






# Prenatal care using a mixed approach during the COVID-19 pandemic: patients' satisfaction study in a tertiary hospital in Peru


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## Abstract

*Objectives: to evaluate patients' satisfaction of mixed prenatal care during the COVID-19 pandemic in a tertiary hospital in Lima, Peru.*

*Methods: we conducted a cross-sectional evaluation of satisfaction in patients receiving mixed prenatal care that includes in-person and virtual visits. All women who gave a written consent between June and July 2021 were included. The survey was based on the Short Assessment of Patient Satisfaction (SAPS) scale which evaluated seven dimensions of satisfaction: access and facilities, effectiveness, information, technical skills, participation, relationship, and general satisfaction.*

*Results: the overall satisfaction on mixed prenatal care was  $3.28 \pm 0.71$ . The mean SAPS score was 33.88 (SD = 5.56). In total, 144 patients (65%) preferred the mixed prenatal care. The mean maternal age of 221 included pregnant women was 30 years and the mean gestational age at the first appointment was 24 weeks. Overall, 88.2% of patients had up to 6 visits among virtual and in-person. Patients with non-health insurance had lower rates of satisfaction when compared with pregnant women with national health insurance ( $p=0.026$ ).*

*Conclusions: women receiving the mixed prenatal care during the COVID-19 pandemic reported a high level of satisfaction. In general, pregnant women would recommend mixed prenatal care.*

**Key words** Prenatal care, Patient satisfaction, Telemedicine, COVID-19 pandemic



## Introduction

Prenatal care is an important public health intervention and one of the most common preventive healthcare worldwide.<sup>1</sup> The traditional model involves evaluating patients every 4 weeks until the 28<sup>th</sup> week, then every 2 weeks until the 36<sup>th</sup> week, and then weekly until delivery. Thus, pregnant women should have at least 14 in-person visits in a routine schedule.<sup>1-3</sup> At the beginning of the COVID-19 pandemic, every outpatient clinic in our country was shut down and healthcare was offered exclusively in the health centers emergency departments.<sup>4</sup> This situation forced the healthcare institutions to implement different approaches to prenatal care to ensure access to prenatal services with less risk of exposure and spread of COVID-19,<sup>5-8</sup> minimizing the occurrence of adverse maternal and perinatal outcomes.<sup>9</sup>

Telemedicine was incorporated into the new model, and virtual visits provided guidance on pregnancy and psychosocial support endorsed by international institutions and experiences.<sup>6,10</sup> The new mixed prenatal care model includes in-person visits scheduled around specific evidence-based services that could only be delivered in-person, such as ultrasounds and laboratory analysis, depending on the assessment of risk factors.<sup>4,5,10-14</sup> While some studies support the safety of reducing the frequency of prenatal visits,<sup>7,15</sup> evidence on satisfaction in pregnant women receiving the mixed prenatal care model during the COVID-19 pandemic has not been found. Thus, this pandemic provides the opportunity to evaluate the new healthcare approach to modify and improve the quality and efficiency of pregnancy healthcare services, from the patients' perspective for inclusion in monitoring care and legitimizing the health policy.<sup>16,17</sup>

The aim of this study is to evaluate the patients' satisfaction of the new mixed prenatal care, which our institution implemented during the COVID-19 pandemic in Peru.

## Methods

We conducted a cross-sectional evaluation of satisfaction among patients receiving the new mixed prenatal care.<sup>8</sup> The *Instituto Nacional Materno Perinatal* is the largest public, academic and referral center in Lima-Peru for perinatal care. It is fully dedicated in providing health care to women, particularly for high-risk pregnant women and their newborns, and houses approximately 16,000 deliveries per year. The new model was implemented in August 2020, in agreement with published national and international guidelines<sup>5,18-20</sup> (Figure 1).

All women receiving prenatal care at our institution at any gestational age, with at least one virtual and one in-person visit and who gave a written consent to participate

in the survey were included in the study. Instruments with incomplete information were excluded. We conducted the survey from June to July 2021.

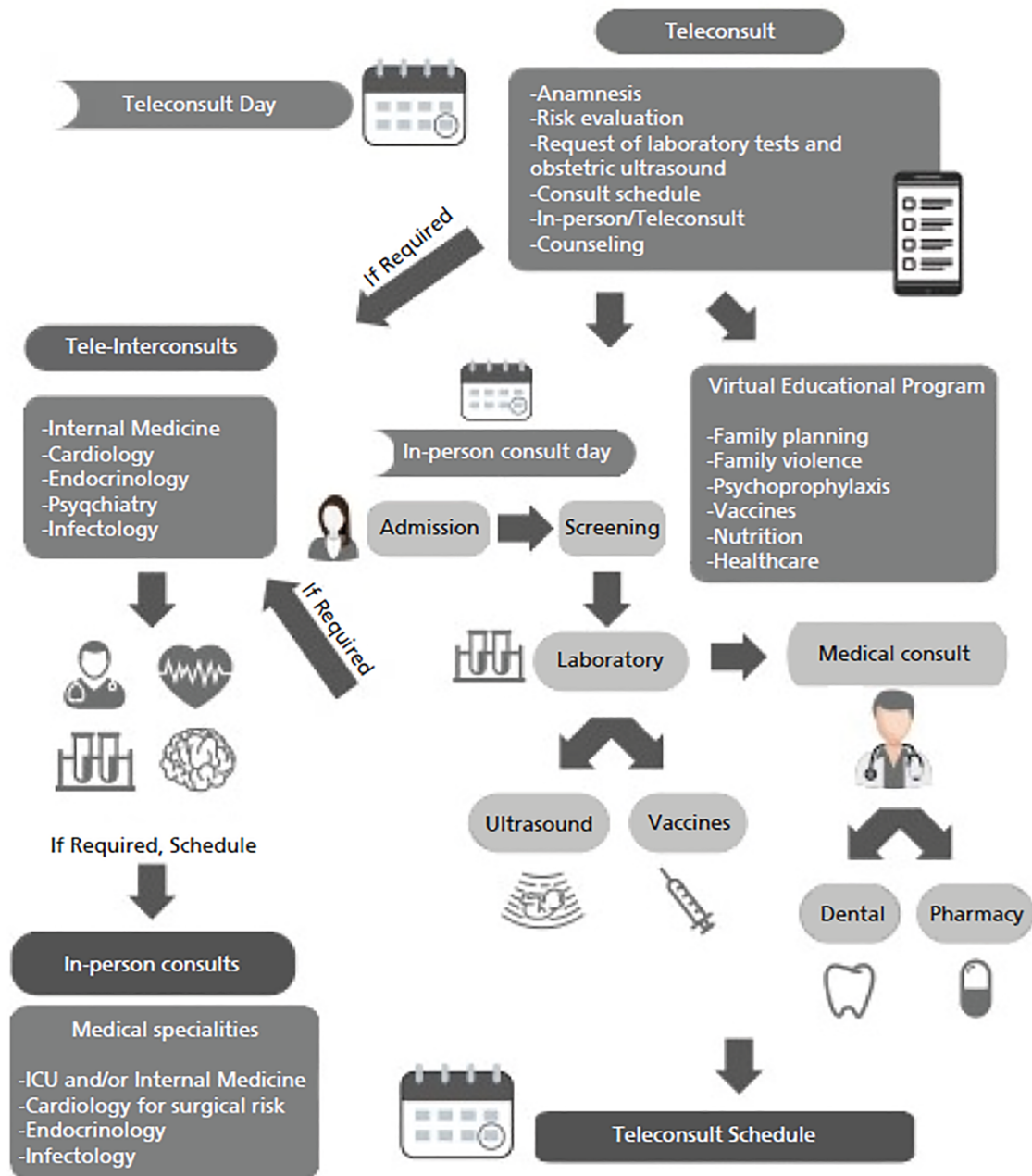
The satisfaction survey was conducted at the end of the in-person medical consult. It was a short, paper-and-pencil based survey in a comprehensive language. It was based on an instrument used previously in satisfaction with health care treatment by Hawthorne *et al.*<sup>16</sup> and was validated in focus groups with patients to improve vocabulary and understanding of the questions. The survey was divided into two sections: the first section includes questions about epidemiological characteristics. The second section includes 11 questions that were measured on a 5-point Likert scale, which varies for each question from "strongly disagree" to "strongly agree" (0 to 4) and one open question about suggestions to improve the mixed prenatal care. Based on the Short Assessment of Patient Satisfaction (SAPS) scale,<sup>16</sup> our survey evaluated seven dimensions of satisfaction: i) *access and facilities* (3 questions), ii) *effectiveness* (1 question), iii) *information* (1 question), iv) *technical skills* (2 questions), v) *participation* (1 question), vi) *relationship* (2 questions), and vii) *general satisfaction* (1 question). We added four questions to the original SAPS scale in order to evaluate the two components of mixed prenatal care: virtual and in-person visits. (Supplemental 1) Therefore, the range of total score was 0–44, where higher scores represent higher levels of patients' satisfaction. We added two questions about prenatal care-type preferences and whether the patient would recommend a new care model. Risk factors and additional information about pregnancy characteristics were obtained directly from the patients and electronic records.

We performed a descriptive analysis, and the distribution of absolute and relative frequencies of categorical variables was calculated. For numerical variables, summary measures were applied as averages and ranges. All the information from paper surveys were transferred into MS Excel 2013. The satisfaction was evaluated by summing the answers of all participants for each point on the Likert scale and represented as mean and standard deviation. In the bivariate analysis, the Mann–Whitney U-test for continuous data that are not normally distributed was used to analyze the SAPS score for the questions on the level of satisfaction and the characteristics of the obstetric population. A relevant significance level less than 0.05 was used. Statistical analysis was performed using the Stata Statistical Software 14.0 (Stata Corp. 2015, College Station, TX, USA).

This study was part of a larger institutional study on COVID-19 (reference number: 063-2020-DG-N°20-OEAIDE/INMP), which was approved by the local Ethical

Figure 1

Mixed prenatal care flow chart.

Adapted from Meza-Santibañez et al.<sup>8</sup>

Institutional Board (reference number: 027-2021-CIEI/INMP) on May 31, 2021.

## Results

Table 1 shows the characteristics of 221 pregnant women receiving mixed prenatal care who met the inclusion criteria and agreed to participate in the study. The mean maternal age was  $30 \pm 6.9$  years. The mean gestational age at the first appointment was  $24 \pm 8.9$  weeks. The distribution according to trimester was as follows: 15

(6.8%) during the first trimester, 64 (29.0%) during the second trimester, and 142 (64.2%) during the third trimester. The average duration of mixed prenatal care was 4.8 weeks; 189 patients (85.5%) had between 1 and 3 virtual visits and 207 patients (93.7%) had between 1 and 3 in-person visits. Overall, 88.2% of patients had up to 6 visits among virtual and in-person. The most common maternal risk factor was previous cesarean sections, that was present in 84 out of 221 patients (38.0%).

Table 2 shows the seven dimensions of satisfaction on mixed prenatal care. Pregnant women were satisfied

Table 1

Maternal and demographic characteristics of the population in the <i>Instituto Nacional Materno Perinatal</i> . Lima, Peru, 2021 (n=221).		
Characteristics	n	%
Maternal age in years, range	30.0 (14 - 48)	
Human Development Index		
Stratum I	7	3.2
Stratum II	99	44.8
Stratum III	94	42.5
Stratum IV	19	8.6
Not Reported	2	0.9
Insurance Modality		
National health Insurance	177	80
Non-health insurance	44	19.9
Nulliparous	63	28.5
Gestational age at first appointment in weeks, range	24.0 (5 - 38)	
Number of virtual visits per patient		
1 - 3	189	85.5
4 - 6	29	13.1
≥ 6	3	1.4
Number of in-person visits per patient		
1 to 3 visits	207	93.7
4 to 6 visits	11	5.0
≥ 6 visits	3	1.3
Maternal risk factors		
Previous cesarean section	84	38.0
Previous fetal death	64	29.0
Obesity (BMI≥30)	60	27.1
Fetus with structural abnormalities	35	15.8
Overweight	34	15.4
History of hypertension/preeclampsia	15	6.8
Multiple pregnancy	11	5.0
Diabetes	11	5.0
Anemia	11	5.0
IUGR	10	4.5
Mother Rh negative	9	4.1
Asthma	5	2.3
Mother with HIV infection	4	1.8
Hypothyroidism	3	1.4
In vitro fertilization	2	0.9
Depression	2	0.9

BMI= body mass index; IUGR= intrauterine growth restriction; HIV= human immunodeficiency virus.

with the *access and facilities, effectiveness, information, technical skills, participation and relationship*. The overall satisfaction on mixed prenatal care was  $3.28 \pm 0.71$ . The distribution of SAPS scores is presented in Figure 2. The study found that no pregnant women was dissatisfied (no patient with a score less than 16). The mean SAPS score was 33.88% (SD = 5.56), which was at the 75<sup>th</sup> percentile

of the possible score range. Seven patients (3.2%) obtained the ceiling score.

Only the characteristics related to insurance modality had a statistically significant difference with lower rates of satisfaction from those with non-health insurance when compared with pregnant women with national health insurance ( $p=0.026$ ) (Table 3). Though statistically

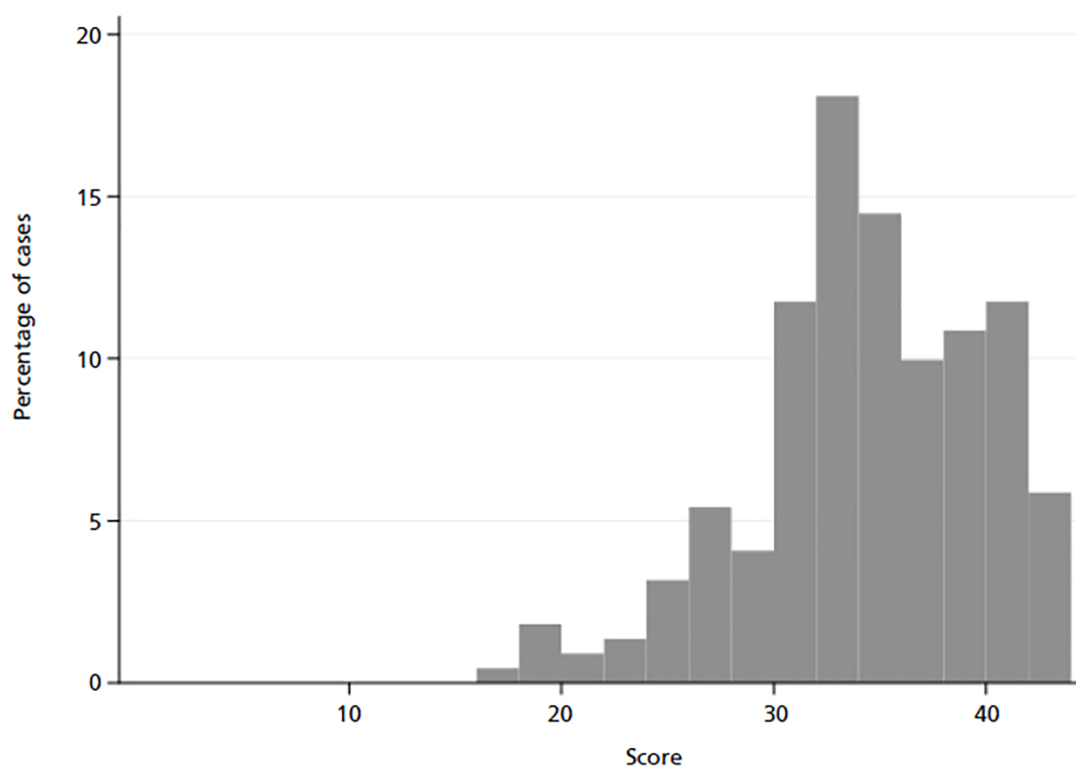
Table 2

Question in the survey	Mean (SD)
Patient agreement with questions regarding satisfaction on mixed prenatal care in pregnant women in the <i>Instituto Nacional Materno Perinatal</i> , Lima, Peru, 2021 (n = 221).	
<b>Access and facilities</b>	
It was easy to get the access to mixed prenatal care (in-person consultation and phone monitoring) given by the <i>Instituto Nacional Materno Perinatal</i>	3.17 (0.87)
How satisfied are you with the time you spent with your OB/GYN doctor during the in-person consultation?	2.38 (0.85)
How satisfied are you with the time you spent with your OB/GYN doctor during phone monitoring?	2.34 (0.90)
<b>Effectiveness</b>	
Do you consider the mixed prenatal care helpful in taking care of your pregnancy?	3.37 (0.72)
<b>Information</b>	
How satisfied are you with the explanations given by the doctors about your state and care given during your pregnancy?	3.26 (0.72)
<b>Technical skills</b>	
During phone monitoring, was the OB/GYN doctor very careful in evaluating your medical history?	3.29 (0.74)
During the in-person consultation, was the OB/GYN doctor very careful in evaluating your medical history and performing the physical examination?	3.13 (0.82)
<b>Participation</b>	
Do you feel that you participated in the decisions that affected your pregnancy and future labor and delivery (type of delivery and post-partum contraceptive methods)?	2.94 (0.79)
<b>Relationship</b>	
During phone monitoring, did you feel the time spent by the OB/GYN doctor in listening to you and addressing your questions and worries was sufficient?	3.37 (0.87)
During the in-person consultation, how much time did you feel the OB/GYN doctor spent in listening to you and addressing your questions and worries?	3.37 (0.86)
<b>General satisfaction</b>	
Are you satisfied with the mixed prenatal care given by the <i>Instituto Nacional Materno Perinatal</i>	3.28 (0.71)

OB/GYN=obstetrician and gynecology; SD=standard deviation.

Figure 2

Distribution of SAPS scores on mixed prenatal care in pregnant women in the *Instituto Nacional Materno Perinatal*, Lima, Peru, 2021 (n = 221).



SAPS= short assessment of patient satisfaction.

**Table 3**

SAPS score on mixed prenatal care according to the characteristics of the obstetric population in the *Instituto Nacional Materno Perinatal*, Lima, Peru, 2021.

Characteristic	Median SAPS score	Z score	p <sup>a</sup>
Human Development Index			
Stratum III-IV	33 (30. 37)		
Stratum I-II	35 (31. 38)	-1.287	0.198
Insurance Modality			
Non-health insurance	32 (29. 36)		
National health Insurance	35 (31. 38)	-2.217	0.026
Parity			
Nulliparous	34 (31. 38)		
Multiparous	34 (31. 38)	0.297	0.767
Trimester at first appointment			
First and second	34 (31. 39)		
Third	33 (31. 37)	0.599	0.549
Prior cesarean section			
No	34 (31. 38)		
Yes	34 (31. 38)	0.314	0.753

SAPS= short assessment of patient satisfaction; ap-Values calculated using Mann-Whitney U-test for continuous data that are not normally distributed, to compare medians (interquartile range) with  $p < 0.05$  to be considered statistically significant.

significant, none of these categories were found to be clinically significant since the median for both was in the SAPS score range of being satisfied.

In total, 144 patients (65%) preferred the mixed prenatal care and 71 (32%) were in favor of in-person visits. In addition, 198 (89.5%) would recommend mixed prenatal care to their family and friends.

## Discussion

This study evaluates satisfaction in patients receiving the mixed model of prenatal care that consists of in-person visits combined with telephone consultation during the COVID-19 pandemic. The assessment of satisfaction was mostly positive with an overall satisfaction of  $3.28 \pm 0.71$ .

Some new models of prenatal care implemented with telemedicine have reported positive maternal and fetal outcomes.<sup>15,21-24</sup> However, there is a need to determine the time and frequency of visits and assess the prenatal care that could be given entirely through phone calls.<sup>10</sup> Furthermore, alternative visit schedules and telemonitoring could be integrated into the healthcare system without compromising the patients' outcomes or satisfaction.<sup>21</sup> Thus, exploring patient satisfaction is crucial before further implementing any mixed prenatal care.

Research in nonpregnant population, conducted prior to the COVID-19 pandemic, has shown that telemedicine is effective in providing patient care, improving access, and reducing costs, but high-quality evidence is lacking.<sup>25</sup> For the general population, advantages of telemedicine included reducing waiting time, ease of scheduling,

and increased feeling of connections with healthcare providers; however, lack of training with technology, lack of privacy at home, and connectivity issues are reported as disadvantages.<sup>26</sup>

Regarding the pregnant women population, Balk *et al.*<sup>27</sup> on a systematic review with low-strength evidence could not report differences in rates of preterm births or neonatal intensive care unit admissions between patients who had mixed care or traditional antenatal care. However, they did suggest high satisfaction with antenatal care in patients having mixed care.<sup>27</sup> With this evidence that provided no sign of harm of nontraditional antenatal care (fewer scheduled visits and use of telemonitoring), it was observed that maternal health units, healthcare providers, and patients had greater comfort in following alternative care models.<sup>27</sup> Previously, we reported feasibility and acceptability among healthcare providers on mixed prenatal care<sup>9</sup> and highly accepted introduction of a novel mobile app as a tool of a mixed model of prenatal care by the patients.<sup>28</sup>

Here, we considered seven domains of patients' satisfaction, of which five had the highest points with an overall satisfaction on mixed prenatal care in the 75<sup>th</sup> percentile of the possible score range. Women who prefer traditional care rather than mixed care are highly motivated by a desire to interact face to face with the healthcare provider at every opportunity and not to have all consultations by phone. Thus, Pflugeisen *et al.*<sup>23</sup> suggested that we must uphold a choice-based model for patients. Further work is needed to better understand the motivating factors for the selection of virtual and traditional care paradigms. In fact, some patients may prefer fewer visit

and mixed visit options, thereby reducing the cost of frequent visits. However, with increased evidence on the alternative models causing no harm, it is likely that many patients and healthcare providers would choose the mixed prenatal care.

We attempted to assess the heterogeneity of patients' satisfaction by evaluating the subgroups. There were lower rates of satisfaction in patients with non-health insurance. However, we did not analyze how mixed visit structures may adversely affect pregnant women due to factors such as internet access, type of pathologies in pregnancy, and other social determinants of health since socioeconomically or medically disadvantaged patients may face difficulty in having successful virtual consultations.<sup>29</sup>

The main strength of our study is that this is the first report on patients' satisfaction in pregnant woman receiving the mixed prenatal care during the COVID-19 pandemic in our region. Some limitations are as follows: first, the instrument used (SAPS scale) has not been evaluated for its psychometric properties and its adaptation to Spanish, however, although SAPS scale needs further validation in another context, Howthorne *et al.*<sup>16</sup> report that it is based on a firm theoretical model of patients' satisfaction and may be used in a wide range of settings. Second, our population is heterogeneous with regard to the number of in-person and virtual visits, which potentially could influence the experience on mixed perinatal care; third, most patients had the first appointment during the third trimester of pregnancy; and fourth, there was no comparison between patients' satisfaction on traditional prenatal care and mixed prenatal care.

In conclusion, women receiving the mixed prenatal care during the COVID-19 pandemic reported a high level of satisfaction. The lowest rates of satisfaction were reported in patients with non-health insurance. Overall pregnant women would recommend mixed prenatal care.

### Authors' contribution

Novoa RH and Ventura W: conceived of the study, planned the methodology and contributed to manuscript writing. Huang-Yang X, Gayoso-Liviac A: conceived of the study, planned the methodology and contributed to data collection and application of surveys. Meza-Santibañez L: contributed to manuscript writing. Bazo-Alvarez JC: conceived of the study and planned the methodology. Torres-Osorio J and Rodríguez-Hilario N: contributed to data collection and application of surveys. All authors contributed to relevant critical review of the intellectual content, have approved the final version of the article and declare no conflict of interest.

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