

ARTICULO ORIGINAL

Attitudes towards the COVID-19 vaccine in the general Paraguayan population Actitudes hacia la vacuna contra la COVID-19 en la población general paraguaya

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RESUMEN

Introducción: la pandemia de COVID-19 ha provocado cambios que afectan a los sistemas sanitarios y al enfoque de las enfermedades infecciosas en todo el mundo. La esperanza de recuperar un cierto nivel de “normalidad” depende del desarrollo de vacunas. **Objetivos:** el objetivo de este estudio fue describir las actitudes hacia la vacuna COVID-19 en la población paraguaya, explorando los factores que podrían abordarse para apoyar la campaña de vacunación contra el SARS-CoV-2. **Materiales y métodos:** estudio transversal y descriptivo. Los participantes fueron reclutados a través de una encuesta por Internet, difundida a través de las redes sociales, durante el mes de marzo de 2021. Todos los participantes recibieron información completa sobre el objetivo del estudio, la privacidad y el procesamiento de datos. **Resultados:** de los 2297 participantes, el 67,9 % (n=1559) eran mujeres, el 49,9 % (n=1147) estaban empleados, el 89,1 % (n=2046) declararon tener estudios universitarios y el 96,6 % (n=2218) eran de zonas urbanas. En general, 81,8 % (n=1879) de los participantes declararon estar dispuestos a vacunarse contra la COVID-19 si hubiera una vacuna disponible. Se encontró una relación significativa entre haber recibido la vacuna contra la gripe y la intención de vacunarse contra la COVID-19 ($p < 0,0001$), con una OR de 3,09 (95% IC 2,1-4,5). **Conclusión:** el porcentaje de participantes inclinados a vacunarse contra la COVID-19 es

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similar al de los que esperan recibir una inmunización adecuada gracias a la vacuna. El gobierno y las agencias de salud deben hacer un esfuerzo para proporcionar información precisa que responda a las preocupaciones de la gente sobre la vacunación, en cualquier nivel de la sociedad.

Palabras Clave: COVID-19; vacuna; población general; salud mental; inmunidad.

ABSTRACT

Introduction: The COVID-19 pandemic has led to changes affecting the healthcare systems and the approach to the infectious diseases worldwide. The hope to regain a certain level of “normalcy” relies on the development of vaccines. **Objectives:** The aim of this study was to describe attitudes towards the COVID-19 vaccine in the Paraguayan population, exploring factors that could be addressed to support the SARS-CoV-2 vaccination campaign. **Materials and methods:** Cross sectional and descriptive study. Participants were recruited through an Internet-based survey, spread through social media, during the month of March 2021. All participants received complete information about the aim of the study, privacy and data-processing. **Results:** Of the 2,297 participants, 67.9% (n=1,559) were women, 49.9% (n=1,147) were employed, 89.1% (n=2,046) reported a university education, and 96.6% (n=2218) were from urban areas. Overall, 81.8% (n=1,879) of participants stated that they were willing to be vaccinated against COVID-19 if a vaccine was available. A significant relationship has been found between having applied for the influenza vaccine and the intention to get vaccinated against COVID-19 ($p < 0.0001$), with an OR: 3.09 (95% CI 2.1-4.5). **Conclusion:** The percentage of participants inclined to be vaccinated against the COVID-19 is similar to that of those expecting a proper immunization from the vaccine. Government and health agencies should make an effort to provide accurate information that responds to people’s concerns about vaccination, at any level of society.

Keywords: COVID-19; vaccine; general population; mental health; immunity.

INTRODUCTION

The COVID-19 pandemic has led to changes affecting the healthcare systems and the approach to the infectious diseases worldwide: it has been argued that is the current emergency will impact on health provision in general in the long-term (1).

Quarantines and social isolation have been adopted in order to prevent the increase of cases of COVID-19 globally (2). These measures can generate consequences at the social level and intense psychological stress that can influence people’s attitudes and behaviors (3) in the search for “normalcy”. And, in fact, it is in the development of vaccines that the hope of regaining some level of “normalcy” lies (4). However, with the enforcement of even more restrictive measures by local governments,

an increasing amount of general distrust in the population towards their governments and official reports of pandemic have been registered and fake news and disinformation have been spread by social media, “opinionists” or politicians also including the efficacy and safety of vaccines (5,6). These aspects may lead to different responses in the population and impact on its attitudes regarding the COVID-19 vaccination (7). Healthcare providers and governmental public health officials should properly address any fear and concern in the general population in order to contrast the disinformation with related psychosocial stress and improve the adherence to the COVID-19 vaccination (8).

The aim of this study was to describe attitudes

towards the COVID-19 vaccine in the Paraguayan population, exploring factors that could be addressed to support the SARS-CoV-2 vaccination campaign.

MATERIALS AND METHODS

Participants

This was a cross-sectional and descriptive study. Participants were recruited through an Internet-based survey, spread through social media, during the month of March 2021. All participants received complete information about the aim of the study, privacy and data-processing. No payment has been foreseen for completing the survey. Subjects were older than 18 years and voluntarily accepted to participate in the study.

The Internet-based survey approach was employed in compliance with the rules of social distancing adopted in the country. Nevertheless, it has been demonstrated that this approach may provide similar findings to those reported through “in person” sampling (9,10).

The sample size was calculated using the Epidat epidemiological package. With a targeted population of 5 174 980 Paraguayans ≥ 18 years, we used a margin of error of 2,1%, a confidence level of 95%, an expected response distribution of 50%, giving a minimum sample size of 2177 (11). Finally, the sample consisted of 2297 respondents, which was found to be suitable for similar research done in Europe and Asia (12,13).

In this research, all measures, conditions, data exclusions, and procedure for the determination of the sample size, have been reported.

Measures

We adapted and translated into Spanish the questionnaire previously used by Yoda and Katsuyama in Japan (13).

We collected the following information:

- Sociodemographic data: gender, age, employment status, area of residence, education level.
- COVID-19 status: explored through the question - have you been diagnosed with COVID-19 previously? (Answers: Yes or No)
- Flu Vaccination: explored through the question- did you get vaccinated against the Influenza virus in the last year? (Answers: Yes or No)
- Attitude for COVID-19 vaccine: explored through the question- are you willing to get vaccinated against COVID-19? (Answers: Yes, No or Unsure).
- Reasons for the previous answer: multiple answers (see figures 1 and 2).

Statistical analysis

Data were processed with the statistical package RStudio, version 1.2.5033. Descriptive analysis has been performed: categorical variables were presented as frequencies and percentages, and the numerical variables with measures of central tendency and dispersion. Chi-squared test was used to evaluate categorical variables. Statistical significance was established for a value of $p < 0.05$. Willingness to be vaccinated against COVID-19 was also explored through an OR analysis between selected variables.

Ethical considerations

The study was approved by the Department of Psychiatry of the National University of Asunción, School of Medical Sciences (Paraguay). Data were treated with confidentiality, equality, and justice, respecting the Helsinki principles. Implied consent was used rather than formal written consent to maintain the anonymity of participants. The participants clicked on the item reporting “I agree” before starting the survey to indicate their own consent.

RESULTS

Of the 2,297 participants, 67.9% (n=1,559) were women, their age was between 18 and 89 years, with a mean age of 34.85 ± 13 and a median of 32 years, IQR=18. Of the participants, 49.9%

(n=1,147) were employed, 89.1% (n=2,046) reported a university education, and 96.6% (n=2218) were from urban areas. These data are shown in detail in Table 1.

Características	n	(%)
Gender		
Female	1559	67.9
Male	723	31.5
Other	15	0.7
Age (group)		
Under 20	83	3.6
20-29	906	39.4
30-39	644	28.0
40-49	304	13.2
50-59	217	9.4
60-69	114	5.0
70 and over	29	1.3
Employment status		
Study	478	20.8
Work	1147	49.9
Both	547	23.8
None	125	5.4
Educational level		
Primary	6	0.3
Secondary	245	10.7
University	2046	89.1
Area of residence		
Rural	79	3.4
Urban	2218	96.6

Table 1. Sociodemographic data of participants (N=2297).

Overall, 81.8% (n=1,879) of participants stated that they were willing to be vaccinated against COVID-19 if a vaccine was available. Of the participants, 11.5% (n=269) stated that they were not sure to be inclined to get vaccinated as well as 6.7% (n=154) stated that they were not into getting vaccinated. As shown in Table 2, we found considerable differences in the attitudes towards the vaccine across age groups, employment status and area of residency.

We asked participants who were willing to get vaccinated about their main reasons for this. Almost all the participants reported they thought that vaccination would have been effective and safe for themselves (n=1400, 73.65%) and for relatives (n=978, 51.45%). 23 respondents (1.21%) reported the thought that after the vaccination they would have not had to engage in preventive measures such as social distancing, respiratory masks and others. The remaining reasons are shown in Figure 1.

Características	n	Unsure	Yes	p*
Gender				
Female	104	194	1261	**
Male	48	68	607	
Other	2	2	11	
Age (group)				
Under 20	6	12	65	0.005
20-29	45	90	771	
30-39	40	81	523	
40-49	22	39	243	
50-59	27	27	163	
60-69	9	14	91	
70 and over	5	1	23	
Employment status				
Study	17	40	421	0.003
Work	82	138	927	
Both	48	69	430	
None	7	17	101	
Education level				
Primary	0	1	5	**
Secondary	20	31	194	
University	134	232	1680	
Area of residence				
Rural	10	12	57	0.044
Urban	144	252	1822	
Place of residence				
Central	65	122	756	0.172
Others	89	142	1123	

*Chi square.

**Cannot be calculated.

Table 2. Willingness to be vaccinated against COVID-19: associated characteristics (N=2297).

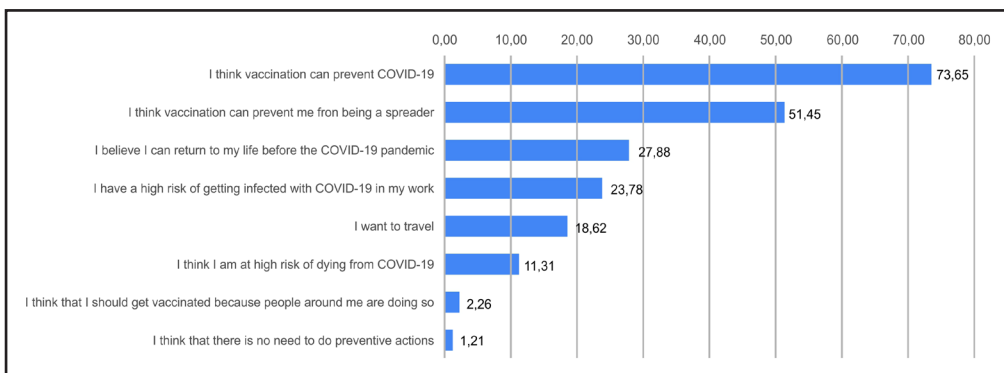


Figure 1. Participants' reasons for getting vaccinated against the COVID-19 (n=1901; multiple answers).

We also asked participants who were unsure (Figure 2) or refused (Figure 3) of being vaccinated about their main reasons for this.

Nearly a half of them reported to be concerned about the potential adverse events related to the vaccine.

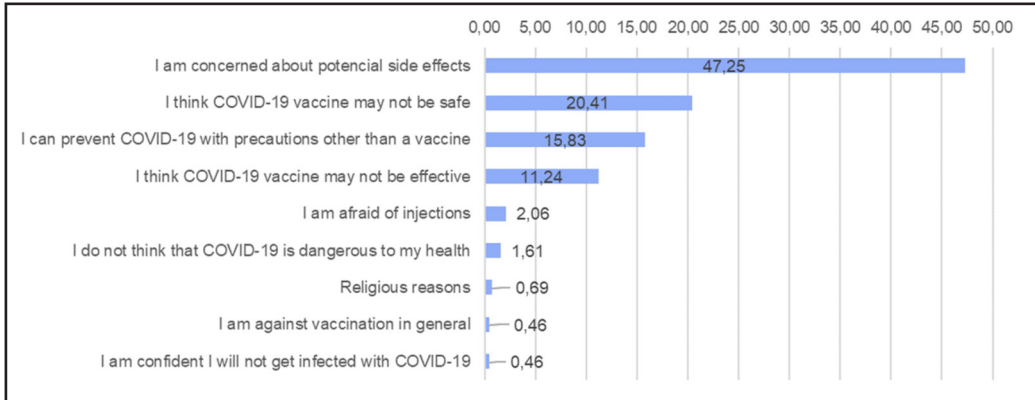


Figure 2. Reasons for being unsure about being vaccinated against COVID-19 (n=436, multiple answers).

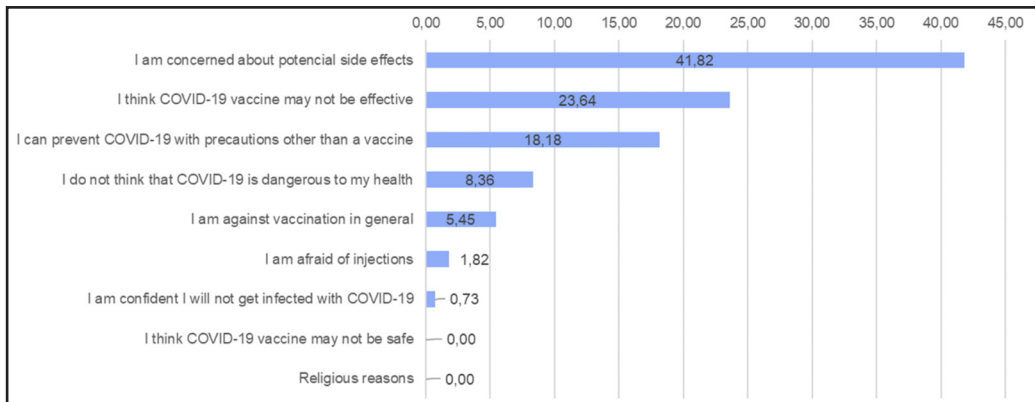


Figure 3. Reasons for refusing to be vaccinated against COVID-19 (n=275, multiple responses).

Table 3 shows that 17.2% have been previously diagnosed with COVID-19 and that 45.1% received the influenza vaccine. A significant relationship has been found between having applied the influenza vaccine and the intention to be vaccinated against the COVID-19 ($p < 0.0001$).

Performing an OR analysis (excluding those who were unsure and those who did not remember to get vaccinated against influenza), we obtained 3.09 (95% CI 2.1-4.5) which meant that those who received the influenza vaccine have been 3-times more willing to be vaccinated against the COVID-19 (Table 3).

	No	Unsure	Yes	p*
COVID-19 status: Have you been diagnosed with COVID-19 previously?				
Yes	31	46	318	0.595
No	123	218	1561	
Flu Vaccination: Did you get vaccinated against the Influenza virus in the last year?				
Yes	37	91	907	$p < 0.0001$
No	109	153	865	
Don't remember	8	20	107	

Table 3. Willingness to be vaccinated against COVID-19: associated characteristics (N=2297).

DISCUSSION

Our study found an overall positive attitude, with more than 80% of the participants expressing willingness to be vaccinated against COVID-19. These results are similar to those reported in China (14,15), Indonesia (16), the United States (17), Australia (18), and Latin America and the Caribbean (19,20). This percentage is somewhat higher than those reported in Italy (21) and in other reports from United States (22). The estimated national rate of immunization, either by vaccination or via prior infection, is more than 82% according to a recent study (23). These results are auspicious and imply that a large part of Paraguayan population should join the vaccination campaign.

There were significant associations between the willingness to be vaccinated and some factors such as being a student, prior influenza vaccination, and those who received the influenza vaccine were 3-times more willing to be vaccinated against the COVID-19. This evidence was reported in a study from China confirming the association between willingness to vaccine and age (between 30 and 49) or university and college education (14). Similarly, predictors for willingness to COVID-19 vaccine in an American study were education, having health insurance, positive attitudes towards the vaccines, high perceived susceptibility to COVID-19 and high perceived benefits of the vaccine (24,25).

An important percentage of subjects were willing to be vaccinated in order to protect themselves and their relatives. Similar attitudes were found among caregivers of children admitted in emergency departments, which also were interested in testing the vaccine before the current clinical use (26).

Reasons motivating the refusal of getting vaccinated included potential side effects. Some strategies to address hesitancy at the individual level are currently based on evidence-based information about COVID-19, on promoting altruism and prosocial behaviors, addressing any misperception on vaccination campaign (7).

Although our study found a high percentage of people willing to be vaccinated against COVID-19, a non-negligible percentage (almost 20%) were unsure or unwilling to do so. In that sense, improving vaccine acceptance requires a deeper understanding of the issues underlying

reluctance to vaccinate (27). Our study can serve as a starting point to explore these issues in Paraguay.

Limitations of this study may include the higher rate of women among participants, the high level of education (mostly university education) and residence in urban areas: this may be related to a selection bias since people with higher education and living in an urban setting may be more accessible. Another limitation may include the lack of open questions regarding the reasons of being willing to be vaccinated as well unwilling: this may have biased the responses of some participants possibly reporting additional personal reasons.

In conclusion, the percentage of participants inclined to be vaccinated against the COVID-19 is similar to that of those expecting a proper immunization from the vaccine; some demographical factors associated to this attitude (age, employment, area of residence) were similar to those reported in studies on general population from different other countries. Government and health agencies should make an effort to provide accurate information that responds to people's concerns about vaccination, at any level of society.

Authors' contribution statement:

Julio César Torales, Carlos Ríos-González, Marcelo Gerardo O'Higgins, José Almirón-Santacruz, Derlis Duarte-Zoilán, Noelia Ruiz-Díaz, Iván Barrios: conception and design of the study, analysis and interpretation of the results and conclusions, critical revision of the manuscript, final approval of the manuscript. José Nicolás Ayala Servín, Oscar García Franco, Gladys Estigarribia Sanabria, Gabriela Sanabria Báez, Patricia Ríos Mujica, Jorge Villalba-Arias, João Mauricio Castaldelli-Maia, Antonio Ventriglio: collection/obtaining data/results, drafting, final approval of the manuscript.

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