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Women's perceptions of biological causes and potentials of genomic risk markers in postpartum depression: A qualitative study

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ABSTRACT

Introduction: Postpartum depression affects 10–15% of women. Novel evidence suggests that genomic markers for enhanced sensitivity to estradiol signaling may help identify women at high risk of postpartum depression. We explored the women's perceptions of testing for genomic risk markers for developing postpartum depression.
Methods: We conducted semi-structured interviews with 13 Danish women who had a history of postpartum depression using a phenomenological approach. A transdisciplinary group of researchers analyzed the interviews thematically. Through the concept of *potentiality*, we unfolded the women's perceptions regarding testing for genomic risk markers for postpartum depression.
Results: We identified three key themes. *1) Biology as a contributing factor to postpartum depression.* Only a few women thought postpartum depression could be related to a sensitivity to hormonal changes. *2) The role of external events in making sense of postpartum depression.* Most women perceived their postpartum depression as primarily triggered by external factors rather than biological factors. *3) The ambiguous potentiality of testing for genomic risk markers of postpartum depression.* Testing for genomic risk markers was envisioned by some women as having the potential to prevent postpartum depression and reduce stigma. Yet, at the same time, knowing their risk was perceived as holding the potential to induce depressive symptoms.
Conclusion: We found that to some women, knowledge about genomic risk markers introduced hope regarding possible prevention and, at the same time, it introduced concerns about inducing depressive symptoms. We suggest considering such perceptions if implementing new genomic risk marker technologies in risk profiling.

Introduction

Postpartum depression affects 10–15 % of women, and the risk of recurrence is up to 40 % in subsequent pregnancies [1,2]. Women experience postpartum depression as a time of hopelessness, loss of control and guilt [3]. Women suffering from postpartum depression attribute their depressive symptoms to personal vulnerability rather than illness, and often describe feeling stigmatized about their inability to cope with the situation [4,5].

Risk factors for postpartum depression encompass a wide range of biological, psycho-social, and pregnancy-related factors [6]. Moreover gene-by-environment factors have been suggested to be involved [7]. Identifying genomic risk markers of enhanced sensitivity to estrogen signaling may help identify women at risk. In addition, this information may guide preventive strategies to protect maternal postpartum mental health [6–8]. Efforts to provide insight into the pathophysiology of relevant subgroups of diseases through genomic risk markers and possibly predict the risk of developing the disease is referred to as precision medicine. Genetic testing and precision medicine have been introduced in psychiatry, related disorders like schizophrenia and major

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depressive disorder [9,10], and are in an exploratory stage within disorders like postpartum depression [11,6–8].

Precision medicine is often articulated as hopeful, imbued with power and potential [12]. The concept of potentiality has been employed to explore people's understanding of the transformations that biomedical and genomic technologies may initiate [13,14]. According to Taussig and colleagues, potentiality depicts something imaginable that may or may not (yet or never) exist [15]. As a concept, potentiality captures human capacities to imagine how something will develop in the future and encompass both desirable and/or undesirable outcomes. Accordingly, potentiality has a temporal complexity by being latently present and yet open to future modification and transformation [15]. Following Taussig and colleagues' anthropological outline of the concept of potentiality, we employed the notion of potentiality to understand how women perceive hormone sensitivity testing and knowledge about genetic risk [15].

Previous studies have focused on facilitators and barriers to genetic testing and precision medicine in psychiatry. They include approval of testing but, at the same time, also a fear of unfavorable consequences [16,17]. However, to understand women's perceptions of hormone sensitivity testing and precision medicine in postpartum depression, it is essential not only to understand the facilitators and barriers but also to gain insight into how the women perceive the potential of knowing and transforming the risk of postpartum depression and how genomic knowledge plays a role in this transformation. By understanding women's perceptions, the study may provide help to tailor communication and educational strategies to better address the concerns and expectations regarding genomic testing. Moreover, it might empower women with more personalized information and maybe reduce anxiety or fear about their condition and its management.

Among women with a history of postpartum depression, we explored their perceptions of testing for genomic risk markers that potentially identify women at risk for developing postpartum depression.

Materials and methods

We conducted a qualitative interview study with women from the Capital Region of Denmark with a history of postpartum depression. The interview study was a part of a broader research study called the Maternal Mental Health (MAMA) Trial, which is aiming to evaluate the preventive effect of three weeks of transdermal estradiol treatment immediately postpartum on depressive episodes in women at high risk of postpartum depression [18]. As a part of the clinical MAMA Trial, the participants were also asked to donate blood for analyses of unique candidate markers to evaluate if genomic markers of estrogen sensitivity qualify as a predictor of postpartum depression risk [18].

The inclusion criteria were a self-reported history of perinatal depression, having experienced a subsequent pregnancy and birth with or without recurrence of postpartum depression, being two weeks to six months postpartum, and enrolled in the MAMA clinical trial. Exclusion criteria for the MAMA Trial included: moderate to severe depression with onset during the current pregnancy, severe psychiatric disorders, serious physical illness, non-fluency in Danish, and severe illness or perinatal death of the infant. For a comprehensive list of inclusion and exclusion criteria, please refer to the MAMA Trial protocol paper [18]. In the subsequent postpartum period, we evaluated if the women developed recurrence of postpartum depression diagnosed according to the Diagnostic and Statistical Manual of Mental Disorders (DSM-V) criteria for Major Depressive Disorder (within six months postpartum).

When the women had their last in-person trial visit at ten weeks postpartum, they were asked if they were interested in participating in the interview study. The first author (SH) provided them with an information letter and stressed that participation was entirely voluntary and would not affect their continued participation in the MAMA trial. Three women did not reply to attempts of contact with information about the study.

We used purposive sampling to ensure that women varied in their socio-economic background and that both women with and without recurrence of postpartum depression were represented [19].

Data collection

We performed individual, semi-structured interviews between three and five months after the second birth, lasting around one hour on average (ranging from 45 min to one hour and 45 min), from January to March 2022. All interviews were performed in the participants' homes, some with their 3–5 months old infant present during the interview. The first author (SH) conducted all interviews. The last author (LEN) participated in one interview, supervising the first author.

The interview themes (Table 1) were based on existing literature on women's experience of postpartum depression, perceptions of genetic testing in psychiatry and field notes from recruitment interviews for the clinical MAMA Trial (more than 100 recruitment interviews) [3,5,16,17]. Following the initial two interviews, we adjusted the interview guide. Specifically, we included more information about genomic risk marker testing to encourage women to reflect more on the biological aspects of risk for postpartum depression.

We were curious about how the women defined biology in relation to postpartum depression and their perceptions of hormone sensitivity testing for risk of postpartum depression. Therefore, we asked them about their perceptions of the biology contributing to their depression and how they would perceive it if we, *hypothetically*, could point at them being predisposed to postpartum depression through testing for genomic risk markers.

The interviews were audiotaped and transcribed ad verbatim. The first author transcribed six interviews, and student assistants transcribed the rest.

Data analysis

The interviews were analyzed using NVivo software. We drew our analysis on a phenomenological tradition, exploring human experience and sense-making [20]. We used a thematic analysis with six phases described by Braun and Clarke [21]. In line with these phases, 1) we read the interviews and initial meaning was noted, 2) we worked

Table 1
Interview theme guide.

Introduction	The aim of the study, voluntary participation, possible to withdraw, tape recording, anonymity, how interview data will be reported.
Opening question	Please tell us your story about the previous birth, where you think it begins…
Guiding interview themes	Expectations to motherhood Experience with postpartum depression Social interactions and relations *Healthcare professionals* *Partner* *Other relatives* Experience with being pregnant again and thoughts of recurrence and prevention Reflections about triggering factors in relation to postpartum depression The value of genomic risk marker testing in mental illness and postpartum depression Perceptions of testing for genomic risk markers related to enhanced sensitivity to estradiol signaling and postpartum depression. Perceptions of prevention and treatment of postpartum depression. Retrospective rationalizations. Looking back on the postpartum depression and creating explanations. Thoughts about the future – future pregnancies and births Questions and was there something we forgot to talk about *Thank you*

systematically through the data and extracted relevant parts of the interviews that seemed interesting according to our research question into codes, 3) we searched for themes across the codes, 4) we reviewed the themes in relation to the coding and generated a thematic map of the analysis, 5) a collective thematic framework was defined involving all authors, and finally, 6) findings were written up. See Supplementary Table S1 for an illustration of the analysis.

We ensured rich data reflections by involving researchers from different fields (midwifery, obstetrics, psychiatry, and anthropology) in the analysis. We found data redundancy after 12 interviews indicating data saturation and decided to stop at 13 interviews.

Results

We conducted 13 interviews with women with a history of postpartum depression and who had experienced going through a pregnancy and birth after the depression. All the women had an infant of 3–5 months of age at the time of the interview. Most of the interviewed women were of Danish origin, between 30–35 years of age, had higher educational degrees, and three had a recurrence of postpartum depression (Table 2).

Through the analysis, we identified three key themes 1) Biology as a contributing factor to postpartum depression, 2) The role of external events in making sense of postpartum depression, and 3) The ambiguous potentiality of testing for genomic risk markers of postpartum depression.

Biology as a contributing factor to postpartum depression

Most women did not spontaneously mention biological contributions to their postpartum depression. When asked about their perceptions of biology possibly contributing to their depression, it became evident that it played a minor role in their understanding of postpartum depression.

When reflecting upon the association between biology and postpartum depression, most women did not perceive their genes or biology as the single cause for their depression; it was closely intertwined with life conditions and specific past experiences.

> "I thought it was me. That I have a flaw that makes me highly anxious. And since I've been depressed before, I think that I'm at risk. Then of course I thought about how difficult the birth was and that I was totally deprived of sleep, not to mention the immense shock of giving birth for the first time. Being responsible for a tiny baby and, well, for a long time I thought the reason was that, with Emil, I was terribly stressed because I breast fed and he had to eat. But it wasn't like that this time; it wasn't something like that making me feel frazzled in the beginning this time, so I can't quite (…) So, but yeah, I definitely believe that there's something about me, genetically, that makes me prone to it." (Ida, postpartum depression with her first child and anxiety with her second child).

To Ida, the potential of testing for genomic risk markers was inevitably linked to reflections on the causality of disease. She perceived her depression as resulting from stressful living during the weeks leading up to the birth, the physical transition from pregnancy, through birth to postpartum, combined with her history of depressive episodes.

Moreover, Karen had experienced a traumatic birth and attributed the experience as the cause of her first postpartum depression. After her second birth, she experienced a recurrence of postpartum depression. However, after experiencing a good pregnancy and birth, she revised her perceptions of the cause of her depression.

> "The typical thing about it was that it occurred three days after I gave birth. It came out of nowhere. I had a really good pregnancy and, before that, was fine mentally and physically, and happy with my life, my work, my home, and my children and all. There was nothing during my pregnancy. Not a glimpse of anything, not before my pregnancy either. She [the psychologist] was like; it appears to be exceptionally hormonal when it happens in one night." (Karen, recurrence of postpartum depression).

In contrast to many other women, Karen did not have a story of traumatic external events, and she was convinced that her hormones affected her risk of postpartum depression.

The role of external events in making sense of postpartum depression

Listening to the women's stories, it became evident that they all were searching for an explanation of why they suffered from depression at a time that was supposed to be the happiest of their lives. To the women, the depression was often closely tied to shattered ideals of motherhood.

Most of the women strived to be the "perfect mom." After birth, women like Kirsten struggled with breastfeeding, overshadowing all other aspects of becoming a mother. She described feelings of anxiety, stress, and self-blame. She had all her identity as a mother tied up in successful breastfeeding, and when failing at breastfeeding, it became difficult for her to envision herself as a good mother.

> "I remember just sitting there. I was so unhappy; I couldn't stop crying and felt like a bad mom. Just the fact that it wasn't as simple as letting the baby nurse at my breast and off we go. I thought that that was what was happening. My expectations didn't match reality at all. That made me think about whether there was something wrong with me. It's me who can't, I can't figure it out; am I even suited to being a mother if I can't do something as basic as breastfeeding my own child?" (Kirsten, no recurrence of postpartum depression).

The quote of Kirsten is representative of many of the interviewed women. The contrast between ideals of motherhood and real life left the women with overwhelming feelings of failing in motherhood, negatively impacting their self-understanding, and feeding their guilt.

Likewise, Lise gave birth by emergency caesarean section which was an overwhelming experience.

> "Of course, it's been a combination of many things, but I had a really complicated birth with Esther the first time (…). So, my initiation into motherhood was, uhm, totally … I got off to a completely bad start, I'd say. I was incredibly drained mentally and physically. Not just the birth but the cesarian section. I didn't get to hold her immediately when she came out. They had to help her, which meant

Table 2
Selected characteristics of the participating women (n = 13).

Characteristics	Number of women
Maternal age (years)	
<30	1
30–35	10
>35	2
Living with partner	
Yes	13
No	0
Danish origin	
Yes	12
No	1
Highest qualification	
Compulsory education	2
1–2 years higher education	2
3–4 years higher education	4
Advanced degree	5
Time since first postpartum depression (years)	
1–3	7
4–5	4
>5	2
Recurrence of postpartum depression	
Yes	3
No	10

> Jens got her. I got her when I woke up in recovery. if you've ever experienced having so much medicine in your body, that needs to be expelled. You're oddly wide awake. Then they give you the child as though it was any old child. Yeah, now you have to breastfeed and everything. I was like; please get this baby away from me. I couldn't cope at all." (Lise, no recurrence of postpartum depression).

With the words, "Then they give you the child as though it was any old child," Lise expressed that experiencing critical events during birth challenged her attachment to her newborn. To Lise, postpartum depression was affected by experiencing a traumatic birth. Lise framed it as she "got off to a completely bad start.".

An overarching theme for the women was the lack of care and support as the cause of their depression. The women described it as relatives neglecting them emotionally or the healthcare professionals failing them in their care, thus leaving them with the impression that staff members were unconcerned about their mental and physical well-being.

Emma described failings in care from the healthcare system, in which she felt left alone, contributing to her postpartum depression. Due to postpartum hemorrhage, Emma went to the operating room immediately postpartum, leaving her husband to care for their newborn daughter by himself. He was so nervous that he vomited, which the medical staff mistook for sickness, and he was sent home. Being new parents and separated, combined with the impression that the professional caregivers not caring about them, was stressful for Emma and her partner.

> "Yeah, he [her partner] had such a rough start, and also a rough start for me to be alone and feeling like I couldn't take care of myself. Uhm … well, when you lie there and can't move and she's lying next to you. Then they stuff a piece of paper in your hand, telling you that you're expected to manage on your own now and that food is available on the ground floor at such and such a time. Even if you made plans with someone, they were not respected because the person you made them with had left. So, it starts off with the feeling of total neglect and abandonment." (Emma, no recurrence of postpartum depression).

The ambiguous potentiality of testing for genomic risk markers of postpartum depression

When introduced in the interview, some women envisioned testing for genomic risk markers as holding the potential to prevent depression and reduce stigma. Yet, at the same time, potentially knowing their risk score was perceived as having the power to enhance awareness of depressive symptoms thus holding the potential to become a self-fulfilling prophecy.

Biology as a hidden force in postpartum depression

The majority of the women spontaneously addressed the stigma surrounding postpartum depression by stressing that they had never thought it was "someone like me" who would get postpartum depression.

Some women anticipated that the effects of testing for risk markers would include reduced guilt, stigma, and shame. The following quotes of Maja and Karen illustrate that perceiving biology as a cause of postpartum depression would relieve them from responsibility and entail accepting the postpartum depression as a life circumstance.

> "Sometimes it's easier to be vulnerable for biological reasons than due to a broken mind, right? It might be less shameful that way, I guess." (Maja, recurrence of postpartum depression).

To Karen, the test for risk markers represented a knowledge that she expected would inevitably manifest itself in the future. Importantly, this means that Karen understood the risk of postpartum depression conveyed through the genomic risk marker test as outside her power to control or change.

> "I think it would also reassure me if I could explain it to myself, well, that I'm not crazy, that it has something to do with my body. It's chemistry; it's biology. Something is happening inside me, and we don't know what it is (…). It would give tremendous peace of mind to know, well, that that's what your DNA is like; it has nothing to do with me or, well, it's me, it's my DNA, but I couldn't have done anything differently. It's just a condition in life that I have. It's not really my fault or something I should have done or not done like that; it's the way it is." (Karen, recurrence of postpartum depression).

Regitze experienced that the ability to localize postpartum depression in biology or hormones established her future as open, and provided her with the possibility to understand, know and act upon postpartum depression.

> "I know my body extremely well, and I'm incredibly aware of what my period can do to me. (…) That's also why it's quite logical if it's something biological or hormonal. That there's a natural explanation for why this happens to some people and why it doesn't happen to others. That makes a lot of sense. I hope, and this sounds utterly insane, but I HOPE that this is why people get postpartum depression because then something can be done about it." (Regitze, no recurrence of postpartum depression).

A couple of the women pointed out that genomic risk marker testing would give them biological proof of their risk of depression, which they imagined as more valued and respected by healthcare professionals.

> "The first time I went to the doctor, she was like, well, let's just wait and see what happens. If you give people this kind of information: I have this gene, whatever it is, we can try to have a serious conversation instead of you just brushing me off with the fact that you're also a first-time mom and you're probably just overreacting and feeling like everything is too much right now. I think maybe the healthcare system would take you more seriously." (Astrid, no recurrence of postpartum depression).
>
> "That would be brilliant because then it would get caught early. Maybe you would be put in touch with a psychologist without delay (…). I just think that it would be taken seriously in a completely different way as well. Both in terms of your health but also for the family (…). I think it would be handled differently when it's precisely something that you specifically can see on a blood test, a bit like diabetes or something." (Kirsten, no recurrence of postpartum depression).

In previous encounters with healthcare professionals, the women had experienced the healthcare professionals not listening to them and wanting to normalize and tone down their depressive symptoms and distress. Hence, they were left with enhanced feelings of guilt and shame. To Kirsten and Astrid, genomic knowledge carried the potential to transform her interaction with healthcare professionals and her family.

The potential to modify the risk of postpartum depression

In contrast to Karen, Lise envisioned that knowing her biological risk would somehow render her future closed; she imagined that knowing her risk could lead to an exaggerated awareness and reinforcement of or even trigger depressive symptoms. In that way, testing for genomic risk markers related to postpartum depression was perceived as carrying a risk of becoming a self-fulfilling prophecy. Two women pointed to the different potential of screening for physical diseases and psychiatric disorders. They perceived testing for genomic risk markers of psychiatric disorders as having transformative power in which anticipation of psychiatric symptoms could potentially trigger or enhance symptoms.

> "I think that it [genetic screening] can be both positive and negative. Because it's not always, I believe, positive to know what can potentially happen. Because, on the one hand, you could say that it's terribly smart in terms of prevention, but I also can't help but think that, well, it can also be a contributing factor in terms of being prone to something happening." (Lise, no recurrence of depression).

Secondly, they all pointed at the transformative potential of the genomic risk marker test in the sense that knowing about a risk of postpartum depression revealed a preventable future. If it was not in their power to modify the risk themselves, it could be modified by others, thus leaving their future open.

> "If you had that blood test taken and you got the result that you were at increased risk, then a lot of other things should be made available to make you better at … (…) well, it should be helpful and not just information, I think. So, yes, what you're told must be accompanied by more. Otherwise, I wouldn't…." (Ida, postpartum depression with her first child and anxiety with her second child).

One woman speculated if knowing the risk could be misused by social system authorities.

> "I would probably take it, I think. But I also think the anxiety I have towards all the social services stuff and about forced child removal and all, that I would like to know ahead of time; what happens if someone is told they have something, and it triggers an avalanche, like completely automatically?" (Kirsten, no recurrence of postpartum depression).

When Kirsten had postpartum depression, she feared that the social services would remove her baby if they found out she had depressive symptoms. Even though Kirsten's fear of the social services is not representative of the interviewed women, it points to the perceived potency of a genomic risk marker test and a fear that the most valuable, namely their child, might be at stake.

Discussion

In this qualitative study, we found that most women perceived their postpartum depression as primarily triggered by external factors rather than biological factors. Only a few women believed postpartum depression could be related to a sensitivity to hormonal fluctuations. Generally, the women envisioned testing for genomic risk markers with ambiguity, i.e., holding the potential to prevent postpartum depression and reduce stigma, and, at the same time, holding the potential to become a self-fulfilling prophecy.

According to Goffman, stigma is an attribute that communicates devalued stereotypes and excludes a person from social acceptability [22]. A sub-group of stigma is self-stigma, which is when a person internalizes the attitudes of the public stigma with a negative impact on self-esteem and self-image [23]. Our analysis provided a nuanced illustration of stigma related to postpartum depression. To some of the interviewed women, having "biological proof" of their depressive symptoms held the potential to change their self-image and not feeling stigmatized. Notably, women who perceived genomic risk marker testing as mitigating feelings of guilt and shame associated with postpartum depression were exclusively those who had experienced a recurrence of depression. One might speculate if their heightened sensitivity to the stigma surrounding postpartum depression, which was still fresh in their minds, influenced this perception. However, we are cautious in concluding, as only two women articulated this perception, and the third woman with a recurrence did not discuss this aspect. The potential of reducing guilt through biogenetic explanations was also found in a *meta*-analysis by Kvaale et al. [24]. In contrast, other studies have shown that genetic information about psychiatric conditions could increase stigma and discrimination in asymptomatic people [17,25]. This aligns with the concerns raised by one woman in our study, who speculated about social services' potential misuse of genomic information. Our findings suggest that knowledge of genetic susceptibility has the potential to reduce stigma but also coexists with fear of genetic discrimination. Our findings underscore the importance of implementing legislation and awareness among policymakers and clinicians to reduce the risk of genetic discrimination arising from predictive genetic testing and mental illness [26].

Most of the interviewed women perceived their postpartum depression as primarily triggered by external factors rather than biological factors. As the women made sense of the postpartum depression, they envisioned the risk as plastic and transformable, as something they and, especially their relatives and caregivers, could actively provoke and prevent. Thus, they perceived it as something that could be modified by experiencing traumatic events. Relating postpartum depression to external causes might leave the women with the hope of evading recurrence in a future pregnancy or postpartum. Predominantly, the women looked back and reflected on the dynamics of their high expectations of motherhood and some experiences of lack of support in healthcare encounters.

The perceived potentiality of hormone sensitivity testing was ambiguous. In theory, testing for genomic risk markers of postpartum depression can induce hope and render the future open; however, as our analysis shows, it sometimes does the opposite. Knowledge about a genetic risk of postpartum depression introduced hope to some women regarding possible prevention. Creating hope for future prevention through genetic testing has similarly been demonstrated among people suffering from depression and unaffected people [17]. In contrast to the hopeful nature of genetic testing articulated among researchers and some patients as enabling multiple alternative futures [15,27–29], some women also pointed to the possibility of knowing their risk of postpartum depression as something that narrowed down their space for maneuvering and shaping their future. By attributing the depression to genetic causes, the women might have been forced to accept a possible recurrence in future pregnancies and were left with less hope. Anchoring postpartum depression in biology or at a molecular level seems to represent something deterministic to some of the women. In line with our findings, other studies have shown that knowledge about genetic causes for depression increased peoples' prognostic pessimism [24,30]. However, previous research has demonstrated that malleability-focused psychoeducation could reduce prognostic pessimism in individuals with depression [31]. Two experimental studies that showed learning that a person was genetically susceptible to depression caused them to feel their depressive symptoms as more severe support our findings that knowledge about a risk represented the potential to induce depressive symptoms [32,33]. Further, the medical anthropologist Monica Konrad argues in her work that learning about a genetic risk makes people be seen as ill before they are ill [14]. Few studies, although not consistently replicated, suggest that estrogen-related genomic risk markers may predict postpartum depression status with an accuracy of 78–88 % [6,34,35]. Nevertheless, whether related to such insights or not, some women expressed concerns about the potential for a self-fulfilling prophecy. Tailoring communication about genetic risks to individual needs and concerns may improve understanding and reduce fear. Clear, empathetic explanations about the probabilistic nature of genetic risk, combined with practical steps for managing mental health, may help women feel more empowered and less deterministic about their condition. Introducing genomic risk markers testing calls to be followed by an intervention that is not (yet) available or efficient psychoeducation support. Thus, ways to address ambiguities and concerns for women eligible for genomic risk marker testing must be developed before designing and implementing testing for postpartum depression based on genomic markers or more complex risk models.

Strengths and limitations

The strength of this study is that the women's participation in the

clinical MAMA Trial could have increased their awareness of postpartum depression and possibly heightened their capacity to reflect on the biological factors involved in postpartum depression. However, at the same time, this increased awareness may limit the generalizability of the findings. Women who decided to participate in the MAMA Trial might have distinct characteristics, such as greater openness to medical research, greater openness to seeking help, or more positive expectations of genomic risk marker testing than those outside the trial. This could mean that the perceptions found in this study may disproportionately reflect the perspectives of women more engaged with or receptive to clinical research. Similarly, cultural and socioeconomic factors play a crucial role in shaping perceptions of mental health, medical interventions, access to clinical care, and genomic research. Thus, the results of this study may not fully represent the diversity of perceptions across different populations. Moreover, the results reflect the perceptions of women with lived experience of postpartum depression, and thus, the findings might differ if women without such experience had been interviewed. However, including women with lived experience likely provided more nuanced reflections, as it can be challenging to reflect on a topic that is not personally relevant. Future studies could benefit from including women without a history of postpartum depression to offer a broader perspective.

A strength was the research group's transdisciplinary nature, enhancing the study's reflexivity and validity . A strength could be that the first author (SH) had met the participants before the interviews when collecting data for the clinical trial. In that sense, the first author was familiar with some of the participants' stories prior to the interview. This might have created a space of trust and confidentiality during the interviews. However, this pre-existing relationship could also be considered a limitation, as it might have unintentionally influenced the interview dynamics. The participants may have felt inclined to provide responses they believed the interviewer expected or desired, or they might have refrained from sharing critical perspectives due to perceived familiarity. However, the genomic marker was not a focus point during the visits in the clinical MAMA Trial. It was only sometimes mentioned when doing blood samples and, therefore, not represented with any expectations of right or wrong answers. Notably, the first author stressed the importance of telling their stories, pretending it was the first time the interviewer heard them and reassured them of her interest in hearing their perceptions.

One limitation of the study is that we asked the women about a hypothetical genomic risk marker test making it more abstract to reflect upon. We might have had different results if the genomic risk marker test had already been implemented in clinical practice and a relevant preventive strategy had been available.

Conclusion

Our study suggests that to women with a history of postpartum depression, the potentiality of testing for genomic risk markers related to postpartum depression was perceived with ambiguity.

Biological causes were represented in the women's stories; however, always intertwined with external causes. Knowledge about hormonal sensitivity at the genomic level for developing postpartum depression could, to some, introduce hope regarding possible prevention. At the same time, it was perceived as having the power to enhance awareness of depressive symptoms and create imaginative negative expectations about the future. Before implementing new genetic technologies in risk profiling, this essential knowledge needs to be considered.

CRediT authorship contribution statement

Stinne Høgh: Writing – original draft, Methodology, Investigation, Funding acquisition, Formal analysis, Conceptualization. **Hanne K. Hegaard:** . **Kristina M. Renault:** . **Mette N. Svendsen:** . **Laura E. Navne:** . **Vibe G. Frokjaer:** Writing – review & editing, Supervision, Methodology, Funding acquisition, Conceptualization.

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Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Appendix A. Supplementary data

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