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Attitudes and perceptions about COVID-19 vaccination in the population with chronic HIV infection: A systematic review

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Abstract

Background and Aims: The coronavirus disease 2019 (COVID-19)-infected population has been increasing during the last 3 years worldwide. Moreover, simultaneously, COVID-19 vaccine clinical trials were launched. By the end of 2020, the Food and Drug Administration had authorized the emergency use of two messenger RNA vaccines against COVID-19. These fast-track vaccine approvals have produced controversy about their safety and efficacy. The purpose of this research was to discover attitudes and perceptions regarding vaccination against COVID-19 disease among vulnerable groups such as human immunodeficiency virus (HIV)-infected patients.

Methods: Between June 2, 2021 and March 4, 2022, we conducted a cross-sectional study through a survey of high-risk patients with severe COVID-19, such as HIV-infected patients in the Infectious Diseases Unit (Hospital Clínico Universitario San Juan, Alicante). For the data collection strategy, a nonprobabilistic snowball sampling was adopted. A structured, anonymous, self-administered questionnaire was developed in which questions and statements were designed to evaluate their attitudes and perceptions about COVID-19 vaccination. Descriptive and bivariate analyses were performed for the obtained data.

Results: Forty-eight participants were recruited with a mean age of 51.5 ± 11.9 years. Thirty-nine of them (81.3%) were male. The acceptance rate of COVID-19 vaccination was extremely high (95.7%). Bivariate analysis showed older patients significantly received a higher proportion of vaccine doses at the time of the survey ($p = 0.047$). Older patients were more aware of the vaccine safety controversy (61.1%) compared to younger patients ($p = 0.054$). There were no other significant differences between groups among questions regarding safety, efficacy, or attitudes about COVID-19 vaccination.

Conclusion: An extremely high degree of acceptance for COVID-19 vaccination was reported. Older patients were more aware of the vaccine safety controversy.

Emilia Afonso López Shirley and Jover-Diaz Francisco contributed equally to this study.

Medical staff is the most trustworthy source of information, far above all other sources. Social networks and opinion leaders have not been shown to significantly influence our population.

KEYWORDS
COVID-19, HIV, SARS-CoV-2, vaccination

1 | BACKGROUND

In December 2019, an outbreak of unknown origin pneumonia occurred in East China, which would later be related to infection by a new virus from the Coronaviridae family, known as "Severe Acute Respiratory Syndrome Coronavirus 2" (SARS-CoV-2). This coronavirus is the cause of the now well-known coronavirus disease 2019 (COVID-19).[1] Since then, the number of infected people has been multiplying over months in most countries in the world. Vaccines have been one of the most important contributions to public health in the 20th century, being responsible for the sharp decline in infectious diseases throughout the world. However, radical changes in the density, age distribution, and travel habits of the population worldwide, as well as climate change, favor the appearance of new pathogens and the re-emergence of other known ones that are at risk of becoming threats. Pandemics, as is the case with the current COVID-19.

In this sense, the rapid global spread of COVID-19 has made evident the imperative need to prepare for a global pandemic, which requires extremely rapid development and comprehensive distribution of SARS-CoV-2 vaccines. Conventional vaccines, developed by attenuating or inactivating pathogens, evoke the immune response without causing disease. However, these established methods may not always be suitable or even feasible in outbreak situations. Live attenuated vaccines often carry the risk of reversion, making this approach unfavorable for highly pathogenic organisms, which are not well characterized. On the other hand, inactivation may not induce protective responses (or induce them at low levels) or even cause adverse effects. Thus, new vaccine technologies, such as viral vector and nucleic acid-based vaccines (DNA and messenger RNA [mRNA] vaccines), highly effective and capable of rapid development as well as large-scale production, have become of significant importance in the fight against COVID-19.[2]

As of the second quarter of 2020, many clinical trials of the COVID-19 vaccine were launched. Researchers use what they previously learned from vaccine studies against SARS-CoV, Middle East respiratory syndrome-related coronavirus, and other viruses such as human immunodeficiency virus (HIV) to develop vaccines to prevent COVID-19.[3] At the end of 2020, the Food and Drug Administration authorized the emergency use of two mRNA vaccines against COVID-19. The first vaccines were administered in our country at the end of 2020. Recently, two systematic reviews and meta-analyses have been published regarding the immunogenicity and efficacy of COVID-19 vaccines in immunosuppressed populations like people living with HIV[4] and solid cancer patients.

Usually, vaccinated people benefit from the effect of the vaccine against the disease of the target infection since there are few vaccines with a sterilizing effect. In addition to this direct effect, vaccination can increase the level of population immunity (or herd immunity), increasing the proportion of the population that is immune to infection. Therefore, for a human-to-human transmitted infection, such as COVID-19, to remain in a population, each case of infection must give rise to at least one other case, that is, the effective reproduction number (Ro) must be at least greater than 1. If the Ro is less than 1, the infection will progressively cease to affect the population. That is, the increase in the level of collective immunity ("herd effect") sufficiently reduces the risk of infection among the uninfected and, therefore, the infection will no longer be transmissible in the population and the disease will potentially be eliminated.[5–7]

However, achieving herd immunity against SARS-CoV-2 through vaccines will require a concerted effort to overcome the implementation barriers of universal vaccination. In this context, any debate on vaccines must face the fact of their potential profound impact on public opinion, which sometimes generates controversy, not only among potential beneficiaries but even within the medical community itself.[8–10] In fact, in recent years, there has been a greater rejection of vaccination. This has caused several outbreaks of preventable diseases, with measles being the best example in our country.[11] This rejection has been attributed to several factors, including the low incidence of many preventable diseases. The perception among the population that the severity and susceptibility of some infections are extremely low is another implicated factor. In addition, there is a concern, often unfounded, about the safety of vaccines.

Undoubtedly, the fear of vaccines has been fueled by the existence of incorrect or biased information, not supported by scientific evidence, broadcast on the Internet ("fake news"), television programs, radio, newspapers, or magazines. The current pandemic scenario, combined with the impact it has on political and economic issues, is understood that the study of the beliefs that the population has about vaccination may be relevant to subsidizing individual or collective care strategies and guidelines aimed at minimizing doubts. or rejection of the implementation of mass vaccination against COVID-19.

The purpose of our research is to find out what attitudes and knowledge exist regarding the COVID-19 disease in a vulnerable

TABLE 1 Summary of the methodological characteristics of the published studies.

Reference	Scope of study	Study period	Publication date	Evaluation tool
[12]	Canada	08/20/2020–03/01/2021	01/12/2022	Online questionnaire
[13]	Rwanda	08/31/2020–09/18/2020	10/26/2020	Self-administered questionnaire
[14]	South Africa	09/25/2020–01/08/2021	06/22/2022	Telephone questionnaire
[15]	USA	10/2020	03/09/2022	Online questionnaire
[16]	USA	12/06/2020-01/08/2021	06/30/2022	Online questionnaire
[17]	United Kingdom	12/2020–11/2021	07/19/2022 (Conference)	Data collection
[18]	China	02/13/2021-02/21/2021	12/10/2021	Online questionnaire
[19]	Uganda	03/29/2021-04/14/2021	06/09/2021	Self-administered questionnaire
[20]	China	05/20/2021-06/20/2021	05/23/2022	Online questionnaire
[21]	United Kingdom	07/2021–09/2021	11/06/2021 (Conference)	-
[22]	Greece	10/2021	07/29/2022 (Conference)	-
Emilia et al. [This study]	Spain	06/02/2021-03/04/2022	This report	Self-administered questionnaire

Abbreviation: USA, United States of America.

group such as HIV-infected patients. When we began the recruitment of patients in our study, there were no data on this subject. However, parallel to our research, the same situation has arisen in different cohorts of HIV patients on various continents. Table 1 summarizes the central studies published to date regarding their design.

1.1 | Outcomes

1.1.1 | Main outcome

- Quantify the intention to receive the COVID-19 vaccine in the HIV population.
- Analyze factors related to nonvaccination.
- Secondary objectives.
- Evaluate the perception of the efficacy and safety of the COVID-19 vaccines by the interviewees and the concept of herd immunity.
- Evaluate the contextual influences of the doubts related to the vaccine and its individual and group factors.
- Strengthen the probability of influencing social and public health policies to better address the conceptions that HIV-infected people have about the adoption of vaccination against COVID-19.

2 | METHODS

2.1 | Study design and sample

This is a cross-sectional observational study. Data were collected through self-administered written surveys or via the Internet from a link made using Microsoft Forms. Links could be sent to participants via email or social media.

2.2 | Sample

People over 18 years of age can participate in the sample. There will be no exclusion criteria. The Hospital Clínico Universitario de San Juan de Alicante offers health coverage to a population of approximately 225,000 people. In the Infectious Diseases Unit of the Hospital Clínico Universitario de San Juan de Alicante, 786 patients with a mean age of 46.7 years are followed up, 81.8% of whom are men. The sample size was estimated assuming an (unknown) prevalence of doubt and/or rejection of the vaccine (set at 50%). The minimum sample size calculation was estimated using $\alpha = 5\%$, $p = 50\%$, $\varepsilon = 10\%$ (margin of error), and is expected to achieve a sample size of 86 individuals with a loss-of-response rate of 25%. A nonprobabilistic snowball sampling was adopted for the data collection strategy. Initial contacts were made by personal interview, email, or telephone based on data from the institutional registry. To expand the sample, at the time of the invitation to participants, the patient will be asked to convey an informative message about the research on their HIV-infected contacts to broaden the scope of the study. Guidance will be provided to disseminate the link via email or social media.

In addition to general information about the study, the message will also include a link (https://docs.google.com/forms/d/1QCjq9YDd4enY1RA759v_00z9nZThOUEMclWBEFCqcuw/edit) or quick response code to access the electronic form containing the study. An informed consent form was obtained.

2.3 | Sample characterization

Instruments to assess people's conceptions of and rejection of vaccines are not yet well established. Various study groups[23,24] have tried to create a questionnaire to quantify reluctance to

vaccination. However, in the absence of standardized tools for measuring this rejection, we opted to develop our questionnaire with questions adapted to the profile of our study population.

The questionnaire structure (Table 2) was composed of 47 questions in six sections.

2.4 | Procedures

As explained above, the data were collected online or in written form. The study population received the invitation personally and/or through an institutional email link. A structured, anonymous, and self-administered questionnaire was developed with questions and statements designed to assess the attitude and perception of the interviewees about the vaccines against COVID-19. The questionnaires were available in Spanish. The Strengthening of the Reporting of Observational Studies in Epidemiology Statement guidelines for reporting observational studies were observed.

2.5 | Data analysis

Descriptive analysis for quantitative data is presented as central measures for a tendency and dispersion, according to their distribution pattern (mean ± standard deviation or median ± interquartile range). Parametric distribution was checked using the Shapiro–Wilks normality test. Categorical variables shall be expressed by their frequencies (percentages). The prespecified exploratory analysis includes the age subgroup. A probability (p) level of less than 0.05 was considered statistically significant. Standard two-tailed t-tests were used to evaluate statistical significance among subgroups. Pearson's χ^2 test was used to assess differences in the distribution of categorical variables between two or more independent groups. If the sample was less than the expected frequency, Yates correction was used. For the nonparametric distribution variables, the Mann–Whitney U-test was used. Descriptive and inferential statistical analyses were performed with SPSS 25.0 software (IBM Corporation).

3 | RESULTS

3.1 | Respondent data

Between June 2, 2021 and March 4, 2022, 48 participants gave consent and completed the survey, of which 41/48 (85.4%) through a self-administered written survey and 7/48 (14.5%) online via Microsoft Forms. Table 3 summarizes the main sociodemographic and clinical characteristics of the participants.

3.2 | COVID-19 information

A total of 89.4% (42/48) of the surveyed patients considered that SARS-CoV-2 represented a real danger to their health. The majority (72.3%, 34/47) considered social isolation measures relevant at that time. Security in that pandemic scenario was considered high by the majority (safe, 57.4%, or very safe, 8.5%). On the other hand, 34.1% (16/48) considered it unsafe or very unsafe; 89.4% (42/48) of participants had not lived with COVID-19-infected people; 72.3% (34/48) have not been evaluated or diagnosed with COVID-19. On the other hand, 17% (8/48) had previously been infected. Only 5/48 (10.2%) state that the virus does not pose a threat to their health.

3.3 | Information on vaccines

A total of 70.8% (34/48) of respondents admitted to being informed about the COVID-19 vaccine. Only 39.6% (19/48) considered that immunization campaigns provide sufficient information; 77.1% (37/48) of the participants trusted their physician as the most relevant source of information regarding vaccines. On the other hand, social networks were considered the least reliable sources of information since 64.6% (31/48) preferred to be informed by other means.

A total of 68.1% (32/48) received at least one dose of COVID-19 vaccine, with Pfizer-BioNTech mRNA being the most used (46.9%) followed by Moderna-Spikevax (31.3%). One-third were unvaccinated; 86.7% of them were willing to be. Only 13.3% (6/48) did not want to be vaccinated, mainly because "vaccine clinical trials were not completed" and "for the emergency approval of vaccines."

TABLE 2 Questionnaire structure by type of questions.

Sections	Number of questions	Type of questions
I—Demography	7	Four open, one dichotomous, one polytomous, one closed
II—COVID-19 knowledge	5	Four dichotomous one security perception scale
III—Vaccine knowledge	13	Six dichotomous, three polytomous, two open, and two 5-point Likert scales
IV—Personal beliefs regarding vaccines	8	Five dichotomous, three 5-point Likert scales
V—Side effects of vaccines	8	Four 5-point Likert scales, three dichotomous, one open polytomous
VI—Efficacy or confidence in vaccines	6	Three 5-point Likert scales, three dichotomous

TABLE 3 Sociodemographic and clinical characteristics of the participants.

Variables	Mean (SD), median (IQR) (%)
Mean age, years, *n* = 40	51.5 (±11.9)
Gender, *n* = 47	
Male	39 (81.3%)
Female	8 (16.7%)
Weight, kg (median, IQR), *n* = 40	71 (56–130)
Size, cm (median, IQR), *n* = 40	174 (150–185)
Chronic disease conditions (excluding HIV), *n* = 34	16 (33%)
Asthma, COPD, pulmonary emphysema, or pulmonary fibrosis	5 (14.7%)
Cancer	2 (5.9%)
Neurological conditions: dementia, seizures, or stroke (stroke)	4 (11.8%)
Diabetes mellitus	4 (11.8%)
Pregnancy	2 (5.9%)
Chronic kidney disease	1 (2.9%)
Cardiovascular diseases	5 (14.7%)
Chronic liver diseases	3 (8.8%)
High blood pressure	7 (20.6%)
Other immunosuppressive states: Solid or hematologic organ transplantation, chemotherapy, immunosuppressive drugs, and biological agents.	1 (2.9%)

Abbreviations: COPD, chronic obstructive pulmonary disease; IQR, interquartile range.

The decision to get vaccinated by 85.4% (41/48) of respondents has not been influenced by the media; 41.7% (20/48) of participants were aware of the existence of a vaccine safety controversy, with the majority (75%) of cases of the AstraZeneca vaccine being the subject of debate. Of the respondents, 61% (29/48) do not support the opinion of leaders or groups who are against vaccination. However, 17.1% (8/48) supported leaders or groups who demonstrated against vaccination; 83.3% (40/48) believed their community leaders supported the use of vaccines, while only 10.4% (5/48) did not.

3.4 | Personal beliefs regarding vaccines

Up to 35.4% (17/48) of respondents know someone who does not want to be vaccinated for religious or cultural reasons and 52% (25/48) reject it. More than 80% (20/25) of these people believe this posture endangers their health or the community; 41.7% (20/48) of participants are convinced that the government buys the best quality vaccines available, while a third do not have a formed opinion, and 22.9% (11/48) believe that not all efforts have been made to have the best vaccines. Most respondents (52.1%) believed that vaccine companies were interested in their health, while 41.7% (20/48) thought the opposite. Almost 80% (38/48) of the participants stated that the fear of needle pain would not make them hesitate to get vaccinated. The belief that vaccines overload the immune system is not true for 62.5% (30/48). However, 27.1% (13/48) agreed with this statement. About natural immunity, there was a diversity of opinions since 35.4% (17/48) thought that it was better at developing immunity with vaccines, while 31.3% (15/48) thought that this immunity was better acquired naturally, and 27.1% (16/48) neither agree nor disagree.

3.5 | Vaccine side effects

Fifty percent (24/48) were "informed enough" about the security of COVID-19 vaccines. On the other hand, 31.3% declared to be not at all or poorly informed; 68.8% of participants trusted pharmaceutical companies and the safety of vaccines; 52.1% reported having enough information about side effects before immunization; 66% (32/48) of participants had received at least one vaccine dose. However, only 25% (12/48) reported any side effects (injection site pain, 9.4%, or fever, 6.5%) and only 35.5% (17/48) were worried or very worried about it.

3.6 | Confidence in vaccine efficacy

Among the participants, 45.9% (22/48) agreed or strongly agreed about the scientific development of COVID-19 vaccines. Only 27.1% (13/48) strongly or partially disagreed; 56.2% (27/48) believed vaccines are still needed even if the disease is no longer prevalent. Almost 80% (38/48) considered vaccination to have a herd effect on the most vulnerable population.

A total of 37.5% (18/48) considered that vaccines manufactured in Europe or North America were safer than those coming from Russia, India, China, or Brazil. Only 14.6% disagreed with this statement. A bivariate analysis of older or younger patients than 51 years old showed that older people were vaccinated more than younger people ($p = 0.047$). Older people were more aware (61.1%) of the controversial safety vaccine issues than the younger group ($p = 0.054$). No other significant differences regarding safety, efficacy, or attitudes to COVID-19 vaccination were detected between both groups.

4 | DISCUSSION

We evaluated attitudes and perceptions about COVID-19 vaccination in our HIV chronic infection cohort. The basal characteristics of our sample are like those described in the literature (Table 4) and represent our cohort of HIV patients.

TABLE 4 Summary of the methodological characteristics and results of the published studies.

Reference	Scope of study	Period of study	Assessment tool	HIV+/− population	Sex	Age	% Vaccine acceptance
[12]	Canada	20/08/20–01/03/21	Online questionnaire	69+/5519−	66 F–3 M	49.9 (±11.4)	HIV+ 65.2
[13]	Rwanda	31/08/20–18/09/20	Self-administered questionnaire	376+	212 F–64 M	38 (±12)	-
[14]	South Africa	25/09/20–08/01/21	Questionnaire by phone	213+	153 F–60 M	35 (29–43)	57
[15]	USA	10/20	Online questionnaire	52+/388−	48 F–325 M	23.4	70.2
[16]	USA	06/12/20–08/01/21	Online questionnaire	1030+	106 F–924 M	50.7 (±12.5)	83.8
[17]	United Kingdom	12/20–11/21	Data collection	4594+	837 F–3757 M	50	67.4
[18]	China	13/02/21–21/02/21	Online questionnaire	1295+	1060 M–122 TGF	29.3	8.70
[19]	Uganda	29/03/21–14/04/21	Self-administered questionnaire	46+/317−	184 F–120 M	51.5 (±14.1)	70
[20]	China	20/05/21–20/06/21	Online questionnaire	350+	15 F–335 M	36.1 (±9.64)	80
[21]	United Kingdom	07/21–09/21	-	515+	93 F–422 M	53	96
[22]	Greece	10/21	-	327+	33 F–294 M	44.1	85
Emilia et al. [This study]	Spain	02/06/21–04/03/22	Self-administered questionnaire	48+	8 F–39 M	51.5 (±11.9)	95.7

Abbreviations: F, female; HIV, human immunodeficiency virus; M, male; TGF, transgender female; USA, United States of America.

It should be noted that most participants were male 81.3% (*n* = 39), with the average age of respondents of 51.5 years (SD ± 11.9). One-third of participants have at least one chronic disease (excluding HIV). The most prevalent comorbidities were arterial hypertension, and cardiovascular or respiratory diseases (asthma, chronic obstructive pulmonary disease, pulmonary emphysema, or pulmonary fibrosis). Sociodemographic and clinical data are consistent with studies conducted among HIV-positive people in various studies.[12,19,21]

COVID-19 vaccine acceptance was extremely high (95.7%; 46/48) and coincides with that shown in other series.[18,21] However, vaccination acceptance varies from 8.7% to 96% in China[18] and the United Kingdom,[21] respectively. More than 70% of the participants considered they were informed about the COVID-19 vaccine. This level of knowledge and favorable attitudes toward the COVID-19 vaccine have been correlated in several studies.[25,26] However, nearly 40% of respondents responded that immunization campaigns did not provide sufficient information. The most appreciated source of information was doctors (77%), while social networks were considered the less reliable sources. Of the respondents, 85.4% were prone to vaccination and it has not been influenced by media. It has been reported that they would be more willing to receive a COVID-19 vaccine if it was recommended by their doctor (61.5%) or if their doctor mentioned that they had been vaccinated themselves.[16] Our survey timing was vaccination first phase in Spain. So, 68.1% had received at least one dose. We would like to highlight that 86.7% of those who had not yet received any doses were willing to be vaccinated (33.6%). Only an exceedingly small number of unvaccinated (4.2%) did not want to be either.

Reasons given for not getting vaccinated were "clinical trials not finished" or "emergency approval of vaccines." These arguments are also described in another study[27] in which the main reasons cited were vaccine mercury content, its association with autism, concerns about vaccine safety, lack of confidence in the research process, and belief that vaccine may "hurt." We did not identify factors associated with low vaccination acceptance for two main reasons. First, because a large majority accepted it, and second, because of the small size of our sample. In other studies, COVID-19 vaccine hesitancy has been significantly associated with younger age (e.g., under 60 years old), race (Black vs. Caucasian), lower education levels, lack of health insurance, gender (women are willing to take fewer risks than men), type of employment, low income, and inadequate control of HIV.[12,28,29]

Safety concerns, especially about the reported incidence of thrombotic episodes from adenovirus-mediated vaccines have been acknowledged by half of the respondents. However, this has not prevented the degree of acceptance of vaccination from being extremely high. Clear and consistent communication by drug regulatory agencies is crucial to building public confidence in vaccination programs[25]; 61% did not share the opinion of leaders or groups who took a stand against vaccination. However, 17% favor positions and 10% of respondents vaccines.

In our data, one-third of respondents said they knew someone who did not plan to get vaccinated for religious or cultural reasons. More than half of those who claimed to be knowledgeable people in this position rejected it. Almost 80% of respondents considered that this attitude, in addition to endangering their health, also puts the health of other people at risk. This attitude is very favorable to the goal of mass vaccination. because if we extrapolate them to the general population, it will represent a significant number of people influencing others against vaccination.

In the analysis by age groups, we have not found significant differences between people over 51 years of age regarding the different items questioned regarding safety, efficacy, or attitudes regarding COVID-19 vaccination. Only older patients reported more frequently (64.7%) that there was a debate about the safety of the adenovirus-mediated AZD1222 vaccine. This difference did not reach statistical significance ($p = 0.054$) due to the small sample size. However, it reflects a tendency to be more aware of the vaccine situation in the older population since they had received vaccination in a higher percentage. Our analysis shows that assessing and reporting on generalizability may be feasible as methods and results are comparable to those of previous studies.

5 | LIMITATIONS

The sample size was smaller than expected and came from a single center. Therefore, our findings may not be generalizable to the population of HIV individuals in Spain. Nonetheless, our results provide useful information on strategies to optimize vaccine uptake among these high-risk populations. Due to the self-administered nature of the survey, we have not been able to conduct an in-depth analysis of some issues such as income level, education, and work, HIV-related attributes, and health.

Some studies have reported that the male gender is a predictor of COVID-19[13] vaccine acceptance. In our series, due to the low proportion of women, we have not been able to perform a gender analysis of the results. No analysis has been conducted between the vaccinated and unvaccinated populations, due to the nonavailability of vaccines at that time. Vaccination was conducted according to age and risk group. Most participants answered the survey before the COVID-19 vaccine became widely available. With the changes in COVID-19 and the continued promotion of vaccination, awareness, and intention to vaccinate may also constantly change. Therefore, the vaccination behavior of HIV-infected individuals should be investigated at different stages of the COVID-19 pandemic.

6 | CONCLUSIONS

The degree of acceptance of the COVID-19 vaccine in our population was extremely high. We have not found factors that are related to the acceptance or rejection of vaccines in our population. Medical personnel are the most credible source of information, far above all other sources. Social networks and opinion leaders have not proven to be significant influencing factors in our population.

AUTHOR CONTRIBUTIONS

Emilia Afonso López Shirley: Conceptualization; data curation; formal analysis; funding acquisition; investigation; methodology; project administration; resources; software; supervision; validation; visualization; writing—original draft; writing—review and editing. **Jover-Diaz Francisco**: Conceptualization; formal analysis; investigation; methodology. **Delgado Sánchez Elisabet**: Data curation; formal analysis; validation; writing—original draft; writing—review and editing. **Gea Velázquez de Castro Teresa**: Conceptualization; data curation; formal analysis; methodology; supervision; validation; writing—original draft; writing—review and editing. **Bernabéu Martínez María**: Data curation; formal analysis; investigation; methodology; supervision; validation; visualization; writing—original draft; writing—review and editing.

CONFLICT OF INTEREST STATEMENT

The authors declare no conflict of interest.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available on request from the corresponding author.

ETHICS STATEMENT

The Research Ethics Committee of the University Hospital of San Juan de Alicante approved the study protocol (Approval number: 21/028). The study has received a favorable opinion through the responsible research evaluation report of the Final Degree Project. The study was conducted by the ethical codes described in the Declaration of Helsinki and all participants provided their written informed consent.

TRANSPARENCY STATEMENT

The lead author Jover-Diaz Francisco affirms that this manuscript is an honest, accurate, and transparent account of the study being reported; that no important aspects of the study have been omitted; and that any discrepancies from the study as planned (and, if relevant, registered) have been explained.

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