

2021

## Factors associated with the level of knowledge of COVID-19 preventive measures in pregnant and puerpal women in two peruvian communities

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### Recommended Citation

Paucar Osorio, Fatima; Rodriguez-Lecaros, Estefani; Montalvo Molero, Selene; Tapahuasco Arones, Alfredo; Salazar Cruz, Janny; Kamiyama Arakawa, Ricardo; and Quiñones Laveriano, Dante (2021) "Factors associated with the level of knowledge of COVID-19 preventive measures in pregnant and puerpal women in two peruvian communities," *Revista de la Facultad de Medicina Humana*: Vol. 21 : Iss. 1 , Article 16.

Available at: <http://inicib.urp.edu.pe/rfmh/vol21/iss1/16>

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This article is available in Revista de la Facultad de Medicina Humana: <http://inicib.urp.edu.pe/rfmh/vol21/iss1/16>



# FACTORS ASSOCIATED WITH THE LEVEL OF KNOWLEDGE OF COVID-19 PREVENTIVE MEASURES IN PREGNANT AND PUERPERAL WOMEN IN TWO PERUVIAN COMMUNITIES

FACTORES ASOCIADOS AL NIVEL DE CONOCIMIENTO DE LAS MEDIDAS PREVENTIVAS DE COVID-19 EN GESTANTES Y PUÉRPERAS DE DOS COMUNIDADES PERUANAS

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## ABSTRACT

The factors associated with the level of knowledge of the preventive measures of COVID-19 in pregnant and postpartum women from two Peruvian communities were determined. Quantitative, prospective, cross-sectional and analytical study. They worked with the entire population. The level of knowledge was measured through a previously validated instrument. Bivariate and multivariate analysis was performed, using linear regression with a 95% confidence interval. The results indicate that the majority (64.7%) considered the use of rubber gloves as a preventive measure, while 33.8% considered the use of homemade masks incorrect and considered that domestic animals transmitted COVID-19. In the multivariate analysis, the level of knowledge was associated with having received information from their health center. There is a good level of knowledge about COVID-19 prevention in pregnant and postpartum women from two Peruvian communities, and that the main associated factor is having received information from their Health Center.

**Key words:** Coronavirus infections; Disease prevention; Prevention and control; Pregnancy (source: MeSH NLM).

## RESUMEN

Se determinaron los factores asociados al nivel de conocimiento de las medidas preventivas de COVID-19 en gestantes y puérperas de dos comunidades peruanas. Estudio cuantitativo, prospectivo, transversal y analítico. Se trabajó con toda la población. El nivel de conocimiento se midió a través de un instrumento validado previamente. Se realizó análisis bivariado y multivariado, usando regresión lineal con un intervalo de confianza al 95%. Los resultados indican que la mayoría (64,7%) consideró como medida preventiva el uso de guantes de goma, mientras que el 33,8% consideró incorrecto el uso de mascarillas caseras y consideraba que los animales domésticos transmitían el COVID-19. En el análisis multivariado, el nivel de conocimiento se asoció a haber recibido información por su centro de salud. Existe un buen nivel de conocimientos sobre prevención de COVID-19 en gestantes y puérperas de dos comunidades peruanas, y que el principal factor asociado es haber recibido información por parte de su Centro de Salud.

**Palabras clave:** COVID-19; Medidas preventivas; Prevención; Gestación (fuente: DeCS BIREME).

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**Cite as:** Fatima Paucar-Osorio, Estefani Ireci Rodriguez-Lecaros, Selene Montalvo-Molero, Alfredo Tapahuasco-Arones, Janny Salazar-Cruz, Ricardo Kamiyama-Arakawa, Dante M. Quiñones-Laveriano. Factors associated with the level of knowledge of covid-19 preventive measures in pregnant and puerperal women in two peruvian communities. Rev. Fac. Med. Hum. January 2021; 21(1):0-0. DOI 10.25176/RFMH.v21i1.3600

Journal home page: <http://revistas.urp.edu.pe/index.php/RFMH>

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## INTRODUCTION

At the end of December 2019, a new disease of unknown etiology appeared in Wuhan, China. It was rapidly identified as a new betacoronavirus and it was related to SARS-CoV, among other coronaviruses similar to SARS transmitted by bats. This new coronavirus species caused a great amount of cases and diseases in China and an increasing amount out of it<sup>(1)</sup>.

There is still no scientific evidence that shall permit a specific treatment against this infection. Thus, in this situation the use of preventive measures is compulsory in order to avoid the propagation of the disease. At the present time, preventive measures recommended by the World Health Organization (WHO) include different aspects, from frequent hand washing, avoid agglomerations, to cover the mouth and nose with masks, social distancing, avoid to travel to affected cities and areas, and the isolation of people at the moment they start to present symptoms associated to COVID-19<sup>(2)</sup>.

The current pandemic due to COVID-19 has generated various health facilities to collapse, this led to prioritizing health care in cases of urgency and emergency. Among the services provided are maternity services, decreasing the provision of services and threatening the well-being of the pregnant women. Pregnancy may compromise the immune system and increase the risk infection for COVID-19. Likewise, the presence of ACE2 receptors in the placenta may increase the risk of vertical transmission of the virus from mother to the child<sup>(3)</sup>.

In a pandemic situation, prevention is one of the pillars to fight against it<sup>(4)</sup>. Therefore, our objective is to determine associated factors with the level of knowledge of preventive measures of COVID-19 in pregnant women and puerperals of two Peruvian communities.

## THE STUDY

Quantitative, prospective, transversal and analytical study. The population in this study consisted of pregnant women and puerperals in two Peruvian health centers, one of them located at a marginal urban area in Chorrillos, Lima, called Centro de Salud Delicias de Villa, and the other one in a rural zone of the province of Utcubamba, Amazonas, called San Juan de la Libertad. A sample size was not calculated since we worked with every pregnant woman and puerperal of the corresponding health center census.

The information was collected through survey techniques in pregnant women and puerperals that were performing their controls, due to the pandemic context and the healthcare situation in medical centers of first level. The data collection and questionnaire filling through telephone and it was realized during September and October, 2020. The main variable was the level of knowledge about preventive measures against COVID-19. Research study consisted of a survey that measured the knowledge of preventive measures against COVID-19 and included 16 questions of general knowledge about prevention. Each question had a Yes, No and I have no idea answers. Maximum score was 32 and the minimum score was 0.

The validation of the instrument of investigation consisted, in the first instance, of a judgement between four experts, three doctors and a Licensed in Obstetrics with speciality in health promotion and prevention. All of them have more than five years of experience in health primary attention. Later, a pilot test was performed in 51 pregnant women, from which Crombach's alpha was calculated, aiming to obtain data in order to measure the reliability of the instrument through estimation of intern consistency, obtaining a coefficient of 0.62. Other variables such as age, district, gestation weeks, prenatal control number, occupation, number of children, civil status, degree of instruction were also obtained via telephone.

Excel program was used in order to enter data of telephone surveys. The statistical analysis was performed using the statistical program Stata 14.0. Quantitative variables were described through central and dispersion trend measures. The bivariate analysis was performed from the Mann-Whitney U test or Spearman correlation, as appropriate, given the unusual distribution of the quantitative dependent variables, it was considered an statistically significant value if it was less than 0.05. To multivariate analysis, linear regression was used to obtain the regression coefficients and its respective 95% confidence intervals.

This research was evaluated by the ethics committee of Universidad Ricardo Palma, and after being approved, proceeded the data collection through via recorded telephone, where the reading of informed consent was emphasized, and it was mentioned that the person is able to terminate the survey at the moment she considers it pertinent without any repercussions of any nature in its prenatal controls.

Thus also no economic compensation was contemplated. The application of informed consent was recorded with the knowledge of the respondent. After the telephonic survey, it was performed a little informative talk about the preventive measures for COVID-19 in every pregnant woman and puerperalis which were attended.

## FINDINGS

In Table 1, it is observed that the majority of participants are housewives (74.6%) and single

(54.4%). Thus also, the most frequent education level was Secondary (63.2%), as well as other characteristics.

In Table 2 it was founded that questions 4 and 10 obtained the greatest number of correct answers. On the other hand, question number 8 obtained the greatest number of incorrect answers.

In Table 3 it is observed that the majority of participants who received information saw it through

**Table 1.** General characteristics of pregnant women and puerperalis of two Peruvian communities.

	Frequency	Percentage
Age (years)*	26,5	23-32,5
<b>Nationality</b>		
Peruvian	53	77,9%
Venezuelan	15	22,1%
<b>Occupation</b>		
Housewife	51	74,6%
Merchant	6	8,9%
Employee	5	7,6%
Others	6	8,9%
<b>Civil status</b>		
Single	37	54,4%
Cohabitant	26	38,2%
Married	5	7,4%
<b>Education level</b>		
Primary	8	11,8%
Secondary	43	63,2%
Superior	17	25%
<b>Condition</b>		
Puerperal	11	20%
Pregnant	44	80%
Gestational age (weeks)*	28	22-36
Prenatal control number*	4	2-5,5
Number of children*	1	1-2

\*Median and interquartile range



**Table 2.** Answers of test questions and information sources in pregnant women and puerperalis of two Peruvian communities.

	Correct	Does not know	Incorrect
<b>Q1:</b> Is a preventive measure against COVID-19 contagion to avoid touching your contaminated eyes, nose or mouth?	67 (98.1%)	0	1 (1.5%)
<b>Q2:</b> Is a preventive measure against COVID-19 contagion to cover the mouth and nose with flexed elbow or a handkerchief when coughing or sneezing?	66 (97.1%)	0	2 (2.9%)
<b>Q3:</b> Is a preventive measure against COVID-19 contagion to wash your hand with water and soap for 20 seconds?	67 (98.5%)	0	1 (1.5%)
<b>Q4:</b> Is a preventive measure against COVID-19 contagion to maintain 2 metres of distance between you and the rest of people?	68 (100%)	0	0
<b>Q5:</b> Is a preventive measure against COVID-19 contagion to avoid contact with other people?	64 (94.2%)	2 (2.9%)	2 (2.9%)
<b>Q6:</b> Is a preventive measure against COVID-19 contagion to avoid visiting to agglomerated places?	67 (98.5%)	0	1 (1.5%)
<b>Q7:</b> Is a preventive measure against COVID-19 contagion to use homemade cloth masks in public places?	36 (53%)	9 (13.2%)	23 (33.8%)
<b>Q8:</b> Is a preventive measure against COVID-19 contagion to use rubber gloves in public places?	20 (29.4%)	4 (5.9%)	44 (64.7%)
<b>Q9:</b> Does using alcohol gel replace hand washing when you don't have access to soap and water?	58 (85.3%)	3 (4.4%)	7 (10.3%)
<b>Q10:</b> Is a preventive measure against COVID-19 contagion to clean and disinfect surfaces, objects and food when returning home?	68 (100%)	0	0
<b>Q11:</b> Do children and young adults need to take steps to prevent COVID-19 virus infection?	67 (98.5%)	1 (1.5%)	0
<b>Q12:</b> Can pets spread COVID-19 when leaving home?	22 (32.4%)	23 (33.8%)	23 (33.8%)
<b>Q13:</b> Is the isolation of people infected with the COVID-19 virus effective ways to reduce the spread of the virus?	60 (88.2%)	5 (7.4%)	3 (4.4%)
<b>Q14:</b> Should people who have contact with someone infected by COVID-19 not leave the house for at least two weeks and avoid contact with other people?	66 (97%)	1 (1.5%)	1 (1.5%)
<b>Q15:</b> Should people with symptoms of COVID-19 infection (fever, fatigue, dry cough, loss of smell or taste, feeling short of breath, etc.) stay home for at least two weeks and avoid contact with other people?			
<b>Q16:</b> Can people infected with COVID-19 who have no symptoms spread the virus?	63 (92.6%)	4 (5.9%)	1 (1.5%)

\*Median and interquartile range

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**Table 3.** Source information about COVID-19 prevention in pregnant women and puerperals of two Peruvian communities.

	Frequency	Percentage
<b>Received information</b>		
Yes	63	92.7%
No	5	7.3%
<b>By what means did you receive the information?</b>		
Relatives and friends	23	36.5%
Social Media	42	66.7%
TV, radio or written press	42	66.7%
Health center	40	63.5%

**Table 4.** It was found that there is a significant association between the level of knowledge and source information obtained by the health center in the multivariate analysis.

	Score*	Rho correlation	p-value	adjusted $\beta$ ** (IC 95%)	p-value
Age		-0.064	0.598		
<b>Nationality</b>					
Peruvian	28 (27-29)		0.856		
Venezuelan	28 (28-30)				
<b>Occupation</b>					
Other occupation	28 (26-28)		0.114		
Housewife	29 (28-29)				
<b>Civil status</b>					
Singles	28 (27-29)		0.049	Ref.	0.582
Married or cohabitant	29 (28-29)			0.31 (-0.83 a 1.46)	
<b>Education level</b>					
Primary	29 (28,5-29)		0.334		
Secondary	28 (26-29)				
Superior	28 (28-30)				
<b>Residence</b>					
Marginal urban	28 (27-30)		0.021	Ref.	0.557
Rural	29 (29-29)			0.42 (-1.02 a 1.88)	
<b>Condition</b>					
Pregnant woman	28 (27-29)		0.497		
Puerperal	28 (27-29)				
Number of children		0.103	0.399		
Prenatal control		0.070	0.566		
Gestational age		-0.146	0.275		

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Information source				
Received information from relatives or friends				
No	28 (27.5-29)			
Yes	28 (28-30)	0.781		
Received information from social media				
No	29 (28-29)			
Yes	28 (27-30)	0.970		
Received information from TV, radio or written press				
No	29 (28-29)			
Yes	28 (28-30)	0.649		
Receive information from its health center				
No	28 (26-29)		Ref.	
Yes	29 (28-29.5)	0.006	1.43 (0.39 a 2.46)	0.008

\*COVID-19 prevention knowledge level test score

\*\* Adjusted regression coefficients

social media and TV, radio or written press.

In Table 4, it was found that there is a significant association between the level of knowledge and source information obtained by the health center in the multivariate analysis.

## DISCUSSION

In general, a good level of knowledge about the prevention of COVID-19 has been found in the population evaluated, unlike that found in other studies in Latin America<sup>(5,6)</sup>, where the groups of pregnant women presented insufficient knowledge; which manifests itself with excessive concern about the disease.

There are some points where there were a great amount of wrong answers. One of them is the use of rubber gloves in public places, in which the majority considered that it is a measure to prevent COVID-19. However, their community use is discouraged, since they do not prevent potential contamination of the person from hand contact. On the contrary, if it is quite clear that hand washing is one of the main means to prevent COVID-19, as well as avoiding crowds and maintaining social distance<sup>(7)</sup>; However, it should be mentioned that almost a third of the population was not clear about the importance of the use of cloth masks, which are recommended for community use; Therefore, it is necessary to emphasize the importance of the use of cloth masks for the prevention of COVID-19<sup>(7)</sup>.

Also, there is no current evidence to indicate that domestic animals can transmit the disease. However, as pets need to walk, it is possible that they act as vehicles for the virus, especially if they had contact with contaminated surfaces, so it is important to emphasize good pet hygiene<sup>(8)</sup>.

On the other hand, the good level of knowledge found probably has to do with the good informative work carried out by the Health Centers, this is evidenced in the association, even in the adjusted model, of the level of knowledge with the source from which it is received the information from the Health Center. It is important that the sources of information come from legitimate means, capable of providing verified and correct information on the prevention of COVID-19; being the health personnel one of them. It is important to strengthen the work of health promotion and prevention, since it is one of the main tasks carried out in these Health Centers, focused mainly on primary care; since, although it was the one that was associated with the best knowledge, it was not the main source of information.

The most common sources of information in the population studied were social networks and information through television, radio or written press. This result agrees with the results of the study carried out by Bhagavathula AS et al.<sup>(9)</sup>, where it is reported that the most common source of information for the participants was television (82.7%), followed



by friends and family (78.5%). Health and Internet workers represented 39.8% and 44.7% of the participants' information sources, respectively. This is relevant because the information that normally circulates through social networks is not necessarily verified information; indeed, its interactivity allows a potential dissemination of fake news and hoaxes that could rather harm people's health<sup>(10)</sup>. On the other hand, the traditional media, such as radio and television, do not escape this practice, having evidenced cases of dissemination of information that is not verified or that contradicts what scientific research normally reports<sup>(10)</sup>.

Unlike other studies<sup>(5,6,11)</sup>, no relationship was found between the level of knowledge with maternal age, gestational age, educational level, area of residence, among others. However, it is striking that in the bivariate analysis, an association was found with the marital status of cohabiting or married of the pregnant or puerperal woman, which would indicate that the couple's relationship could positively

influence knowledge; This could be in agreement with the finding of Maharlouei et al.<sup>(12)</sup>, who found an association between the level of knowledge and the duration of the couple's relationship.

Within the limitations of the study, there was a small sample size, which probably could have increased the probability of committing a type II error in some variables evaluated.

## CONCLUSION

It is concluded that there exists a good level of knowledge about prevention against COVID-19 in pregnant women and puerperals of two Peruvian communities and that the principal associated factor is because they received a great amount of information from their Health Center.

## Acknowledgement

The authors acknowledge to directors, doctors and obstetrics from Health Centers who participated in this investigation

**Authorship contributions:** The authors have participated in the conception and design of the investigation, data collection, analysis and interpretation, critical review and drafting of the final version.

**Funding sources:** Self-financed

**Conflicts of interest:** The authors have declared that they have no conflicts of interest for this investigation.

**Received:** November 30, 2020

**Accepted:** January 7, 2021

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