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Sociocultural Factors Affect Covid-19 Vaccine Hesitancy Among Pregnant Women? A Hospital-Oriented Cross-Sectional Study in Turkey

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ABSTRACT

Background: It was aimed to evaluate COVID-19 vaccine hesitancy among pregnant women.

Material and Method: This study was a hospital-oriented cross-sectional study. The study population consisted of 8972 pregnant women. The number of pregnant women included in the study sample was 368. The dependent variable was vaccine hesitancy, whereas the independent variables consisted of the sociodemographic, bio-demographic and socioeconomic characteristics of pregnant women. Chi-square analysis was used for paired comparisons, and logistic regression analysis was used to determine risk factors.

Results: The rate of pregnant women who had vaccine hesitancy was 59.5% in this study. Vaccine hesitancy was 2,470-fold (CI: 1,319-4,625) higher in pregnant women who did not have a formal education than those who had a formal education, 8,136-fold (CI: 3,461-19,122) higher in pregnant women who had a living child in the household than those who did not, 1,776-fold (CI: 1,039-3,035) higher in pregnant women who had a wanted pregnancy than those who had an unwanted one and 7,485-fold (CI: 2,894-19,360) higher in pregnant women who were influenced by the social media than those who were not.

Conclusion: low education level, first pregnancy, desire for pregnancy and being influenced by the social media were the risk factors for COVID-19 vaccine hesitancy among pregnant women.

Keywords: COVID-19 vaccine, vaccine hesitancy, pregnant, Turkey

INTRODUCTION

Pregnant women constitute a special group. In previous studies, it was reported that morbidity and mortality were higher among pregnant women with COVID-19 compared to those without the disease. [1,2] However, pregnant women were not included in the studies during the COVID-19 vaccine development process. Therefore, there is scarcity of data about the safety and efficacy of the said vaccines in pregnant women. [2]

Since the coronavirus disease (COVID-19) was declared a pandemic, it was aimed to develop a vaccine that would effectively fight against the virus in most of the studies. A large number of vaccines have been developed and approved simultaneously at an unprecedented rate. [3-5] However, even if a vaccine is developed, widespread immunity will not be achieved without vaccinating a sufficient number of people. In other words, at least 60.0% -70.0% of the society should be vaccinated for this pandemic to stop. Therefore, studies should aim to determine vaccine acceptance rates in the society. [6-8] In this study, it was aimed to determine the level of COVID-19 vaccine hesitancy among pregnant women and the sociocultural factors affecting the vaccine hesitancy.

METHOD

Defining the region where the research was conducted: Turkey is divided into 30 health zones. The hospital where the research was conducted is the regional hospital of the 30th health zone. The area where the hospital is located is a neighbour of Iran, Georgia, Nakhichevan and Armenia. The main means of livelihood in the region are agriculture and livestock farming. The said region is below Turkey's average in terms of socioeconomic development. Illiterate people constitute 11,70 % and those who have not received any education constitute 13,50% of the total population in the region (9).

The region is also below Turkey's average in terms of health workforce per 1000 population. Moreover, the region is above Turkey's average in terms of infant and maternal mortality rates, i.e. 11,20 per 1000 and 24,50 per 100,000 (the mean infant and maternal mortality rates are respectively 6,80 per 1000 and 14,60 per 100,000 in Turkey) (10).

Type of research: hospital-oriented cross-sectional study.

Study population: In 2020, there were 8972 pregnant women who presented to the "Gynaecology and Obstetrics" outpatient clinic of Kars Regional State Hospital. Assuming that the same number of pregnant women will also present to the clinic in 2021, the study population consisted of 8972 pregnant women.

Study sample: Since the population is known, the number of pregnant women to be included in the sample was calculated with the formula n=Nt2p q/d2 (N-1) + t2 p q. N, the number of individuals in the study population; n, the number of individuals to be included in the sample; p, the prevalence (probability) of the event in question; q, the prevalence (probability) of the event in question not happening; t, the theoretical value found in the t table at the given degree of freedom and the determined level of error; d, the desired ± deviation according to the prevalence of the event (11). Accordingly, the sample size was found to be 368, when p=0,50; q=0,50; t=1,96 and d=0,05.

Creating the data collection form: The data collection form, which consists of two parts, was prepared by the researchers. The first part of the form included the sociodemographic, bio-demographic and socioeconomic characteristics of pregnant women; the second part consisted of questions about the COVID-19 vaccine.

Variables of the research and definitions related to the variables:

Dependent variable: COVID-19 vaccine hesitancy among pregnant women. To determine the hesitancy, pregnant women were asked " Can you get pregnant women to get the COVID-19 vaccine?". They were asked to answer "yes-no-not sure". Those who answered "I am not sure" about vaccination were considered as those who have vaccination hesitancy. In addition, those who answered "Yes / No" about vaccination were presented with a diagram divided into 1-10 equal divisions to measure how serious they were in their decision, and they were asked to mark "the level of their determination". One indicated the lowest and 10 the highest level of determination. Those who marked 8, 9 and 10 on the diagram

were considered determined, while others were considered to have vaccine hesitancy. As a result, pregnant women were divided into 2 groups according to the dependent variable as those who were determined to be vaccinated and those who were hesitant about vaccination.

Independent variables: The sociodemographic, bio-demographic and socioeconomic characteristics of the pregnant women included in the study and the status of being influenced by the social media were used as independent variables.

Ethics committee approval and verbal consent for the study: All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the Helsinki declaration and its later amendments or comparable ethical standards. The ethics committee approval for the study was obtained from the Kafkas University committee (80576354-050-99/154). In addition, written and verbal consent was obtained from the participants of the study.

Data collection: The data for the study were collected by the researcher between 15 March and 30 April 2021 using face-to-face interview technique at the gynaecology and obstetrics outpatient clinic.

The preliminary trial of the study was conducted with 9 pregnant women aged 15-49 who presented to the outpatient clinic. Defective parts of the data collection form were identified and necessary corrections were made.

Statistical Analysis: SPSS 21 package was used for data analysis. Chi-square analysis was performed in paired comparisons. The variables that yielded significant results in the chi-square analysis were included in the Backward LR logistic regression analysis and the risk factors related to vaccine hesitancy were identified.

RESULTS

Although 2 pregnant women answered “yes, I would get the vaccine”, they marked 7 and below on the diagram. 7 pregnant women answered "no, I would not get the vaccine" but marked 7 and below on the diagram. Accordingly, 29,10% of the pregnant women (107 pregnant women) were considered as those who would definitely get the vaccine, whereas 11,40% (42 pregnant women) as those who would definitely not get the vaccine and 59,50% (219) were hesitant (undecided) about getting vaccinated.

As a result, 40,50% of the pregnant women were considered determined to get/not get the vaccine, and 59,50% were considered to be hesitant.

While there was a statistically significant relationship (p=0,005) between the place of residency, i.e. one of the sociodemographic characteristics, and vaccine hesitancy; there was no statistically significant relationship between the number of people living in the house, family type and type of marriage and vaccine hesitancy (p=0,244, p=0,218 and p=0,918, respectively) (Table 1).

Table 1: Factors affecting COVID-19 vaccine hesitancy in pregnant women

Independent variables		Vaccine hesitancy			
		Yes	No	Total	P
		n (%)*	n (%)*	n (%)**	
Sociodemographic					
Place of residence	Rural	93 (68,90)	42 (31,10)	135 (36,70)	0,005
	Urban	126 (54,10)	107 (45,90)	233 (63,30)	
Number of people per	≤4	154 (57,70)	113 (42,30)	267 (72,60)	0,244
	≥5	65 (64,40)	36 (35,60)	101 (27,40)	
Family type	Nuclear	158 (57,70)	116 (42,30)	274 (74,50)	0,218
	Extended	61 (64,90)	33 (35,10)	94 (25,50)	
Type of marriage	Arranged marriage	82 (59,90)	55 (40,10)	137 (37,20)	0,918
	Marriage of convenience	137 (59,30)	94 (40,70)	231 (62,80)	

(Table 1 cont)

Socioeconomic					
Health insurance	Yes	163 (56,20)	127 (43,80)	290 (78,80)	0,013
	No	56 (71,80)	22 (28,20)	78 (21,20)	
Women's formal	No	55 (75,30)	18 (24,70)	73 (19,80)	0,002
	Yes	164 (55,60)	131 (44.4)	295 (80.2)	
Spouse's formal	No	11 (68,80)	5 (31,30)	16 (4,30)	0,441
	Yes	208 (59,10)	144 (40,90)	352 (95,70)	
Total household	Sufficient	26 (55,30)	21 (44,70)	47 (12,80)	0,531
	Not sufficient	193 (60,10)	128 (39,90)	321 (87,20)	
Biodemographic					
Age of the woman	≤19	42 (51,90)	39 (48,10)	81 (22,00)	0,082***
	20-34	156 (60,90)	100 (39,10)	256 (69,60)	
	≥35	21 (67,70)	10 (32,30)	31 (8,40)	
Gestational week	≤12	38 (66,70)	19 (33,30)	57 (15,50)	0,231
	≥13	181 (58,20)	130 (41,80)	311 (84,50)	
Are there any living children in	**No**	**45 (75,00)**	**15 (25,00)**	**60 (16,30)**	**0,008**
	Yes	174 (56,50)	134 (43,50)	308 (83,70)	
Desired pregnancy	Yes	189 (63,40)	109 (36,60)	298 (81,00)	0,002
	No	30 (42,90)	40 (57,10)	70 (19,00)	
Sociopolitical					
Influence of religion	Yes	17 (47,20)	19 (52,80)	36 (9,80)	0,114
	No	202 (60,80)	130 (39,20)	332 (90,20)	
Social media	Yes	67 (70,50)	28 (29,50)	95 (25,80)	0,011
	No	152 (55,70)	121 (44,30)	273 (74,20)	
Origin of the virus	Human-made	54 (65,90)	28 (34,10)	82 (22,30)	0,184
	Natural origin	165 (57,70)	121 (42,30)	286 (77,70)	

* row percent, ** column percent, *** chi-square on slope

Considering the socioeconomic factors, women's health insurance and women's education level had a statistically significant relationship with vaccine hesitancy (p=0,013, p=0,002). On the other hand, there was no statistically significant relationship between vaccine hesitancy and the education level of the spouse and the total household income (p=0,441, p=0,531) (Table 1).

Considering the biodemographic characteristics, while vaccine hesitancy had a statistically significant relationship with the first and desired pregnancy (p=0,008, p=0,002), there was no statistically significant relationship between the same and the age of the pregnant women and gestational week (p=0,082, 0,231) (Table 1).

There was a statistically significant relationship between vaccine hesitancy and the influence of social media (p=0,011). On the other hand, vaccine hesitancy had no statistically significant relationship with the belief of pregnant women and the origin of the virus (p=0,114, p=0,184) (Table 1).

The variables that yielded statistically significant results in paired analyses (Table 1) were included in the logistic regression analysis. Table 2 shows the results of the logistic regression analysis. Accordingly, vaccine hesitancy was 2,470-fold (CI: 1,319-4,625) higher in pregnant women who did not have a formal education than those who had a formal education, 8,136-fold (CI: 3,461-19,122) higher in pregnant women who had a living child in the household than those who did not, 1,776-fold (CI: 1,039-3,035) higher in pregnant women who had a wanted pregnancy than those who had an unwanted one and 7,485-fold (CI: 2,894-19,360) higher in pregnant women who were influenced by the social media than those who were not.

Table 2: Logistic regression analysis table for factors affecting COVID-19 vaccine hesitancy in pregnant women

Independent variables		Adjusted OR	95% CI
Has the pregnant woman received formal education?	No	2.470	1.319-4.625
	Yes		1 (reference)
Are there any living children in the household?	No	8.136	3.461-19.122
	Yes		1 (reference)
Has the woman desired to get pregnant?	Yes	1.776	1.039-3.035
	No		1 (reference)
Does social media have an influence?	Yes	7.485	2.894-19.360
	No		1 (reference),

DISCUSSION

In the study, 59.5% of pregnant women stated that they were hesitant about getting the COVID-19 vaccine during pregnancy. In the literature, studies on COVID-19 vaccine hesitancy among pregnant women are extremely scarce. However, in a study conducted with pregnant women, 29, 20% stated that they would be hesitant about getting the vaccine when asked "if they would get vaccinated if a vaccine was developed" (12). In a study encompassing 16 countries, it was stated that the vaccine acceptance rates varied among pregnant women, but there was not enough information about hesitancy (13). In another study covering England and Turkey, although not related to pregnant women, 31,00% of the participants in Turkey and 14,00% of the participants in England stated that they were hesitant about getting vaccinated (14). According to a study conducted before the vaccine was available in Turkey, 35,90% of the participants were hesitant about vaccination (15). To summarize, nearly 6 in 10 pregnant women were hesitant about getting vaccinated in the present study, which indicates vaccine hesitancy remains to be an important public health concern.

The study also showed that the lack of formal education led to a 2,470-fold (CI: 1,319-4,625) increase in vaccine hesitancy among pregnant women. In a study conducted with the general population in Kuwait, it was reported that higher education level led to 0,78-fold (CI: 0,64-0,94) less hesitation towards the COVID-19 vaccine as compared to a lower education level (16). Education level is thought to have a protective effect against vaccine hesitancy on health-related issues both through social status and intellectual knowledge (17). As a matter of fact, it was shown in a study that women with a high level of education had higher "health literacy" (18,19). We also believe that education leads to a lower hesitation towards the COVID-19 vaccine due to increased health literacy.

Although not related to pregnant women, a study conducted in Greece showed that the desire of a woman to get the COVID-19 vaccine was 0.69-fold (CI: 95%, 0,53-0,91) lower if she had a child (20). In a study conducted with the general population in the United States, the presence of a living child in the household led to a 1,04-fold (CI: 0,98-1,10) increase in vaccine hesitancy, taking the woman being the adult in the household as a reference. The same study also showed that vaccine hesitancy was decreased in parallel to the number of children in the household according to paired analyses (21-23). Consistent with the studies in the literature, this study also showed that there was an 8,136-fold (CI: 3.,461-19,122) increase in vaccine hesitancy in women who did not have a living child in the household as compared to those who had 1 or more children at home.

In addition, vaccine hesitancy was found to exhibit a 1,776-fold (CI: 1,039-3,035) increase in the presence of a wanted pregnancy. Although there are no studies asking a similar question about pregnant women in the literature, we believe that one of the possible reasons for the said increase is that pregnant women have stronger protective instincts, and another reason is the lack of sufficient research on the use of the vaccine in pregnant women.

In the literature, information on vaccines provided in the social media were studied in 2017, and it was found that 65% of the social media sources contained anti-vaccine information. In addition, considering the information provided on today's social media, it was understood that 27,50% of the information about the COVID-19 vaccine was inaccurate. Moreover, apart from the fact that social media contains a lot of anti-vaccination information as well as information that may lead to vaccine hesitancy, studies have also shown that such information receives more likes from people (24-26). Similarly, considering the effect of social media on vaccine hesitancy, the present study showed that social media led to a 7,845-fold (OR: 7,845, CI: 95%, 2,894-19,360) increase in vaccine hesitancy.

As a result; lack of education, absence of a living child, presence of a desired pregnancy and information on social media were found to be risk factors for vaccine hesitancy in pregnant women.

In this context, healthcare professionals providing public healthcare services should start training pregnant women who possess the abovementioned characteristics.

Limitation of the study: Since the cultural structure in the region where the research was conducted is not representative of entire Turkey, it is necessary to be careful in generalizations.

Strength of the study: The researcher collected data using face-to-face interview technique and the study is one of the first studies to determine the causes of COVID-19 vaccine hesitancy among pregnant women.Prevalence of awareness of COPD in rural setting attending tertiary care hospital.

Disclosures

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Conflict of Interest: The authors have no conflicts of interest to declare.

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