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HEALTH PROMOTION STRATEGIES TO COMBAT COVID-19 VACCINE HESITANCY AMONG ADOLESCENTS

Estratégias de promoção da saúde para combater a hesitação vacinal de adolescentes contra a covid-19

Estrategias de promoción de la salud para combatir la vacilación vacunal contra la covid-19 entre adolescentes

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RESUMO

Objetivo: compreender os motivos da hesitação em receber a vacina contra COVID-19 entre adolescentes e construir materiais educativos sobre vacinação para esse público. **Métodos:** estudo transversal com coleta de dados entre julho e setembro de 2021, com adolescentes brasileiros de 14 a 19 anos. Foi aplicado questionário virtual com variáveis sociodemográficas, intenção vacinal e motivos da hesitação. A análise foi descritiva, com uso de nuvens de palavras. **Resultados:** dos 526 participantes, 56 (10,64%) relataram hesitação vacinal. A média de idade foi 16 anos, com maioria do sexo feminino (n=40) e residentes da Região Norte (n=39). Foram coletadas 80 respostas. Os principais motivos foram: medo de efeitos colaterais (26,2%), agulhas (18,7%), percepção de baixo risco de infecção (10%) e receio de reações alérgicas (10%), os dados subsidiaram a construção de cartilhas e *podcasts*. **Conclusão:** a pesquisa contribui para compreender os motivos da hesitação vacinal entre adolescentes, relevante a outras vacinas.

DESCRITORES: Saúde do adolescente; Hesitação vacinal; COVID-19; Promoção da saúde; Tecnologia educacional.

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ABSTRACT

Objective: to understand the reasons behind vaccine hesitancy regarding the COVID-19 vaccine among adolescents and develop educational materials on vaccination for this population. **Method:** a cross-sectional study was conducted from July to September 2021, collecting data from Brazilian adolescents aged 14 to 19. Participants were asked to complete a virtual questionnaire including sociodemographic variables, vaccination intent, and reasons for hesitancy. Descriptive data analysis was performed using word clouds. **Results:** of the 526 participants, 56 (10.64%) reported some degree of vaccine hesitancy. The average age was 16 years, and the majority were female (n = 40) and resided in the northern region (n = 39). A total of 80 responses were collected. The main reasons for hesitancy were fear of side effects (26.2%), fear of needles (18.7%), perceived low risk of infection (10%), and fear of allergic reactions (10%). The data supported the development of educational booklets and podcasts. **Conclusion:** this research contributes to our understanding of the reasons for vaccine hesitancy among adolescents, a topic that is also relevant to other vaccines.

DESCRIPTORS: Adolescent health; Vaccine hesitancy; COVID-19; Health promotion; Educational technology.

RESUMEN

Objetivo: Comprender los motivos de la vacilación para recibir la vacuna contra la COVID-19 entre adolescentes y elaborar materiales educativos sobre vacunación para este público. **Métodos:** estudio transversal con recolección de datos entre julio y septiembre de 2021, con adolescentes brasileños de 14 a 19 años. Se aplicó un cuestionario virtual con variables sociodemográficas, intención de vacunarse y motivos de vacilación. El análisis fue descriptivo, con uso de nubes de palabras. **Resultados:** de los 526 participantes, 56 (10,64%) informaron algún grado de vacilación vacunal. La edad media fue de 16 años, con mayoría del sexo femenino (n=40) y residentes de la Región Norte (n=39). Se recogieron 80 respuestas. Los principales motivos fueron: miedo a los efectos secundarios (26,2%), a las agujas (18,7%), percepción de bajo riesgo de infección (10%) y temor a reacciones alérgicas (10%). Los datos subsidiaron la elaboración de cartillas educativas y podcasts. **Conclusión:** La investigación contribuye a comprender los motivos de vacilación vacunal entre adolescentes, siendo relevante también para otras vacunas.

DESCRIPTORES: Salud del adolescente; Hesitación vacunal; COVID-19; Promoción de la salud; Tecnología educativa.

INTRODUCTION

In the first half of 2021, Brazil released vaccination against COVD-19 (SARS-CoV-2) for adolescents over the age of 12, with different schedules in each state. The main objective of vaccinating adolescents was and remains to control the transmission of the disease since adolescents transmit the virus in the same way as adults. The disease spreads easily in environments such as schools, but immunization can interrupt or greatly reduce transmission, as has been confirmed over time.[1]

Despite the well-established evidence on immunization for individual and collective prevention, vaccine refusal and hesitancy are growing worldwide. In 2019, vaccine hesitancy was ranked as one of the top ten global health risks, gaining notoriety in research on adherence to the SARS-CoV-2 vaccine in several countries.[2] Hesitancy is defined as the delay in accepting or refusing vaccination, even when the vaccine is available. It occurs on a spectrum ranging from high acceptance to total refusal. It varies over time and place and with the types of vaccines available.[3]

Several factors can contribute to vaccine hesitancy, including gender; trust in policymakers' motivations regarding vaccines; trust in the system that provides vaccines; and trust in health professionals, services, and the efficacy and safety of vaccines.[3]

A 2021 systematic review involved surveys on acceptance rates of the COVD-19 vaccine among adults and found information on 33 countries. The highest acceptance rates were found in Ecuador (97.0%), Malaysia (94.3%), Indonesia (93.3%), and China (91.3%). The lowest rates of acceptance were found in Kuwait (23.6%), Jordan (28.4%), Italy (53.7%), Russia (54.9%), Poland (56.3%), the United States (56.9%), and France (58.9%). Brazil had an acceptance rate of 85.4%. A study of guardians of Brazilian children and adolescents yielded a similar result to a systematic review, indicating a 15% rate of vaccine hesitancy.

Research into the reasons adolescents do not get vaccinated against SARS-CoV-2 is in its early stages. However, international studies[6-7] show that females, lower education levels, lower incomes, and younger age are related to lower vaccine acceptance. Similarly, a national survey of adolescents[8] reveals that adolescents with higher income and schooling are less likely to intend not to get vaccinated.

Additionally, adolescence is a critical period that shapes health-related attitudes in adulthood. Therefore, it is crucial to examine the factors contributing to vaccine hesitancy and how adolescents perceive, comprehend, and disseminate information about vaccination and health in general, to grasp its impact on vaccine accessibility.

Evaluating the reasons that lead to vaccine hesitancy can help in the fight against the ongoing global pandemic of SARS-CoV-2, as well as in the prevention and control of future pandemics. In this context, educational technologies can promote health literacy (HL) among adolescents and consequently contribute to health promotion. These technologies can come in different formats, and adolescents can use them individually and spontaneously. Additionally, these resources can be used by health professionals in educational strategies to promote health.

Thus, the goal of this study was to understand the reasons for hesitancy regarding the receipt of the COVD-19 vaccine among adolescents, as well as to develop educational materials on vaccination for this audience.

METHOD

Research type

This study is an excerpt from a quantitative, cross-sectional study of a matrix project. The present study highlights aspects of vaccine hesitancy with a view to developing educational technologies and is classified as descriptive and exploratory.

Participants, Inclusion and exclusion criteria

The sample consisted of adolescents between 14 and 20 years old, in the middle and late stages of adolescence. All adolescents in the age group who had internet access and answered the survey were included. Participants whose questionnaires were not completed were excluded.

Data collection and study location

Data was collected virtually using Google Forms. Adolescents were recruited through the snowball technique from July to September 2021. Survey invitations were disseminated via digital media (email, TikTok, Facebook, and WhatsApp) in spaces such as schools, universities, municipal and state health and education departments, community organizations, and churches in the five macro-regions. Parents/guardians and adolescents who agreed to participate in the study were instructed on how to participate after reading and recording their acceptance of the informed consent form in digital format.

Collection Instrument

The authors used a questionnaire adapted from Ruiz and Bell[9] with six items on sociodemographic variables and one item on intention to be vaccinated and possible reasons for vaccine hesitancy, as shown in Chart 1.

Chart 1 – Reasons for vaccine hesitancy against COVID-19. Brazil, 2021

The vaccine probably wouldn't work for me.
I don't need it because I'm already immune from a previous infection.
I would rather develop immunity through infection than through vaccination.
I don't need the vaccine because I'm healthy and have a low risk of infection.
I'm young, so I have a low risk of infection.
Even if I were to get infected, I wouldn't get seriously sick.
The vaccine can have dangerous side effects.
I hate needles and injections.
I may be allergic to the vaccine.
I had a reaction to the first dose

Source: Adapted from Ruiz and Bell.[9]

Participants could select more than one reason for hesitation. They could also add a reason that was not included in the presented options through free writing.

Educational technologies derived from research

The results of the research were used to develop educational technologies employing accessible language with the help of Canva. Two educational booklets based on Health Literacy principles were created, using accessible language and sources. Additionally, two podcasts were produced using the Spotify for Podcasters platform. Podcasts are audio episodes available for streaming or downloading. These educational technologies are freely available and detailed in the results section.

Data analysis

Data were tabulated in Microsoft Office Excel® 2016 and then subjected to descriptive statistical analysis. To better visualize the results regarding reasons for vaccine hesitancy, the WordCloud virtual tool was used to generate a word cloud grouping the most frequently reported reasons. This tool helps visualize repeated words, and in this study, it highlighted the main reasons for vaccine hesitancy.

Ethical aspects

This study was conducted according to the requirements of Resolution No. 466 of the National Health Council (CNS), from December 12, 2012. This research is part of an umbrella project entitled "Health Literacy, Threat of Getting Sick from the Coronavirus, and Intention to Vaccinate Brazilian Adolescents ("*Letramento em saúde, ameaça de adoecer pela COVID-19 e intenção de vacinar de adolescentes brasileiros*")", which was submitted to the Research Ethics Committee (CEP) of the Federal University of Tocantins. The research was approved with certificate of ethical appreciation (CAAE) number 48257321.0.0000.5519 and opinion number 4833554/2021.

RESULTS

Of the 526 adolescents who participated in the macro survey, 56 indicated vaccine hesitancy. Most of these individuals were female (n = 40), with a mean age of 16 years (SD = 1.62), and residents of the North Region (n = 39), as shown in Table 1.

Table 1 - Sociodemographic characteristics of adolescents who are hesitant to vaccination against COVID-19. Palmas, TO, Brazil, 2021

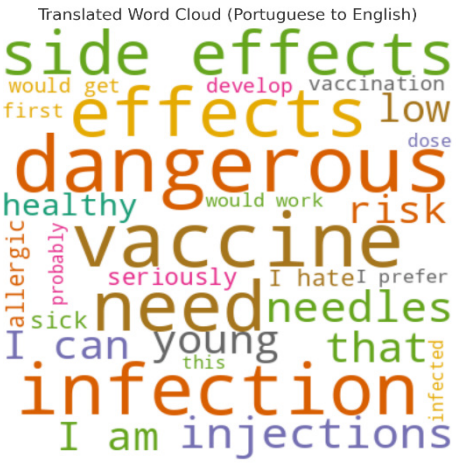
Variables		N	%
Sex	Female	40	71,4
	Male	16	23,2
Region	North	39	69,6
	Northeast	4	7,1
	Midwest	5	8,9
	Southeast	7	12,5
	South	1	1,8
Education	Elementary School	13	23,2
	High School*	42	75,0
	Higher education**	1	1,8
Income	<0.5	20	35,7
	0,5–1	11	19,6
	1–2	15	26,8
	2–5	10	17,9

Legend: * complete or attending; ** attending
Source: Research data.

Regarding their intention to be vaccinated against the novel coronavirus, adolescents were asked, "All things considered, how likely are you to get a vaccine when one is available?" The responses from those who were hesitant were distributed as follows: extremely unlikely (n = 6), somewhat unlikely (n = 12), not sure (n = 22), and unlikely (n = 16).

Figure 1 illustrates the 80 reasons for vaccine hesitancy identified by the 56 participants.

Figure 1 – Word cloud with the reasons for vaccine hesitancy against COVID-19 of Brazilian adolescents. Palmas, TO, Brazil, 2021

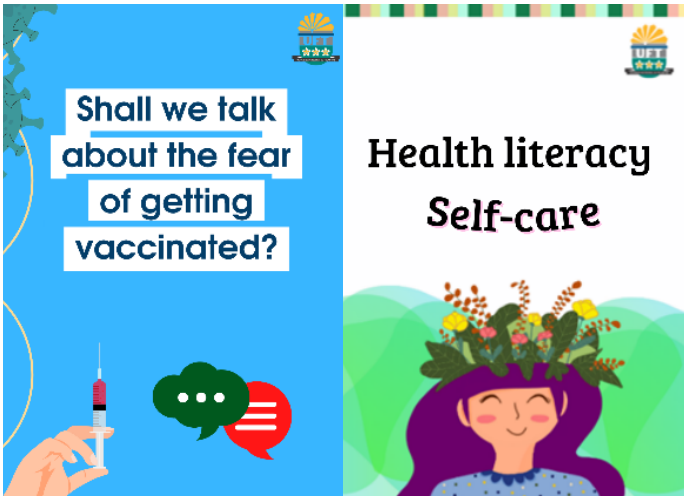


Source: The Authors.

The most relevant reasons were found in 21 (26.2%) of the 80 responses. Adolescents reported the following reasons: 15 responses (18.7%) mentioned a fear of needles and injections; 8 responses (10%) mentioned a low risk of infection because they are healthy; 8 responses (10%) mentioned a low risk of infection because they are young; 8 responses (10%) mentioned a fear of an allergic response to the vaccine.

Based on these results, two educational technologies were developed in the form of educational notebooks. The first material, entitled "Let's Talk About the Fear of Getting Vaccinated?" (Figure 2), addresses the main reasons for vaccine hesitancy pointed out by adolescents and is organized into six topics across 15 pages. The second material, entitled "Health Literacy and Self-Care" (Figure 2), addresses issues related to health promotion and the safe search for information. It is summarized in nine pages and is available electronically (https://shre.ink/uft and https://shre.ink/uft2). Additionally, two podcasts were produced. One is titled "Adolescence, Health Literacy, and Vaccination Against Covid-19" and was published and disseminated on the Spotify app in partnership with the Brazilian Network of Health Literacy (REBRALS). It is available at https://open.spotify.com/episode/3AoTra4hVVzVxDjDpLtLCK and is 35 minutes long. The other is titled "What Else Prevents Vaccination? Why Should I Get Vaccinated?" was also published on Spotify (https://open.spotify.com/episode/7zKkMheESntcx1rTnxD7aE) and is about eight minutes long. These materials were disseminated on social networks, such as Instagram and WhatsApp, to provide feedback on the results of this survey to the population, especially adolescents.

Figure 2 – – Cover of educational technologies. Palmas, TO, Brazil, 2022



Source: The Authors.

DISCUSSION

This study presents the sociodemographic profile of adolescents with vaccine hesitancy and the main reasons for this hesitancy. The most common reasons are that vaccines can have dangerous side effects, fear of needles, and the belief that they are at low risk of contracting SARS-CoV-2. Additionally, the study stands out for developing technologies based on the information needs of adolescents.

Studies conducted with adolescents in China and Southern California corroborate our study's data. In China, causes of hesitancy include side effects and the belief that there is no risk of contracting SARS-CoV-2. In Southern California, adolescents believed that vaccines could cause unwanted short- and long-term effects, and they reported fear of needles.

A study with adolescents in sub-Saharan Africa (Burkina Faso, Ethiopia, Ghana, Nigeria, and Tanzania) revealed that most hesitant adolescents are male, live in rural areas, and are not studying, that is, they have a different profile than the adolescents in our study.

There is no consensus in the literature on the relationship between gender and vaccine hesitancy. Research conducted in Ethiopia reveals that young women with only a primary education tend to be more hesitant.[14] Qualitative analysis provides information about young people's beliefs regarding the low risk of a SARS-CoV-2 infection, distrust of the vaccine, and fear of dangerous side effects.

As for Brazilian studies, an online survey was carried out in 2021 through the Oswaldo Cruz Foundation (Fiocruz). The survey aimed to evaluate Brazilian parents' and guardians' intention to vaccinate their children and adolescents. Of the 15,297 participants, 1,896 (12%) reported having doubts or reasons for vaccine hesitancy. These reasons fell into two categories: fear of vaccination (46.74%) and lack of intention to vaccinate (53.26%). Most of those afraid of vaccination believe that the vaccine is still in the experimental phase, fear adverse reactions, and do not know what the long-term side effects will be. These last two reasons corroborate our study. Regarding those who do not intend to get vaccinated, parents and guardians believe that: Covid-19 is not serious in children; The risks of the vaccine outweigh the benefits; They have the autonomy to choose not to vaccinate. The first reason (belief that the disease is not severe in children) aligns with the findings of the present study.

A study conducted in Maranhão with 4,630 adults shows that the prevalence of vaccine hesitancy is 17.5%, which is higher than the percentage indicated among adolescents in our study (10.64%). However, a 2022 national study of the Brazilian elderly population identified an 8.2% rate of people who reported some degree of uncertainty in their intention to vaccinate against SARS-CoV-2, which is lower than the rates observed among the adult population of Maranhão and Brazilian adolescents. It can be inferred that the elderly may feel more vulnerable to the disease, which could explain the lower rate of vaccine hesitancy. Regarding the main reason for hesitancy, research with adolescents is similar to research with the elderly. The hesitant elderly are afraid the vaccine will cause adverse reactions.

Bagateli *et al*. (2021) conducted a survey evaluating vaccine hesitancy among parents of children and adolescents in relation to the SARS-CoV-2 virus in Bauru, São Paulo, Brazil. Although only a minority (n = 14/501; 2.8%) were hesitant about vaccines, half of those individuals (n = 7) were still willing to vaccinate their children against SARS-CoV-2.

Several tools have been created to combine communication and the propagation of scientific information, such as podcasts and educational notebooks. These resources are important for promoting science-based health and are relevant for disseminating self-care guidelines due to their accessible language and propagation.

Using technologies to promote health among adolescents creates new ways of communicating with society amid the challenges posed by the global pandemic. Thus, educational technologies are timely tools for promoting health and offering support for addressing health-related situations.[19]

Educational technologies are essential for improving people's adherence to immunization, which contributes to the fight against vaccine-preventable diseases. Hu, Li, and Chen (2018) conducted a study with 200 pregnant women in eastern China, evaluating the effectiveness of two health education interventions aimed at improving adherence to varicella immunization. The researchers used a video with emotional messages and a booklet with informational messages. The study revealed that the educational technologies improved vaccination coverage and adherence among pregnant women. Similarly, a study in the Brazilian state of Ceará involving 228 female adolescents from the municipal school system revealed that message cards effectively increased participants' knowledge of and adherence to the quadrivalent HPV vaccine, demonstrating the effectiveness of educational technology.

Based on this study's data, public health policies should address vaccine hesitancy among adolescents regarding not only the novel coronavirus (SARS-CoV-2) but also other diseases. Investing in education about vaccination is essential, as is emphasizing its importance and combating misinformation. Educational technologies can support nurses and health teams in school activities and make better use of the educational space to promote health and strengthen adolescents' understanding of vaccines.

Schools are ideal places for developing health education programs related to vaccination because they are environments where adolescents obtain important information and learn skills that will impact their lives. They also develop interpersonal relationships that influence their decisions and behaviors, including whether they choose to engage in behaviors that promote their well-being.[22]

According to Wilson, Mote, and Morse (2022), nursing professionals in schools should establish relationships with adolescents, use motivational interviewing techniques, and address communication and trust barriers. They can also promote vaccination and use educational resources to help families understand its importance.

In a narrative review, Guarinoni and Dignani (2021) cite activities that can increase vaccination coverage. These activities include assessing the vaccination status of school students through a computerized system, involving parents/guardians and teachers in encouraging vaccination, and implementing health education projects. Health education with adolescents should stimulate the development of a social protection network involving the parents and guardians of these individuals. Additionally, spaces typically used by adolescents, such as networks and social media, should be explored.

One limitation of the study is the method of data collection, which occurred online and limited access for those without internet access. Nevertheless, this study broadened knowledge about reasons for vaccine hesitancy among adolescents in Brazil, a relatively new subject.

CONCLUSION

The results reveal the presence of vaccine hesitancy among Brazilian adolescents. Uncertainties about the safety and efficacy of vaccines should be addressed from elementary school onward, as adolescence is an opportune time for educational interventions and health promotion. Using educational materials, such as notebooks, and technologies, such as podcasts, as well as other technological resources, can improve communication strategies between health professionals and adolescents.[25]

These strategies can foster bonds between health professionals and adolescents, as well as other groups in society. Together, they can clarify doubts, combat misinformation, and achieve the vaccination coverage recommended by the Ministry of Health.

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