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ANTIVACCINE BELIEF SYSTEMS AND CONSPIRACY THEORIES IN BRAZIL: AN EXPLORATORY STUDY ON THE COVID-19 PANDEMIC

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ABSTRACT

This paper aims to investigate the beliefs that are present in the population regarding vaccines during the Covid-19 pandemic. It is considered that during this period; besides the negative effects of the virus, the world also suffers from the dissemination of fake news, inducing a part of the population to have an opinion contrary to what has been sought by scientists. Since belief is understood as any statement accepted by at least one person about a social object, the study had the participation of a sample of 200 people to answer the Adherence to Antivaccine Conspiracy Theories Scale, in which the participants presented their beliefs about vaccines through their answers. The results point out that in the sample studied there is no evidence of a significant adherence to antivaccine conspiracy theories, and this can be explained by the level of education of the participants. And it suggests that new studies should be carried out to expand the sample.

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INTRODUCTION

The World Health Organization (FIOCRUZ, 2020) defines a pandemic as the worldwide spread of a new disease, and the term is now used when an outbreak initially affects one region, subsequently spreading to different continents with sustained person-to-person transmission. Covid-19 adds to an extensive list of pandemics that runs through human history, among them are the Plague of Egypt, Plague of Cyprian, Black Death, Spanish Flu, Meningitis, and Swine Flu. The Spanish Flu is cited as a reference of effects and forms of care, considering the rapid contamination, the unbridled search for medicine and protection, the disbelief and devaluation of the disease, the observance of lethality in all age groups, the creation of numerous fake news and the shutdown of all the continents, factors that are similar to COVID-19 and greatly impact the world scenario. The Spanish Flu was the pandemic that quickly spread through all regions of the planet, leaving the largest number of people infected and dead, if compared to pandemics that had occurred previously, having killed 20 million people worldwide (but some records speak of 50 million

deaths). Regarding the number of sick people, the difficulties at that time in making an actual count were even greater, and the numbers more frightening: at least 600 million people are thought to have fallen ill. Before Covid-19, the most recent pandemic occurred in 2009, with the so-called swine flu. Caused by the H1N1 virus, Swine Flu is estimated to have infected about 1 billion people and killed thousands in the first year of detection. Regarding COVID-19, a total of 15,586,534 confirmed cases and 434,715 deaths were recorded in Brazil as of May 16, 2021 (Ministério da Saúde, 2021). However, these numbers are estimated to be even higher, data that do not consider delays in notifications or untested positive cases. During the initial months of the pandemic, countless actions without historical precedent emerged, such as the social isolation decree, the massive investment in scientific research, the efforts to rapidly sequence the viral genome, the development of effective diagnostic methods, and the research and development of vaccines seeking to minimize the effects of the virus. These actions have generated numerous reflections in the work of the scientific community to fight a virus that has destabilized the world organization.

A Brief History of Vaccines: In the 18th century smallpox, an extremely serious viral disease, was a serious public health problem in the world. The smallpox virus emerged as an animal pox virus existing in domesticated species when human populations began to have agricultural practices and animal husbandry. It is believed that it evolved, and gradually adapted to humans. The first human victims probably lived in one of the first areas of agricultural concentration in Asia or Africa, approximately 10,000 years ago (Hopkins, 1983). The smallpox vaccine emerged in the late 18th century, from the studies of English physician Edward Jenner, who observed that people who had been contaminated by milking cows with cowpox became immune to smallpox. On May 14, 1796, Jenner performed his first vaccination on an eight-year-old boy named James Phipps and, on July 1st of the same year, inoculated him with pus from a case of smallpox. Over time, the signs of the vaccination disappeared, and the boy showed no signs or symptoms of the disease (Fischmann, 1978). After the findings on the safety and effectiveness of inoculation, Jenner started the immunization of children using fragments of cowpox pustules (Cunha; Krebs; Barros, 2009). He then started inoculating other individuals with the material extracted from the wounds of previously inoculated people, passing the inoculations arm by arm (Ballalai, 2013). The results of the research were not easily accepted. Doctors ridiculed them, and the population initially remained very reluctant for fear that the vaccine, formulated from material taken from the cow's udders, would transfer characteristics of the animal to the human being. Although Edward Jenner's findings were initially the target of harsh criticism, immunization gained ground with the confirmation that his proposal was innovative and effective. Studies have pointed out that a lot of ground has been covered in Brazil and in the world until mass vaccination reached the current level. Issues such as the initial fear of the vaccine itself, fear of acquiring characteristics of the animal or of contracting the disease in its most severe form, which hindered the dissemination of the vaccine culture, cause revolt in the population and point to how difficult the beginning of this process was in Brazil until it reached the reality that we have today (Larocca and Carraro 2000). Over the years, new vaccines were discovered.

One hundred years after the experiment that gave birth to the immunization against smallpox, Luiz Pasteur discovered the possibility of producing other immunizing agents (vaccine) using microorganisms, bacteria and viruses (Larocca; Carraro, 2000). Coming from Portugal, the vaccine only arrived in Brazil in 1804, transported by the process of arm-in-arm inoculation. According to Risi, "For this, six slave boys were sent to Lisbon, and on the return ship, vaccinated in sequence, in order to preserve the vitality of the virus. By the same system the vaccine was transferred to Rio de Janeiro and then to São Paulo" (Risi, 1968, p.130). At the beginning of the 20th century, the mandatory vaccination against smallpox and the resistance of sectors of society resulted in the so-called Vaccine Uprising, a situation in which the population demonstrated indignation with the mandatory immunization. The immediate trigger for this revolt was the publication of the plan to regulate the mandatory application of the smallpox vaccine on November 9, 1904. The lack of information about the effectiveness and safety of the vaccine caused great dissatisfaction among the population, who was already suffering from urban restructuring. Therefore, several people took to the streets to protest against the mandatory vaccination. Rio de Janeiro experienced a major confrontation between the population, the police, and the army. The confrontations occurred in the period from November 10 to 16, 1904 and caused the death of many people becoming the week of tension that was the biggest riot in the history of Rio. (Sevcenko, 1993). Regarding COVID 19, in Brazil the first person was vaccinated on January 17, 2021, in São Paulo, with CORONAVAC by the Butantã Institute. From then on, the national immunization program was started all over Brazil. (CorreioBraziliense, 2021)

Beliefs and Belief systems: In psychology, belief is any proposition that is in some way present in our psychic life, from its origin to its influence on behavior, through cognitive processes performed at the level of consciousness and the cognitive unconscious. On this plane,

which is that of empirical reality, people and even extensive human groupings can accept false propositions as true and reject true statements by reversing their decisions due to the influence of various processes, including ignorance. This is just one example of what happens in personal and collective experiences, and it is interesting to propose psychological explanations for such facts. One must consider the essential difference between beliefs and their connections of psychological nature, and the knowledge one wishes to obtain about it, making the transition from objective reality to the abstract plane of theoretical cogitations, producing hypotheses and scientific theories. (Krüger, 2018, pp. 20-21). A belief combines ideas or concepts, and the communication for this combination occurs through words organized by rules applied to different dimensions being lexical, syntactic and semantic, according to the natural language of the subject. The question of natural language generates a scientific problem at the philosophical, psychological, and neuroscientific levels. From the perspective of social psychology, however, this problem is not an obstacle, because belief research is carried out in such a way as to take belief as the basic unit of investigation. Regarding considerations about the essence of beliefs, whether their content is abstract or concrete, when one accepts the notion of their concreteness, beliefs are sentences that demonstrate the meaning that the speaker or the group to which he or she belongs has decided to attribute. Another perspective within contemporary psychology is based on the understanding that the root of beliefs lies in abstract ideas, originating in sensory and cognitive experiences, in the perception of material attributes of objective reality, and that they can be communicated through language, this being the so-called conceptualist solution. It is important not to limit the meaning of the word "belief" to religious thinking, which is something that often happens in popular knowledge. This interpretation is valid, but it cannot be applied as the only correct understanding of the word, it cannot limit the concept. Moreover, those who believe on a religious level, believe because they have faith, which puts the concept in a different condition from the philosophical definition, in which the belief in question is not taken as an absolute truth, but as a statement whose validity still needs to be analyzed, following logical criteria. Beliefs, besides being able to be true or false, can also be constant or inconstant (Campos, 2018, p.88).

In cognitive psychology, belief cannot be observed directly. It is treated as an intervening variable. One can only attempt to gain knowledge of a belief through its objective expression, through speech and writing. A possible problem with this type of research is that there can be inconsistency from the research participants in how they actually think and how they express their beliefs and opinions. The researcher needs to act to estimate this coherence and thus avoid further errors in the collection of information. Certain stimuli and particular psychological conditions can interfere with a subject's coherent expression. However, from the behaviorist perspective, beliefs are observable manifestations of verbal behavior, dismissing mention of conscious or unconscious processes. These are two divergent interpretations, while for the behaviorist view human behaviors result from psychological causal relationships, for the cognitivist model the emphasis is on the relative autonomy of the individual's cognition and volition. In the cognitivist view, the biggest problem is the mind-brain relationship, which is still not very clear at the scientific level. There are many types of belief, but the general definition of belief here proposed refers to any statement made by a person, originating from his experience, which can be of perceptual or cognitive origin. Two important contributions are added to this definition. The first is that perception is a psychological process of obtaining information from sensory experience. The second is that cognition is a system made of processes, contents, psychological states, which make it possible to obtain, interpret, retain, retrieve, process, and communicate information (Krüger, 2018, p. 25).

It is also interesting to point out that beliefs are not necessarily received with the same level of acceptance. Some beliefs receive strong approval, and may even become personal convictions, while others are received with reservation, with doubts about their validity. This involves the concepts of opinion and validated knowledge,

which in Psychology constitute poles united by an imaginary logical line, in which there are different levels of acceptance of beliefs, and it is essential that these concepts be considered, because the influence of beliefs on human behavior, and cognitive and affective processes is directly proportional to their acceptance.

The Belief Systems: Belief systems have personal experiences as the cognitive basis for their formation, both conscious and unconscious. Part of this process is the subject's interests, imagination and intellectual capacity, the latter of which includes the extent of language proficiency, and it activates logical rules and semantic criteria that give meaning to the systems under construction. These systems guide thought and conduct according to their strength and influence. Belief systems can be private or collectively accepted. Both types are important, but individual ones tend to be more questioned for their incoherence than collective ones, although some collectively accepted systems can also be illusions, the broad systems are sometimes less vulnerable to criticism because of their link to political and/or religious passions. Krüger (2018, p. 52) presents about the breadth that there are three classes of belief systems which are those of individual scope (idiosyncratic), medium scope, and those of great social influence. Those of medium and large scope have a collective acceptance, while the idiosyncratic ones are the personal systems, those developed with a variable portion of subjectivity that guide social roles and formulate a particular idea of the future. Mid-range systems are the descriptive, explanatory belief systems, referring to political, religious, professional, and cultural commitments, shaped by the society of each time. The wide-range systems, on the other hand, deal with scientific systems composed of descriptive and predictive beliefs about the universe and the condition of the world, and, on the other hand, with descriptive and evaluative systems in an existential sense, of the values that move humanity, values with religious and philosophical origins.

Far-reaching belief systems sometimes take the form of religious doctrines, philosophical systems, and political ideologies, and can be based on positive ideas, directed toward progress and freedom, but also on negative ideas, directed toward violence and domination. Human history shows how belief systems of this nature can influence entire nations, guiding them to progress or condemning them to decadence. In contemporary societies more influenced by scientific progress, the knowledge coming from specialized research makes some wisdoms outdated, and new information becomes known quickly through the various means of communication. Scientific knowledge, mainly based on Biology and Psychology, produces reflections about human nature and one's placement in the world. The reception of beliefs that arise from these reflections can generate a conflict with other religious beliefs, and believers usually react to this based on faith. Also, according to Krüger (2018, p. 54), conflicts of this kind, subjective, resulting from important beliefs potentially excluding each other, happen to many people, and their origin lies in the perception about social changes, so that they can generate frustration or hope, depending on the content of these perceptions. When there is doubt about the validity of a new belief system, the conflict between it and an old already accepted one remains. This conflict ends when one system is rejected in favor of the other. Experiences such as these cause discomfort in those who remain bound to failed ideologies, whose failure has already been demonstrated by history itself. It is important to consider the possibility that there is some flexibility in belief systems. At the end of the 20th century the thesis advocated by Karl Popper (1902-1994) of science as an open system was discussed.

In this perspective, science, understood as a political, social, economic, and methodological process, aimed at obtaining knowledge, constitutes an objective, real system that, desirably, must be criticized, revised, modified, and even replaced, if necessary. The product of this process are scientific theories, which are complex abstract systems, which must also be open, hence subject to change or abandonment (Krüger, 2018, p. 55-56). Karl Popper defended an opening to theoretical novelty, and for it to be accepted, it should prove to be superior to other hypotheses that were being contested, to

proceed scientifically, limiting the scope of the knowledge obtained. Thus, conflicts are prevented when the human intellectual limitation is considered, even because divergences in thought may also have their origin on other levels, personal or even political. Based on the belief of man's intellectual limitation, the importance of acting with caution becomes clear.

Krüger (2018, p. 57) also defines those cultural characteristics naturally exert influence at the psychological level, but when one understands this, it is possible to present a conduct more focused on submission and acceptance in relation to groups and the collectivity or else one can present a conduct more focused on autonomy, according to specific patterns that have been internalized. Thus, society may or may not favor the understanding that beliefs and belief systems can be questioned and reevaluated, depending on the type of socialization to which people are submitted. This theme is clearly present in political discussions, and the result of this presence leads to important social mobilizations, such as the way education is conducted in a country. The formation of individual consciousness also goes through religious beliefs and traditional customs, and it can produce a way of thinking aimed at one's independence or the submission to the thought already accepted by most people. Within these two poles, there are different combinations, the human experience is unique, and it does not necessarily lie at one end or the other, just like the social dynamic, which is also variable. The work of sociologist David Riesman (1909-2002) follows this line of thought and has oriented the way of thinking about the relationship established between the individual and society, identifying three sociocultural trends in history: societies whose behavior is based on the traditions of previous generations, societies that submit to the collectivity, understanding themselves as part of a larger social whole, and societies that favor the promotion of individual autonomy. Societies that submit to the collectivity and those that promote more individual autonomy tend to be more open to criticism of the beliefs and belief systems that guide them and operate within them. And the society that most promotes individual autonomy is also the one that most strengthens the belief about the advantage of open systems in the acquisition and production of knowledge.

This description of sociocultural scenarios proposed by David Riesman and its relation to open systems, suggested by me, starts from the belief in the power that the social environment, seen from the perspective of social norms and patterns of culture, has in the formation of belief systems, directing them to topics of scientific research, philosophical reflection, and religious devotion, situated in the horizon of collective interests (Krüger, 2018, p. 58). In addition to the social conditions that influence the creation and changes on belief systems, psychological factors must be considered, and cognitive flexibility is one of these factors, which makes it a research topic in Psychology, and also in Education. Krüger (2018, p. 59) points out that cognitive flexibility is understood as an intellectual ability, and appears in subjective and social situations, it is considered in the formation of personality, interpersonal relationships, and in the performance of social roles. Thus, cognitive flexibility will act directly on the quality of cognitive choices and processes, so that one can perform well in any situation with which one needs to deal with.

People who are more cognitively flexible have a greater tendency toward well-being because they are generally more well-adjusted. The opposite trait to cognitive flexibility is rigidity in the way of thinking, which is a characteristic of more authoritarian people. It is important to point out that cognitive flexibility does not mean the exclusion of one's principles, who can be cognitively flexible and remain firm in his values focused on ethics and justice. These values can be questioned, if only provided with truly superior arguments so that a possible change in understanding is valid. Criticism that questions a value or a belief must be well founded. Cognitive flexibility is a way to prevent fanaticism and intolerance, and it can be exercised in such a way that it becomes a mental habit, leading the subject to a condition to question and evaluate more carefully the information he receives. According to Pereira and Campos (2020), belief systems have a nature of their own with respect to their

structure, differences, mode of development, learning, functions, relations with motivations, cognition, and affect, and finally their conditions for modification.

Antivaccine Conspiracy Theories Belief Scale: The Vaccine Conspiracy Beliefs scale is widely endorsed by the general population. Because beliefs in vaccine conspiracies are widespread and present, an important opportunity for understanding vaccine refusal, using this scale researchers will be able to investigate how these beliefs affect vaccine hesitancy and vaccine acceptance across a variety of other vaccines. In 2016, Shapiro, G. K., Holding, A., Perez, S., Amsel, R., & Rosberger, Z. conducted the validation of a brief vaccine conspiracy belief scale, examining its structure and internal consistency, construct validity, and criterion validity (Shapiro et al 2016).

This scale originated in 2014 with Jolley and Douglas who used ten items to examine the effectiveness of a conspiracy theory manipulation task. Shapiro et al (2016) removed six of Jolley and Douglas' ten items that referred specifically to a conspiracy (i.e., a deception or collusion rather than a general fear or attitude) and added the item "the government is trying to cover up the link between vaccines and autism" since this is a common conspiratorial belief (Oliver et al 2014). Thus, the authors constructed a 7-item scale with a one-factor structure in which participants indicated how much they agreed or disagreed with a given statement on a 7-point scale ranging from 1 for "strongly disagree" to 7 for "strongly agree." In the study, the results revealed that the higher the income, the greater the parents' willingness and adherence to vaccines. Interestingly, however, there was still a significant (though weaker) positive relationship between parental income and willingness when the vaccine was free, indicating that wealthier parents were even more likely to vaccinate their children when the cost issue was completely eliminated (Shapiro et al 2016).

MATERIALS AND METHODS

A sociodemographic questionnaire was used to collect online data on information such as gender, age, education, employment status, income, place of residence, religion, marital status, vaccination habits, and positioning (favorable or unfavorable) about vaccines. Questions about how much harm (1 = little harm; 10 = a lot of harm) and benefit (0 = little benefit; 10 = a lot of benefit) the participants believed vaccines cause were added to this form. In addition to the sociodemographic form, participants answered the Adherence to Antivaccine Conspiracy Theories Scale adapted from the study by Shapiro et al. (2016). One item was removed and two others specific to the Brazilian context were added to the scale that counted 8 items in a unifactorial structure to assess how much people believe in antivaccine conspiracy theories in Brazil. The items added were "Immunizations allow the government to track and control people" and "Pharmaceutical companies, scientists and academics work together to hide the dangers associated with vaccines". The response options were kept as 1 = strongly disagree to 7 = strongly agree. Data collection occurred from August to October 2020. Its disclosure occurred in several social networks and had as method the use of online survey conducted through the "Snowball" technique. In this technique a respondent indicates the survey to others and so on until it reaches the entire national territory.

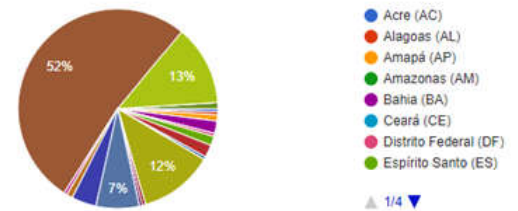
RESULTS AND DISCUSSION

Psychometric Properties: The original study presented an analysis of the internal structure with Cronbach's of 0.94. The values for Cronbach's vary from 0 to 1.0, the closer to 1, the greater reliability among the indicators. In this research, the coefficient value found was $\alpha = 0.75$, confirming good consistency and reliability in its application. Therefore, the use of reliability measures, such as Cronbach's, does not guarantee the one-dimensionality of the questionnaire, but assumes that it exists.

Research Participants Profile: A total of 200 people from all over Brazil participated in this survey. The participants are distributed in 52% in the state of São Paulo, 13% in Sergipe, 12% in Minas Gerais, 7% in Rio de Janeiro, and 16% distributed in other Federative Units and 1%. Regarding age and educational level, the results revealed that the average age of the respondents is 35.2 years old (SD=12.89) and that, most of the participants have completed college education 71.5%.

3. Em qual estado do Brasil você vive:

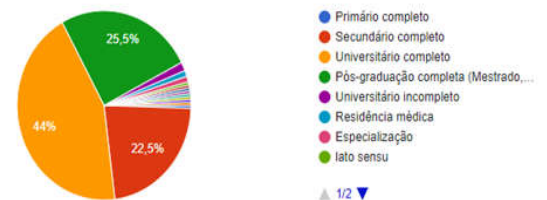
200 respostas



Graph 1. Geographical distribution of the participants

4. Qual o seu nível educacional

200 respostas

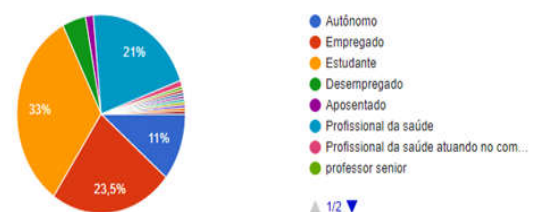


Graph 2. Educational level of the participants

As to occupation, 93.8% of the participants said they were working or studying at the time. We believe that this data possibly reflects the profile of the portion of the population that has access to the Internet in the country. Considering that the modality used for the research was online and that access to the internet is a basic requirement for this. Certainly, undergraduate students and recently graduated professionals, with direct access to information during the pandemic.

5. Ocupação principal

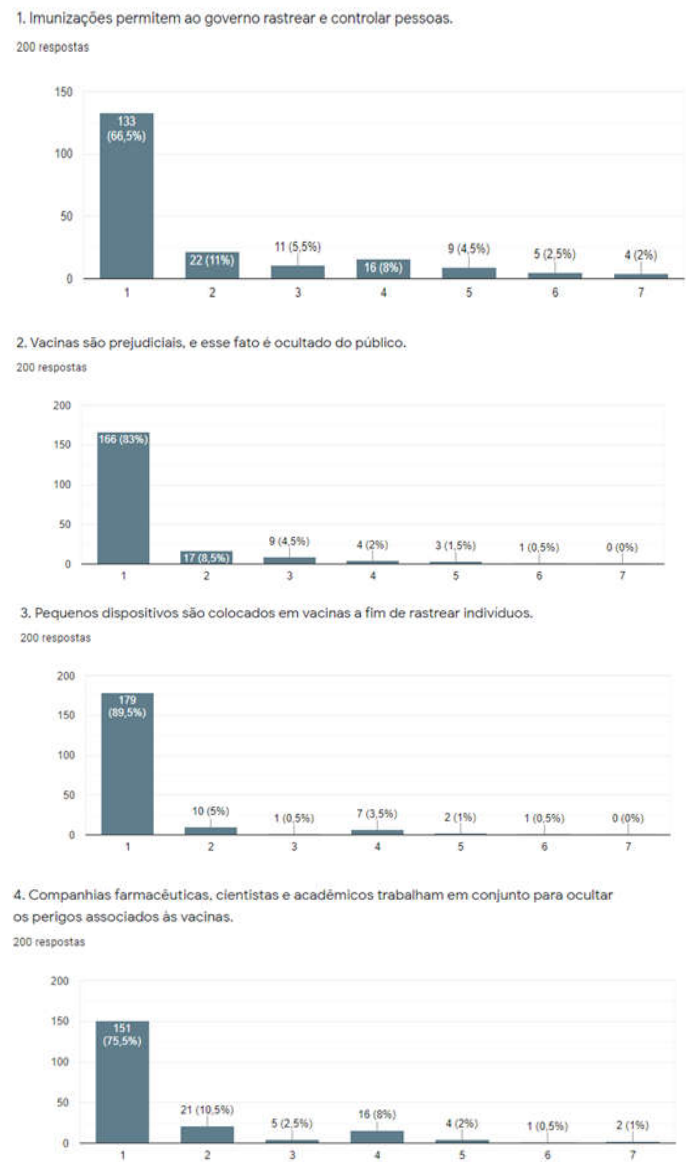
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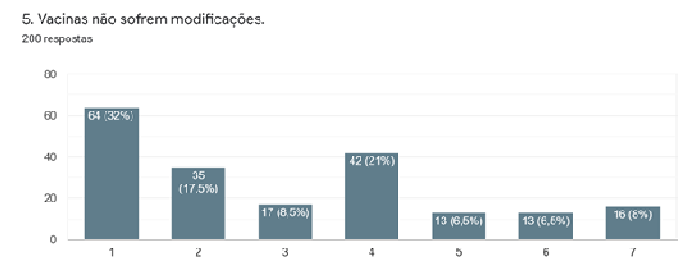
Graph 3. Occupation of participants

In relation to the descriptive analysis, it was possible to notice a linear and stable behavior of disagreement of the items related to conspiracy theories in most questions of the scale. However, item number five on the statement that "Vaccines do not undergo modifications" was the only one that found a possibility of adherence. In this one question it is noticeable that the participants behaved completely differently from the sample distribution diverged from all previous questions. However, in a preliminary analysis of the item, one can conjecture that it does not necessarily measure Conspiratorial Beliefs, but rather real vaccine data. We believe that the statement may have caused some confusion or doubt among the participants, who were mostly distributed between question 1 (total disagreement) with 32% and 4 (neutrality of response) with 21%. We point out that in the Likert scale the interviewees specify their level of agreement

with a statement (attitudinal assertive) proposed in a certain item, through a criterion that can be objective or subjective. In this way, the level of agreement or non-agreement can be measured to the respective statement. In this scale, seven levels of responses are used, with 1 = strongly disagree, 4 = neutral response and 7 = strongly agree. It can be inferred, in this case, that part of the sample did not know how to give an opinion on the matter due to the lack of clarity in the statement of the item and not necessarily due to the neutrality of the response when comparing the sampling behavior in all the previous items.



Graph 4. Sample Behavior on questions 1 to 4 of the Antivaccine Conspiracy Theories Scale



Graph 5. Sample result for item 5 of the Antivaccine Conspiracy Theories Scale

In this research, the sample average on the scale of adherence to antivaccine conspiracy theories was 1.64 (SD = 1.34). This result indicates that, in the sample evaluated, there is no significant adherence to these conspiracy theories. Given the advent of various vaccines around the world and with technology updating the population positively and negatively, and reporting true and false information, there are questions regarding the effectiveness of each vaccine used. Taking into consideration also the data obtained during this research, most of the population with higher education in metropolises believes in the effectiveness of the vaccine, which today is the only way to prevent the disease, just as it is for countless diseases that were discovered years ago. The results lead them to infer, in the case of this research, the higher the schooling of the participants, the lower the adherence to this conspiracy theory. With the emergence of the new coronavirus pandemic, the importance of immunization has been increasingly highlighted in social networks and TV news, being widely reported by the media. Researchers have started a race against time to develop the vaccine and seek to prove the efficacy and safety of different types, developed from existing and new technologies, which represent important innovations for the future treatment of various diseases. At no other time in history has the population had the opportunity to follow so many issues related to the production of a vaccine, from what is the API - Active Pharmaceutical ingredient - to the marketing and distribution of vaccines throughout the country and other issues related to a national immunization project. As mentioned before, psychological research works on dynamic, psychosocial aspects that assess from cognition to affect, motivation and behavior, as well as one's relationship with beliefs. All these aspects are important for processing beliefs, with the exception of those that act at the level of the cognitive unconscious, of which one sometimes becomes aware through an inference (Krüger, 2018, p. 19). Taking into consideration the factors about COVID-19 as the rapid contamination, the observation of lethality in all age groups, the creation of countless fake news and the shutdown of all continents, greatly impacting the world scenario, markers were created that are daily impacting the hospital networks, changing countries and directly impacting social, economic and behavioral issues, among others, the global investment in scientific research becomes essential for the diagnosis and minimizing these effects of the virus on humans and social life. Considering the inexistence of contraceptive methods, besides the vaccine, that are 100% effective to fight COVID-19, scientists invested in the search for a way to minimize the deadly effects of the virus against human beings, as well as to prove the efficacy and safety of vaccines developed through research and voluntary tests around the world.

Final Considerations

As mentioned earlier, the psychological aspect of obtaining beliefs is different from beliefs themselves, and from personal acceptance of beliefs. Aspects such as retention, retrieval and processing of beliefs can still be added to these. In philosophical research, an interest in the validity of beliefs is evident, and there is a commitment to investigating the structure and meanings that make the beliefs under analysis intelligible, and thus valid to be used in communication. In the present research the sample studied did not show evidence of acceptance of conspiratorial beliefs by the participants. Results that can be justified by the level of education and direct access to reliable sources of information. Also, no significant differences were found regarding gender, age, or geographical region. Therefore, new research is suggested, expanding the number of categories, and further refining the scale for its subsequent validation. Some limitations were encountered such as the period in which the survey was conducted and the partial accessibility of the population. Since it was an online survey, unfortunately the respondents' profile bias could not be eliminated, and language and cultural barriers could not be overcome. Thus, the survey ended up naturally focusing on the highly educated population living in urban areas and reflecting the opinion of a population group, and it is necessary to point out that the same answers may vary with less educated people living in less urbanized areas with easy access to information today. It is important to research the relationship between the Beliefs in Antivaccine

Conspiracy Theories and verify its reflection in the immunization process of the Brazilian population, considering that the vaccine is fundamental to health and indispensable for being considered as the second largest factor in reducing mortality. Despite different approaches among various scientists, all vaccines aim to induce the body's immune response, causing it to produce defenses against COVID-19. With the constant study and success by these scientists, several vaccines have already been approved and are already being used for immunization and prevention of the new virus, some of them are already being applied in Brazil and others are in the process of negotiation with the Brazilian government for immunization of the population. According to the World Health Organization (WHO), hundreds of millions of doses are expected to be produced by the end of 2021.

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APPENDIX

Antivaccine Conspiracy Beliefs Scale

For each statement, indicate how much you disagree or agree by selecting the appropriate number:

	<i>Strongly Disagree</i>	-	-	-	-	-	<i>Totally agree amente</i>
1. Immunizations enable the government to track and control people.	1	2	3	4	5	6	7
2. Vaccines are harmful, and this fact is hidden from the public.	1	2	3	4	5	6	7
3. Small devices are placed in vaccines in order to track individuals.	1	2	3	4	5	6	7
4. Pharmaceutical companies, scientists and academics work together to conceal the dangers associated with vaccines.	1	2	3	4	5	6	7
5. Vaccines are not adulterated.	1	2	3	4	5	6	7
6. The government is trying to hide the link between vaccines and autism.	1	2	3	4	5	6	7
7. Small devices are implanted in vaccines to perform mind control experiments.	1	2	3	4	5	6	7
8. The flu vaccine allows the government to monitor the elderly by implanting small tracking devices.	1	2	3	4	5	6	7
