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Research article

Contextual influence of the COVID-19 pandemic on pregnant women's emotional regulation abilities

Influence du contexte de la pandémie de COVID-19 sur les capacités de régulation émotionnelle des femmes enceintes

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ABSTRACT

Introduction. – Emotional regulation is a key factor that could determine the quality of becoming a parent. Since pregnancy is accompanied by changes in the emotional system, fluctuations in emotional regulation may also occur during this period. In 2020, the COVID-19 pandemic had major psychological repercussions on the general population which could have also affected emotional regulation capacities.

Objective. – The objective of this study was to determine whether emotional regulation has characteristics during pregnancy and to evaluate the influence of the COVID-19 pandemic on the emotional regulation of pregnant women.

Method. – One hundred fifty-one women aged between 19 and 42 years old participated in this study. Their emotional regulation abilities were assessed using the Difficulties Emotion Regulation Scale before and during the pandemic. A two-factor multivariate analysis of covariance, “parental status” (pregnant vs. childless) and “time of data collection” (before vs. during COVID-19), was conducted to compare the emotional regulation abilities of pregnant women with those of childless women before and during the pandemic.

Results. – (1) Prior to the pandemic, pregnant women exhibited better emotional regulation skills than childless women, characterized by greater acceptance and understanding of their emotions. (2) During the pandemic: (a) pregnant women's emotional regulation scores were comparable to those of women without children. (b) They also had more difficulty than pre-pandemic pregnant women in identifying their emotions.

Conclusion. – The lack of improvement in emotional regulation skills in pregnant women during the COVID-19 pandemic is a specific impact of COVID on this population. This could affect their mental health, as well as the emotional adjustment of the mother towards her baby.

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R É S U M É

Introduction. – La régulation émotionnelle est un facteur clé dans la qualité du devenir parent. Comme la grossesse s'accompagne de changements au niveau du système émotionnel, des changements pourraient opérer au niveau de la régulation émotionnelle pendant cette période. En 2020, la pandémie de la COVID-19 a eu des retentissements psychologiques majeurs sur la population générale; ces retentissements ayant également pu affecter les capacités de régulation émotionnelle.

Objectif. – L'objectif de cette étude était de déterminer si la régulation émotionnelle présente des spécificités pendant la grossesse et d'évaluer l'influence de la COVID-19 sur la régulation émotionnelle des femmes enceintes.

Mots clés :

Régulation émotionnelle
Grossesse
COVID-19

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Méthode. – Les capacités de régulation émotionnelle de 151 femmes, âgées de 19 à 42 ans, ont été évaluées à l'aide de la *Difficulties Emotion Regulation Scale*, avant et pendant la pandémie. Une analyse de la covariance multivariée à deux facteurs, « statut parental » (enceinte vs sans enfant) et « période de recueil des données » (avant vs pendant la COVID-19) a été menée, afin de comparer les capacités des femmes enceintes à celles de femmes sans enfant, avant et pendant la pandémie.

Résultats. – (1) Avant la pandémie, les femmes enceintes présentaient de meilleures capacités de régulation émotionnelle que les femmes sans enfant, caractérisées par une meilleure acceptation et compréhension de leurs émotions. (2) Pendant la pandémie: les femmes enceintes (a) ont perdu cet avantage; leurs scores de régulation émotionnelle étaient comparables à ceux des femmes sans enfant. (b) Elles présentaient également plus de difficultés que les femmes enceintes rencontrées avant la pandémie pour identifier leurs émotions.

Conclusion. – L'absence d'amélioration des capacités de régulation émotionnelle chez les femmes enceintes pendant la pandémie de COVID-19 constitue un retentissement spécifique de la COVID sur cette population. Celle-ci pourrait retentir sur leur santé mentale mais aussi sur l'ajustement émotionnel de la mère à son bébé.

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Introduction

Emotional regulation is a key factor that could determine the quality of becoming a parent. [1,2]. The psychological consequences related to the COVID-19 pandemic, particularly the increase of stress and anxiety symptoms [3–5], raise questions about the outcomes posed by the pandemic on pregnant women's emotional regulation abilities. Given this information, this study aimed to describe the particularities of emotional regulation among pregnant women before and during the COVID-19 pandemic.

A high level of emotional self-regulation would be a key factor in determining the capacity of becoming a mother and an overall positive experience during motherhood [1]. Gratz et Roemer [6] conceptualized emotional regulation as a multidimensional capacity involving awareness, understanding and acceptance of emotions, as well as the ability to control impulsive behaviors. This also includes the capability to conduct oneself in a manner that is consistent with the desired objectives when encountering negative emotions, and the ability to use adaptive emotional regulation strategies that are appropriate to a given situation.

These different dimensions are assessed using the six dimensions of the "Difficulties Emotion Regulation Scale" (DERS, [6]): (1) emotional awareness, (2) emotional clarity, (3) the (non) emotional acceptance, (4) impulsivity, (5) goal-oriented behavior and (6) the strategies.

Studies that have investigated the emotional capacities among mothers have highlighted the development of a "parental brain" [7] facilitating interactions between mother and infant during the period of access to motherhood. However, few studies have focused on emotional regulation abilities in postpartum mothers or pregnant women [8,9] and none have evaluated these capacities in a non-clinical population. Moreover, existing studies have only focused so far on observing cues of maternal emotional regulation in the context of interactions with the baby or with another adult; they do not directly measure the mother's emotional regulation. However, they allow the formulation of hypotheses on the dimensions likely to be improved during this period, notably: clarity (identification), acceptance and emotional awareness (consideration). Indeed, several indications suggest an improvement in the identification of emotions during the perinatal period: a more intense activation of the cerebral regions involved in the processing of emotional information have been observed [7,10–12]; mothers would be more vigilant to auditory [13] and visual [14] infantile emotional stimuli; especially when the stimulus emanates from their own child [11,15]. Moreover, the "emotional acceptance" dimension, reflects what is observed in caregiving. To be able to

provide proper caregiving, the mother must demonstrate reactivity towards her baby's solicitations, especially when expressing distress [1]. This reactivity involves identification and acceptance of the baby's emotions. As for the "emotional awareness" dimension, it refers to the individual's ability to pay attention and take their emotions into account. During selective attention tasks, pregnant women are more observant in processing adult faces expressing fear compared to childless women [16]. During mother/baby interactions, it is observed that in mothers of infants, the brain regions involved in mentalization and empathy are activated, allowing them to understand the mental states of their child in real time [10]. These results lead us to hypothesize that the scores related to these three dimensions (clarity, acceptance, and emotional awareness) will be better in pregnant women than in childless women. These improvements could be part of an evolutionary perspective according to which mothers establish many psychological mechanisms aimed at protecting themselves as well as their (future) child who remains vulnerable [17].

The first wave of COVID-19 triggered significant stress among mothers [18,19], requiring the implementation of adaptive behaviors [4]. Emotional regulation constituted an important component in the ability to manage these disturbances [20]. The high level of stress perceived during COVID-19 raises questions about the repercussions of contextual influence of COVID-19 on the emotional regulation of pregnant women.

Since December 2019, the COVID-19 pandemic has had an impact on the physical and mental health of people worldwide. Health protocols have been implemented to limit the spread of this virus: sanitary measures, social distancing, confinement, quarantine, etc., resulting in disrupted lifestyles and routines. Consequently, a significant increase in the levels of depression and anxiety has been noticed in the general population [5] but also among pregnant women [21]. The emergence of a stress syndrome related to COVID-19 has also been observed [3,4]. The psychological consequences linked to the pandemic would be equally significant as the medical ones with a high number of psychologically affected individuals [4] and it appears that the impact on mental health may last beyond the pandemic itself. [5], specifically because of the socio-economic consequences. During the first wave, other than the initial stress factors that were induced by the pandemic, additional stress factors probably existed. These added factors included the lack of consensus regarding the potential ramifications of the COVID-19 virus on the course of pregnancy [22], the possible impact on the mother and the fetus, and the sanitary measures that restricted the mother's partner from being present during medical examinations and childbirth.

Emotional regulation was a key factor during COVID-19, modulating the general population's ability to adapt to the pandemic [20] by affecting levels of anxiety. In general, emotional regulation is considered as a predictor of the level of perceived stress [23] and would play a mediating role in the relationship between perceived stress and anxiety [24] modulating the experience of stress according to the type of strategy put in place [23–25]. This calls into question whether emotional regulation capacities presented particularities during COVID-19 in response to the crisis.

Given the existing data in the literature, two hypotheses have been proposed:

- Before the COVID-19 pandemic, some components of emotional regulation could be more improved in pregnant women than in childless women, due to the neurophysiological and emotional modifications that operate during the perinatal period;
- COVID-19 could affect the emotional regulation capacities of pregnant women.

Methods

Study setting

This study is part of a prospective longitudinal project, entitled “*Maternité: L'apport des ressources émotionnelles dans le vécu de l'accès à la parentalité*”. The project's aim is to study the protective and vulnerability factors likely to influence different dimensions related to parenthood: emotional regulation, but also mental health, the bond between mother and baby, attachment representations, self-esteem, and social support. Participants were assessed during their pregnancy and then followed up until four months postpartum. To identify the specificities of this period, a control group of childless women is also included in this study. The data presented in this article are extracted from the data collection at T₀ among pregnant women and are compared with the results of childless women in the control group.

Participants

one hundred and fifty-one participants were included in this study and were divided into 4 groups, according to two factors: the parental status (being pregnant or without children) and the time period during which the data was collected (before the COVID-19 pandemic; during the COVID-19 pandemic):

- Pregnant women encountered before the COVID-19 pandemic (PW before COVID);
- Childless women encountered before the COVID-19 pandemic (CW before COVID);
- Pregnant women encountered during the COVID-19 pandemic (PW COVID);
- Childless women encountered during the COVID-19 pandemic (CW COVID).

Table 1 presents the sociodemographic characteristics of the studied population.

Measures

A socio-demographic questionnaire was proposed to the participants in order to assess their socio-economic level (year and country of birth, marital status, professional occupation) as well as the constitution of the family and the characteristics of the pregnancy (term, sex of the child) for pregnant women.

The French version of the self-report questionnaire Difficulties in Emotion Regulation Scale (DERS; [26]) permitted the evaluation

of the participants' emotional regulation difficulties. It consists of 36 items to be answered on a 5-point Likert scale ranging from 1 (almost never) to 5 (almost always); the higher the score, the greater the difficulties. The DERS includes 6 dimensions to assess (1) the lack of consideration of one's emotional state (A; awareness), (2) the lack of emotional identification and understanding (C; clarity), (3) non-acceptance of emotional responses when experiencing negative emotions (N; non-acceptance), (4) difficulties in controlling impulsive behaviors when experiencing negative emotions (I; impulse), (5) difficulties to directing behavior according to a goal, to concentrate on a goal when the person feels negative emotions (G; goals), (6) the lack of strategies to regulate the emotions (S; strategies). The results within the population of this study highlight the excellent internal consistency of this scale and the subscales ($\alpha_{\text{Total}} = .94$; $\alpha_{\text{Awareness}} = .74$; $\alpha_{\text{Clarity}} = .69$; $\alpha_{\text{Non-acceptance}} = .91$; $\alpha_{\text{Impulse}} = .85$; $\alpha_{\text{Goals}} = .88$; $\alpha_{\text{Strategies}} = .91$).

Procedure

The participants who were encountered during the COVID-19 pandemic were recruited between February and June 2020. As for the ones who participated prior to the pandemic, they were recruited between October 2018 and October 2019. This study received Ethics Committee approval and the recommendations concerning the data collection procedure were vigorously followed.

The DERS (Difficulties in Emotion Regulation Scale; [26]) and the socio-demographic questionnaire were presented to all the participants via an online platform.

Statistical analyzes were performed using the Statistical Package for the Social Sciences version 25. software. In order to fulfill our study's objectives, a 2 × 2 MANCOVA was conducted crossing the inter-subject variables “Parental status” (pregnant vs childless) and “Data collection period” (before COVID vs COVID), by entering the participants' age as a covariate (see preliminary analyses). Bonferroni corrections were used to adjust multiple comparisons.

Results

Descriptive analyses

The four groups did not exhibit differences according to age ($P = .46$) or place of birth ($P = .19$). Among pregnant women, the groups before and during the health crisis showed no difference in the progress of their pregnancy ($P = .34$). The sociodemographic profiles were therefore identical for the same parental status before and during COVID (see Table 2).

Preliminary analyses

The results showed a significant correlation between the age of the participants and the emotional awareness dimension of the DERS ($r = -.19$; $P = .02$), thus leading to a control of age in the statistical analyses. No significant difference was found between primiparous pregnant women and multiparous DERS scores ($-.87 < t < .82$; $.39 < P < .97$).

Principal analyses

Table 3.1, Table 3.2, Table 3.3 presents the MANCOVA results.

Emotional regulation of pregnant women (i.e., before and during COVID-19) versus childless women (i.e., before and during COVID-19).

Pregnant women presented better emotional regulation abilities than childless women regarding acceptance of their emotional

Table 1
 Socio-demographic characteristics of the participants.

Variables	PW _{before COVID} (n = 36) M (SD)	CW _{before COVID} (n = 34) M (SD)	PW _{COVID} (n = 39) M (SD)	CW _{COVID} (n = 40) M (SD)
Age of the women (years)	29.97 (5.47) [19.00–39.00]	29.08 (5.93) [20.00–40.00]	29.18 (4.71) [20.00–41.00]	30.88 (6.17) [22.00–42.00]
Duration of the pregnancy (months)	6.68 (1.94) [2.00–9.00] % (n)	– % (n)	7.06 (1.46) [3.00–9.00] % (n)	– % (n)
Place of birth				
France métropolitaine	91.70 (33)	85.30 (29)	76.90 (30)	85.00 (34)
DROM (Antilles, Réunion, Guyane. . .)	.00 (0)	5.90 (2)	.00 (0)	.00 (0)
Europe	5.60 (2)	5.90 (2)	15.40 (6)	5.00 (2)
North Africa	.00 (0)	.00 (0)	2.60 (1)	.00 (0)
Other	2.80 (1)	2.90 (1)	5.10 (2)	10.00 (4)
Marital Status				
Single	5.60 (2)	25.00 (9)	.00 (0)	30.00 (12)
Married/Civil Union (Pacs)	44.40 (16)	22.20 (8)	61.50 (24)	17.50 (7)
Cohabitation with partner	50.00 (18)	44.40 (16)	38.50 (15)	50.00 (20)
Widowed	.00 (0)	2.80 (1)	.00 (0)	.00 (0)
Separated/Divorced	.00 (0)	5.60 (2)	.00 (0)	2.50 (1)
Professional Status				
Employee	72.20 (26)	52.8 (19)	51.30 (20)	60.00 (24)
Student/undergoing professional training	5.60 (2)	27.80 (10)	.00 (0)	30.00 (12)
Company Director/Independant	5.60 (2)	8.30 (3)	20.50 (8)	5.00 (2)
Unemployed (in search of a job, housewife. . .)	16.60 (6)	11.10 (4)	28.20 (11)	5.00 (2)

PW: Pregnant Women; CW: Childless Women.

Table 2
 Socio-demographic difference between the groups of the study.

Variables	Compared groups	Comparison tests
Marital Status	Pregnant Women–Childless Women: PW _{before COVID} –PW _{COVID} CW _{before COVID} –CW _{COVID}	$\chi^2(4, 151) = 31.18; P \leq 0.001$ $\chi^2(2, 75) = 3.76; P = 0.15$ $\chi^2(4, 76) = 2.07; P = 0.72$
Professional Occupation	Pregnant Women–Childless Women: PW _{before COVID} –PW _{COVID} CW _{before COVID} –CW _{COVID}	$\chi^2(4, 151) = 24.58; P \leq .001$ $\chi^2(4, 75) = 8.02; P = .09$ $\chi^2(4, 76) = 6.77; P = .15$
Place of birth	PW _{before COVID} –PW _{COVID} –CW _{before COVID} –CW _{COVID}	$\chi^2(12, 149) = 16.04; P = .19$
Age of participants	PW _{before COVID} –PW _{COVID} –CW _{before COVID} –CW _{COVID}	$F(3, 147) = .86. P = .46; \eta^2 = .02$
Term of pregnancy	PW _{before COVID} –PW _{COVID}	$t = -.96; P = .34$

PW: Pregnant Women; CW: Childless Women.

Table 3.1
 Effect of the parental status: comparison of the DERS means between pregnant and childless women.

Variables	Pregnant Women (n = 75)		Childless Women (n = 76)		Effect of the factor "parental status"		
	M	SD	M	SD	F	P	η^2
Non-acceptance	13.65	5.70	15.83	7.29	4.67	.03	.03
Goals	14.76	4.81	15.99	5.39	2.35	.13	.02
Impulsivity	13.59	4.89	14.01	5.92	.31	.58	.01
Strategies	20.52	5.90	21.70	7.83	1.31	.25	.01
Clarity	10.51	3.42	11.76	3.91	5.05	.03	.03
Awareness	14.71	4.64	14.88	4.47	.08	.78	.01

Table 3.2
 Effect of the time of data collection: comparison of DERS means between women encountered before and after COVID-19.

Variables	Women _{before COVID} (n = 72)		Women _{COVID} (n = 79)		Effect of the factor "time of data collection"		
	M	SD	M	SD	F	P	η^2
Non-acceptance	13.39	5.94	16.05	6.79	6.42	.01	.04
Goals	14.38	5.16	16.34	4.97	5.52	.02	.04
Impulsivity	13.32	5.24	14.20	4.57	1.13	.29	.01
Strategies	19.35	6.30	22.78	7.14	9.65	.01	.06
Clarity	10.58	3.54	11.62	3.81	3.39	.07	.02
Awareness	14.89	4.65	14.67	4.46	.04	.85	.01

Table 3.3
 Comparisons of DERS means between pregnant women (before and during COVID) and childless women (before and during COVID).

Variables	PW ^{before COVID} (n = 36)		CW ^{before COVID} (n = 36)		PW ^{COVID} (n = 39)		CW ^{COVID} (n = 40)		Effect of the interaction "parental status" × "time of data collection"		
	M	SD	M	SD	M	SD	M	SD	F	P	η ²
Non-acceptance	11.86	5.17	14.92	6.34	15.31	5.73	16.78	7.69	.71	.40	.01
Goals	13.58	4.90	15.17	5.35	15.85	4.52	16.83	5.38	.19	.67	.01
Impulsivity	12.28	4.68	14.36	5.64	14.79	4.82	13.63	6.22	2.95	.09	.02
Strategies	18.19	4.65	20.50	7.49	22.67	6.16	22.90	8.05	.90	.35	.01
Clarity	9.31	2.53	11.86	3.90	11.62	3.77	11.73	3.91	3.95	.05	.03
Awareness	14.78	4.44	15.00	4.92	14.64	4.87	14.70	4.08	.03	.87	.01

Note. PW = Pregnant Women; CW = Childless Women

Table 4
 Post-Hoc analyses regarding the interaction "parental status" X "time of data collection".

		Clarity Dimension of DERS	
		I-J	SD
Effect of parental status	Before COVID	Pregnant - Childless	-2.49*
	COVID	Pregnant - Childless	-.01
Effect of the time of data collection	Childless	Before COVID–COVID	.24
	Pregnant	Before COVID–COVID	-2.25*

* P < .01.

responses (N: $F(1, 146) = 4.67, P = .03$) and emotional clarity (C: $F(1, 146) = 5.05, P = .02$) (see Table 3.1).

Emotional regulation in all women (i.e., pregnant and childless) before and during the COVID-19 crisis

Women encountered before the pandemic exhibited better emotional regulation abilities than women encountered during the pandemic in terms of emotional acceptance (N: $F(1, 146) = 6.42, P = .01$), ability to maintain goal-directed behavior (G: $F(1, 146) = 5.52, P = .02$) and use of emotional regulation strategies (S: $F(1, 146) = 9.65, P = .01$) (see Table 3.2).

Emotional regulation of pregnant women during COVID-19

The interaction analysis between the "Parental status" factor (pregnant vs childless) and the "Data collection period" factor (before COVID vs COVID) highlighted significant differences regarding the emotional clarity dimension ($F(1, 146) = 3.95, P = .05$) (see Table 3.3).

Childless women showed no significant difference in emotional regulation scores before and during the pandemic crisis (see Table 4). On the other hand, the scores for pregnant women show an evolution (see Table 4). Before the COVID-19 crisis, pregnant women had a better perception of their emotions than childless women (C: $I-J = -2.49; P = .01$). During the pandemic crisis, they were no longer different from childless women and had more difficulty perceiving their emotions than the pregnant women encountered before the pandemic (C: $I-J = -2.25; P = .01$)

Discussion

This study investigated women's emotional regulation during pregnancy as well as the influence of the COVID-19 pandemic on these abilities.

The results revealed that during pregnancy, certain emotional regulation capacities are more efficient, suggesting possible improvements in these capacities among mothers from prepartum. Indeed, compared to women without children, pregnant women exhibited higher abilities when it comes to regulating their emotions, and more precisely in identifying their emotions and

accepting their emotional responses. These findings are congruent with the literature which defends the hypothesis of an evolution of the maternal emotional system [7,10,27] starting from pregnancy [28,29].

Since this study was interested in emotional regulation in daily life in general, while focusing on the mother's skills and own emotions, it is complementary to existing studies in the literature that are focused on the improvements of the emotional system in the context of interactions. It enriches knowledge on the mechanisms that are established during the period of pregnancy and demonstrates that two dimensions of emotional regulation are central during this period in the process of becoming a mother: (1) identification and (2) the acceptance of one's own emotions. (1) The "emotional clarity" dimension of the DERS [6] includes items such as "I have difficulty making sense out of my feelings", "I know exactly how I am feeling". This ability is essential for the future mother who will need to regulate her own emotional state in order to make herself emotionally available to her child. Indeed, the identification of emotions is the first step in the process of emotional regulation [30]. (2) The "non-acceptance" dimension includes items such as "when I'm upset, I become angry with myself for feeling that way", "when I'm upset, I become embarrassed for feeling that way". The ability to accept her emotions is vital for the future mother in order to encourage the establishment of quality caregiving. Indeed, welcoming a child requires maternal emotional adjustments [29] and often leads to concerns associated with a feeling of emotional distress [31].

In addition to having to manage her own emotions, the mother should also assist her child in regulating his or her emotions. In order to ensure this emotional availability, it is fundamental for the mother to accept her own emotions and emotional responses, which will allow her to better regulate her emotions. By allowing the mother not to be overwhelmed by her negative emotional states, emotional acceptance reinforces her abilities to adjust to her baby, and therefore the development of quality caregiving [1]. It is noteworthy to mention that the improvement in the ability to accept one's own emotions and emotional reactions begins with pregnancy. In addition to fostering the postnatal mother/baby adjustment, this ability could support the woman's experience by limiting the negative impacts that certain aspects of her pregnancy could have (negative emotions aroused by the constraints of pregnancy, such as nausea, weight gain or any other symptom, etc.). Acceptance and commitment therapies present the process of "acceptance" as an essential active process contributing to the well-being of the individual by participating in the development of his psychological flexibility when facing harmful or distressing events [32].

Pregnancy could promote the establishment of the acceptance process and thus facilitate the many adaptations necessary in the perinatal period. All these conclusions are part of the continuity of evolutionary theories that address the process of becoming a parent as a series of mechanisms that are put in place, from the

pre-partum, in order to enable parents to face their vulnerabilities as well as those of the child [17].

This study also underlines that pregnancy constitutes a period of vulnerability when faced with a major stress factor such as COVID-19, by limiting the developmental process of the improvement of emotional regulation capacities that occur during normal times. Regarding the first wave of COVID-19, the literature has highlighted the vulnerability of parents, and particularly mothers, to the stress induced by the health crisis [18,19]. The literature has also highlighted the increase in anxiety and depressive symptoms among pregnant women compared to historical norms [21]. The results of the research study are in line with the findings in the literature and invite us to consider pregnant women as vulnerable to the stress induced by COVID-19. Indeed, pregnant women exhibited better emotional regulation capacities (identification and emotional acceptance) than childless women before the pandemic. However, during the COVID-19 pandemic, pregnant women no longer experienced improvement in their emotional regulation: their scores were comparable to those of childless women. In addition, the comparison of the emotional regulation scores of pregnant women before and during COVID-19 highlighted that, during the crisis, pregnant women presented poorer abilities to identify and perceive their emotions.

As the emotional system appears to evolve to facilitate the reception of the child, these results lead to question whether the ability of future mothers to identify their baby's emotions will not also be impacted. If mothers perceive their emotions and those of their babies less clearly, this could affect their ability to adjust emotionally to their children and therefore to fulfill their caregiver role. It seems important that health professionals pay particular attention to pregnant women and their ability to regulate their emotions during this period of health crisis.

It is noteworthy to mention that a limitation exists in this study, concerning the fact that the data is gathered from independent groups and not matched groups before and after COVID. However, it was not possible to form matched groups given the context of the pregnancy (testing at 6.5 months of pregnancy on average).

Conclusion

This study found improved emotional regulation abilities in pregnant women compared to childless women during pre-COVID-19 times. During the COVID-19 pandemic, this improvement was not observed, showing an impact of the pandemic on pregnant women. This impact highlights the importance for professionals working in perinatal care to pay particular attention to the ability of pregnant women to regulate emotions during this pandemic crisis and to propose, when necessary, psychotherapeutic assistance such as that offered by emotion-based therapies [33]. This psychotherapeutic approach aims, among other things, to regulate emotions. Based on the exploration of the emotional experience, it makes it possible to give meaning to the lived experience in order to transform it and adapt to it; which is a deficient capacity among pregnant women during the crisis.

This research paves way for new questions. (1) What are the consequences of the rupture of the process of improvement of emotional regulation on motherhood itself? To what extent could the ability to identify emotions affect mothers' interpretation and understanding of their future child's emotions? Could this influence on emotional regulation affect the quality of the mother's interactions with her child? (2) Since emotional regulation is a process involving intergenerational transmission [34,35], will this deficit presented by pregnant women during the pandemic period have a long-term effect on the capacity for emotional regulation among children?

Disclosure of interest

The authors declare that they have no competing interest.

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