Are more religious people less willing to be vaccinated against COVID-19?

Pessoas mais religiosas estão menos dispostas a se vacinar contra a COVID-19?

¿Las personas más religiosas están menos dispuestas a vacunarse contra el COVID-19?

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ABSTRACT

Some researchers have investigated whether religiosity is one of the causes of people's hesitancy to get vaccinated against COVID-19, but the results of the literature are inconsistent. This study aimed to test whether the intention to vaccinate could be predicted by participants' religiosity, controlling for variables such as political orientation and trust in scientists. Study participants were 270 Brazilians, who used an online platform to respond. Intention to be vaccinated was assessed by the item “When the Covid-19 vaccine is offered, will you get vaccinated?”, whose response options ranged from “1 – Definitely not” to “5 – Definitely yes”. Organizational religious activity (ORA), non-organizational religious activity (NORA) and intrinsic religiosity (IR) were assessed by The Duke Religion Scale (DUREL). Unlike NORA and IR, the participants who had higher levels of ORA were less willing to be vaccinated. The possible mechanisms that explain these findings are discussed.

Keywords: coronavirus, COVID-19, religion, religiosity, vaccination.

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RESUMO
Alguns pesquisadores têm investigado se a religiosidade é uma das causas da hesitação quanto à vacinação contra a COVID-19, mas os resultados da literatura são inconsistentes. Este estudo teve como objetivo testar se a intenção de se vacinar poderia ser prevista pela religiosidade dos participantes, controlando variáveis como orientação política e confiança nos cientistas. Os participantes do estudo foram 270 brasileiros, os quais utilizaram uma plataforma online para responder. A intenção de ser vacinado foi avaliada pelo item "Quando a vacina Covid-19 for oferecida, você vai se vacinar?", cujas opções de resposta variaram de “1 – Definitivamente não” até “5 – Definitivamente sim”. Atividade religiosa organizacional (ARO), atividade religiosa não organizacional (ARNO) e religiosidade intrínseca (RI) foram avaliadas pela Duke Religion Scale (DUREL). Diferentemente de ARNO e IR, os participantes que apresentaram níveis mais altos de ARO estavam menos dispostos a se vacinar. Os possíveis mecanismos que explicam esses achados são discutidos.

RESUMEN
Algunos investigadores han estudiado si la religión es una de las causas de la resistencia a vacunarse contra el COVID-19 en algunas personas, pero los datos publicados son contradictorios. Este estudio pretendía determinar si la intención de vacunarse podía predecirse en función de la religiosidad de los participantes, controlando variables como la orientación política y la confianza en los científicos. Los participantes en el estudio fueron 270 brasileños, que utilizaron una plataforma en línea para responder. La intención de vacunarse se evaluó mediante el ítem “Cuando se ofrezca la vacuna Covid-19, ¿se vacunará?”, cuyas opciones de respuesta oscilaban entre “1 - Definitivamente no” y “5 - Definitivamente sí”. La actividad religiosa organizativa (ORA), la actividad religiosa no organizativa (NORA) y la religiosidad intrínseca (IR) se evaluaron mediante la Escala de Religión de Duke (DUREL). A diferencia de NORA e IR, los participantes que tenían niveles más altos de ORA estaban menos dispuestos a vacunarse. Se discuten los posibles mecanismos que explican estos hallazgos.
Introduction

Since the first cases of COVID-19 were reported in Wuhan, China, the entire world has been facing the problems arising due to the spread of the coronavirus. With the development of vaccines, it is expected that the pandemic will be effectively controlled, making the implementation of restrictive measures such as social isolation unnecessary (Bartsch et al., 2020). However, there are estimates that more or less a third of the population of different countries is not willing to be vaccinated (Callaghan et al., 2020; Murphy et al., 2020; Reiter et al., 2020). Studies have been conducted to discover the causes of resistance to vaccination, and some researchers have investigated whether religiosity is one of them.

The correlation between religious involvement and willingness to be vaccinated against COVID-19 is not consistent in the literature. Some findings indicate that people who have a higher level of religiosity (Callaghan et al., 2020; Olagoke et al., 2021), who endorse religious beliefs more strongly (Murphy et al., 2020) and who interpret the Bible literally (Drew, 2021) are less likely to adhere to vaccination. However, some studies did not find significant associations when considering the level of religiosity (Lennon et al., 2020; Reiter et al., 2020) or religious denomination (Corpuz, D’Alessandro, Adeyemo, Jankowski & Kandalaft, 2020; Murphy et al., 2020; Olomofe et al., 2021) of the participants.

Despite this inconsistency, the association between religiosity and vaccination deserves further investigation. For example, there is some evidence that more religious people are more likely to believe conspiracy theories about the vaccine and/or the coronavirus (Drew, 2021; Freeman et al., 2020), and this could decrease their intention to get vaccinated (Freeman et al., 2020; Zein, Arinda & Rikardi, 2020). Some authors have raised different hypotheses to explain why religiosity is negatively associated with other types of attitude related to containing the pandemic – such as social isolation. Hill, Gonzalez and Burdette (2020) suggest that more religious people are more suspicious of information about COVID-19 released by scientists and/or are more inclined to accept fake news propagated by political or religious leaders. Similarly, Perry, Whitehead, and Grubbs (2020) speculated that “Christian nationalists” of the USA are more suspicious of science, believe in divine protection, and/or display a “devotion” to then-President Donald Trump – who frequently attacked the media and gave
controversial statements about how to deal with the coronavirus. These hypotheses can be extended as possible explanations for the findings regarding vaccination resistance.

In the present study, we aim to test whether the religiosity of a sample of Brazilians would predict their intentions to be vaccinated. Unlike the aforementioned studies, this was assessed from three dimensions of religiosity (cf. Koenig et al., 1997): the organizational (i.e., how much participants participate in religious meetings), the non-organizational (e.g., how much the participants pray) and the intrinsic (i.e., how much the participants live according to the precepts of their religion). Subdividing these components is important to check whether different expressions of religiosity can be associated differently with the willingness to be vaccinated. Based on previous findings (e.g., Callaghan et al., 2020; Hornsey et al., 2020; Kerr et al., 2021), this study investigated whether the perceived risk of death due to COVID-19, political orientation and trust in scientists and the federal government – as sources of information about the pandemic – would also be associated with the variables of interest. The intention was to test the hypotheses that, regardless of the presumed predictive effects of these covariates, the more religious participants would be less inclined to be vaccinated.

Method

Sample
Initially, between the 1\textsuperscript{st} and 19\textsuperscript{th} of July, our profiles on social networks (e.g., on Instagram and Twitter) were used to publicize the study, and a post made on a Facebook page was sponsored in order to increase the number of participants. The data analyzed in this work are part of the second stage of this research, which were collected between August 2\textsuperscript{nd} and 13\textsuperscript{th}, 2020. All those who were recruited in the first stage were invited via email to participate again. Only Brazilians aged 18 or over were included. A total of 270 people participated in this second stage.

Instruments

\textit{Sociodemographic questionnaire}: The participants completed a questionnaire with information regarding their gender, age, marital status, education, religious/spiritual orientation and economic level.
The Duke Religion Scale (DUREL; Koenig, Meador & Parkerson, 1997; Brazilian version adapted/validated by Lucchetti et al., 2012; Tau-nay et al., 2012). The DUREL measures three components of religiosity: organizational religious activity (ORA), non-organizational religious activity (NORA) and intrinsic religiosity (IR). The ORA is evaluated by the item “How often do you go to a church, temple or other religious meeting?”, and its response options range from “1 – More than once a week” to “6 – Never”. The NORA is evaluated by the item “How often do you spend time in private religious activities, such as prayer, meditations or Bible study?”, and its response options vary from “1 – More than once a day” to “6 – Rarely or never”. The IR is assessed by three items (e.g., “My religious beliefs are what really lie behind my whole approach to life”), and its response options range from “1 – Definitely true for me” to “5 – Definitely not true”.

Political orientation. Two questions about political orientation were included: one about the level of economic liberalism (“The economy should function without any government interference”) and another about the level of liberalism in customs (“As long as they do not harm others, people should be free to do as they please”). The response options for each item ranged from “1 – Strongly disagree” to “5 – Strongly agree”.

Trust in the federal government and scientists. Participants were asked to rate how much they trusted the federal government and scientists as sources of information about the pandemic. The question asked was “In your opinion, to what extent is the information made available [by scientists or the federal government] about COVID-19 reliable?”, and the response options were “1 – Not at all reliable”, “2 – Slightly reliable”, “3 – Moderately reliable” and “4 – Very reliable”.

Chance of dying. To assess the participants’ belief that they would died from the coronavirus, they were asked “In your opinion, if you contract COVID-19, what is the chance that you will end up dying?”. The response options were “1 – Low chance”, “2 – Moderate chance” and “3 – High chance”.

Vaccination Intention to be vaccinated was assessed by the question “When the Covid-19 vaccine is offered, will you get vaccinated?”. The response options were “1 – Definitely not”, “2 – Probably not”, “3 – I don’t know”, “4 – Probably yes” and “5 – Definitely yes”.
Data analysis

Descriptive analyses were used to specify the sample characteristics, including participants’ intention to be vaccinated. Pearson correlations and hierarchical linear regressions were performed in order to check the association between the variables of interest. In the regressions, the religious variables (Model 1), the demographic variables (Model 2), the perception of the risk of death (Model 3), the political orientation variables, and the trust in the federal government and in the scientists variables (Model 4) were inserted, respectively. Associations in which the $p$ value was less than .05 were considered statistically significant.

Ethical aspects of research

This study is part of a broader project on religiosity and mental health during the pandemic (CAAE: 32371420.6.0000.0008), which was approved by the National Research Ethics Committee (report number: 4.190.324).

Results

Descriptive statistics

Of the 270 participants, 89 (33.0%) declared themselves to be atheists, 82 (30.4%) reported being religious, 52 (19.3%) declared themselves to be agnostics, 45 (16.7%) reported being spiritualists and 2 (0.7%) had another denomination. A total of 159 people (58.9%) were women, 110 (40.7%) were men, and 1 (0.4%) was of unspecified gender. Regarding marital status, 182 (67.4%) were single and 88 (32.6%) were married. The mean age was 32.35 years ($SD = 11.14$), ranging from 18 to 73 years. With regard to schooling, 96 (35.6%) had not graduated, 80 (29.6%) had studied until graduation and 94 (34.8%) had completed a graduate degree. Concerning the economic level, 46 (17.1%) perceived living below the Brazilian average, 122 (45.2%) perceived living around the average and 102 (37.7%) perceived living above average. Regarding the intention to vaccinate, 2 (0.7%) participants answered “Definitely not”, 6 (2.2%) answered “Probably not”, 12 (4.4%) answered “I don’t know”, 67 (24.8%) answered “Probably yes” and 183 (67.8%) answered “Definitely yes”. The mean score was 4.57 ($SD = 0.747$).
Correlations

As predicted, people that were more religious had a lower intention to be vaccinated (Table 1). Those that reported being more liberal in morals tended to be less religious and those more liberal in economics were more likely to not want to get vaccinated. People who trusted scientists more tended to be less religious and were more inclined to get vaccinated. Those who trusted the federal government more were more religious and were less willing to be vaccinated. The more participants thought they would die if they acquired COVID-19, the greater their intention to get vaccinated. No other correlation was statistically significant.

Table 1.
Correlations between religiosity, vaccination, political orientation and trust in government and scientists.

<table>
<thead>
<tr>
<th></th>
<th>ORA</th>
<th>NORA</th>
<th>IR</th>
<th>Vaccine</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organizational religious activity</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-.211**</td>
</tr>
<tr>
<td>Non-organizational religious activity</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-.123*</td>
</tr>
<tr>
<td>Intrinsic religiosity</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-.158**</td>
</tr>
<tr>
<td>Liberalism (Customs)</td>
<td>-.159**</td>
<td>-.154*</td>
<td>-.129*</td>
<td>.089</td>
</tr>
<tr>
<td>Liberalism (Economics)</td>
<td>.100</td>
<td>.119</td>
<td>.094</td>
<td>-.289**</td>
</tr>
<tr>
<td>Trust in the government</td>
<td>.176**</td>
<td>.127*</td>
<td>.171**</td>
<td>-.150*</td>
</tr>
<tr>
<td>Trust in scientists</td>
<td>-.170**</td>
<td>-.134*</td>
<td>-.145*</td>
<td>.407**</td>
</tr>
<tr>
<td>Chance of dying</td>
<td>-.031</td>
<td>.014</td>
<td>-.026</td>
<td>.138*</td>
</tr>
</tbody>
</table>

Note: * Statistically significant correlation (p < .05); ** Statistically significant correlation (p < .01).

Regressions

In Model 1 (Table 2), it was found that the higher the level of organizational religiosity, the lower the participants’ intention to be vaccinated \[F(3, 257) = 5.684; p < .01; R^2 = .062\]. Non-organizational and intrinsic religiosities did not prove to be significant predictors. In Model 2 \[F(8, 252) = 2.926; p < .01; R^2 = .085\], of the new variables inserted, only age was a significant predictor, that is, older people tended to be less willing to be vaccinated. In Model 3 \[F(9, 251) = 3.630; p < .01; R^2 = .115\], it was found that people who believed more that they could die if they contracted COVID-19 were more inclined to get vaccinated. Finally, in Model 4 \[F(13, 247) = 8.238; p < .01; R^2 = .302\], it was found that, while
the more liberal participants in the economy and more confident in the federal government were less willing to be vaccinated, those who trusted the scientists more were more willing. With the inclusion of these variables, being married became a positive predictor variable of the intention to get vaccinated. As only organizational religiosity predicted the variance in the variable of interest, the hypothesis was partially supported.

Table 2.
Hierarchical linear regression regarding the intention to vaccinate.

<table>
<thead>
<tr>
<th>Predictors</th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
<th>Model 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>β</td>
<td>Part r</td>
<td>β</td>
<td>Part r</td>
<td>β</td>
</tr>
<tr>
<td>Organizational rel.</td>
<td>-.305**</td>
<td>-.172</td>
<td>-.308**</td>
<td>-.171</td>
</tr>
<tr>
<td>Non-organizational rel.</td>
<td>.177</td>
<td>.085</td>
<td>.203</td>
<td>.097</td>
</tr>
<tr>
<td>Intrinsic rel.</td>
<td>-.085</td>
<td>-.040</td>
<td>-.094</td>
<td>-.043</td>
</tr>
<tr>
<td>Gender</td>
<td>-.023</td>
<td>-.022</td>
<td>-.018</td>
<td>-.017</td>
</tr>
<tr>
<td>Marital status</td>
<td>.066</td>
<td>.060</td>
<td>.069</td>
<td>.062</td>
</tr>
<tr>
<td>Age</td>
<td>-.158*</td>
<td>-.132</td>
<td>-.227**</td>
<td>-.180</td>
</tr>
<tr>
<td>Schooling</td>
<td>.109</td>
<td>.092</td>
<td>.116</td>
<td>.099</td>
</tr>
<tr>
<td>Economic level</td>
<td>-.004</td>
<td>-.003</td>
<td>.025</td>
<td>.023</td>
</tr>
<tr>
<td>Chance of dying</td>
<td>-.158*</td>
<td>-.132</td>
<td>-.227**</td>
<td>-.180</td>
</tr>
<tr>
<td>Liberalism (Customs)</td>
<td>-.208**</td>
<td>-.187</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Liberalism (Economics)</td>
<td>-.112*</td>
<td>-.107</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trust in the government</td>
<td>.328**</td>
<td>.304</td>
<td></td>
<td></td>
</tr>
<tr>
<td>R^2 (adjusted)</td>
<td>.051</td>
<td>.056</td>
<td>.083</td>
<td>.266</td>
</tr>
<tr>
<td>R^2 change</td>
<td>.062</td>
<td>.023</td>
<td>.030</td>
<td>.187</td>
</tr>
<tr>
<td>F change</td>
<td>5.684**</td>
<td>1.255</td>
<td>8.558**</td>
<td>16.578**</td>
</tr>
</tbody>
</table>

Note: Rel. = Religiosity; β = beta; Part r = semi-partial correlation; * p < .05; ** p < .01.

Discussion

Considering some inconsistencies in the literature (e.g., Lennon et al., 2020; Murphy et al., 2020; Olagoke et al., 2021; Reiter et al., 2020), this study was carried out in order to investigate whether more religious people tend to be less willing to get vaccinated against COVID-19. Although this hypothesis was supported by correlational analyses, only organizational religiosity was a statistically significant predictor in the regression models. It is possible, as suggested by Hill et al. (2020), that
people more involved with a religious organization are more likely to believe fake news about the pandemic propagated by its leaders. Future studies could investigate whether these ideas refer to conspiracy theories – such as that “the coronavirus is a plot by globalists to destroy religion by banning gatherings” (Freeman et al., 2020) and/or to claims that call into question the efficacy and safety of the vaccines. As these beliefs often correlate with resistance to vaccination (e.g., Callaghan et al., 2020; Freeman et al., 2020; Reiter et al., 2020; Zein et al., 2020), perhaps religious communities are environments relatively fertile for their development and/or propagation.

It is important to emphasize that the association between organizational religiosity and vaccination remained significant even after the inclusion of the other covariates in the models. It was found that participants less willing to be vaccinated were less afraid of dying from COVID-19 and tended to be single, older, more liberal in the economy, less trusting of scientists and more trusting of the federal government. This indicates that, despite the correlation between religiosity and some of these variables – e.g., more religious people tending to trust science less (Chan, 2018) –, institutional religious involvement may have a more direct effect on vaccination.

The results need to be considered with some caution. First, as the design of this study is cross-sectional, the data do not allow any conclusions regarding causal relationships between religiosity and intention to vaccinate. Second, the sample was relatively small and mostly composed of non-religious people – which contrasts with Brazilian demographics (Instituto Brasileiro de Geografia e Estatística, 2012). Therefore, it is possible that the negative association that was found between organizational religiosity and intention to vaccinate is not generalizable. Third, this study was conducted at a time when attendance at religious meetings was being discouraged across the country, which may have skewed the results.

Despite the aforementioned limitations, the findings are in line with others in the literature (Callaghan et al., 2020; Drew, 2021; Murphy et al., 2020; Olagoke et al., 2021). However, using more specific forms of measurement, it was found that the intention to vaccinate was negatively associated with organizational religiosity, and not with its intrinsic or non-organizational (or private) dimensions. If these data portray
reality, we suggest, as did Olagoke et al. (2021), that researchers and government bodies seek to create partnerships with religious leaders in order to influence members of their congregation to be vaccinated. Given the findings regarding people’s trust in scientists and the federal government – whose Brazilian leader, Jair Bolsonaro, made several irresponsible pronouncements regarding vaccination (Cruz, 2021) –, we may need to focus more on the scientific literacy of the population.

References


