

Impact of covid 19 pandemic on knowledge, practice and mental health of breastfeeding women: experience of souissi maternity hospital of Rabat, Morocco

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Abstract: In Morocco, the promotion of maternal and child health is an important axis of the strategy to fight against the repercussions of the covid-19 pandemic. We aim to explore knowledge, practices and mental health of breastfeeding mothers. A cross-sectional study was conducted at the maternity hospital center in Rabat. The data has been collected through a face-to-face interview with mothers. Information regarding mental health were collected using the questionnaire of the post-traumatic stress disorder. Analysis showed that three quarters of mothers were unaware of transmission of the virus through the fetal route and through breastfeeding. This ignorance was significantly high among illiterate mothers compared to educated women ($p < 0.001$). Analysis of practices showed that early breastfeeding, practice skin-to-skin, use of a facemask and compliance with respiratory hygiene rules during breastfeeding were found only in 53.4%, 43.1%, 38.3% and 42.2% of mothers respectively. Psychological disorder concerned 45.7% of mothers and was significantly associated with place of residence ($p < 0.001$), educational level ($p < 0.001$), profession ($p < 0.001$) and monthly expenditure ($p = 0.019$). This study can be used to evaluate the national Covid 19 pandemic monitoring and response plan and highlights the importance of mental health care for pregnant and breastfeeding women.

1 Introduction

Maintaining essential health services and particularly the continuity of maternal and child health care services are one of the major challenges facing the health system today following the emergency of the pandemic known as Covid 19. Since its appearance, the life of the global society has been completely disrupted due to the particular characteristics of the pandemic, the causative agent and the restrictive public health measures implemented to curb its transmission [1]. Thus, a preparedness and response strategy plan has been implemented with the aim of guiding the public health response to COVID 19 on a global scale and providing practical guidance to prevent indirect morbidity linked to the disease. Pandemic, namely the complications associated with late seeking of care and the increase in non-chronic diseases following the interruption of care. In this sense, a vigilance and health security strategy has been put in place to combat the negative repercussions of this pandemic on the population in general and on vulnerable groups in particular. Thus, certain areas have deserved priority attention in order to protect the categories most exposed to infection by the Sars-CoV 2 virus, in particular pregnant women due to physiological and immune changes, which increase their sensitivity to respiratory infection. In this context, maternal and newborn services must face emerging needs during this pandemic to ensure on the one hand the continuity of prenatal health services and postnatal care and on the other hand to promote and protect breastfeeding whose health benefits for both mother and child

have been widely documented in the scientific literature. Indeed, breastfeeding in the context of the pandemic has aroused the interest of the scientific community and several studies have been conducted to explore the impact of the pandemic breastfeeding practices. Although some studies have confirmed the absence of the sarscov-2 virus in breast milk [2], the practice of breastfeeding and its sustainability during this pandemic have been the subject of several questions in connection with the transmission of the virus through respiratory secretions from the infected mother or during breastfeeding [3]. Thus, this situation can lead to fears and a state of stress in nursing mothers accentuated by other psychological and psychosocial stressors linked to the pandemic and to the preventive measures taken to limit its spread. As a result, the disruption of mental health can cause nursing mothers to refuse to give this biologically valuable fluid to their infants and subsequently to discontinue this practice during the COVID-19 pandemic. Morocco, with regard to other countries, has not escaped the negative repercussions of this perinatal health crisis despite the early and multisectoral response arrangements (security, health, economic and social) undertaken following the appearance of the first local outbreak. In addition, there are no national data describing the current state of knowledge and practices of pregnant women in the prevention of infection by SARS-CoV-2 during the postnatal period. It is within this framework that this work falls, which represents a first Moroccan study, carried out at the beginning of the pandemic and dealing with this problem. This study aims to assess the impact of the Covid 19 pandemic, on the one

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hand, on breastfeeding knowledge and practices and on the

2 Materials and methods

2.1 Study location and population

We conducted a single-center cross-sectional survey over a period of 6 months (from June 31, 2020 to December 31, 2020) in the Souissi maternity hospital of Rabat.

The study population was a population of breastfeeding mothers who gave birth in this hospital during the period of our study and who agreed to participate in our survey. We excluded all women with a termination of pregnancy or fetal death in utero, women under psychological treatment, women with a mental pathology and non-consenting women

2.2 Data collection tools

We conducted a face-to-face interview with the parturients in postpartum between the first and second day of postpartum. The data were collected using a simple, clear, precise questionnaire and a psychometric tool. These have been completed by a healthcare professional.

The questionnaire made it possible to collect data relating to the socioeconomic and biodemographic profiles of mothers, data on the progress of pregnancy and childbirth, neonatal data, knowledge and practices of nursing mothers in the context of Covid-19 pandemic.

The Posttraumatic Stress Disorder Checklist Scale (PCLS) is a self-measuring. It is made up of 17 items corresponding to the 17 symptoms of PTSD. Each item is rated on a 5-point likert scale according to the intensity and frequency of the disorders (1 = not at all, 2 = a little, 3 = Moderately, 4 = Quite a bite, 5 = Extremely).

These were grouped into three main syndromes: * Intrusion (items 1 to 5), ** Avoidance (items 6 to 12), *** Hyperstimulation or hypovigilance (items 13 to 17).

Compared to the rating of the scale, an overall score is obtained by adding the scores for each item. The overall score is between 7 and 85. In our study, the participants who presented a PCLS score above 34 were referred to psychotherapy.

2.4 Statistical analysis

All statistical analysis were performed using statistical Package for Social Sciences (SPSS) version 13. The Kolmogorov-Smimov test was used for the study of quantitative variables. Thus, the Gaussian-distributed quantitative variables (gestational age and number of antenatal consultations) were expressed as mean and standard deviations and compared by student t test. Categorical variables were expressed as frequency and percentage and compared using Chi-square test, although Fisher's exact test was used in cases where data was limited. A two-sided α of less than 0.05 was considered statistically significant for all analysis.

other hand, on the mental health of breastfeeding mothers.

2.5 Ethical Considerations

The study protocol was approved by the ethics committee of the Faculty of Medicine and Pharmacy, Mohammed University of Rabat, Morocco (Ethics approval number IORG0006594). The purpose and protocol of the study were presented and explained to the participants. The women subsequently gave their oral and written consent before the start of the survey. The right to anonymity and confidentiality has been rigorously respected.

3 Results

3.1 Sociodemographic characteristics of the participants

The average age of the 313 mothers in our population was 27.42 ± 5.3 with extremes ranging from 15 to 44 years and with a preponderance of the 25 to 35 age group : 199 / 313 (63.6%). More than half resided in urban area 194/313 (62%) and almost three-quarters 229/313 (73.2%) were Arab ethnic origin. Regarding the level of education, we noted that 113/313 (36.1%) were illiterate, 177/313 (56.60%) had a primary or secondary level while only 23/313 (7.3%) had a higher-level .271/313 (86.6%) were housewives and half of the population 161/313 (51.4%) had an average socioeconomic level.

3.2 Prenatal and neonatal characteristics

The information on prenatal were presented in Table 1. At the time of the declaration of the covid-19 pandemic, 71.2% of mother's respondents were in the second trimester of their pregnancy with a mean gestational age of 5.38 ± 1.14 months. 61.7% mothers continued to monitor their pregnancy mainly in the public sector (65.5%). Comparison of the average number of antenatal consultations performed by women in our population revealed that the average number of antenatal consultations was significantly high during the period before the declaration of the pandemic compared to the period after the declaration of the pandemic (2.16 ± 0.85 versus 1.73 ± 0.78 ; $p < 0.001$). In addition, our results showed that childbirth was normal in 60.1% of women and that the majority of newborns (87.2%) had a normal birth weight.

Table 1 Distribution of mother according to prenatal and neonatal parameters during pandemic covid-19 declaration

Characteristics	Population of mothers N=313 n (%)
gestational age	
First trimester	12(3.8)
Second trimester	223(71.2)
Third trimester	78(24.9)
Pregnancy monitoring (yes)	193(61.7)
pregnancy monitoring area	

Public	206(65.8)
Private	31(9.9)
Public and private	76(24.3)
mode of delivery	
Cesarean	33(10.5)
Vaginal birth with episiotomy	92(29.4)
Vaginal without episiotomy	188(60.1)

of infection of the mother	
No	226(72.2)
Yes	87(27.8)
Possibility of separation of her newborn in case of infection of the mother	
No	271(86.6)
Yes	29(9.3)

3.3 Mothers' knowledge of breastfeeding and Sars cov-2 infection

Analysis of (Table 2) revealed that three quarters of mothers were unaware that the virus is not transmitted through the maternal-fetal route (70%) and breastfeeding (71.2%) and that the breast milk does not contain the virus (70.6). The same proportion were also unaware that the mothers did not breastfeed their child (73.2%) and hug them (72.2%) even if she was infected with the virus. The majority of women had knowledge of respiratory hygiene (82.1%) and personal hygiene (92%). Our results revealed that a minority of women (9.3%) knew that the newborn must separate from his mother if she is infected or if he is seriously ill. However, almost half (49.2%) of the mothers knew that separation is also possible if the newborn has a comorbidity requiring hospitalization in an intensive care unit. Otherwise, analysis of advice provided during the prenatal period on breastfeeding and infection with Sars cov-2 revealed that 278/313 (88.82%) of mothers received advice on the importance of respecting respiratory and body hygiene rules on the prevention of infection by the virus. In contrast, 219/313 (70%) did not receive information on the means of transmission of the virus during pregnancy and childbirth.

Table 2 Distribution of Mother's according knowledge of breastfeeding and Sars cov-2 virus infection

Characteristics	Population of mothers N=313 n(%)
Maternal fetal transmission of the virus	
No	219(70)
Yes	94(30)
Existence of the virus in breast milk	
No	221(70.6)
Yes	92(29.4)
Transmission of the virus through breastfeeding	
No	223(71.2)
Yes	90(28.8)
Possibility of breastfeeding in case of infection of Mother	
No	229(73.2)
Yes	84(26.8)
Respiratory hygiene	
No	56(17.9)
Yes	257(82.1)
Personal hygiene	
No	25(8)
Yes	288(92)
Possibility of taking a newborn in the arms in case	

3.4 Correlation between socio-demographic parameters and mothers' knowledge of the transmission of the covid-19 virus during pregnancy and breastfeeding

The analysis of the association between the socio-demographic parameters of mothers (age, level of education and profession) and knowledge of the sarscov-2 virus transmission during pregnancy and lactation (revealed a great lack of knowledge among illiterates and housewives. In fact, the percentage of ignorance was significantly high among illiterate mothers compared to educated women concerning knowledge about the existence or not of the virus in breast milk ($p < 0.001$), vertical transmission of the virus by the fetal- maternal route ($p < 0.001$), or through breastfeeding ($p < 0.001$). This finding was also noted among housewives compared to officials. On the other hand, knowledge was statistically similar according to the place of residence.

3.5 Mothers' Practices Regarding Breastfeeding and Sars cov-2 Infection

Analysis of practices (Table 3) revealed that breastfeeding during the first half hour after childbirth concerned only half of the population (53.4%). The distribution of mothers according to compliance with protective measures showed that the use of a facemask and compliance with respiratory hygiene rules during breastfeeding were found only in 38.3% and 42.2% of mothers respectively. In contrast, the majority of mothers (80.5%) practiced the body hygiene particularly in hand washing before breastfeeding. In addition, among mothers who practiced skin to skin with their babies (43.1%) we noted that more than half 61.5% put on their facemask during this contact. However, the majority of mothers (82.7%) exclusively breastfed their infant and plan to breastfeed exclusively until the age of 6 months in 79.2% of cases and continue breastfeeding until the age of 24 months in 77.2% of cases. During our investigation, we were also interested in exploring the organization of family visits by women in the hospital establishment after childbirth. With this in mind, we found that 104/313 (33.2%) received visits during their stays in the maternity ward, and of which more than half 41/104 (39.43%) did not respect the rules of social distancing. Similarly, 34/104 (32.70%) did not wear appropriate protective equipment, which included a gown, gloves, and a face shield.

Table 3 Breastfeeding practice of mothers in the context of the Covid 19 pandemic

Characteristics	Population of mothers N=313 n(%)
Breastfeeding in the delivery room ½ hour after delivery	
No	146(46.6)
Yes	167(53.4)
Use a facemask during feeding	
No	193(61.7)
Yes	120(38.3)
Practice of respiratory hygiene, during feeding	
No	181(57.8)
Yes	132(42.2)
Practice of hand hygiene before and after each feeding	
No	61(19.5)
Yes	252(80.5)
Skin-to-skin contact	
No	178(56.9)
Yes	135(43.1)
Use a facemask during skin-to-skin contact	
No	52(38.5)
Yes	83(61.5)
Exclusive breastfeeding	
No	54(17.3)
Yes	259(82.7)
Exclusive breastfeeding up to 6month	
No	11(4.2)
Yes	248(95.8)
Breastfeeding up to 24 month	
No	59(22.8)
Yes	200(77.2)

3.6 Impact of the Covid 19 pandemic on the mental health of mothers

The final part of our work was oriented towards exploring the impact of the covid-19 pandemic on women's mental health using the Posttraumatic stress disorder Checklist Scale (PCLS). Analysis of the results obtained revealed on the one hand that the median total score was 34 [28-48.50] with extremes ranging from 17 to 85 and on the other hand, that almost half of the women have manifested post-traumatic stress disorder. In fact, 143/313 (45.7%) of the women had a total score greater than 34 and 81/313 (25.9%) had a total score greater than 45. The median score of the three sub-dimensions were represented in figure 1. Analysis of correlation between the state of post-traumatic stress disorder and the socio-demographic characteristics of breastfeeding mothers (Table 4) revealed a significant state of stress among women living in peri-urban and rural areas, illiterate women and those with secondary education, housewives and finally, among women whose

monthly income is less than 220.77 US\$, as well as those with a monthly income included in the range of 220.77 and 551.93 US\$ with an overall proportion of 88.1% (p = 0.019).

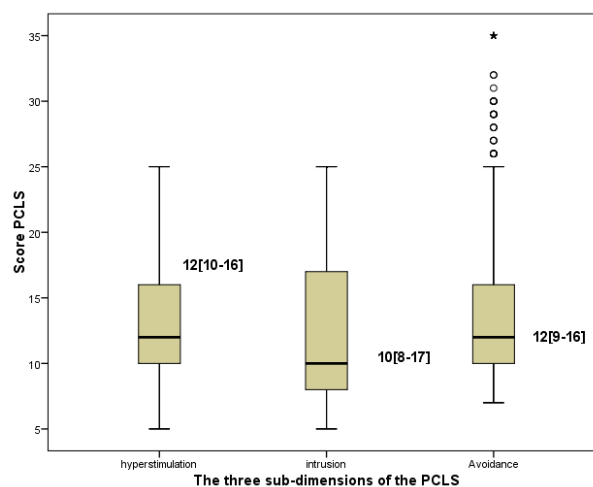


Figure 1: Distribution of the population of breastfeeding mothers according to the three sub-dimensions of the PCLS (Posttraumatic stress disorder Checklist Scale)

Table 4 Correlation between socio-demographic characteristics and post-traumatic stress disorder

Variables	Population of mothers N= 313		P*
	Total score< 34 n=170	Total score> 34 n=143	
Place of residence			
Urban	47(27.6)	14(9.8)	<0.001
Rural	27(15.9)	31(21.7)	
Suburban	96(56.5)	98(68.5)	
Level of education			
Illiterate	75(44.1)	38(26.6)	<0.001
Primary	54(31.8)	37(25.9)	
Secondary	38(22.4)	48(33.6)	
Higher education	3(1.8)	20(14)	
Profession of mother			
Unemployed	162(95.3)	109(76.2)	<0.001
Public profession	1(0.6)	28(19.6)	
Liberal profession	7(4.1)	6(4.2)	
Monthly expenditure (US\$)			
Less than 220.77	77(45.3)	51(35.7)	0.019
Between 220.77 and 551.93	86(50.6)	75 (52.4)	
More than 551.93	7(4.1)	17(11.9)	

Note the values are expressed as number and percentage. *Chi-square test. US\$: American dollar

4 Discussion

The analysis of the results obtained allowed us to make an inventory of the knowledge and practices of breastfeeding in a population of Moroccan nursing mothers. The theme of this work remains a subject of concern in the promotion of maternal and child health, especially during this unprecedented health crisis that has disrupted the lives of billions of people and destabilized health systems worldwide in the face of increased demand for care for people with COVID-19. In addition, this situation created fear, stress, anxiety and concern among individuals in general and pregnant women in particular. As a result, the perinatal effect represents an important aspect of the covid 19 pandemic due to the changes and organizational modifications of obstetric care in this epidemic context [4-5]. With this in mind, we were initially interested in knowing to what extent access to healthcare services and medical advice have been affected by Covid 19 in our population. Analysis of the results obtained revealed a statistically significant decrease in the average number of prenatal consultations ($p < 0.001$, table 1) and that almost half of the women were unable to continue the follow-up during the confinement period. The decrease in access to the service observed in our work can be explained by the increased demand for care by the affected population, which disrupted health services, and by the fear of contamination, misinformation and confinement of the population.

Our first finding emphasizes the importance of continuity of prenatal care in the context of the Covid pandemic 19 as data from the scientific literature from previous outbreaks have reported that decreased access to essential health care services has indirect consequences in terms of mortality from preventable and treatable conditions [6-7]. Indeed, the interruption or under-utilization of maternal and neonatal care services during this epidemic can lead to a considerable increase in maternal and/or fetal mortality or morbidity during prenatal, delivery or postpartum periods according to the literature [8].

It has also been reported that the number of maternal and neonatal deaths as well as the number of unwanted pregnancies is increasing even with a small decrease (10%) in the coverage of services during pregnancy due to the disorganization of family planning services [9]. In this sense, the WHO has given recommendations to maintain all the essential elements of prenatal and postnatal care and to guarantee the accessibility at all times of women as well as newborns to health services, especially clinical and paraclinical care [10].

Our study also showed a great lack of knowledge among breastfeeding mothers about SARS-CoV-2 infection, namely the possible impact of the virus on the fetus, vertical transmission, transmission through breast milk, as well as the reasons for mother-infant separation in this epidemic context. This great ignorance is explained by the characteristics of the pandemic and its causal agent,

but also by the absence of definite scientific information on its mode of transmission. The latter was the subject of several questions at the beginning of the pandemic and

several scientific works including meta-analyses by Fenizia et al, Flaherman et al, Knight et al and Walker et al reported that vertical transmission is a rare phenomenon [10-13]. Cases of transmission during the third trimester and particularly during the 14 days prior to delivery were reported by a study that examined transmission in 936 SARS-CoV-2 positive mothers and found that 3.2% (95% CI: 2.2% to 4.3%) of neonates were infected with SARS-CoV-2 immediately after birth or within the first 48 hours [14]. Nevertheless, our results remain similar to a study that reported that the level of knowledge of pregnant women remains low and far from reality and this seems to be associated with an indirect effect on the psychological anxiety and stress of pregnant women [15].

For the association between the knowledge of pregnant women about SARS-CoV-2 infection and socio-demographic parameters, the results showed a significant correlation between women's knowledge, their level of education and their professional status ($p < 0.001$). Our results are similar to those of the study conducted in Colombia which showed significantly higher knowledge of the effects of SARS-CoV-2 during pregnancy in women with a higher level of education and a higher socioeconomic status.[20]. In addition, data from the literature have shown the existence of a positive correlation between intellectual level and understanding of educational material [16] as well as health-related behaviors [17]. The level of education also influences the level of understanding and appropriation of public health messages [18].

Concerning practices of mothers, our survey showed that the percentage of early breastfeeding during the first half hour (53.4%, table 3) considerably exceeded the percentage reported in a similar single-center study carried out in the same hospital center with a percentage of 11.4% [19]. In addition, almost half of mothers have practiced skin-to-skin contact with their infant (43.1%, Table 4) and the majority of mothers plan to breastfeed exclusively until 6 months and even continue breastfeeding until 24 months. This is probably the result of national health strategies to promote breastfeeding and the development of recommendations to support this practice. In this context, UNICEF-Morocco has supported the Ministry of Health since 2018, through an integrated quality management of newborn health through interpersonal communication sessions for behavioral and social change on the main themes of maternal and child health, in particular early childhood development and breastfeeding promotion.

In terms of application of the recommendations, which aim at protecting against infection and transmission of the virus, we found that more than three quarters of the breastfeeding mothers had knowledge of the means of protection and the rules of respiratory and body hygiene. This high level of knowledge can be explained by the

educational role of the media and social networks in this context and by the early implementation of major awareness campaigns, which aim at providing accurate, and reliable information to the general public regarding the prevention of Sars Cov 2 infection. Nevertheless, we noticed that the practice of these rules is observed only in 38.3% of the mothers for the use of the facemask and in 42.2% for the practice of respiratory hygiene. Consequently, more than half of the mothers did not respect these rules of protection despite the high level of knowledge found in our study. This finding may be related to the stress of mothers in this pandemic context, that the reason why we have explored in this second part of our work the impact of the pandemic on the mental health of breastfeeding mothers.

Thus, the analysis of the psychological survey using the PCLS tool revealed that 45.7% manifested a state of post-traumatic stress. This result is a normal consequence as fear, worry and stress are normal responses of any person facing a real threat such as natural disasters and epidemics. Therefore, it is understandable that pregnant women are vulnerable to mental health problems especially at the beginning of the declaration of the Covid 19 pandemic, a period during which information about the virus and the infection was very limited and uncertain. Which seems to be consistent with our results since our study was conducted at the beginning of the declaration of the pandemic. On the other hand, some studies conducted immediately after the declaration of the pandemic revealed that psychological disorders are more frequent in women compared to men, which further increases the vulnerability of pregnant women to mental disorders [20].

At the same time, data from the literature have reported that pregnant women experience moderate to high emotional distress related to pregnancy-related stress and stress related to fears of perinatal COVID-19 infection [21-22]. Indeed, according to the results of study that addressed vulnerability to covid-19 stress in 4,451 pregnant women in the United States, almost 1/3 reported high stress related to unpreparedness for pregnancy due to the pandemic and the same proportion exhibited fear of perinatal infection [23]. Simultaneously, several authors have reported that the effect on women's mental health during pregnancy and infancy is an important aspect of the COVID-19 pandemic [24-26]. Thus, women are at increased risk of depression, anxiety and post-traumatic stress, accentuated by new stressors related to the preventive health measures of the pandemic, such as physical distancing, isolation at home [27-28]. The psychological outcomes of the pandemic on pregnant women at the beginning of the pandemic was also highlighted by a study conducted in Italy which showed that the COVID-19 epidemic had a moderate to severe psychological impact on pregnant women [29].

According to the results of this study, more than two thirds showed higher than normal anxiety and almost half of the women reported high anxiety related to vertical transmission, which explains to some extent the state of stress found in our study since almost three

quarters of our women had no knowledge about vertical transmission of the virus (Table 2). Furthermore, our study revealed a significant association between post-traumatic stress and certain social determinants of health such as level of education, mother's profession and social economic level, which explains the high prevalence of post-traumatic stress in our study population. Indeed, the analysis of our results revealed that the psychological impact of the pandemic was more accentuated among illiterate women or those with a low level of education, among housewives and among women with a low or average economic income (Table 4). This finding is consistent with the magnitude of the problem given the social, economic and intellectual profile of our group, which highlights other stressors related to the economic and social consequences of the pandemic, including financial difficulties and increased interpersonal stressors [29].

The results of our study were limited by the single center design. Nevertheless, it represents a first experience that allowed the exploration of the impact of the Covid19 pandemic in perinatal in a Moroccan context.

5 Conclusion

The results of this study clearly demonstrated that there are gaps in women's knowledge about SARS-CoV-2 infection during gestation and postpartum. In addition, this study also revealed that mothers as a group at high risk of postpartum mental disorders require mental health and psychosocial support during the period of the pandemic because current scientific evidence suggests that in this context a long-term psychological distress can affect both mothers and infants and the risks to infants may extend into infancy

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