping ability, belonging to the risk group, and having close contact (at home) with people from the risk group are predictors of adherence. Thus, this study becomes relevant because it proposes to offer empirical data that signal some variables that determine adherence to pandemic control measures.

Method

It was a descriptive, correlational, transversal research, with a quantitative approach and a national survey.

Participants

We counted a non-probabilistic convenience sample composed of 2,705 Brazilians, representatives of all Brazilian states, although with a greater sample concentration in the Northeastern region (Table 1). The inclusion criterion was: being a Brazilian native, over 18 years of age, with internet access. The exclusion criteria were: people without internet access and/or unable to read the questionnaire.

Instruments

The participants answered an instrument divided into six parts:

Biodemographic questionnaire – created for this study, it contains questions about age, sex, income, educational level, region of the country, and questions about infection history, whether they belong to the risk group or having close contact (at home) with people from the risk group for COVID-19. In addition, two questions investigated the participant's agreement level with the position of the country's president (against social isolation) and with the position of the World Health Organization (in favor of social isolation).

Questionnaire of Adherence to the Pandemic Control Guidelines – created for this study, it quantifies the adherence behavior to the WHO strategies. It consists of three items that evaluate adherence to the guidelines for staying home, wearing masks, and washing hands, with a Likert response of 5 points (1 = "I totally disagree" and 5 = "I totally agree"). For evaluation and interpretation, the total sum of items was obtained, ranging between 3 and 15 points, in which higher scores indicate a higher adherence level.

Table 1
Sociodemographic data of the sample of Brazilian individuals

Variables	*n*	%
Sex		
Male	606	22.40
Female	2099	77.60
Family income		
No income	317	11.70
Below BRL 1000	178	06.60
Between BRL 1001 and BRL 2000	376	13.90
Between BRL 2001 and BRL 3000	350	12.90
Between BRL 3001 and BRL 4000	273	10.10
Between BRL 4001 and BRL 5000	260	09.60
Above BRL 5000	951	35.20
Educational level		
Elementary/Middle School	18	00.70
High School	200	07.40
Incomplete Higher Education	512	18.90
Complete Higher Education	659	24.40
Graduate Studies	1316	48.70
Region of residence (in Brazil)		
Northern	78	02.90
Northeastern	1298	48.00
Midwestern	51	01.90
Southeastern	698	25.80
Southern	580	21.40
The individual is part of the risk group		
Yes	824	30.50
No	1881	69.50
The individual has close contact (at home) with people from the risk group		
Yes	1471	54.40
No	1234	45.60
COVID-19 infection history record		
The individual has or has had COVID-19	138	5.10
The individual has not had COVID-19	2567	94.90
The individual agrees with the position of the World Health Organization		
The individual agrees with the World Health Organization	2382	88.10
The individual disagrees with the World Health Organization	323	11.90
The individual agrees with the position of the current president		
The individual agrees with the president	349	12.90
The individual disagrees with the president	2356	87.10

Altruistic Attitudes Questionnaire – its main objective is to evaluate altruistic attitudes in their cognitive, affective, and behavioral components. It consists of four items taken from the Altruistic Attitudes Scale (Loureiro & Lima, 2013), such as "I assist family and friends, without expecting anything in exchange" and "I think that, in this world, everyone has to take care of him or herself". This is a Likert-type scale, ranging between 1 and 5 points. For evaluation and interpretation, the total sum of items was obtained, which varies between 4 and 20 points, in which higher scores indicate a higher altruism level.

Empathy Questionnaire – it aims to measure characteristics related to empathy. It has four items created from the Multidimensional Interpersonal Reactivity Scale (Davis, 1983), which is adapted and validated for

the Brazilian population (Koller et al., 2001). It has items like "before criticizing someone, I try to imagine how I would feel if I were in their shoes" and "other people's misfortunes and problems generally don't bother me much". It is a Likert-type scale, ranging from 1 to 5 points, in which the higher the score, the greater the respondent's empathic characteristics. For evaluation and interpretation, the total sum of items was obtained, ranging between 4 and 20 points, in which higher scores indicate a higher empathy level.

Coping Strategy Questionnaire – has four items created from the Coping Strategies Inventory (Savóia et al., 1996), which analyzes coping behavior in stressful situations in the coronavirus context. The items include aspects of adaptation: "I try to analyze the problem to understand it better"; "I made an action plan and followed it"; "I rediscovered what is important in life", and "I changed something in myself, I changed myself in some way". This is a Likert-type scale, ranging between 0 and 3 points. For evaluation and interpretation, the total sum of items was obtained, which varies between 0 and 12 points, in which higher scores indicate a higher coping level.

Emotions Questionnaire – measures the frequency of emotions. It consists of six items, with positive (Productive, Inspired, and Secure) and negative (Worried, Bored, and Distressed) emotions, taken from the *Escala de Bem-Estar Subjetivo* (EBES, Subjective Well-Being Scale) (Albuquerque & Tróccoli, 2004), and answered on a 5-point Likert scale (1 = "Not at all" and 5 = "Extremely"). For evaluation and interpretation, a sum of positive questions was made, generating a factor of positive emotions and a sum of negative questions, generating a factor of negative emotions, both allowing a variation between 3 and 15 total points.

Procedures

Regarding the ethical aspects for research involving human beings, this research was approved by the Research Ethics Committee of the Universidade de Fortaleza (University of Fortaleza), opinion nº 4.014.996. Then, the instrument with all the questionnaires was made available on the internet along with the Consent Term, through a specific webpage in a private domain. The dissemination and data collection took place between May 8th and June 21st/2020, through social networks, newspaper reports, and web portals. After the research was published, people who follow the posts in these media could autonomously enter the questionnaire and answer it individually, self-administered and anonymously, in a single access, with an average duration of 15 minutes.

Data Analysis

At the end of collection, all analyzes were performed with the aid of the SPSS (version 25), from the International Business Machines Corporation (IBM), from New York (USA). Data analyzes were divided into three stages. Initially, descriptive statistical analyzes were performed, involving measures of central tendency and frequency analysis, to evaluate the sociodemographic variables and verify the scores of the studied variables.

In the second stage, tests were carried out to compare the sample scores of the index of to the COVID-19 containment measures according to data related to the COVID-19 infection history record, belonging to the risk group for the disease, having close contact (at home) with people from the risk group, agreement with the position of the country's president regarding COVID-19, and agreement with the position of the WHO on pandemic control guidelines. Finally, in the third stage, correlations were verified between the adherence index and five variables – altruism, empathy, coping, positive emotions, and negative emotions, with a significance level lower than 5% ($p < 0.05$).

Then, two multiple linear regression tests were performed, a raw model (without covariates) and an adjusted model (considering sex, age, income, educational level, and COVID-19 infection history as covariates), in order to evaluate whether adherence in the sample is better explained by these covariates or whether the results of the main variables remain statistically significant regardless of them. The regressions were performed via stepwise insertion, using adherence behavior as the dependent variable and the other variables as independent variables – belonging to the risk group, having close contact (at home) with people belonging to the risk group, COVID-19 infection record, agreement with the WHO, agreement with the president, and the variables that showed significant correlations in the correlation analysis (altruism and coping). Such analysis aimed to verify the predictive and explanatory power of the studied variables on adherence behavior indices.

The indices of the constructs used showed an abnormal distribution: Adherence Behavior ($W = 0.516$; $p = 0.000$), Altruistic Attitudes ($W = 0.895$; $p = 0.000$), Empathy ($W = 0.965$; $p = 0.00$), Coping ($W = 0.976$; $p = 0.000$), Positive Emotions ($W = 0.977$; $p = 0.000$), Negative Emotions ($W = 0.977$; $p = 0.000$); thus indicating non-parametric tests for the analyses, performed with the Mann-Whitney, for sample comparison, and Spearman's correlation coefficient, to verify the associations between the variables. It is contemplated that there was no missing in the responses to the general questionnaire.

Results

The participants had a mean age of 38.63 years ($SD = 14.26$). Most were in voluntary social isolation/distancing ($n = 2,244$; 83.00%). Other variables can be seen in Table 1.

The adherence behavior to pandemic control guidelines had an average of 14.38 points ($SD = 1.35$). The altruism index had an average of 17.55 points ($SD = 2.24$). The empathy index had an average of 14.95 points ($SD = 2.22$). The coping indices had an average of 7.56 points ($SD = 2.35$). The general index of positive emotions had a mean score of 9.29 ($SD = 2.89$). For negative emotions, an average of 7.85 points ($SD = 2.58$) was obtained (Table 2).

Table 2
Descriptive statistics of the Brazilian volunteers' scores in the studied variables – adherence, altruism, empathy, coping, and emotions

Variables	Minimum	Maximum	*M*	*SD*
Adherence to the pandemic control guidelines	3.00	15.00	14.38	1.35
Altruism	4.00	20.00	17.55	2.24
Empathy	4.00	20.00	14.95	2.22
Coping	0.00	12.00	7.56	2.35
Positive emotions	3.00	15.00	9.29	2.89
Negative emotions	3.00	15.00	7.85	2.58

Subsequently, comparisons of indices of adherence behavior between groups were performed based on data on the COVID-19 infection history record, belonging to the risk group, having close contact (at home) with people from the risk group, agreement with the position of the country's president, and agreement with the position of the WHO. Differences in comparisons according to COVID-19 infection records were not significant. Next, only the evaluations that stood out due to the existence of statistically significant differences will be registered.

When comparing between participants and belonging to the risk group, there was a statistically significant difference in the rates of adherence ($U = 708627.500$; $p < 0.001$), with a greater adherence

among the participants who are part of the risk group. A statistically significant difference in the adherence level due to having close contact (at home) with people from the risk group (U = 843986.500; $p < 0.001$) was also found, with higher adherence rates among subjects residing with people from the risk group (Table 3).

In the comparison between groups and agreement with the WHO position on the orientation towards social distancing, there was a statistically significant difference in the adherence rates (U = 141490.500; $p < 0.001$), in which the participants agreed with the WHO had higher adherence rates. When comparing the participants according to the agreement with the country's president, a statistically significant difference was found in the adherence levels (U = 154116,000; $p < 0.001$), in which participants who do not agree with the president had higher adherence rates (Table 3).

Table 3
Comparison of adherence behavior indices among groups of Brazilian individuals

Variables	Distribution			
	M	*SD*	Median	*IR*
Comparison between adherence rates and belonging to the risk group (U = 708627.500; $p < 0.001$)				
The individual belongs to the risk group	14.51	0.042	15.00	0.00
The individual does not belong to the risk group	14.32	0.32	15.00	1.00
Comparison between adherence rates and residing with people who are part of the risk group (U = 843986.500; $p < 0.001$)				
The individual resides with people from the risk group	14.46	0.03	15.00	1.00
The individual does not reside with people from the risk group	14.27	0.04	15.00	1.00
Comparison between adherence rates and agreeing with the position of the WHO (U = 141490.500; $p < 0.001$)				
The individual agrees with the WHO	14.60	0.02	15.00	0.00
The individual does not agree with the WHO	12.74	0.12	13.00	2.00
Comparison between adherence rates and agreeing with the position of the president (U = 154116.000; $p < 0.001$)				
The individual agrees with the president	12.84	0.11	13.00	2.00
The individual does not agree with the president	14.60	0.02	15.00	0.00

Note: IR: Interquartile Range.

To better understand the relationships between adherence behavior and the studied variables, a Spearman correlation analysis was performed between the adherence behavior index and five studied variables – altruism, empathy, coping, positive emotions, and negative emotions.

It was possible to verify a positive and significant correlation between adherence behavior and altruism ($p = 0.177^{**}$; $p < 0.001$) and adherence and coping ($p = 0.114^{**}$; $p < 0.001$). These results indicate that higher altruism and coping levels are associated with greater adherence to pandemic control guidelines. There were no statistically significant correlations with empathy, positive or negative emotions.

To investigate the predictive power of the studied variables, a multiple linear regression analysis was performed, using adherence behavior as the dependent variable and six variables as independent variables – agreement with the WHO, agreement with the president, belonging to the risk group, having close contact (at home) with people who belong to the risk group, record of COVID-19 infection, and the variables that showed significant correlations in the correlation analysis (altruism and coping).

The analysis resulted in a statistically significant model [F (6.2698) = 146.184; $p < 0.001$], in which agreement with the WHO, agreement with the president, altruism, coping, belonging to the risk group, and

having close contact (at home) with people belonging to the risk group were significant variables for the regression model ($p < 0.001$) and explain 24.4% ($R^2 = 0.244$) of the variations in the indices of adherence behavior to the COVID-19 pandemic control guidelines. The infection record variable was not significant for the model.

Among these variables, it was found that agreement with the WHO is the variable that most explains the model ($R^2 = 19.8\%$; $\beta = 0.262$; $T = 9.443$; $p < 0.001$), followed by agreement with the president ($R^2 = 1.8\%$; $\beta = -0.225$; $T = -8.108$; $p < 0.001$), altruism ($R^2 = 1.7\%$; $\beta = 0.107$; $T = 6.237$; $p < .001$), coping ($R^2 = 0.6$; $\beta = 0.080$; $T = 4.703$; $p < 0.001$), belonging to the risk group ($R^2 = 0.5\%$; $\beta = 0.064$; $T = 3.812$; $p < 0.001$), and residing with someone who belongs to the risk group risk ($R^2 = 0.2\%$; $\beta = 0.045$; $T = 2.668$; $p < 0.001$) (Table 4).

Then, in order to confirm the explanatory power of the variables used in the model, an adjusted model was performed, considering sex, age, income, educational level, and COVID-19 infection history record as covariates. After the analysis, a statistically significant model was found [F (11.2685) = 80.922; $p < 0.001$], explaining 24.6% ($R^2 = 0.246$) of the variations in the indices of adherence behavior to the COVID-19 pandemic control guidelines, noting that the covariates explained 1.8% ($R^2 = 0.018$). The agreement with the WHO ($R^2 = 18.9\%$; $\beta = 0.256$; $T = 9.144$; $p < 0.001$), agreement with the president ($R^2 = 1.9\%$; $\beta = -0.226$; $T = -8.126$; $p < 0.001$), altruism ($R^2 = 1.0\%$; $\beta = 0.93$; $T = 5.275$; $p < .001$), coping ($R^2 = 0.6\%$; $\beta = 0.077$; $T = 4.530$; $p < 0.001$), belonging to the risk group ($R^2 = 0.2\%$; $\beta = 0.048$; $T = 2.544$; $p < 0.001$), and residing with someone who belongs to the risk group ($R^2 = 0.2\%$; $\beta = 0.048$; $T = 2.804$; $p < 0.001$) variables, remained significant in the model (Table 4).

Table 4
Multiple linear regression with two models for predicting adherence behavior in a Brazilian sample

Predictors of adherence	Linear regression (Raw model)				Linear regression (Adjusted model)			
	R^2 (%)	β	*t*	*p*	R^2 (%)	β	*t*	*p*
The individual agrees with the WHO	19.8	0.262	9.443	< 0.001	18.9	0.256	9.144	< 0.001
The individual agrees with the president	1.8	-0.225	-8.108	< 0.001	1.9	-0.226	-8.126	< 0.001
Altruism	1.7	0.107	6.237	< 0.001	1.0	0.93	5.275	< 0.001
Coping	0.6	0.080	4.703	< 0.001	0.6	0.077	4.530	< 0.001
The individual is part of the risk group	0.5	0.064	3.812	< 0.001	0.2	0.048	2.544	< 0.001
The individual has close contact (at home) with people from the risk group	0.2	0.045	2.668	< 0.05	0.2	0.048	2.804	< 0.05

Specifically, it is concluded that agreement with the WHO, disagreement with the current president, altruism, coping, belonging to the risk group, and residing with people who are part of the risk group imply higher rates of adherence to the pandemic containment strategies.

Discussion

From the results of the present study, it was possible to identify some predictors of the adherence behavior to the guidelines for the control of the COVID-19 pandemic in Brazil: agreement with the WHO and disagreement with the country's president, altruism, coping, belonging to the risk group, and having close contact (at home) with people who are part of the risk group.

Adherence to prevention measures is related not only to the perceptions that individuals have about the disease, but also to the trust they have in their leaders, governments, and institutions (Van Bavel et al.,

2020). The WHO oriented the different countries of the world to adhere to several COVID-19 containment measures (Baghchechi, 2020; WHO, 2020a, 2020c). In Brazil, the current president, several times, publicly disagreed with these guidelines through the media, exposing that the disease was not as serious as the information recommended by the health agency, minimizing it. Furthermore, citing economic reasons, he encouraged the population to return to work and routine activities (Do Bú et al., 2020), causing divergence in health-related positions and recommendations.

In the present research, the agreement with the position of the WHO and the disagreement with the current president's position regarding the pandemic significantly influenced the adherence to its containment strategies. It can be inferred that the recognition of the WHO as a credible health authority may have influenced the association between agreeing with this institution and following preventive measures oriented by it. In turn, due to the strong political polarization existing in Brazil and the explicit position of the country's leader against social distancing, the participants who did not identify the president as a leader or did not agree with his position, did not follow his guidelines, adopting the pandemic containment strategies recommended by the WHO. It appears, therefore, that the inconsistency in the recommendations or taking a stand to minimize the problem can reduce the population's adherence (Brooks et al., 2020; Do Bú et al., 2020; Van Bavel et al., 2020).

In the results found, it was observed that being part of the risk group or sharing a household with someone who is in this condition was associated with adherence to the COVID-19 control strategies. Since the beginning of the pandemic, several health institutions, including the WHO, massively publicized the information that people from risk groups should adopt stricter social isolation measures, as they would be more vulnerable to the more severe reactions of the disease (Williamson et al., 2020). Likewise, those who were not at risk, but who resided with someone in such a condition, should also adopt containment measures, as they could contaminate their loved ones.

Altruism was also associated with a higher rate of adherence to virus containment strategies. Even if the individual does not belong to any risk group, the adoption of social isolation measures, hand washing, using hand sanitizers, and wearing masks can be understood as a voluntary behavior that involves the individual's concern not only with him or herself, but also with other people, without waiting for external rewards. Accordingly, solidarity actions around the country and the world were reported and encouraged by the media and the WHO to help people in situations of greater vulnerability, immersed in a scenario of anguish and uncertainty (Ho et al., 2020; Pereira et al., 2020; Van Bavel et al., 2020; WHO, 2020b).

Regarding coping, it was observed that those who took an active stance in the face of the pandemic, reflecting on it and promoting adaptive behavior changes, had a higher rate of adherence to measures to contain the disease. Coping strategies such as resting, healthy eating, exercising, and having contact with other people (albeit virtually) were encouraged by the WHO as a way to deal with the stress generated by the pandemic (WHO, 2020b). Adaptive coping strategies can increase the sense of control and also decrease anxiety and depression symptoms (Ho et al., 2020; Pereira et al., 2020).

Conclusion

From the results of this study, it can be concluded that agreement with the WHO, disagreement with the current president, altruism, coping, belonging to the risk group, and residing with people who are part of the risk group imply higher rates of adherence to pandemic containment strategies.

Like all scientific research, this study has some limitations. Despite including participants from all regions of the country, there was a significant concentration of Northeastern region individuals. In addition, a significant number of people in the highest income and educational levels participated. These variables limit

the generalization of the results, as they do not correspond to the reality of most of the country's population. It is highlighted, however, that the purpose of this study is not to generalize the results, but rather to indicate factors that can predict the adherence of pandemic containment measures. Data collection, carried out over the internet, may also have limited the participation of people who did not have access to the network. This was, however, a methodological decision based on cost-effectiveness, as the online collection enabled the participation of people from different regions of the country. Further studies, carried out at other moments of the pandemic, are suggested in order to verify possible changes over time and to perform surveys with more representative samples of the Brazilian population.

Given the scarcity of studies on the subject, this research brings contributions to understanding the behavior of some Brazilian individuals in the face of a global health crisis. The identification of predictors of adherence to disease control strategies can help managers and health agencies in the development of more effective prevention actions to combat, not only COVID-19, but other public health emergencies.

It is concluded that adherence to pandemic control guidelines is influenced by the following predictors: the individuals' faith in institutions and governments, their degree of altruism, the adoption of adaptive coping strategies in the face of difficulties brought by the pandemic and belonging to the risk group.

Contributors

F. M. P. HILDEBRANDT and C. F. MELO were responsible for the study conception, design, and analysis, data interpretation, and for writing this paper. I. M. COSTA, L. M. S. MENESES and J. L. ARAÚJO NETO collaborated with data collection, analysis, interpretation, and discussion and in the review of the final approval of this article.

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