

Level and Factors Associated with the Satisfaction of Teaching Staff with the COVID-19 Vaccination Program.

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Research

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Abstract

Background

The impact of COVID-19 triggered an unparalleled effort towards the development of a vaccine given that vaccination is currently the most important strategy available for controlling the pandemic. Achieving high levels of vaccination coverage is key to this approach, and requires knowledge of user satisfaction levels. Thus, the objective of this work was to determine the levels of satisfaction with the COVID-19 vaccination program among vaccinated school workers.

Methods

This was a cross-sectional study which included the staff from educational centres invited for vaccination over 4 days at the Hospital General University Hospital of Alicante. The survey included sociodemographic variables, 13 questions on satisfaction with the vaccination program, and one open question for further suggestions. Satisfaction was calculated globally for each question and specifically by employing Student *t*-tests; the association between each variable and a high level of satisfaction was analysed with Chi-squared tests.

Results

Of 9,869 professionals invited, 9,261 attended the appointment; 5,756 were offered the possibility of participating in this survey and 2,989 (51.9%) accepted. The highest overall scores were assigned to the treatment patients received at the 'registration point' and the care they received from nurses during the vaccination. The aspect for which the lowest levels of satisfaction were registered was for the information received prior to vaccination. Sex and place of work were significantly associated with a high degree of satisfaction.

Conclusions

Understanding people's perception of vaccination programs is essential to implementing improvements and to increase vaccination coverage. The level of satisfaction among school personnel was remarkably high, especially in relation to the treatment and attention they received at different points during the vaccination care circuit.

Background

The disease caused by the SARS-CoV-2 coronavirus (COVID-19) has affected millions of people worldwide. The first cases of atypical pneumonia that turned out to be caused by SARS-CoV-2 were reported in December 2019 in the city of Wuhan in the Hubei province in China. The World Health Organization eventually declared the outbreak a public health emergency of international importance (ESPII) on 30 January 2020 and on 11 March of that same year, COVID-19 was declared a pandemic. Despite all the advances achieved since that time, there are still no specific treatments for the management of the disease.

The severity of COVID-19 and its impact on society led to an unprecedented effort towards the development and subsequent distribution of vaccines against the disease. At the present time, vaccination is probably the most effective strategy to control COVID-19 and prevent it in the future, and therefore represents a fundamental strategy that should be closely monitored and evaluated^{1,2}. Vaccination programmes against SARS-CoV-2 are tools that will help reduce both the number of cases, as well as the number of hospitalisations and deaths associated with the infection. Thus, the hope is that they will help facilitate the restoration of the normal functioning of society, which has suffered huge human costs and economic consequences as a result of the pandemic.

In Spain, the main objective of the vaccination strategy against COVID-19 is to reduce the morbidity and mortality of the disease. In addition, the progress of the programme is being modified as different vaccines are authorised and received, our scientific knowledge is expanding, and the context of the pandemic is changing³. However, despite the obvious impact on human health, the economy, and people's lifestyles, several studies have shown that acceptance of the vaccine to prevent SARS-CoV-2 infection will not be universal. During the H1N1 pandemic, which had a lesser impact than that of COVID-19, the vaccine acceptance rate was also low. The main reasons cited for this were fear of adverse events associated with a new vaccine, distrust of the vaccine and the authorities administering it, and an underestimation of the risk of becoming infected with the H1N1 flu virus.

Therefore, it seems that, despite its strong impact on the functioning of our societies, acceptance of a vaccine to prevent SARS-CoV-2 will also not be automatic⁴. While vaccination is widely recognised by health authorities and the medical community as an effective measure to reduce or eliminate the burden of infectious diseases, its effectiveness also depends on the willingness of individuals to be vaccinated. Moreover, the receptiveness of the population towards vaccines could be negatively affected by their doubts and concerns about their safety and suitability¹.

As we previously noted, despite the enormous efforts and progress made in addressing COVID-19 since the beginning of the pandemic, little attention has been devoted to another important aspect of the crisis: understanding and assessing the perception of the care received by patients who have had the disease. The work published in March 2021 by Meng-San Wu showed the results of a satisfaction survey completed by patients hospitalised for COVID-19 in Liverpool in the United Kingdom. Users gave a high rating to the quality of care received, particularly from medical and nursing staff, with communication being the area for improvement most often recommended by those surveyed^{5,6}.

Limited information is available regarding the perceptions and beliefs of people who have recovered from COVID-19 in relation to the care they received during the healthcare process. Therefore, a better understanding of these attitudes remains crucial because they could contribute to both the design and implementation of future interventions related to COVID-19. Sadly, this fact appears to have been overlooked by the scientific community during the pandemic, because little attention has been paid to these perspectives.

To improve future vaccination strategies and help achieve greater vaccination coverage we must assess the satisfaction perceived by users at different points during the vaccination process. This will allow areas of deficit to be identified and worked upon to promote improvement measures and achieve higher quality care. Despite the fact that many studies have analysed the reasons that determine the decision to get vaccinated, fewer have analysed the perception or satisfaction of users towards the vaccination process itself^{7,8}. Moreover, to the best of our knowledge, no studies have evaluated patient satisfaction with current COVID-19 vaccination programmes.

Given that the perception of users towards the quality of the care process is related to the characteristics of each patient, satisfaction must be assessed not only globally, but also specifically in subpopulations with certain characteristics. In the case of Spain, vaccination against COVID-19 is being carried out in a staggered manner according to priority. The programme started in March 2021 with the vaccination of Group 6 comprising teaching and non-teaching staff working in early childhood, special-needs, primary, and secondary education.

In this study we carried out the first patient satisfaction survey completed by a specific population group (educational centre staff) regarding the COVID-19 vaccination programme. Thus, our objective was to determine the level of satisfaction of these staff with the COVID-19 vaccination programme carried out at the facilities of the General University Hospital of Alicante in Spain.

Methods

We carried out a cross-sectional study of the personnel from educational centres (both teachers and non-teachers) who were (1) assigned to the facilities of the General University Hospital of Alicante for their COVID-19 vaccination by the Ministry of Education; (2) came for their first vaccine dose from 26 March to 1 April 2021; (3) voluntarily and anonymously participated in the satisfaction survey; and (4) provided their informed consent to participation.

The variables included in the survey were vaccination date, age, sex, marital status (single, married or common-law partner, widower, separated, or divorced), education level (no education, primary, secondary, high-school, or special), workplace setting (infant, primary, secondary, high-school, special, or professional training), satisfaction with the care received (based on 13 questions scored on a scale from 0 to 10 where 0 = completely unsatisfied and 10 = maximum satisfaction, as shown in Annex 1). A high level of global satisfaction was considered to be a score of 9 or more points on question 13.

The data were collected using an anonymous and self-completed ad-hoc survey that was available both in paper and electronic format (through a QR code that participants could scan with their mobile device; Annex 1). The first part of the survey collected the sociodemographic variables and the vaccination date and the second part corresponded to patient satisfaction and comprised 13 questions, 12 of which evaluated each of the aspects of the care received by the patient from the time they had been invited for vaccination until the end of the observation time after the vaccination itself.

This whole process included evaluation of aspects related to the information received, signs present at the facilities, waiting times, comfort of the stay, treatment received, and care for their privacy; question 13 evaluated their overall satisfaction with the vaccination process. Each question was scored on an ordinal scale from 0 to 10, where 0 was the worst possible level of satisfaction and 10 was the highest possible satisfaction level. The questionnaire ended with an open-ended question, "What can we do to improve?", to explore other possible areas for improvement. The survey was completed by the patients themselves at the Alicante University General Hospital facilities while they waited in the recovery room immediately after their vaccination.

In our statistical analysis, first we described the demographic characteristics of the included patients. The mean and standard deviation were calculated for quantitative variables and absolute and relative frequencies are provided for qualitative variables. The general overall level of satisfaction was determined for each of the items studied first for all the included patients and then more specifically according to their age, sex, marital status, education level, and workplace groupings using Student *t*-tests to compare the means for independent samples.

Possible factors associated with a high level of global satisfaction (a score of 9 or more on question 13) were also studied. Chi-squared tests were applied to examine the existence of an association between each of the variables and high levels of satisfaction. In addition, to quantify the magnitude of the association, the odds ratio was calculated with its 95% confidence interval. The level of statistical significance was set at $p < 0.05$. We performed all the statistical analyses using SPSS software (version 25.0; IBM Corp., Armonk, NY). Finally, a qualitative assessment of the comments was undertaken for the results of the open-ended question.

Results

A total of 9,869 patients (educational centre staff) were invited for vaccination at the facilities of the General University Hospital of Alicante over 4 vaccination days: 26, 27, and 31 March and 1 April 2021. Of these, 9,261 people attended for vaccination, of which 5,756 were offered the opportunity to participate in this satisfaction survey; 2,989 (51.9%) of those invited to participate finally answered the survey. The mean age and standard deviation of the questionnaire participants was 43.6 ± 11.6 years and 65.9% (1,970/2,989) were women. The remaining characteristics of the included patients (marital status, educational level, and workplace) are shown in Table 1.

Table 1

Characteristics of educational center personnel who completed the satisfaction questionnaire (n=2989)

Age, years; Mean \pm SD	43,6 \pm 11,6
Age	
<45 years	51,0 (1525)
=>45 years	49,0 (1464)
Sex; % (n)	
Man	34,1 (1019)
Woman	65,9 (1970)
Civil Status ; % (n)	
Single	35,9 (1074)
Married	51,4 (1537)
Widower	1,7 (50)
Separate	11,0 (328)
Level of studies; % (n)	
No studies	0,6 (17)
Primary school	9,2 (274)
High School/ Vocational studies	15,5 (462)
University studies	74,8 (2236)
Work place; % (n)	
Infant	16,3 (486)
Primary	30,1 (899)
Secondary	22,6 (677)
High School	6,2 (185)
Special	19,8 (593)
Vocational training	5,0 (149)

The overall level of satisfaction with each of the aspects studied was high and all the questions obtained a mean score higher than 9 points, both globally for all the patients (Figure 1) as well as according to their age, sex, marital status, education level, and workplace groups (Table 2). The aspects that attained the greatest satisfaction levels were the treatment received from the staff at the 'registration point', with a mean score of 9.8 ± 0.7 points, and the care received from the nursing staff during the vaccination, with a mean score of 9.8 ± 0.7 points (Figure 1). The aspect with the lowest degree of satisfaction was the information received prior to the vaccination, with a mean score of 9.1 ± 1.5 points (Figure 1).

Table 2

Level of satisfaction of educational center personnel according to different characteristics of the people vaccinated

	Age			Sex			Civil Status			Level of stud
	<45 (n=1525)	=>45 (n=1464)	p	Man (n=1019)	Woman (n=1970)	p	Married (n=1537)	Others (n=1452)	p	No studies / Primary (n=291)
1. The information received to keep your appointment was complete.	9,4 ± 1,3	9,3 ± 1,3	0,466	9,3 ± 1,3	9,4 ± 1,3	0,073	9,4 ± 1,2	9,3 ± 1,3	0,140	9,2 ± 1,4
2. The signage of the facilities to access the "Registration Point" is adequate.	9,3 ± 1,4	9,4 ± 1,2	0,028	9,2 ± 1,4	9,4 ± 1,3	<0,001	9,4 ± 1,2	9,3 ± 1,4	0,166	9,4 ± 1,2
3. Waiting time at the "Registration Point" is adequate.	9,4 ± 1,5	9,5 ± 1,3	0,406	9,3 ± 1,5	9,5 ± 1,3	<0,001	9,4 ± 1,4	9,4 ± 1,4	0,998	9,5 ± 1,3
4. Was your stay at the "Registration Point" comfortable?	9,5 ± 1,3	9,4 ± 1,3	0,440	9,3 ± 1,5	9,5 ± 1,2	<0,001	9,4 ± 1,4	9,4 ± 1,2	0,340	9,5 ± 1,1
5. How do you rate the treatment received from the staff at the "Registration Point.	9,8 ± 0,7	9,8 ± 0,7	0,313	9,7 ± 0,9	9,8 ± 0,6	<0,001	9,8 ± 0,7	9,8 ± 0,6	0,700	9,7 ± 0,8
6. Waiting time in the "Single Row" is adequate.	9,7 ± 1,0	9,6 ± 1,0	0,120	9,5 ± 1,1	9,7 ± 0,9	<0,001	9,6 ± 0,9	9,6 ± 1,0	0,974	9,6 ± 0,9
7. How do you value the information received prior to the vaccination.	9,1 ± 1,6	9,2 ± 1,4	0,511	9,0 ± 1,6	9,2 ± 1,5	0,027	9,1 ± 1,5	9,1 ± 1,5	0,972	9,2 ± 1,5
8. How do you value the care of your privacy during the vaccination act.	9,4 ± 1,3	9,3 ± 1,4	0,038	9,3 ± 1,4	9,4 ± 1,3	0,007	9,3 ± 1,3	9,4 ± 1,3	0,381	9,4 ± 1,2
9. How do you rate the attention received from the nursing staff during the vaccination.	9,8 ± 0,6	9,8 ± 0,7	0,030	9,8 ± 0,7	9,8 ± 0,6	0,203	9,8 ± 0,7	9,8 ± 0,7	0,594	9,7 ± 0,8
10. Has your stay in the "Recovery Room" been comfortable?	9,6 ± 1,0	9,5 ± 0,9	0,110	9,5 ± 1,0	9,6 ± 0,9	0,002	9,6 ± 0,9	9,6 ± 1,0	0,518	9,6 ± 1,1
11. How do you rate the information received during your stay in the "Recovery Room".	9,3 ± 1,4	9,4 ± 1,3	0,686	9,3 ± 1,4	9,4 ± 1,3	0,016	9,3 ± 1,4	9,4 ± 1,3	0,587	9,5 ± 1,3

12. If you have needed medical attention (only answer in this case), how do you rate the care you received	9,5 ± 1,3	9,6 ± 1,0	0,514	9,5 ± 1,1	9,6 ± 1,3	0,592	9,5 ± 1,2	9,5 ± 1,2	0,842	9,2 ± 1,9
13. Please make an overall assessment of the vaccination process.	9,6 ± 0,9	9,5 ± 0,9	0,589	9,5 ± 1,0	9,6 ± 0,8	<0,001	9,6 ± 0,9	9,6 ± 0,9	0,894	9,7 ± 0,8

The patient sex and their workplace were significantly associated with a high degree of satisfaction (Table 3). The last (open-ended) question on the questionnaire obtained an 18.8% (561/2,989) response rate. Of all the responses obtained, 65.1% (365/561) corresponded to positive comments and 34.9% (196/561) of the responses suggested aspects for improvement. Among these, the ideas cited more than twice referred to the following factors: (1) a lack of privacy, the presence of a lot of people, and high levels of noise in the recovery room or registration point ($n = 9$) with phrases such as: "more privacy and fewer people in the recovery room" and "there was a little too much noise in the post-vaccination room, if someone is unwell, it may make them feel worse"; (2) the lack of information received during the vaccination process ($n = 48$): "The only thing missing for me was the availability of more information", "there was a lack of information about the post-vaccination advice", and "offer more information prior to the vaccination"; (3) signposting and indication of the registration point ($n = 20$): "You don't realise its the registration point" and "notify in advance that you have to go to the registration beforehand"; (4) environmental conditions ($n = 18$): "Very hot in the recovery room", "Too much ambient noise from people talking", and "More silence"; and (5) waiting times ($n = 14$): "The waiting time spent in the street should improve" and "The waiting time at the registration point was very long".

Table 3
Factors associated with High Level of Satisfaction (score 9-10).

	High Level n (%)	OR (IC 95%)	p	OR adjusted (IC 95%)	p
Age					
<45 years	1363/1525 (89,4)	1,03 (0,81-1,3)	0,834	-	-
=>45 years	1305/1464 (89,1)	1			
Sex					
Man	884/1019 (86,8)	0,68 (0,54-0,86)	0,001	0,75 (0,59-0,95)	0,019
Woman	1784/1970 (90,6)	1		1	
Civil Status					
Married	1372/1537 (89,3)	1,00 (0,79-1,26)	0,994	-	-
Others	1296/1452 (89,3)	1			
Level of studies					
No studies / Primary	267/291 (91,8)	1,38 (0,89-2,13)	0,148	-	-
High School / University	2401/2698 (89,0)	1			
Work Place					
Infant / Primary	1263/1385 (91,9)	1,79 (1,36-2,35)	<0,001	1,68 (1,27-2,23)	<0,001
Vocational training	132/149 (88,6)	1,22 (0,71-2,10)	0,473	1,32 (0,76-2,27)	0,324
Special	518/593 (87,4)	1,09 (0,80-1,48)	0,608	1,07 (0,79-1,47)	0,655
Secondary / High School	745/862 (86,4)	1		1	

Odds Ratio adjusted for Sex and Work Location

Discussion

Patient satisfaction is the result of assessments given by users, considering their own appreciations, expectations, and perceptions of the work of health professionals and the elements involved in the healthcare process. The measurement of satisfaction is essential to improve quality of care. However, despite its importance in detecting areas for improvement, the assessment of satisfaction during the COVID-19 pandemic was neglected by most healthcare providers. Vaccination against SARS-CoV-2 represents a vital turning point in the control of the pandemic. Therefore, measuring the levels user satisfaction with the vaccination programme is a decisive element in evaluating the vaccination circuit design and will allow us to try to improve upon any areas of deficit that may be identified.

In our work, the level of satisfaction with the COVID-19 vaccination programme among educational centre staff was remarkably high, both globally and during each of the phases of the vaccination process. However, despite the high level of satisfaction, potential areas for improvement were also detected. Among these, the following were identified as areas whose redress should be prioritised by improving (1) the information offered prior to the vaccination; (2) privacy during the vaccination; (3) the information provided before attending the facilities for vaccination. Of note, all of these areas coincide with the results of previous studies evaluating other vaccination strategies⁹⁻¹². It is essential to continue periodically evaluating satisfaction with the COVID-19 vaccination programme, both in this and other subgroups of the population. Our aim should be to detect new opportunities for improvement and to increase the quality of the services offered, which will help us to attain the benefits derived from achieving maximum vaccination coverage¹³.

To the best of our knowledge, no work published to date has assessed patient satisfaction with a COVID-19 vaccination programme¹⁴. Another strength of this work was the good survey response rate, with approximately 60% of the population participating. In addition, recall bias was minimal or non-existent because the survey was carried out immediately after the vaccination. Thus, the questionnaire results likely reflected the true impression of the patient's impressions, as soon after the end of the experience as possible. It is possible that the high level of satisfaction achieved with the vaccination programme was determined less by organisational issues related to the programme, and more by the fact that patients who wanted to be vaccinated for COVID-19 had received the vaccine.

Limitations

The survey could not be provided to patients on the first day of vaccination because it was still being put together that same day. Thus, not all the patients who came for vaccination during the study period were able to participate in this work. This could have led to a non-participation bias related to a possible difference in satisfaction between the participating and non-participating patients not measured in this study. Moreover, the survey we used has not yet been validated, which could limit the validity of our study findings. However, it is worth noting that the Department of Preventive Medicine, who was responsible for carrying out this work, does have previous experience in this field¹³. In addition, the subpopulation we studied has its own characteristics and therefore, was not representative of the entire population. Finally, it is possible that the high level of satisfaction achieved with the vaccination programme was not determined exclusively by the organisation of the vaccination circuit but was also influenced by the very fact that patients had received a vaccine they desired, given the context of the COVID-19 pandemic.

Conclusions

Knowing the perception of vaccines and vaccination programmes among the population is essential for the implementation or improvement of vaccination health programmes. In turn, these help to improve vaccination coverage, leading to both individual and collective benefits. The staff at educational centres who participated in this current study were very satisfied with the COVID-19 vaccination programme carried out at the facilities of the General University Hospital of Alicante. The aspects of the programme they were most satisfied with were related to the treatment and care received by the staff at the different assistance points. Their satisfaction with the information they had received prior to vaccination was lower. A qualitative assessment of their suggestions showed that the factors users perceived as being improvable were the lack of privacy, number of people present, high levels of noise in the recovery room, and the lack of information received during the vaccination process.

Abbreviations

Covid-19: Coronavirus disease of 2019.

Declarations

Ethics approval and consent to participate:

The principles of the Declaration of Helsinki were respected in this research. Informed consent was not required because no patient interventions were carried out. The data were treated anonymously through the hospital's Healthcare-Associated Infection Epidemiological Surveillance System, thereby guaranteeing coherence with the guidelines on privacy and data protection.

Consent for publication:

Not applicable

Availability of data and materials:

The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

Competing of interest:

The authors declare that they have no competing interests.

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Authors' contributions:

NAS, PCS, PGV and JSP designed the study. All the authors collected all data material, NAS, PCS, PGV, JSP and EMRP drafted the manuscript, and all the authors revised the manuscript for intellectual content. PCS and PGV contributed to the analysis and interpretation of data. NAS, JSP and EMRP contributed with critical reviews of the work. All authors read, commented on and approved the final manuscript.

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Figures

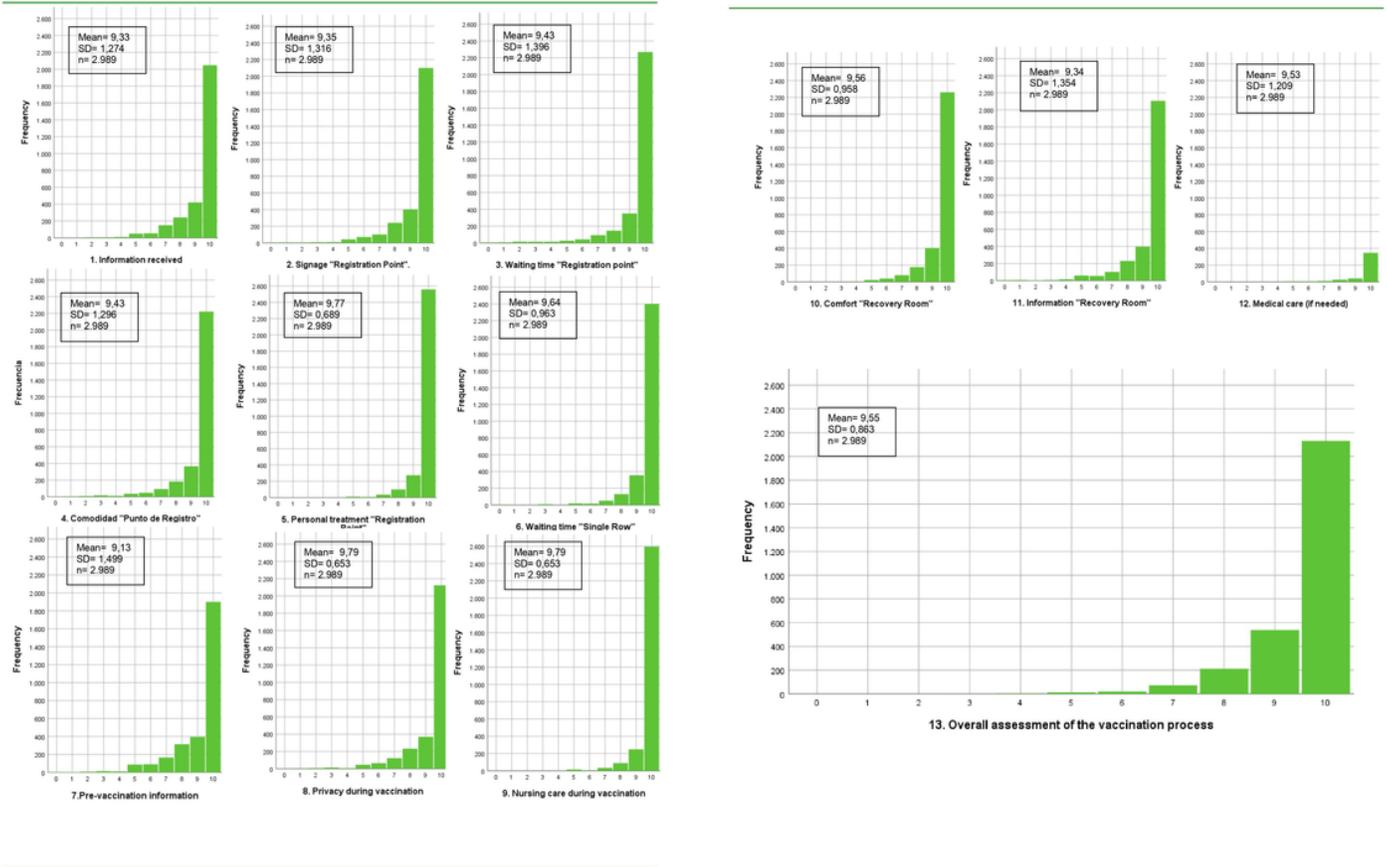


Figure 1

Overall level of satisfaction with each of the aspects surveyed

Supplementary Files

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