Original Article

Knowledge and attitude about COVID-19 Vaccination in pregnant women at Baqai Medical University

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ABSTRACT

BACKGROUND & OBJECTIVE: Coronavirus (COVID-19) is a highly contagious disease that can cause severe maternal and fetal complications. After the availability of the COVID-19 vaccine, vaccine apprehension was seen in pregnant women. This study aimed to explore pregnant women's knowledge and attitude about COVID-19 vaccination.

METHODOLOGY: Cross tabulation was done by using the Chi-square test to assess the association between the respondents' socio-demographic characteristics and their willingness to receive the COVID-19 vaccine. A p-value of ≤ 0.05 was considered statistically significant. A cross-sectional survey at Fatima Hospital, conducted from May 1st to November 30th, 2022, included 500 pregnant women aged 18-40 seeking antenatal care. Categorical variables were described using frequencies and percentages. Chi-square tests assessed associations between socio-demographics and COVID-19 vaccine acceptance (p≤0.05). Exclusions comprised pregnant women in active labor.

RESULTS: Participants in this study exhibit poor knowledge regarding the COVID-19 vaccine. COVID-19 was not considered as serious disease by 53.6% while 74.4% were unaware of its administration during pregnancy. Additionally, 52.6% thought the vaccine could harm a fetus and 54.6% feared its impact on future reproductive health. Notably, 62.2% had received tetanus toxoid but not the COVID-19 vaccine. Only six percent had a history of COVID-19 infection before pregnancy. Among 327 non-vaccinated participants, 52% refused vaccination, including 27 who declined the second dose. Stratification by age revealed significant associations with vaccine willingness (p=0.010).

CONCLUSION: In t Study over half of pregnant women hesitant towards COVID-19 vaccine, likely due to safety concerns during pregnancy, highlighting awareness gaps.

KEYWORDS: Pregnant Women, Knowledge, Attitude, Acceptance, COVID-19 vaccine.

INTRODUCTION

Corona virus (Covid 19) is a highly contagious disease caused by SARS-CoV-2, a positive- sense single–stranded ribonucleic acid (ss RNA) virus causing tremendous illness that mainly affects the respiratory system of patients [1].
Almost 760 million people around the world are affected by this virus and almost 7 million people died worldwide. (as of 21/5/23) [2]. It was declared a pandemic by WHO on 11 March 2020 [3]. In Pakistan, total COVID cases according to the government of Pakistan website were more than 15 lac, and reported deaths were more than thirty thousands (as of 11/3/23) [4]. In three years, several variants of coronavirus SARS-COV-2 have emerged including the delta variant linked to increased infectivity and increased mortality whereas the omicron variant has resulted in a large rise in infections [5].

Vaccination is the most effective strategy to protect vulnerable people from infectious illnesses and can establish herd immunity [6]. Worldwide almost 13.3 billion vaccine doses have been administered. (as of 21/5/23) [2]. In Pakistan, 13 million had completed two doses of the COVID-19 vaccine (as of 11/3/23) [7]. COVID-19 during pregnancy has been linked to an increased risk of severe maternal and fetal complications [8].

Despite being a high-risk group pregnant women were not included in initial vaccination trials which led to poor knowledge and hesitancy about COVID-19 vaccination in pregnancy. In August 2021 Centres for Disease Control and Prevention (CDC) released data on the safety of the COVID-19 vaccine in pregnancy and encouraged pregnant women to get vaccinated and protect themselves from COVID-19 [9]. Similarly, the Royal College of Obstetrics and Gynaecology also recommended COVID-19 vaccination in pregnancy and emphasized its importance and safety in all trimesters [10].

Despite all this safety data and guidelines, vaccine apprehension is a common problem among the general public especially in pregnant women [11]. Before the release of Centres for Disease Control and Prevention (CDC) guidelines, a survey was done in various countries which showed only 13.8% to 52% of pregnant women decided to get vaccinated [12]. After declared guidelines about the safety of the COVID-19 vaccine in pregnant women still less data has been reported regarding its knowledge and acceptance in pregnant women across the globe. Although studies showed the effectiveness and safety of COVID-19 vaccine in the antenatal period. Women who have received COVID-19 vaccine had a significantly reduced risk of severe COVID-19 [13].

After the availability of COVID-19 vaccines, evidence-based research on knowledge, attitude, perception, and acceptance of COVID-19 vaccine in pregnant women in third-world Asian and African countries is still lacking which suggests a direction for future research. The objective of this study was to explore the knowledge and attitudes of pregnant women about COVID-19 vaccination.

METHODOLOGY

A cross-sectional survey was conducted between 1st May 2022 to 30th November 2022 at OPD of Gynecology &Obstetric department, Fatima Hospital, Baqai Medical University. The study was approved by the Institutional Review Board of Baqai Medical University (Ref: BMU-EC/04-2022). A total number of 500 patients were included in this study. A written informed consent was signed by all participants before the start of the study. Participants' names and other personal data/identity were kept confidential and each questionnaire was given a serial number to maintain anonymity. This survey included women aged 18-40 years seeking antenatal care through OPD and all pregnant women who were coming in an emergency in active labor were excluded.

A non-probability consecutive sampling technique was employed and the sample size was calculated by using open epi software by keeping a 95% confidence level with a 5% margin of error and 50% anticipated prevalence rate. The sample size calculated was 384 but we further inflated the sample size to 500 to ensure accurate and generalizable results. A Pre-validated questionnaire was used in this study [14].

The questionnaire was divided into two sections. Section A included demographic profile, booking status, parity, gestational age, past obstetric history, and risk in current pregnancy. Section B included 5 questions related to knowledge and 7 questions regarding attitudes toward COVID-19 vaccination. In this section, participants were given the option to answer with "yes," or "no,".

Data was collected through face-to-face interviews with the patients in OPD by the principal investigator (the first author). Individual participants were given numbers on Performa instead of using names to maintain confidentiality. Each participant was interviewed for 10-15 minutes. WHO COVID-19 prevention protocols were maintained using facemasks and gloves. Data was entered and statistical analysis was done using SPSS version 25.0 (IBM Corp., Armonk, NY, USA). Categorical variables were described using frequencies and percentages. Cross tabulation was done by using the Chi-square test to assess the association between the respondents' socio-demographic characteristics and their willingness to accept the COVID-19 vaccine. A p-value of ≤ 0.05 was considered statistically significant.

RESULTS

The total number of participants were 500. In the age group category, most patients were between the ages of 26-30(41.6%) followed by age group 18-25(39.4%), age group 31-36(14.6%), and 36-40(4.4%). The educational background showed 370(74%) were Illiterate. Three hundred and sixty-three (72.6%) patients were unbooked. The demographic characteristics of the participants are represented in Table 1.

Table-I: Demographic characteristics of pregnant women

Variables	categories	n(%)
Age groups	18-25	197(39.4)
	26-30	208(41.6)
	31-35	73(14.6)
	36-40	22(4.4)
Educational status	Illiterate	370(74)
	literate	130(26)
Booking status	Booked	137(27.4)
	Un booked	363(72.6)
Parity	Primi gravida	104(20.8)
	1-4	274(54.8)
	>5	122(24.4)
Gestational Age	1st Trimester	52(10.4)
	2nd Trimester	163(32.6)
	3rd Trimester	285(57.0)

Table II represents the frequency of participants' responses Table II represents the frequency of participants' responses to knowledge of the COVID-19 vaccine. Nearly 268(53.6%) did not consider COVID-19 as a serious disease. Around 372(74.4%) were not aware of vaccine administration in pregnancy and 257(51.4%) responded that COVID-19 vaccination is not important before or during pregnancy. Almost 263(52.6%) thought the vaccine could harm the fetus and 273(54.6%) had a fear that the vaccine could affect

Table-II:Knowledge of pregnant women towards COVID-19 vaccine.

Variables	Options	Frequency n(%)
Do you think COVID-19 is a serious disease	Yes No	232(46.4%) 268(53.6%)
Do you think COVID-19 vaccination is important before or during pregnancy?	Yes No	243(48.6%) 257(51.4%)
Are you aware of vaccine administration in pregnancy?	Yes No	128(25.6%) 372(74.4%)
Do you think vaccines can affect your reproductive life in the future?	Yes No	273(54.6%) 227(45.4%)
Do you think the vaccine will harm the fetus?	Yes No	263(52.6%) 237(47.4%)

Table III represents the frequency of participants' responses to Attitudes regarding COVID-19 vaccine questions. Almost 30(6%) had a history of COVID-19 infection before pregnancy and 311(62.2%) were vaccinated with vaccines (e.g. tetanus toxoid) other than the COVID-19 vaccine. Around 173(34.6%) received COVID-19 vaccination out of which 67(13.4%) took one dose of COVID-19 vaccine and 106(21.2%) had both doses of COVID-19 vaccination before pregnancy and were considered already vaccinated in this study. Nearly 327(65.4%) did not receive the vaccine and upon asking if they were willing to receive it, around 260(52%) refused. This also includes 67(13.4%) study participants who have received one dose of the vaccine and refused to take a second dose. Around 272(54.4%) trusted vaccines available in Pakistan while 266(53.2%) had family pressure of not receiving vaccination.

Table-III: Attitude of pregnant women towards Covid 19 vaccine.

Variables	Options	Frequency (%)
History of Covid 19 infection before pregnancy and conception	Yes No	30(6%) 470(94%)
Have you ever been vaccinated other than the COVID-19 vaccine before/ during pregnancy? (tetanus toxoid)	Yes No	311(62.2%) 189(37.8%)
Have you received the COVID-19 vaccine	Yes 1 dose 2 doses No	173(34.6%) 67(13.4%) 106(21.2%) 327(65.4%)
If you have not received Covid 19 vaccine. Are you willing to receive the vaccine?	Yes No	134(26.8%) 260(52%)
Do you trust on COVID-19 vaccine available in Pakistan?	Yes No	272(54.4%) 228(45.6%)
Family pressure for not having COVID-19 vaccine	Yes No	266(53.2%) 234(46.8%)
Fear of injection	Yes No	153(30.6%) 347(69.4%)

Table IV shows the Stratification of data with willingness to receive COVID-19 vaccination and age was found to be significant(p=0.010).

Table-IV:Stratification of data with regard to willingness to receive COVID-19 vaccination.

Variables	Categories	Willing to receive vaccine n(%)	Not willing to receive vaccine n(%)	Covid vaccine Already done n(%)	p-value
Age Groups	18-25 26-30 31-35 36-40	45 (22.8) 54 (26.0) 31 (42.5) 4 (18.2)	116 (58.9) 105 (50.5) 29 (39.7) 10 (45.5)	36(18.3) 49(23.6) 13(17.8) 8(36.4)	0.010
Parity	Primigravid 1-4 >5	26(25.0) 76(27.7) 32 (26.2)	62 (59.6) 134 (48.9) 64 (52.5)	16(15.4) 64(23.4) 26(21.3)	0.385
Educational status	Illiterate Literate	93 (25.1) 41(31.5)	202 (54.6) 58 (44.6)	75(20.3) 31(23.8)	0.143

DISCUSSION

This study explored the knowledge and attitude of pregnant women towards COVID-19 vaccination. According to the present study result majority of pregnant women had poor knowledge related to COVID-19 vaccination. In the present study, it was observed that a large percentage(74.4%) of women were not aware of COVID-19 vaccine administration in pregnancy, and more than half did not consider COVID-19 as a serious disease. This poor knowledge could be because

despite being the vulnerable category for COVID-19 severe disease, pregnant women were excluded from initial vaccine trials and public health awareness programs leading to limited data about vaccine efficacy in this high-risk group [15].

Almost more than 50% of our study participants thought that vaccination could affect the reproductive life and harm the fetus. Similarly, a study by Kumari A. et al mentioned that 58.6% also felt about the unforeseen future effects on the fetus [16].

In our study, 34.6% received a single dose or two doses of the COVID-19 vaccine and the majority refused to receive vaccination. Various studies conducted in India, China, Qatar, and South American countries discovered a relatively higher acceptance rate which was nearly 80% among pregnant and lactating women compared to the general population. [12,17]. In contrast, research undertaken in North America, Europe, Russia, and Australia found low levels of acceptability which was less than 45%. [12,18].

As a result, it is possible to claim that the vaccination uptake rate is affected by geographical location and the date of the pandemic. Countries where the pandemic has had a large impact, such as China and Italy, have a comparatively higher vaccination uptake rate among expectant women. Furthermore, when compared to previous studies, a low acceptance rate was observed during the summer and before vaccine introduction [19]. A multi-centric prospective survey-based study done in Punjab Pakistan also showed that more than half of the participants did not receive COVID-19 vaccination. [20].

This study also explored that 53.2% did not receive COVID-19 vaccine due to family pressure. Patriarchal society is a form of social control in South Asian society including Pakistan which regulate women's social and economic behaviour including education and health, therefore women have less autonomy and limited decision-making authority toward reproductive health [21]. In the present study, willingness to receive the vaccine was statistically significant according to age (p = 0.005), while exploring another local study educational status was found to be significant [21].

The difference in the studies regarding attitude while comparing with variables may be because of differences in study setting, sample size, and study selection criteria. Hsu AL et al mentioned that the attitude of pregnant women is affected by the media's exaggeration of the detrimental consequences of Covid 19 immunisation during pregnancy which fostered more misinformation regarding the vaccine. [22]. Internet and social media have been identified as major impact factors during the COVID-19 pandemic on pregnant women [23].

It is proven that individuals' awareness of the decreased risk of COVID-19 infection after vaccination significantly enhanced the vaccination rate. Vaccination lowers maternal and fetal complications and can prevent the severity of COVID-19 infection [24].

STRENGTH AND LIMITATION:
To the best of our knowledge, this is the first study in Karachi (Sindh) to assess knowledge and attitude regarding COVID-19 vaccination in pregnant women and it can be counted as a strength while study being unicentric considered as the limitation.

CONCLUSION

The study found that more than half of pregnant women were not willing to receive Covid 19 vaccination more likely due to a lack of awareness regarding the safety of vaccination during pregnancy.

REFERENCES:

1. Chan JF, Yuan S, Kok KH, To KK, Chu H, Yang J, et al. A familial cluster of pneumonia associated with the 2019 novel coronavirus indicating person-to-person transmission: a study of a family cluster. Lancet. 2020;395(10223):514-523. Doi: 10.1016/S0140-6736(20)30154-9.
2. WHO COVID-19 Dashboard. Geneva: World Health Organization, 2020. Available online: https://covid19.who.int/
3. Cucinotta D, Vanelli M. WHO Declares COVID-19 a Pandemic. Acta Biomed. 2020;91(1):157-160. Doi: 10.23750/abm. v91i1.9397
4. Covid-19 Heath Advisory Platform by Ministry of National Health Services Regulations and Coordination [internet] .2023. http://www.covid.gov.pk/stat/Pakistan
5. Long B, Carius BM, Chavez S, Liang SY, Brady WJ, Koyfman A, et al. Clinical update on COVID-19 for the emergency clinician: Presentation and evaluation. The American Journal of Emergency Medicine. 2022; 54:46-57. Doi: 10.1016/j.ajem.2022.01.028
6. Anderson RM, Vegvari C, Truscott J, Collyer BS. Challenges in creating herd immunity to SARS-CoV-2 infection by mass vaccination. The Lancet. 2020;396(10263):1614-1616. Doi: 10.1016/S0140-6736(20)32318-7
7. Registration/Vaccination Procedure for Eligible Citizens. [internet] Last updated: 07 Jul, 2023. http://www.covid.gov.pk/vaccine. detail.
8. Allotey J, Stallings E, Bonet M, Yap M, Chatterjee S, Kew T, et al; for PregCOV-19 Living Systematic Review Consortium. Clinical manifestations, risk factors, and maternal and perinatal outcomes of coronavirus disease 2019 in pregnancy: living systematic review and meta-analysis. BMJ. 2020 ;370:m3320. Doi: 10.1136/bmj.m3320.

9. Centres for disease control and prevention. National Centre for Health Statistics. [internet] Last Reviewed: July 10, 2023. https://www.cdc.gov/nchs/recommendation/pregnancy

10. COVID-19 vaccines, pregnancy and breastfeeding. The Royal College of Obstetricians and Gynaecologists (RCOG). [Internet]. updated 29 November 2022 http://www.rcog.org.uk/guidance/Covid-19 vaccines, pregnancy and breastfeeding.

11. Anorue LI, Ugwu AC, Ugboaja SU, Nwabunze UO, Ugwulor-Onyinyechi CC, Njoku C. Communicating COVID-19 Vaccine Safety: Knowledge and Attitude Among Residents of South East, Nigeria. Infection and Drug Resistance. 2021; 14:3785-3794. Doi: 10.2147/IDR.S329183.

12. Skjefte M, Ngirbabul M, Akeju O, Escudero D, Hernandez-Diaz S, Wyszynski DF et al. COVID-19 vaccine acceptance among pregnant women and mothers of young children: results of a survey in 16 countries. European Journal of Epidemiology.2021;36:197-211. Doi: 10.1007/s10654-021-00728-6.

13. Wang AM, Berry M, Moutos CP, Omere C, Clark SM, Harirah HM et al. Association of the Delta (B. 1.617. 2) variant of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) with pregnancy outcomes. Obstetrics and Gynecology. 2021 Dec 1;138(6):838-841. Doi: 10.1097/AOG.0000000000004595

14. Goncu Ayhan S, Oluklu D, Atalay A, Menekse Beser D, Tanacan A, Moraloglu Tekin O.et al. COVID-19 vaccine acceptance in pregnant women. International Journal of Gynecology and Obstetrics. 2021;154(2):291-296. Doi: 10.1002/ijgo.13713

15. Costantine MM, Landon MB, Saade GR. Protection by Exclusion: Another Missed Opportunity to Include Pregnant Women in Research During the Coronavirus Disease 2019 (COVID-19) Pandemic. Obstetrics and Gynecology. 2020. Doi: 10.1097/AOG.000000000000392 4

16. Kumari A, Ranjan P, Chopra S, Kaur D, Kaur T, Upadhyay AD. Knowledge, barriers and facilitators regarding COVID-19 vaccine and vaccination programme among the general population: a cross-sectional survey from one thousand two hundred and forty-nine participants. Diabetes and Metabolic Syndrome: Clinical Research and Reviews. 2021;15(3):987-992. Doi: 10.1016/j.dsx.2021.04.015

17. Tao L, Wang R, Han N, Liu J, Yuan C, Deng L, et al. Acceptance of a COVID-19 vaccine and associated factors among pregnant women in China: a multi-center cross-sectional study based on health belief model. Hum Vaccines and Immunotherapeutic. 2021;17(8):2378-2388. Doi: 10.1080/21645515.2021.1892432.

18. Ceulemans M, Foulon V, Panchaud A, Winterfeld U, Pomar L, Lambelet V et al. Vaccine willingness and impact of the COVID-19 pandemic on women's perinatal experiences and practices—A multinational, cross-sectional study covering the first wave of the pandemic. International Journal of Environmental Research and Public Health. 2021;18(7):3367. Doi:10.3390/ijerph18073367

19. Abu Hammad S. Attitude of pregnant and lactating women toward COVID-19 vaccination in Jordan: a cross-sectional study. Journal of Perinatal Medicine. 2022;50(7):896-903. Doi:10.1515/jpm-2022-0026

20. Mustafa ZU, Bashir S, Shahid A, Raees I, Salman M, Merchant HA.et al. COVID-19 vaccine hesitancy among pregnant women attending antenatal clinics in Pakistan: a multicentre, prospective, survey-based study. Viruses. 2022;14(11):2344. Doi: 10.3390/v14112344.

21. Isran S, Isran M. Patriarchy and gender inequalities in Pakistan: a critical analysis. Journal of Social Sciences and Interdisciplinary Research. 2013;2(3).

22. Ain QU, Sultan U, Aslam S, Farooq N, Shafiq S, Farooq M. Attitude of pregnant and lactating women towards vaccination against Covid-19. Annals of Punjab Medical College .2022;16(2): 128-131.Doi: 10.29054/APMC/2022.1203

23. Hsu AL, Johnson T, Phillips L, Nelson TB. Sources of Vaccine Hesitancy: Pregnancy, infertility, minority concerns, and general skepticism. Open Forum Infectious Diseases.2021;9(3): ofab433.Doi: 10.1093/ofid/ofab433

24. De Brabandere L, Hendrickx G, Poels K, Daelemans W, Van Damme P, Maertens K. Influence of the COVID-19 pandemic and social media on the behaviour of pregnant and lactating women towards vaccination: a scoping review. BMJ Open. 2023;13(2): e066367. Doi: 10.1136/bmjopen-2022-066367

25. Chavan M, Qureshi H, Karnati S, Kollikonda S. COVID-19 Vaccination in pregnancy: the benefits outweigh the risks. Journal of Obstetrics Gynaecology Canada. 2021;43(7):814-816. Doi: 10.1016/j.jogc.2021.03.010.

Authors Contributions:

Saadia Akram : Substantial contributions to the conception.

Farrukh Naheed: Design of the work and the acquisition.

Nazish Ali : Analysis and interpretation of data for the work.

Naila Qamar : Drafting the work.

Farah Liaquat: Reviewing it critically for important intellectual content.

Nikhat Ahsan: Final approval of the version to be published.