

Mental health and marital satisfaction changes of pregnant and lactating women during the COVID-19 pandemic: A comparative cross-sectional study

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Abstract

Background: Women' mental health during reproductive age is a major public health concern in both developing and developed countries. There is a relationship between mental health and marital satisfaction. This study aimed to assess mental health, anxiety, depression, and marital satisfaction among pregnant and lactating women and compared the results with non-pregnant/lactating (as control group) during the COVID-19 pandemic in Iran.

Methods: A cross-sectional study among married women in range of 18 to 45 years via online questionnaires was conducted from 20 March to 25 April, 2020. A total of 604 valid questionnaires were analyzed, including 200 pregnant women, 203 lactating women, and 201 non-pregnant/lactating women. Mental health, COVID-19-related anxiety, and marital satisfaction were respectively assessed by the General Health Questionnaire (GHQ), the Corona Disease Anxiety Scale (CDAS), and ENRICH Marital Satisfaction Scale (EMS Scale). The data were analyzed using Statistical Package for Social Sciences (SPSS) software.

Results: The scores of mental health problems in pregnant and lactating women were significantly higher than the control group (18.86 ± 12.56 and 18.83 ± 13.99 vs. 13.01 ± 8.15 , $P < 0.00$). The total CDAS score in the control group was significantly less than pregnant women (30.87 ± 10.56 vs. 26.05 ± 6.12 , $P < 0.001$) and lactating women (30.80 ± 11.37 vs. 26.05 ± 6.12 , $P < 0.001$). The mean of marital satisfaction was significantly lower in the pregnant women (28.06 ± 2.67 vs. 29.64 ± 3.18 , $P < 0.001$) and lactating women (28.74 ± 3.58 vs. 29.64 ± 3.18 , $p = 0.01$) compared with the control group. There was no statistically significant difference in the depression among three groups ($P < 0.05$).

Conclusions: Pregnant and lactating women had more mental health problems, more anxiety and less marital satisfaction in comparison to non-pregnant/lactating women in the course of COVID-19 outbreaks. Further study is needed to investigate the effect of COVID-19 prevalence on mental health and marital satisfaction of pregnant and lactating women, considering the socioeconomic status.

Background

Due to fluctuations and decline in the levels of ovarian hormones, women are at higher risk for mental health issues compared to men (1) and their mental health during reproductive age is a major public health concern in both developing and developed countries (2). There is an association between mental health status and marital satisfaction (3); anxiety and depression are associated with lower marital satisfaction (4, 5). On the other hand, a satisfactory marital relationship prevents depression and psychological disorders, and improves the immune system (6, 7). Pregnancy and childbearing has a major impact on the relationships and subsequently on marital satisfaction (8, 9). Reduced marital satisfaction can lead to anxiety and depression in a pregnant woman and may have negative effects on the outcome of pregnancy (10, 11). Women, who have a higher marital satisfaction, have a greater breastfeeding self-efficacy postpartum and are more likely to initiate and continue breastfeeding (12, 13).

Ideally, pregnancy and having a baby, looking for a safe and positive pregnancy are events that are accompanied by joy and delight. However, some women may experience a range of negative emotions in course of this period (14). Almost all women can have mental disorders during pregnancy and in the first year after childbirth, but emergency and conflict situations, natural disasters, extreme stress, and low social support can increase risks for specific mental health disorders (15). Hence, it is acceptable that these women are vulnerable to mental disorders in the outbreaks of infectious diseases (16). The Covid-19 pandemic has created anxiety among pregnant women in different parts of the world (17, 18).

Coronavirus Disease (COVID-19, also known as 2019-nCoV) has been announced as the sixth Public Health Emergency of International Concern (PHEIC) by the World Health Organization (WHO) (19). In December 2019, China was the first country reporting the COVID-19 as the cause of an outbreak of a respiratory illness (20, 21). In March 2020, a rapid surge in the number of infected people was observed across the world (22).

Previous studies have demonstrated that an outbreak of a novel or serious infectious disease is associated with worsened mental health (23, 24). Hence, the spread of infectious diseases affects the psychological health and well-being of the infected and non-infected people, as well as the physical health of patients (25). The COVID-19 not only causes physical illness but also has a serious impact on people's mental health (26), such as anxiety, depressive symptoms, insomnia, and fear (27). This anxiety and depression may be due to social isolation, media information overload, limited access to basics, high mortality rate, discrimination, and disrupted travel plans (28, 29).

In the Covid-19 pandemic, the concerns of pregnant women include: exposure to the COVID-19, planning their delivery, baby's birth, breastfeeding, neonatal care, and employees who constantly use sodium hypochlorite and alcohol (17).

Therefore, women can be vulnerable to mental health problems during pregnancy and in the first year after childbirth within the COVID-19 outbreak. Also, based on the interaction between mental health and marital satisfaction, both mental health and marital satisfaction can be affected in the prevalence of COVID-19. The aim of this study was therefore to assess mental health, anxiety, depression, and marital satisfaction among pregnant and lactating women and compare the results with non-pregnant/lactating (as control group) during the COVID-19 pandemic in Iran.

Methods

According to the purpose of this study, a descriptive cross-sectional study, a comparison of three groups was conducted from 20 March to 25 April in Iran. Ethics Committee of Tarbiat Modares University of Medical Sciences ratified the research protocol (IR.MODARES.REC.1399.004).

To abide by quarantine for prevention of the COVID-19 spread, an online questionnaire was used to collect data. The online questionnaire creation software (porsline) was used. In this software, more than once the response by one person a mobile phone was prevented. The self-report online questionnaires, including: socio-demographic and obstetric information, General Health Questionnaire (GHQ), Corona Disease Anxiety Scale (CDAS), and ENRICH Marital Satisfaction Scale (EMS Scale).

Firstly, the valid questionnaires link (<https://survey.porsline.ir/s/qahAeAY>) was created and was sent through personal accounts on social media to all social groups that were only female. The objectives of the research, methods and potential outcomes were explained in the first page of the survey. Data was directly stored in the online database upon completion of the survey by the participants. Convenience sampling method was used in this study.

Inclusion criteria were as follows: age range of 18 to 45 years, no history of chronic diseases (such as psychiatric illnesses, infertility, diabetes, cardiovascular disease, premature ovarian failure, hysterectomy), being married and living with husband, having sexual intercourse, not using any medications that is effective in the sexual response cycle (such as hormonal drugs, antidepressants, antihypertensive drugs, and antipsychotic drugs), and no current drug and alcohol abuse. Eligible women entered the study and were classified as one of the three groups of pregnant, lactating (delivered earlier < 1 year ago), and non-pregnant /lactating (delivered > 2 year ago).

Measures:

Socio-demographic and obstetric information were collected. These included: women's age, age at marriage, body mass index, province and city of residence, monthly income amount, educational level, duration of marriage, occupational status, gestational age (based on the week), gravidity, parity, number of live children, previous mode of delivery, and type of pregnancy (willing or unwilling).

Mental Health

The General Health Questionnaire (GHQ) was used to identify potential or at-risk for psychiatric disorders and based on 4 factors labeled anxiety, depression, somatic symptoms, and social dysfunction. The GHQ-28 was developed by Goldberg and Hillier in 1979 and is based on the original GHQ-60. The scores on each subscale were categorized as 0-6 as having no disorder, 7-11 as mild, 12-16 as moderate and 17-21 as severe disorders. At any scale, a score of 6 or higher and a total of 22 or higher indicated morbid symptoms (30). The validity and reliability of GHQ-28 were confirmed in Iran (31).

Corona Disease Anxiety

The Corona Disease Anxiety Scale (CDAS) was prepared to measure the anxiety caused by the outbreak of coronavirus. This tool had 2 subgroups and each question was ranked on a four-point Likert scale (0 = never, 1 = sometimes, 2 = most of the time, and 3 = always). The highest and lowest scores for respondents in this questionnaire are between 0 and 54. High scores on this questionnaire indicate higher levels of anxiety in individuals. Preliminary validity and reliability of CDAS were confirmed in Iran (32).

Marital Satisfaction

ENRICH (Enriching and Nurturing Relationship Issues, Communication and Happiness) Marital Satisfaction Scale (EMS Scale) was used which is composed of 10 questions scoring a 5-point Likert-type. Total score ranges 10 to 50. Higher scores indicate higher marital satisfaction (33). The Persian version of the EMS Scale has been validated (34).

Statistical analysis

After completing the questionnaires by the participants, the data were analyzed using Statistical Package for Social Sciences (SPSS) software, version 22, by descriptive and analytical statistics. $P < 0.05$ was considered statistically significant. To calculate the sample size, the appropriate formula was used and the 95% confidence interval and the 80% power test were considered. Data was summarized as mean (SD) for continuous variables, or n (%) for discrete variables. To compare the mean mental health, anxiety, depression, and marital satisfaction in three groups, analysis of Variance (ANOVA) was used Post-hoc correction using Tuckey's.

Results

Of the 657 women who completed the questionnaires, 53 women were excluded due to either not meeting the inclusion criteria or incomplete filling of questionnaires. A total of 604 valid questionnaires were analyzed, including 200 pregnant women, 203 lactating women, and 201 non-pregnant/lactating women (Figure 1).

The mean age of the participants was 31.01 ± 5.92 , the mean duration of married was 6.71 ± 5.03 , and the mean number of children was 1.09 ± 0.82 . There were no significant differences in education level, duration of menstruation, duration of marriage, number of children, and history of COVID-19 ($P > 0.05$). Demographic characteristics of the three groups are shown in Table 1.

Mental Health Status

Out of 545 (90.8%) women who had minimal or no anxiety, there were 179 (29.8%) pregnant women, 174 (29.0%) lactating women, and 192 (32.0%) control group ($P < 0.05$). There were 150 (25.0%) pregnant women, 160 (26.7%) lactating women, and 186 (31.0%) control group, among 496 (82.7%) women who had minimal or no social dysfunction ($P < 0.05$). About 23 (3.8%) and 22 (3.6%) of women reported moderate to severe anxiety and social dysfunction respectively ($P < 0.05$) and there were no reports from the control group.

The results of table 2 show that there were statistically significant differences between the three groups in somatic symptoms, anxiety, social dysfunction, and total GHQ scores ($P < 0.001$).

Toki Post-hoc comparisons revealed significantly less total GHQ scores between control group with pregnant women (13.01 ± 8.15 vs. 18.86 ± 12.56 , $P < 0.001$) and lactating women (13.01 ± 8.15 vs. 18.83 ± 13.99 , $P < 0.001$).

COVID-19-related anxiety

Based on table 3, there were statistically significant difference between the mean of physical symptoms, psychological symptoms, and total CDAS score (30.87 ± 10.56 and 30.80 ± 11.37 vs. 26.05 ± 6.12 , $P < 0.001$) in pregnant, lactating women and control group ($P < 0.05$). Although there was no significant difference among the pregnant and lactating women in physical symptoms, psychological symptoms, and total scores of CDAS ($P > 0.05$).

Marital satisfaction status

In table 4, Toki post hoc test revealed that the mean of marital satisfaction was significantly higher in control group compared with the pregnant (29.64 ± 3.18 vs. 28.06 ± 2.67 , $P < 0.001$) and lactating women (29.64 ± 3.18 vs. 28.74 ± 3.58 , $P = 0.01$). There were no significant differences between the lactating women and the pregnant women in the mean score of marital satisfaction ($P > 0.05$).

Discussion

In this article pregnant and lactating women are at higher risk for mental disorders during outbreaks of COVID-19. According to our results, the total scores of GHQ in pregnant and lactating women was higher than non-pregnant/lactating women and even almost all cases of moderate to severe levels of anxiety, social dysfunction, and physical symptoms were observed in these women. This is supported by the fact that emergency and conflict situations, natural disasters, extreme stress, and low social support can increase the risks associated with specific mental health disorders during pregnancy and after childbirth (15), and so these women are at risk for mental disorders in the spread of infectious diseases (16).

Moghanibashi-Mansourieh. found that the level of anxiety in women was significantly higher than men in the COVID-19 outbreaks (35) and Lee DT et al. reported that the anxiety levels of pregnant women at the peak of the SARS outbreaks in Hong Kong were slightly higher than a comparative pre-SARS group (36). In the present study, both anxiety and COVID-19-related anxiety were measured, and the mean anxiety of pregnant and lactating women was higher than non-pregnant/lactating women. According to previous studies, the cause of increased anxiety may be due to issues related to pregnancy, lactating, or the additional burden of anxiety caused by the outbreaks of COVID-19 (14, 15, 17, 18).

Lee DT et al. also reported that there was no statistically difference in the levels of depression between the pregnant women at the peak of the SARS and pre-SARS group. As in our research, there was no significant difference in

depression between the three groups, which was different from previous research that depression symptoms existed among the general population during the COVID-19 outbreaks. Huang Y and Zhao N found that almost one in five participants in the study had depressive symptoms (37).

Our results on depression among the three groups were possibly due to the high socioeconomic status, such as the large number of participants with education over 12 years and income above 3 million (Tomans) in our participants.

Pregnancy and childbirth are periods of life transition in which the quality of the relationship may play an important role (38). Bayrami M et al. reported that marital satisfaction was negatively associated with anxiety. The anxiety was stable in different circumstances and could have a significant negative effect on marital satisfaction (39). The outbreaks of COVID-19 can cause anxiety, which can affect marital satisfaction. According to the present study, the marital satisfaction of pregnant and lactating women was lower than non-pregnant/lactating women. Hence, both pregnant and lactating women are at higher risk for anxiety and low marital satisfaction within the COVID-19 outbreaks.

The limitation of this study is that participants must have the ability to use computers at least; otherwise they would not be able to participate in the study. Therefore, the results of this research cannot be generalized to all pregnant and lactating women. The strength of this research is that participants from a wide range of geographical and socioeconomic backgrounds were included.

Conclusion

In conclusion, our results showed that pregnant and lactating women are vulnerable to mental health problems and are more likely to experience anxiety and have less marital satisfaction during the outbreaks of COVID-19. Further research is warranted to explore the impact of COVID-19 outbreak on the mental health and marital satisfaction of pregnant and lactating women with consideration of socioeconomic status.

List Of Abbreviations

SARS: Severe Acute Respiratory Syndrome

COVID-19: Coronavirus Disease 2019

WHO: World Health Organization

PHEIC: Public Health Emergency of International Concern

GHQ: General Health Questionnaire

CDAS: Corona Disease Anxiety Scale

EMS Scale: ENRICH Marital Satisfaction Scale

ENRICH: Enriching and Nurturing Relationship Issues, Communication and Happiness

SPSS: Statistical Package for Social Sciences

ANOVA: Analysis of Variance

Declarations

Ethics approval and consent to participate

The study was approved by the Ethics Committee of Tarbiat Modares University of Medical Sciences (IR.MODARES.REC.1399.004). All procedures were in accordance with the ethical standards of the Regional research committee and with the Declaration of Helsinki 1964 and its later amendments. After explaining the study's purposes, written consent assent were collected from all participants and women were informed that their participation were voluntary, confidential, and anonymous, and were apprised of their right to withdraw from the research at any time.

Consent for publication

Not applicable.

Availability of data and materials

The datasets used and analyzed during the current study are available from the corresponding author on reasonable request

Competing interests

The authors declare no conflict of interest.

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None.

Authors' contributions

Sh.JS, M.GH and A.M contributed to the conception and design of the study; Sh.JS and M.GH did the literature search; A.K, and M.B performed the statistical analysis; M.GH, Sh.JS, A.M, and M.B wrote the first draft of the manuscript. All authors contributed to manuscript revision, read, and approved the submitted version.

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Tables

Table 1: Comparison of Demographic Characteristics Between, Pregnant, Lactating, non-pregnant/lactating (N=604)

Variables	Pregnant (N=200) Mean ± SD or n (%)	Lactating (N=203) Mean ± SD or n(%)	non- pregnant/ lactating (N=201) Mean ± SD or n (%)	P-value
Age (years) ^a	30.01±5.83	30.35±5.30	32.75±6.26	<0.001
Gravid ^a	1.86±1.25	1.23±0.85	1.15±1.00	<0.001
Parity ^a	0.97±0.84	1.19±0.79	1.05±0.84	0.03
Number of Children ^a	1.02±0.84	1.20±0.78	1.07±0.82	0.08
Education ^b				0.10
≤12 years	34(17.2)	28(13.7)	43(21.3)	
>12 years	164(82.8)	175(86.2)	149(78.4)	
Occupation ^b				0.01
Unemployed	2(1.1)	2(1.0)	4(2.1)	
Employed	136(73.9)	145(74.2)	111(58.4)	
Self-employed	16(8.7)	15(7.7)	18(9.5)	
Student	30(16.3)	35(17.0)	58(30.0)	
Duration of Marriage (years) ^a	7.11±4.80	6.74±4.56	6.30±5.66	0.27
Monthly Income (Tomans) ^b				0.34
No Income	10 (5.9)	9(4.7)	9(4.8)	
< =3 Million	19(11.2)	12(6.3)	12(6.3)	
>3 Million	140(82.8)	174(89.1)	169(88.9)	

Note: Significant at the 0.05 level (two-tailed). n = number; % = percentage; SD = standard deviation

ANOVA test, ^b Chi-square test

Table 1: Comparison of Demographic Characteristics Between, Pregnant, Lactating, non-pregnant/lactating (N=604) (Continued)

Variables	Pregnant (n=200) n (%)	Lactating (n=203) n (%)	non- pregnant/ lactating (n=201) n (%)	P- value ^a
Monthly Income (Tomans)				0.34
No Income	10 (5.9)	9(4.7)	9(4.8)	
< =3 Million	19(11.2)	12(6.3)	12(6.3)	
>3 Million	140(82.8)	174(89.1)	169(88.9)	
History of COVID-19				0.19
No	194(97.5)	188(94.4)	190(95.5)	
Yes	4(2.0)	3(1.5)	4(2.0)	
The family members we live with have COVID-19	1(0.5)	8(4.1)	4(2.0)	<0.001
During of Quarantine (days)				
Not at all	2(1.0)	4(2.0)	3(1.5)	
Very little	84(42.4)	4(2.0)	7(3.5)	
Low	23(11.6)	17(8.6)	16(8.1)	
Much	47(23.7)	44(22.2)	44(22.2)	
Very much	42(21.2)	132(65.2)	129(64.6)	

Note: Significant at the 0.05 level (two-tailed). n = number; % = percentage; COVID-19, coronavirus disease

Chi-square test

Table 2: Comparison of GHQ and Its Subgroups Between, Pregnant, Lactating, and Non-Pregnant/Lactating (N=604)

Variables	Pregnant (P) (n=200) Mean ± SD	Lactating (L) (n=203) Mean ± SD	Non- pregnant/ lactating (C) (n=201) Mean ± SD	P- value ^a	Pair Wise Comparison P-Value ^b
Somatic Symptoms	8.15±5.16	7.92±5.12	5.74±4.04	< 0.001	P vs. L: 0.87 P vs. C: < 0.001 L vs. C: < 0.001
Anxiety	3.09±3.90	3.15±4.32	1.62±1.91	< 0.001	P vs. L: 0.98 P vs. C: < 0.001 L vs. C: < 0.001
Depression	2.45±3.15	3.06±3.85	2.32±3.13	0.06	P vs. L: 0.16 P vs. C: 0.92 L vs. C: 0.07
Social Dysfunction	5.16±3.33	4.70±3.55	3.32±1.93	< 0.001	P vs. L: 0.27 P vs. C: < 0.001 L vs. C: < 0.001
Total Scores	18.86±12.56	18.83±13.99	13.01±8.15	< 0.001	P vs. L: 1.00 P vs. C: < 0.001 L vs. C: < 0.001

Note: Significant at the 0.05 level (two-tailed). GHQ, General Health Questionnaire; SD = standard deviation

^a One-way ANOVA test

^b One-way ANOVA followed by Toki post hoc test.

Table 3: The CDAS Scores in Pregnant and Lactating Women Compared with Non-Pregnant /Lactating (N=604)

Variables	Pregnant (P) (n=200) Mean ± SD	Lactating (L) (n=203) Mean ± SD	Non- pregnant/ lactating (C) (n=201) Mean ± SD	P- value a	Pair Wise Comparison P-value ^b
Physical Symptoms	11.91±5.00	12.27±5.53	10.20±1.97	< 0.001	P vs. L: 0.69 P vs. C: < 0.001 L vs. C: < 0.001
Psychological Symptoms	18.96±6.30	18.53±6.39	15.84±4.80	< 0.001	P vs. L: 0.74 P vs. C: < 0.001 L vs. C: < 0.001
Total Scores	30.87±10.56	30.80±11.37	26.05±6.12	< 0.001	P vs. L: 0.99 P vs. C: < 0.001 L vs. C: < 0.001

Note: Significant at the 0.05 level (two-tailed). CDAS, Corona Disease Anxiety Scale; SD = standard deviation

One-way ANOVA test

One-way ANOVA followed by Toki post hoc test.

Table 4: Comparison of ENRICH Marital Satisfaction Between, Pregnant, Lactating, and Non-Pregnant /Lactating (N=604)

Variables	Pregnant (P) (N=200) Mean ± SD	Lactating (L) (N=203) Mean ± SD	Non- pregnant/ lactating (C) (N=201) Mean ± SD	P- value a	Pair Wise Comparison P-value ^b
Marital Satisfaction	28.06±2.67	28.74±3.58	29.64±3.18	< 0.001	P vs. L: 0.07 C vs. L: 0.01 C vs. P: < 0.001

Note: Significant at the 0.05 level (two-tailed). ENRICH, Enriching and Nurturing Relationship Issues; SD = standard deviation

One-way ANOVA test

One-way ANOVA followed by Toki post hoc test.

Figures

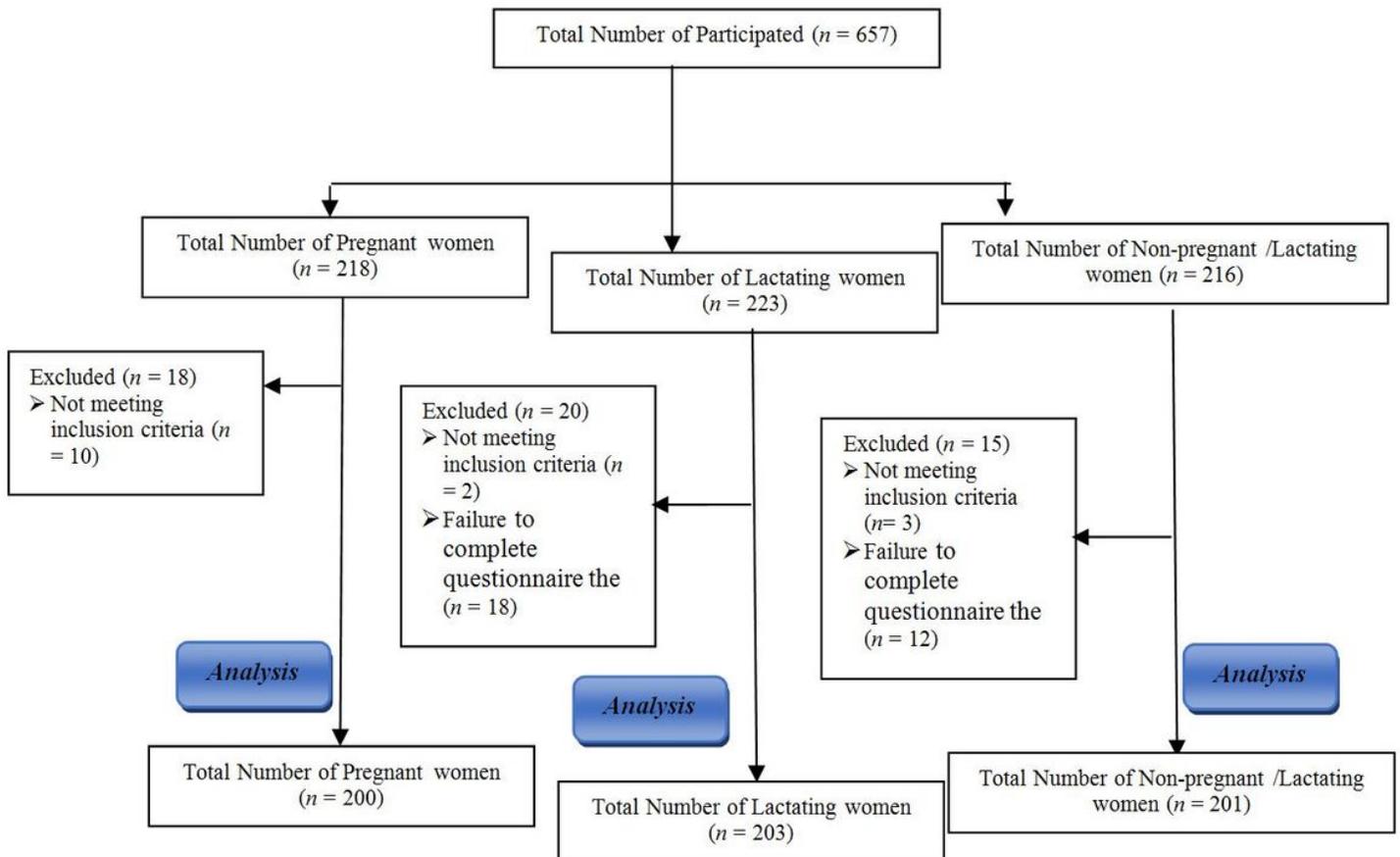


Figure 1

Flow chart for this cross-sectional study.

Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- [Questionnaire.pdf](#)