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Association of Socio-economic and Mental Health Determinants with Breastfeeding Practices among a Population of Moroccan Women during the COVID-19 Pandemic: A Cross-sectional Study

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ABSTRACT

Background: The worldwide pandemic imposed by SRAS-CoV-2 affected all aspects of daily life including those of pregnant and breastfeeding women. This work aims to explore the impact of socio-economic determinants and mental health on breastfeeding practices among a group of Moroccan women during this pandemic.

Methods: This is a descriptive and observational study carried out over 6 months in a maternity hospital. Data relating to the practices and the state of stress of women were collected via an interview and a questionnaire on post-traumatic stress disorder (PTSD).

Results: Early breastfeeding and skin-to-skin practice were significantly elevated among educated women ($p < 0.001$) and housewives ($p = 0.028$). Compliance with respiratory and body hygiene rules was significantly higher among women: of urban origin, educated, housewives, and those with medium or high socioeconomic levels. The study of the impact of stress on breastfeeding practices revealed a statistically significant difference in early breastfeeding ($p = 0.004$), compliance with respiratory and body hygiene rules ($p < 0.001$), and skin-to-skin practice ($p < 0.001$) between the group of normal women and the group of stressed women.Our results showed the impact of socio-economic determinants and mental health on breastfeeding practice during this pandemic.

Conclusion: This represents a great challenge for the health system to promote breastfeeding and reduce the consequences of psychological disorders for mothers and unborn children in Morocco.

Keywords: Breastfeeding, Covid 19, Practices, Post-traumatic stress, Socio-economic determinants

Introduction

The pandemic imposed by the coronavirus (COVID 19) and the measures taken to control its spread, have profoundly affected all aspects of the world's daily life (1) and especially women's lives during the gestation period and postpartum.

As a new pathogen, no data was initially available on its vertical or postnatal transmission (2). This is compounded by conflicting messages from major public health agencies (3).

This situation is likely to lead to increased stress, anxiety, loneliness, and depression in this vulnerable population (4-5). At the same time, the

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pandemic and the response to the pandemic have affected both the provision and use of reproductive, maternal, newborn, and child health services (6).

Decrease in coverage ranging from 9.8% to 18.5% of reproductive, maternal, and child health interventions have been recorded (7). For example, several countries have had to cancel antenatal exercises, hospital visits, and antenatal classes (6, 8).

In Morocco, health protection of both pregnant women and newborns was one of the priorities in the strategy to fight against the repercussions of this pandemic. Its objective was to ensure the continuity of maternal and neonatal services and to promote and protect breastfeeding, whose role in maternal and infant health is indisputable (9-10).

However, many factors are already recognized as variables influencing breastfeeding. Indeed, it has been reported that young mothers, uneducated mothers, and those from low socioeconomic backgrounds are less likely to breastfeed or continue breastfeeding (11).

Breastfeeding rates also vary according to different cultural and linguistic backgrounds and according to occupations (12-14). Moreover, this pandemic has had negative repercussions on the mental health of breastfeeding mothers, primarily due to the confinement measures imposed by the Moroccan government. Additionally, particular characteristics of this emerging desease, such as the severity of the infection, and the rapid transmission of the causal agent (15), have further contributed to the challenges faced by breastfeeding mothers.

The present study aims to explore the association of socioeconomic and mental health determinants with breastfeeding practices among a population of Moroccan women during the Covid-19 pandemic.

Methods

Type and Location of the Study

This cross-sectional study was conducted at the maternity ward of the IBN SINA University Center in Rabat from June to December 2020.

Study Population

Inclusion Criteria

This study involved a population of breastfeeding mothers who gave birth vaginally at the maternity hospital of IBN SINA University center in Rabat during the study period. The study focused on mothers of singleton babies born at term.

Exclusion Criteria

We excluded all women with a termination of pregnancy or fetal death in utero, women undergoing psychological treatment or with a mental pathology, and women who did not provide consent.

Sampling and Data Collection Instrument

Sampling

In this study, a simple random sampling method was used. The survey was conducted on all women who gave birth at the study site. The sample size was determined using the Lorenz formula developed by Cochran and Ardilly (16-17): $n = t2 \times p \times (1-p)/m2$

With $t = 1.96$, a precision of $m = 5\%$, and a national prevalence of breastfeeding of 97.1% in 2018. In this study, we recruited a total sample of 310 women.

Data Collection Instrument

A face-to-face interview was conducted with a population of postpartum women between the first and second days after childbirth, using a pre-established questionnaire, tested and validated by perinatal experts (Mother-Child Health and Nutrition Research Team) based on the literature review.

The collected data included the socioeconomic and biodemographic profile of the mothers, pregnancy, delivery and neonatal characteristics, and breastfeeding practices in the context of the Covid 19 pandemic as:

Early breastfeeding (during the half-hour after delivery),skin-to-skin practice, physical distancing practices, barrier gestures, exclusive breastfeeding for up to 6 months, and breastfeeding for up to 24 months.

Data on the stress experienced by breastfeeding mothers were collected using the Posttraumatic Stress Disorder Checklist Scale (PTSC) questionnaire (18-19). This tool consists of 17 items that assess the intensity of the 17 PTSD symptoms and measure three types of disorder: intrusion (items 1 to 5), avoidance (items 6 to 12), and hyperstimulation or hypervigilance (items 13 to 17).

With a threshold score of 34, this test enables the identification of individuals who may require psychiatric or psychotherapeutics with a sensitivity of 78% and a specificity of 94%. Participants with a non-significant score (< 34) receive information about mental disorders.

Statistical Analysis

The data were analyzed using the statistical software SPSS (Statistical Package for Social Sciences) version 20. The distribution of quantitative variables was assessed using the Kolmogorov-Smirnov test. Variables with a normal distributed were presented as mean and standard deviation. Categorical variables were presented as numbers and percentages and compared using the chi-square test of independence or Fisher's exact test. A p-value of less than 0.05 was considered statistically significant for all statistical analyses.

Ethics Approval and Consent to Participate

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 provided their oral and written consent before the investigation began. The right to anonymity and confidentiality was respected. All participants were informed that they are free to participate or not in the study as they may refuse to participate and/or withdraw at any time without any justification.

Results

Sociodemographic, Obstetrical and Neonatal Characteristics of Breastfeeding Mothers

Overall, 310 mothers participated in this study. Analysis of the socio-demographic parameters (Table 1) showed that the age of breastfeeding mothers ranged from 15 to 44 years with an average of 27.42 ± 5.3, with a preponderance of the age group 25 to 35 years (63.6%).

The majority of the mothers (62%) lived in urban areas and 65.2% had either no education or a low level of education. The economic level was low for almost half of the participants (40.9%). Furthermore, we noted that the gestational age of the women was 5.38 ± 1.14 and 193 (61.7%) received prenatal care in the public sector. Among the participants, 106 (33.9%) were primiparous, 121 (38.7%) had two children and 86 (27.5%) were multiparous. All women delivered vaginally with episiotomy in 29.4% of cases and without episiotomy in 60.1% of cases.

Regarding the neonatal data, the distribution of the neonate population by sex was statistically similar. The birth weight was low (<2500g) in 14 (4.5%) cases, normal (between 2500g and 3500g) in 273 (87.2%) cases and high (>3500g) in 26 (8.3%) cases.

Table 1. Socio-demographic characteristics of the mother population

characteristics	Mother populati on N= 313	95% confidence interval (CI)
Age groups (years)		
<à 25 years	93(29.7)	24.6 – 34.5
25 à 35 years	199(63.6)	58.1 – 69.0
>à 35 years	21(6.7)	4.2– 9.6
Place of residence		
Urban	194(62)	56.9 –67.1
Rural	58(18.5)	14.4 –22.7
Suburban	61(19.5)	15.3 –23.6
Ethnic origin		
Amazigh	51(16.3)	12.1 – 20.1
Arab	229(73.2)	68.4 –78.4
Jebli	12(3.8)	1.9 –6.1
Rifiane	9(2.9)	1.3 –4.8
Sahrawi	12(3.8)	1.6 – 6.1
Level of education		
Illiterate	113(36.1)	31.0 –41.9
Primary	91(29.1)	24.0 –33.9
Secondary	86(27.5)	22.7 – 32.6
University	23(7.3)	4.8 – 10.5
Mother's occupation		
Housewife	271(86.6)	82.4– 90.1
Civil servant	42(13.4)	9.9–17.6
Monthly income (MAD)		
< à 2000	128(40.9)	35.8–46.6
Between 2000 and 5000	161(51.4)	46.0–56.9
≥5000	24(7.7)	4.8–10.9

Values are expressed in count and percentage. MAD= Moroccan dirham

Breastfeeding Practices of Mothers: a Global Analysis

The analysis of breastfeeding practices among mothers in our population revealed that early breastfeeding and skinning were respectively observed in 53.4% and 43.1% of mothers. Also, the majority of mothers (82.7%) exclusively breastfed their babies Additionally, 79.2% of mothers expressed their intention to exclusively breastfeed until the age of 6 months in 79.2% and 77.2% planned to continue exclusive breastfeeding until the age of 24 months in 77.2% of cases.

Compliance with protective measures showed that the use of a face mask and respect for respiratory hygiene rules during breastfeeding were only found in 38.3% and 42.2% of mothers respectively. Whereas body hygiene and the use of facial masks during skin-to-skin contact were observed in 80.5% and 61.5% of mothers respectively.

Association of Breastfeeding Practices with Sociodemographic Characteristics of Breastfeeding Mothers

The distribution of women by breastfeeding practices, age, and ethnicity were statistically similar. The association between the level of education, place of residence, socioeconomic level, and profession of mothers revealed the following results:

The percentage of mothers who breastfed their infants in the first half-hour after delivery was significantly high among educated mothers compared to illiterate mothers (62.9 % versus 37.1%; p=0, 001, Table 2) and also among housewives compared to female public servants (82.6 % versus 17.4 %; p=0.028, Table 3). On the other hand, no statistically significant differences in this practice were found according to the environment of residence (Table 2).

The practice of skin-to-skin was significantly high among mothers residing in urban areas (p=0.009, Table 2), among mothers with a high level of education (p=0.004, Table 2), and among housewives (p<0.001, Table 3) although this practice was statistically similar according to socioeconomic level.

The percentage of mothers who respected the rules of respiratory and body hygiene was significantly high among women of urban origin and educated women (Table 2). The same observation was noted among women with a high or average economic level and among housewives (Table 3).

Table 2. Association of breastfeeding practices with place of residence and education level

Practices	place of residence			*p*	education level				*p*
	Rural	Suburban	Urban		Illiterate	Primary	Secondary	University	
Breastfeeding 1/2 hour after delivery				0.424*					0.001**
No	29(19.9)	32(21.9)	85(58.2)		51(34.9)	53(36.3)	39(26.7)	3(2.1)	
Yes	29(17.4)	29(17.4)	109(65.3)		62(37.1)	38(22.8)	47(28.1)	20(12)	
Wearing a facemask				0.003*					<0.001**
No	35(18.1)	49(25.4)	109(56.5)		84(43.5)	62(32.1)	44(22.8)	3(1.6)	
Yes	23(19.2)	12(10)	85(70.8)		29(24.2)	29(24.2)	42(35)	20(16.7)	
Practice of respiratory hygiene during breastfeeding				0.006*					<0.001**
No	34(18.8)	46(25.4)	101(55.8)		83(45.9)	59(32.6)	36(19.9)	3(1.7)	
Yes	24(18.2)	15(11.4)	93(70.5)		30(22.7)	32(24.2)	50(37.9)	20(15.2)	
Practice hand hygiene before and after each feeding or contact with the baby				<0.001*					<0.001**
No	21(34.4)	15(24.6)	25(41)		33(54.1)	21(34.4)	7(11.5)	0(0)	
Yes	37(14.7)	46(18.3)	169(67.1)		80(31.7)	70(27.8)	79(31.3)	23(9.1)	
Cleaning and disinfection of affected surfaces				<0.001*					<0.001**
No	32(34)	18(19.1)	44(46.8)		51(54.3)	27(28.7)	15(16)	1(1)	
Yes	26(11.9)	43(19.6)	150(68.5)		62(28.3)	64(29.2)	71(32.4)	22(10)	
Skin to skin practice				0.009*					0.004*
No	26(14.6)	44(24.7)	108(60.7)		69(38.8)	59(33.1)	44(24.7)	6(3.4)	
Yes	32(23.7)	17(12.6)	86(63.7)		44(32.6)	32(23.7)	42(31.1)	17(12.6)	

*Note: Values are expressed as numbers and percentages. * Pearson chi-square test ;**Fischer exact test. A p-value < 0.05 was statistically significant*

Table 3. Association of breastfeeding practices with socioeconomic level and occupational status of the mother population

Practices	Socioeconomic level			*p*	Occupational status		*p*
	Faible	Moyen	Elevé		Femme au foyer	fonctionnaire	
Breastfeeding 1/2 hour after delivery				0.896*			0.028*
No	58(39.7)	76(52.1)	12(8.2)		133(91.1)	13(8.9)	
Yes	70(41.9)	85(50.9)	12(7.2)		138(82.6)	29(17.4)	
Wearing a facemask				<0.001*			<0.001**
No	91(47.2)	95(49.2)	7(3.6)		192(99.5)	1(0.5)	
Yes	37(30.8)	66(55)	17(14.2)		79(65.8)	41(34.2)	
Practice of respiratory hygiene during breastfeeding				0.001*			<0.001**
No	88(48.6)	85(47)	68(4.4)		177(97.8)	4(2.2)	
Yes	40(30.3)	76(57.6)	16(12.1)		94(71.2)	38(28.8)	
Practice hand hygiene before and after each feeding or contact with the baby				0.003**			0.030**
No	36(59)	24(39.3)	1(1.6)		58(95.1)	3(4.9)	
Yes	92(36.5)	137(54.4)	23(9.1)		213(84.5)	39(15.5)	
Cleaning and disinfection of affected surfaces				0.001**			0.001**
No	52(55.3)	40(42.6)	2(2.1)		91(96.8)	3(3.2)	
Yes	76(34.7)	121(55.3)	22(10)		180(82.2)	39(17.8)	
Skin to skin practice				0.211*			<0.001*
No	71(39.9)	97(54.5)	10(5.6)		91(96.8)	3(3.2)	
Yes	57(42.2)	64(47.4)	14(10.4)		180(82.2)	39(17.8)	

*Note: Values are expressed as numbers and percentages. * Pearson chi-square test;**Fischer exact test. A p-value < 0.05 was statistically significant*

Association of Breastfeeding Practices with Mothers' Mental Health

Analysis of the post-traumatic stress disorder scale questionnaire results (Table 4) revealed a median total score of 34 (28-50) ranging from 17 to 85. Almost half (45.7%) of the women exhibited psychological distress.

Table 4 summarizes the impact of posttraumatic stress related to the covid pandemic19 on breastfeeding practices among mothers, divided into two groups:

- Group 1 consists of mothers without psychological problems (score <34)
- Group 2 consists of mothers with psychological problems (score >34).

The results revealed a significant increase in the proportion of women who complied with the recommendations for good breastfeeding practices in the context of the covid 19 pandemic in group 1 compared to group 2, namely:

- Early breastfeeding during the first half-hour after delivery (62.2% versus 45.9%; p= 0.004);
- Wearing a face mask (66.4% versus 14.7%; p<0.001);
- Compliance with respiratory hygiene rules (64.3% versus 23.5%; p<0.001);
- Skin-to-skin contact (68.5% versus 21.8%; p<0.001).

Table 4.Association of breastfeeding practices with the psychological status of the mother population

Practices	mother population N=313		***P***
	With psychological disorder	Without psychological disorder	
Breastfeeding 1/2 hour after delivery			0,004*
Non	92(54.1)	54(37.8)	
Oui	78(45.9)	89(62.2)	
Wearing a facemask			<0.001*
Non	145(85.3)	48(33.6)	
Oui	25(14.7)	95(66.4)	
Practice of respiratory hygiene during breastfeeding			<0.001*
Non	130(76.5)	51(35.7)	
Oui	40(23.5)	92(64.3)	
Practice hand hygiene before and after each feeding or contact with the baby			0.970*
Non	33(19.4)	28(19.6)	
Oui	137(80.6)	115(80.4)	
Cleaning and disinfection of affected surfaces			0.211*
Non	46(27.1)	48(33.6)	
Oui	124(72.9)	95(66.4)	
Skin to skin practice			<0.001*
Non	133(78.2)	45(31.5)	
Oui	37(21.8)	98(68.5)	

*Note: Values are expressed as numbers and percentages. * Pearson chi-square test. A p-value < 0.05 was statistically significant*

Discussion

Protecting the health of pregnant and lactating women is one of the priority areas in the fight against the negative impact of the Covid-19 pandemic. This work is the first Moroccan study to explore breastfeeding practices and their associations with socio-demographic characteristics in this context.

The first part of this work focused on the exploration of prenatal follow-up of the participants. The survey results revealed that almost two-thirds of the participants (61.7%) received prenatal care. This first observation reflects the efforts made by the Ministry of Health to promote the health of this vulnerable group, which is susceptible to infectious agents, particularly respiratory pathogens. Indeed, a national plan for monitoring and response against COVID-19 has been implemented to ensure uninterrupted care, enable optimal delivery of prenatal consultations, childbirth, postpartum and neonatal care (20).

Likewise, a practical guide has been developed f to reinforce measures related to the prevention of COVID-19 risks, the appropriate organization of health services, and the management of care for women and newborns in this specific epidemiological context. Our results contrast with those of other countries such as China, where prenatal exercises, hospital visits, and prenatal classes were canceled and about two-thirds (528/817, 64.6%) of the participants delayed or canceled prenatal visits (8). Early breastfeeding was observed in more than half of the mothers. Our results are better than those reported in a national multi-center study which reported a prevalence of 23.42% (21).

These results once again demonstrate the importance of breastfeeding in the context of COVID 19 and are in line with the recommendations of the World Health Organization (WHO) and UNICEF which encourage continued breastfeeding,. To date, no solid evidence of the presence of live virus in breast milk has been found in studies (22-23). Additionally, 63.7% of the participants practiced skin-to-skin contact. This practice is considered the safest and most beneficial transition for both mothers and their infants as they begin their new life together (24). The infant's microbiome can benefit from the mother's flora, which is so beneficial during this pandemic.

However, the current COVID-19 pandemic leads us to combine the promotion of breastfeeding with correct anti-infectious measures, to limit the spread of the virus through respiratory droplets and contact with respiratory secretions of infected individuals, including recently delivered mothers (25).

In this sense, our results showed that 88.82% of the mothers received advice during the prenatal period about the importance of respecting the rules of respiratory and body hygiene in the prevention of infection by the virus. The majority of mothers (80.5%) practiced handwashing before breastfeeding, more than half (61.5%) wore a face mask during mother-newborn contact, and the majority of mothers (82.7%) exclusively breastfed their infants with 79.2% planning to continue exclusive breastfeeding until their infants reatch 6 months of age. These results highlight the effectiveness of awareness campaigns in promoting the importance of breastfeeding, as well as practical advice on the essential steps to achieve optimal breastfeeding in recent years and particularly in the context of the Covid pandemic.

Furthermore, socioeconomic status (SES) is already recognized as a variable that influences breastfeeding (26-27). In our study, we found a statistically significant association between early breastfeeding with education level (p=0.001, Table 2) as well as occupation (p=0.028, Table 3). Education level is likely to influence literacy and health-related behaviors as indicated by the literature (28). Our results are similar to pre-COVID studies conducted in Morocco and another context (5). Nevertheless, further studies are needed to investigate other determinants that may impact early breastfeeding in the Covid 19 context as it is a key measure of essential care for newborns, providing them with the best chance to survive, grow, and reach their full potential (29).

In addition, our study also aimed to explore the mental health of mothers in this specific epidemiological context, because in addition to the stress related to this new pandemic, the postpartum period represents a period of increased stress and vulnerability for many women, even under the best circumstances (30-31). This period is characterized by intense emotions and a high susceptibility to emotional problems. According to the National Institute for Health and Care Excellence, 10-20% of pregnant and early postpartum women experience mental health problems issues (32).

In this work, 45.7% of mothers exhibited symptoms of post-traumatic stress disorder. Our findings align with two studies conducted in Italy,

reported prevalences of 42.9% and 43.4% respectively, However this prevalence is higher compared to study conducted in the Moroccan context outside the COVID-19 pandemic witch reporteda prevalence of 28.57% (33-35). These results could also be explained by concerns and fears regarding the risk of infection or hospitalization due to COVID-19, particularly in relation to perinatal morbidity and mortality associated with the virus.

The study of the association between maternal mental health status and breastfeeding practices (Table 4) revealed, a statistically significant prevalence of favorable breastfeeding practices among non-stressed mothers. This included early breastfeeding (p= 0.004), adherence to respiratory and body hygiene guidelines (p<0.001) and skin-to-skincontact. These results reflect the effects of posttraumatic stress on the behavior of postpartum women.

Our results corroborate Molenda's statement that post-traumatic stress can generate unusual behaviors such as flabbergasting that leaves the person frozen in a state combining cognitive stupefaction (lack of understanding of what is happening) and affective stupor (emotional emptiness), or a panic reaction that manifestets as reckless behavior (36). This mental burden imposed by COVID-19 on society, coupled with the inherent mental sensitivity during the pregnancy and breastfeeding period may offer a plausible explanation for these results, It underscores the significance of providing mental health support for pregnant and breastfeeding mothers as a vulnerable population during the pandemic (37).

This pandemic has been described as a traumatic event, which has been the subject of increasing concern among obstetricians, pediatricians, mental health clinicians, centers for disease control, and policymakers (38-39). A better understanding of these impacts is crucial for informing practices and policies aimed at providing support for pregnant women and new mothers.

Conclusion

The results of the present study revealed that despite the challenges posed by the SARS-CoV-2' pandemic, substantial efforts have been made to safeguard the health of pregnant women and newborns. However, the results reported that postpartum mothers, who are particulary vulnerable to mental disorders, require psychiatric or psychotherapeutic care during the coronavirus pandemic.

It seems that paying more attention to the mental health of pregnant and postpartum women during the so-called pandemic from the perspective of combating and reducing the consequences of depression and anxiety in both mothers and the unborn child in Morocco. Future studies are needed to elucidate these associations and to assess the long-term impact of Covid-19 on the emotional distress of mothers and their relationship with their children.

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Conflicts of interest

The authors declared that they have no conflict of interest.

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