Fekih-Romdhane et al. BMC Psychiatry (2024) 24:587
https://doi.org/10.1186/s12888-024-06019-0

BMC Psychiatry

RESEARCH

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Relationship between childhood trauma and postpartum psychotic experiences: the role of postnatal anxiety and depression as mediators

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Abstract

Background Postpartum psychosis (PP) is a psychological emergency requiring rapid intervention, hospitalization and psychiatric management. However, PP has been neglected in the postpartum literature. Understanding the detrimental consequences of childhood trauma across mother's life span is crucial to prevent this serious condition. The study's objectives were to demonstrate the relationship between childhood trauma and postpartum psychotic experiences (PPEs) and to look over the mediating role of postnatal depression (PD) and anxiety (PA) in this relationship.

Methods This cross-sectional study, which enrolled 438 postpartum females 4–6 weeks after delivery (mean age: 31.23 ± 5.24 years), was carried out from September 2022 to June 2023. The Arabic validated versions of the Postpartum Psychotic Experiences Scale, the Edinburgh Postnatal Depression Scale, the Perinatal Anxiety Screening Scale, and the Child Abuse Self Report Scale were used.

Results Both PD and PA partially mediated the correlation between psychological abuse and PPEs, and fully mediated the association between neglect and PPEs. Higher psychological abuse and neglect were significantly associated with higher PD (Beta = 1.11) and PA (Beta = 3.94), higher PD (Beta = 0.84) and PA (Beta = 0.26) were significantly associated with higher PPEs in both models, whereas greater child psychological abuse (Beta = 1.37) (but not neglect) was directly and strongly correlated with higher PPEs in all models.

Conclusion The significant mediating effect of PA and PD on the association between childhood adversities and PPEs among postpartum females may offer additional therapeutic avenues to help attenuate various postpartum mental health issues and their potential serious risks on both mother and child.

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Keywords Postpartum psychosis, Postpartum psychotic experiences, Postnatal depression, Postnatal anxiety, Psychosis, Childhood trauma

Introduction

Postpartum is a sensitive period described by biological, social, physical and emotional changes for mothers and leaves them extremely susceptible to a range of mental health issues. One of the most serious types of mental illnesses associated with childbirth is postpartum psychosis (PP), which occurs beyond the four weeks until up to 6 months after delivery [1]. This condition is a life-threatening emergency [2] that affects postpartum females' sense of reality, causing hallucinations, delusions and disorganized thoughts. In acute cases, mothers with PP may attempt to harm themselves or their babies. Despite its harmful effects and possible fatality, PP has received little attention in the postpartum literature [3]. PP is thought to be relevant from a global public health standpoint and deserves special attention because of the intensity of its repercussions, despite occurring at a very low rate (0.9 to 2.6/1000 births) [4] .

The causes of PP are unclear and not well known [5]. According to the psychosis paradigm, a number of researchers have begun looking at subacute psychotic symptoms in new moms, which are also referred to as psychotic experiences (PEs). Psychotic phenomena, in line with the continuum of psychosis, encompass the full range of psychotic symptom presentations, ranging from mild to the clinically severe symptoms found in psychotic diseases [6]. As a result, PEs are defined as a non-pathological phenotype that can be observed in the general population and is characterized by perceptual anomalies and delusional beliefs [7]. PEs are linked to an increased risk of developing clinical psychotic disorders in the future, and those who report PEs could be considered to be part of a population that is "pre-prodromal". Besides, it has been demonstrated that PEs are linked to the start of a variety of behavioral issues and psychopathologies, as well as a worse level of overall functioning [8]. Most patients respond well to treatment when diagnosed and treated adequately, and many of them achieve complete remission and a satisfactory functional return [9]. Therefore, research aiming at establishing correlates of PP across the continuum of psychosis may be a crucial and necessary step toward creating successful strategies and interventions to diagnose this serious condition. The current study suggests concentrating on childhood trauma as a crucial component influencing PPEs.

The relationship between childhood trauma and PPEs

Childhood trauma is defined as "all forms of physical and emotional ill-treatment, sexual abuse, neglect, and exploitation that results in actual or potential harm to the child's health, development or dignity" [10] . It has been determined that childhood trauma is a significant predictor of a number of mental health conditions throughout life, including psychosis [11]. Varese and colleagues' (2012) meta-analysis of the proposed relationship reveals a strong correlation between childhood abuse and psychosis [12]. A growing amount of research demonstrated a significant positive association between childhood trauma and PEs in individuals with various stages and degrees of severity of the disease, including patients with schizophrenia [13], individuals at risk for psychosis [14, 15], and non-clinical samples from the general population [16]. In contrast, the relationship between childhood trauma and PP has received little scientific interest. Research on the connection between unfavorable life experiences in childhood and PP is rather rare and inconclusive, according to a systematic analysis that included 17 case control and cohort studies [17]. A cohort study conducted in Denmark revealed that 31 out of 85,080 females experienced PP; certain unfavorable childhood experiences were linked to higher chances of psychiatric diagnosis; nevertheless, there was insufficient power to investigate PP in detail [18]. Besides, authors noted that PP is rarely considered as a separate entity; rather, it is often considered part of a bipolar spectrum.

[19, 20].

Other findings suggested a dose-response model, with females who have been the victims of several or more severe abuse are more prone to develop PP [21]. In addition, a prospective longitudinal study indicated that severe childhood maltreatment was a significant predictor of mental relapse in females at risk of PP during the first four weeks after giving birth (because of either a previous PP or a previous diagnosis of psychotic disorder) [22]. Nevertheless, the association between childhood abuse and PPEs, which is the focus of the present study, remains under- or un-explored. Furthermore, the mechanisms underlying the childhood trauma-PP relationship are largely unknown. Prior studies attempted to locate possible neurotransmitter candidate genes and gain a better understanding of the disorder's heritability; however, meta-analyses indicate that results are contradictory and that causative pathways are still unknown [23]. In order to add to the body of knowledge already in existence, the current study invested the role of postpartum depression and anxiety in the pathways between child abuse and PPEs.

Postnatal depression as a mediator on the association between childhood trauma and PPEs

Postnatal depression is the psychological problem associated with childbirth that is most statistically significant. According to recent meta-analytic evidence, individuals with psychosis who experience abuse and neglect are positively correlated with having more severe depression symptoms [24]. Plaza et al. (2005) showed that self-reported psychological child abuse was substantially linked with a five-fold increase in depression symptomatology in a study of 236 women immediately postpartum (24–48 h after birth) [25]. Additionally, depression is linked to poor outcomes in terms of suicide, relapse rates, and functional recovery. There is now mounting evidence that, in many cases, depression precedes the beginning of first-episode psychosis [26]. According to epidemiological studies, psychotic symptoms are seen in 19% of people with serious depression [27]. However, the association between postpartum depression and PP has scarcely been investigated [28]. Research has indicated that PD may serve as a clinical indicator of bipolar illness in the future, and that PP may also manifest as bipolar disorder [29, 30]. Based on the link between childhood trauma and PD on one hand, and PD and PP on the other hand, it can be hypothesized that depression experienced during postpartum might serve as an intermediary in the relationship between childhood trauma and PPEs.

Postnatal anxiety as a mediator on the association between childhood trauma and PPEs

Another vulnerability that women may experience during the postpartum period is anxiety. Many new mothers express concern about giving their child the right care and about keeping their child safe. Females who were abused as children may feel conflicted or anxious during their pregnancies, labors, deliveries, and postpartum periods [31]. In a group of people with psychosis lasting up to ten years, a study discovered that anxiety was bridging the gap between abuse and paranoia [32]. According to Wisner et al., over two-thirds of females who tested positive for depression during the postpartum period also had comorbid anxiety disorders [33]. Additionally, anxiety may play a part in the emergence of particular psychopathologies associated with psychosis, such as hypervigilance and an elevated threat to one's own network that result in persecutory delusions, or it may act as a catalyst for the incorrect interpretation of unusual experiences that result in hallucinations [34]. Anxiety problems are prevalent in psychosis at prevalence rates of 42–74% [35]. Furthermore, research has demonstrated a significant correlation between panic attacks and elevated levels of psychoticism [36]. Therefore, anxiety are considered as sequelae of childhood abuse potentiating the development of PEs during the postpartum period.

The current study

To our knowledge, this is the first research that directly sheds light on the connection between personal history of childhood trauma and PPEs, using a newly developed scale that specifically measures PEs phenomena in postpartum females (i.e. the Post-partum Psychotic Experiences Scale, PPES [42]). This is also the primary study that investigates the role of possible mediators in this interaction. Investigating the mechanisms that underlie the connection between childhood adversities and PPEs would allow to identify specific targets for early prevention and intervention of PP. Finally, the relevance of this study lies on the fact that it explores this topic in an under-represented population within the particularly vulnerable Lebanese context. In Lebanon, recent findings have showed that abuse and neglect have significantly increased over the past years [37][38]. All of these contributed to mental health problems in the Lebanese populace, particularly among postpartum mothers [39, 40]. Our research aims to contribute to the current corpus of knowledge, by: (1) examining the association between child abuse and PPEs in a sample of Lebanese post-partum females, and (2) assessing the role of depression and anxiety as mediators in this association. Our hypothesis was that the positive correlation between child maltreatment and PEs would be mediated by the degree of anxiety and depressive symptoms.

Methods

Study design

This study had a cross-sectional design, and was carried-out during the period from September 2022 to June 2023. A confidential online survey has been distributed to all participants in various departments of gynecology and obstetrics throughout Lebanon. Inclusion criteria were the following: (1) being an over-18-year-old post-partum female; (2) having given birth during the last 4–6 weeks; (3) having no previously diagnosed mental disorders (including psychotic disorders) by a psychiatrist or a primary care physician; (3) having no previous use of psychotropic medications, including antipsychotics; (4) originating from, and residing in Lebanon; and (5) willing to participate. Exclusion criteria included postpartum females who did not consent to participate, i.e. those who ticked 'No' to the informed consent statement "I actively consent to take part in this study of my own free will" which was included in the first section of the questionnaire. Techniques for respondent-driven sampling and snowball sampling were used to gather data. Participants received a soft copy of the survey via the hospital's emails, social media accounts, and messaging apps once it was produced using Google Forms. It has been made clear to participants that participation in this study is entirely voluntary and anonymous. No payment was done to participants.

Minimal sample size calculation

For the analysis, a minimum sample size of 416 was determined to have sufficient statistical power, following the formula suggested by Fritz and MacKinnon [41] $n = \frac{L}{f2} + k + 1$, where f=0.14 for small effect size, L=7.85 for an α error=5% and power β=80%, and k=15 variables that will be included to the finished model.

Questionnaire

Consent is requested in the first question. The initial section of the survey comprised inquiries related to variables linked to PP as per the literature review. These variables included age, marital status, educational attainment, employment status, pregnancy mode, epidural injection, pain during pregnancy, insurance, parity, socioeconomic status and financial burden.

The scales utilized in the study were included in the second section:

- **Postpartum Psychotic Experiences Scale (PPES)**: Validated in Arabic [42], it consists of fifteen items that are graded from never to always on a five-point Likert scale. Higher scores reflect higher postpartum psychosis. There were multiple processes involved in developing the PPES scale. In order to evaluate the majority of scales measuring PEs, as well as the unique characteristics of psychotic manifestations during the postpartum period, they first thoroughly researched pertinent literature. The researchers then combined 22 questions based on previously published studies and scales, such as the PQ-B [43] and the Community Assessment of Psychic Experiences [44]. The PPES demonstrated strong convergent validity with the Prodromal Questionnaire-Brief scale and good concurrent validity with PD and anxiety scales. As the ideal cutoff point, a PPES score of 8.5 was determined. 47% of the females who had participated were thought to be potentially at risk for postpartum psychosis at this cutoff (current Cronbach's α = 0.96).
- **Edinburgh Postnatal Depression Scale (EPDS)**: Validated in Arabic [45, 46], it is composed of 10 questions that is useful for detecting the risk of depression following childbirth. The EDPS questionnaire is graded using the following system: responses are rated on a range of 0 (not at all) to 3 (as much as I ever did). As a result, the overall score runs from 0 to 30, with a PD positive score of 11 or higher. The threshold value of ≥ 11 on the overall EPDS score is considered a valid diagnostic criterion to accurately diagnose postnatal PD within the 4 to 6 weeks post-delivery time frame (current Cronbach's α = 0.93).
- **Perinatal Anxiety Screening Scale (PASS)**: This 31-item self-report measure evaluates problematic anxiety in females who are pregnant or have just given birth [47]. The validated Arabic version was employed in this investigation [48]. Each anxiety symptom is self-rated by respondents on a scale from 0 ("not at all") to 3 ("almost always"), which represents the frequency of the symptoms during the preceding month. We found internal consistency coefficient values of ω = 0.98 and α = 0.98 in this sample (current Cronbach's α = 0.99).
- **The Child Abuse Self-Report Scale (CASRS)**: The four basic criteria identified by the original Child Abuse Self Report Scale (the Arabic 38 item CASRS) are replicated in the 12-item Arabic version of the CASRS. The four subscales' McDonald's ω values, which ranged from 0.87 to 0.93, as well as the scale's configural, metric, and scalar invariance across genders demonstrated the scale's strong internal consistency [49]. Twelve elements total, broken down into four categories of child abuse: three each for psychological, physical, sexual, and neglect. The following is a report of the responses: 0 = Never 3 = Invariably. In all subscales, higher scores correspond to more abuse (current Cronbach's α = 0.93).

Statistical analysis

The statistical analysis was performed with SPSS software version 26. There was no missing data in our dataset. Because the PPEs scores' skewness and kurtosis values ranged from −1 to +1, it was determined that they were normally distributed [50]. The Pearson test was used to correlate two continuous variables, the Student's t- test was used to compare two means, and the ANOVA test to compare three means. Three paths were computed using the PROCESS SPSS Macro version 3.4, model four [51]. The impact of child abuse on depression and anxiety was ascertained by Pathway A; the relationship between depression and anxiety and PPEs was investigated by Pathway B; and the overall and direct effects of child abuse on PPEs were evaluated by Pathways C and C'. If the bootstrapped confidence interval did not pass by zero, significance was considered to be present [51]. All factors that displayed a $p<0.25$ in the bivariate analysis had their results corrected. Statistical significance was defined as $P<0.05$.

Table 1 Sociodemographic and other characteristics of the sample (n = 438)

Variable	*n* (%)
Marital status	
Single	49 (11.2%)
Married	389 (88.8%)
Education level	
Secondary or less	74 (16.9%)
University	364 (83.1%)
Occupation	
Unemployed	189 (43.2%)
Employed	249 (56.8%)
Intended & wanted pregnancy	
Yes	342 (78.1%)
No	96 (21.9%)
Pregnancy method	
Natural	388 (88.6%)
In-Vitro Fertilization	50 (11.4%)
Delivery method	
Vaginal	193 (44.1%)
Cesarean	245 (55.9%)
Epidural injection	
No	130 (29.7%)
Yes	308 (70.3%)
Pain during pregnancy	
No	222 (50.7%)
Yes	216 (49.3%)
Insurance	
No	88 (20.1%)
Nation Social Security Found	183 (41.8%)
Private	167 (38.1%)
	Mean ± SD
Age (years)	31.23 ± 5.24
Age at marriage (years)	26.63 ± 3.93
Number of children	1.73 ± 0.94
Household crowding index	1.12 ± 0.51
Psychological abuse	1.34 ± 2.46
Neglect	3.27 ± 2.76
Physical abuse	0.81 ± 1.78
Sexual abuse	0.84 ± 1.77
Postnatal depression	13.61 ± 8.08
Postnatal anxiety	37.76 ± 27.11
Postpartum psychotic experiences	13.39 ± 13.49

Table 2 Bivariate analysis of factors associated with Postpartum psychotic experiences

Variable	Mean ± SD	t / F	df	*p*
Marital status		19.75	436	**< 0.001**
Single	39.47 ± 11.65			
Married	10.10 ± 9.56			
Education level		7.86	436	**< 0.001**
Secondary or less	28.36 ± 19.26			
University	10.34 ± 9.45			
Occupation		5.21	436	**< 0.001**
Unemployed	17.36 ± 16.29			
Employed	10.37 ± 9.90			
Intended & Wanted pregnancy		-6.68	436	**< 0.001**
Yes	10.51 ± 9.98			
No	23.65 ± 18.52			
Pregnancy method		-4.50	436	**< 0.001**
Natural conception	12.30 ± 13.02			
In vitro fertilization	21.82 ± 14.21			
Delivery method		-1.21	436	0.228
Vaginal delivery	12.52 ± 12.47			
Cesarean delivery	14.07 ± 14.23			
Epidural injection		7.27	436	**< 0.001**
No	21.58 ± 17.14			
Yes	9.93 ± 9.75			
Pain during pregnancy		-8.77	436	**< 0.001**
No	8.20 ± 7.16			
Yes	18.72 ± 16.14			
Insurance		95.15	2, 435	**< 0.001**
No	28.15 ± 17.34			
National Social Security Fund	10.38 ± 9.67			
Private	8.90 ± 8.54			

Significant p values are indicated by numbers in bold. The Student's t-test was used to compare two groups and the one-way ANOVA test was used to compare three or more groups

Results

Sociodemographic and other characteristics of the sample

In this study, 438 postpartum females were involved; their mean age was 31.23 ± 5.24 years, and 83.1% of them had completed university education. Table 1 contains more sample descriptive statistics.

Bivariate analysis of factors associated with PPEs

The findings demonstrated that mothers who were single, had only completed secondary school or less, were unemployed, did not wish to become pregnant, became pregnant through in vitro fertilization, did not receive an epidural injection, experienced pain during pregnancy, and lacked insurance coverage had higher PPEs. Additionally, there was a correlation found between greater PPEs and increased household crowding index, neglect, psychological, physical, and sexual abuse, as well as PA and PD. Lastly, Tables 2 and 3 showed a strong correlation between lower levels of PPEs and older age.

Mediation analysis

Postnatal depression as the mediator

The following variables were taken into account while adjusting the results of the mediation analysis: age, insurance, household crowding index, marital status, education, occupation, desired pregnancy, delivery mode, epidural injection, pain during pregnancy, and the other three categories of abuse. PD partially mediated the association between psychological abuse and PPEs (indirect effect: Beta = 0.93; Boot SE = 0.20; Boot CI 0.54; 1.34); PD was strongly correlated with higher levels of

Table 3 Correlations matrix of continuous variables

	1	2	3	4	5	6	7	8
1. Postpartum psychotic experiences	1							
2. Age	−0.30***	1						
3. Household crowding index	0.44***	−0.16**	1					
4. Psychological abuse	0.80***	−0.39***	0.54***	1				
5. Neglect	0.70***	−0.23***	0.48***	0.74***	1			
6. Physical abuse	0.56***	−0.33***	0.45***	0.68***	0.52***	1		
7. Sexual abuse	0.47***	−0.22***	0.34***	0.52***	0.40***	0.82***	1	
8. Postnatal depression	0.84***	−0.23***	0.44***	0.71***	0.71***	0.47***	0.36***	1
9. Postnatal anxiety	0.86***	−0.22***	0.42***	0.72***	0.67***	0.48***	0.39***	0.88***

*$p<0.05$; **$p<0.01$; ***$p<0.001$. Pearson correlation test was used for this analysis

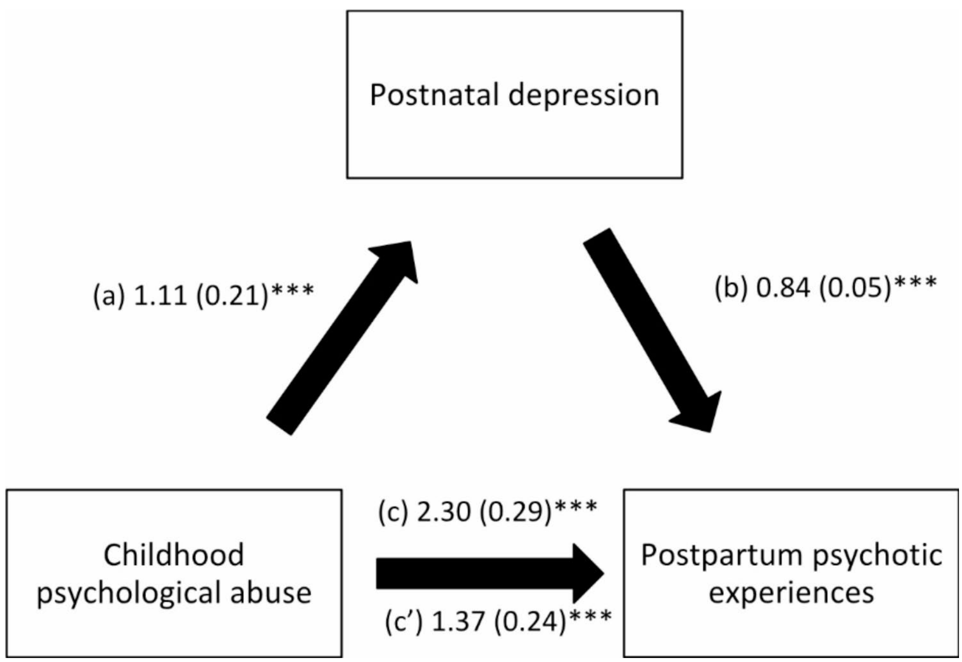

Fig. 1 (**a**) Relation between psychological abuse and postnatal depression ($R^2=.610$); (**b**) Relation between postnatal depression and postpartum psychotic experiences ($R^2=.825$); (**c**) Total effect of psychological abuse on postpartum psychotic experiences ($R^2=.726$); (c′) Direct effect of psychological abuse on postpartum psychotic experiences. Numbers are displayed as regression coefficients (standard error). ***$p<0.001$

psychological abuse, while PPEs were significantly correlated with higher levels of PD. Additionally, there was a direct and substantial correlation between higher PPEs and increased psychological abuse of children (Fig. 1).

The relationship between neglect and PPEs was completely mediated by PD (indirect effect: Beta=0.84; Boot SE=0.15; Boot CI 0.55; 1.13); higher neglect was significantly associated with higher PD, whereas higher PD was significantly associated with higher PPEs. Moreover, neglect was not directly correlated with PPEs (Fig. 2).

However, it did not mediate the associations between physical abuse and PPEs (indirect effect: Beta=−0.06; Boot SE=0.23; Boot CI −0.51; 0.40) and sexual abuse and PPEs (indirect effect: Beta=−0.09; Boot SE=0.20; Boot CI −0.45; 0.34).

Postnatal anxiety as the mediator

Postnatal anxiety partially acted as a mediator in the relationship between psychological abuse and PPEs (indirect effect: Beta=1.04; Boot SE=0.24; Boot CI 0.58; 1.52); higher psychological abuse was strongly correlated with higher PA, whereas higher PA was significantly associated with higher PPEs. Moreover, higher child psychological abuse was directly and significantly associated with higher PPEs (Fig. 3).

Postnatal anxiety fully mediated the association between neglect and PPEs (indirect effect: Beta=0.60; Boot SE=0.14; Boot CI 0.32; 0.87); higher neglect was significantly associated with higher PA, whereas higher PA was significantly associated with higher PPEs. Moreover, childhood neglect was not directly associated with PPEs (Fig. 4).

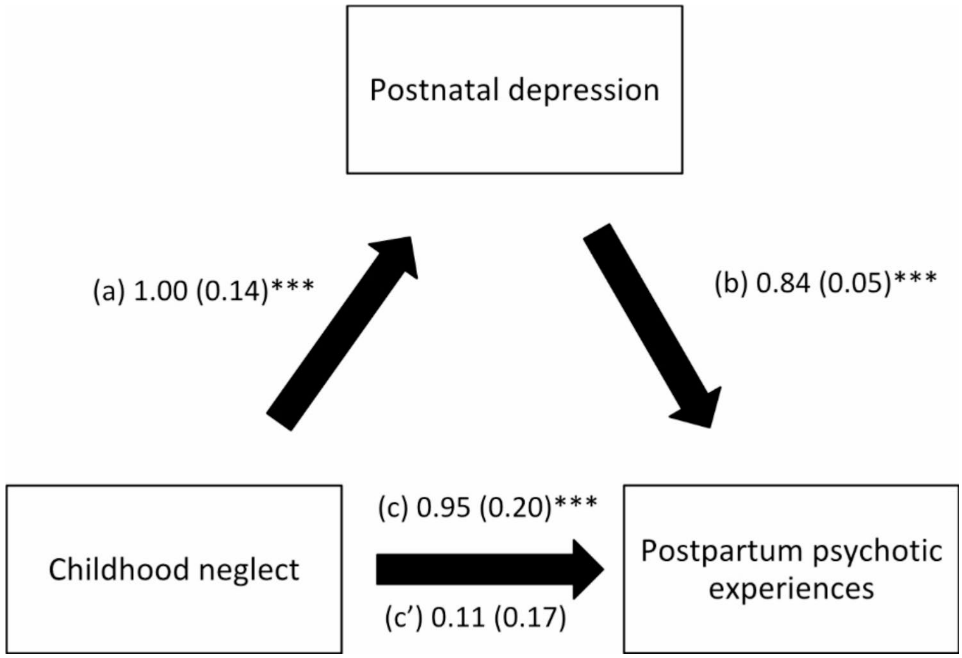

Fig. 2 (**a**) Relation between childhood neglect and postnatal depression (R^2 = .610); (**b**) Relation between postnatal depression and postpartum psychotic experiences (R^2 = .825); (**c**) Total effect of neglect on postpartum psychotic experiences (R^2 = .726); (c′) Direct effect of childhood neglect on postpartum psychotic experiences. Numbers are displayed as regression coefficients (standard error). ***$p < 0.001$

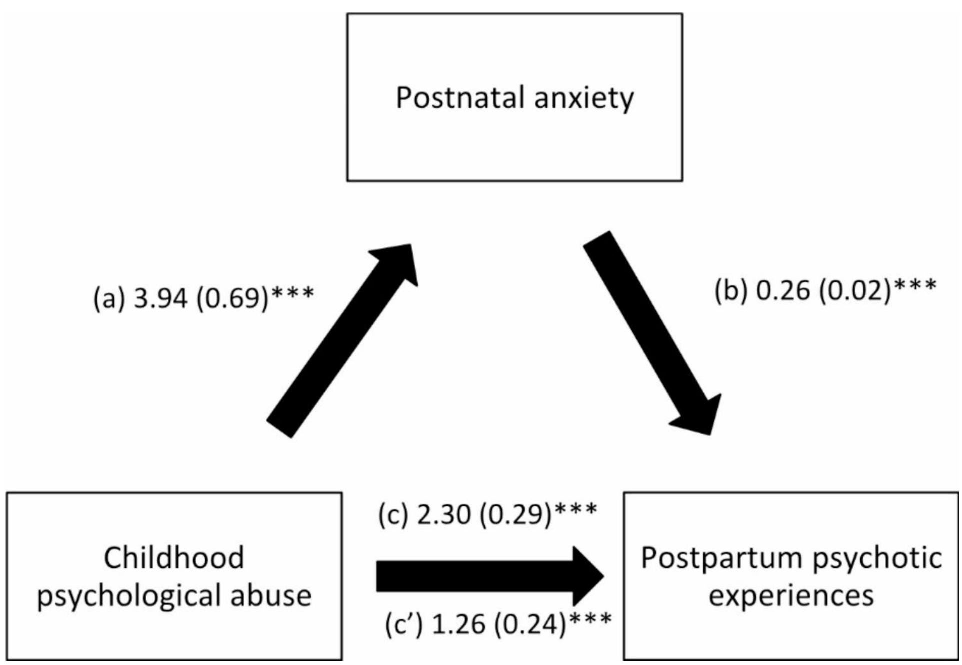

Fig. 3 (**a**) Relation between psychological abuse and postnatal anxiety (R^2 = .628); (**b**) Relation between postnatal anxiety and postpartum psychotic experiences (R^2 = .830); (**c**) Total effect of psychological abuse on postpartum psychotic experiences (R^2 = .726); (c′) Direct effect of psychological abuse on postpartum psychotic experiences. Numbers are displayed as regression coefficients (standard error). ***$p < 0.001$

However, it did not mediate the associations between physical abuse and PPEs (indirect effect: Beta = −0.20; Boot SE = 0.24; Boot CI −0.65; 0.29) and sexual abuse and PPEs (indirect effect: Beta = 0.09; Boot SE = 0.22; Boot CI −0.37; 0.53).

Discussion

The current study is the first to demonstrate that PD and PA have had mediating roles in fully and partially potentiating the association between childhood neglect and PPEs and between psychological abuse and PPEs,

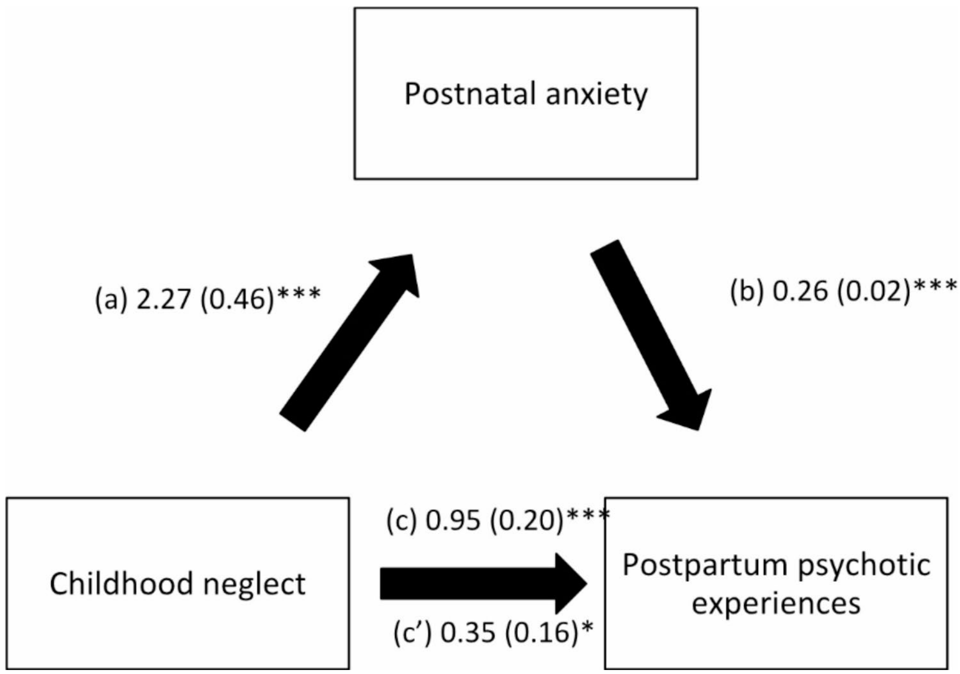

Fig. 4 (**a**) Relation between neglect and postnatal anxiety ($R^2 = .628$); (**b**) Relation between postnatal anxiety and postpartum psychotic experiences ($R^2 = .830$); (**c**) Total effect of childhood neglect on postpartum psychotic experiences ($R^2 = .726$); (c') Direct effect of childhood neglect on postpartum psychotic experiences. Numbers are displayed as regression coefficients (standard error). ***$p < 0.001$

respectively. Neglect was indirectly associated with PPEs, however, psychological child abuse was more strongly and directly associated to PPEs than any other types of child abuse. Moreover, the mediating effects of postnatal depression/anxiety on the associations between the other forms of childhood trauma (i.e., physical or sexual abuse) and PPEs were not significant.

The association between childhood trauma and PPEs in our sample of postpartum females

Our results showed that a particular type of childhood trauma, i.e. psychological abuse, was the most significantly associated with PPEs symptoms severity. Psychological abuse appears to have particularly powerful and longer-lasting effects than other types of abuse. In agreement with previous findings, our study has demonstrated that childhood abuse is predictive of PP [52]. Therefore, psychological child abuse is the most impactful type of abuse [53], leading later in life to adverse effects on moms' physical, emotional, and general wellbeing. This may be explained by many mechanisms: stress in the early years of life modifies the HPA axis, leading to serious mood disorders including psychosis.

Postnatal depression as a mediator

Our study found that postnatal depression partially mediated the association between psychological abuse and PPEs and fully mediated the association between neglect and PPEs. While mistreatment history is a lifelong risk factor for psychopathology [54], it could especially trigger depression in the postpartum frame where hormone fluctuations are common [55]. As a result, moms who are depressed tend to follow daily routines less regularly, read less to their children, play less, and feed their babies less optimally [56]. Considering the compelling evidence that PD negatively impacts mother-infant interactions [57], it may contribute to future psychopathology.

Anxiety as a mediator

Our research also found that postnatal anxiety partially mediated the association between psychological abuse and PPEs and fully mediated the association between neglect and PPEs. In actuality, PD and PA are also linked to a number of additional detrimental effects on both moms and babies, such as decreased breastfeeding, a lack of emotional and behavioral sensitivity on the part of the mother, unfavorable temperament in the baby, and abnormal neurodevelopment. Studies focusing on particular brain regions revealed that females with PD who also experienced noticeably higher levels of anxiety had reduced corticolimbic and corticocortical connections [58, 59]. As a result, anxiety may contribute to the development of paranoid thoughts and the expectation of danger, both of which are precursors to the symptoms of psychosis [60].

Clinical implications

Although the physical health of the mother and child is usually the focus of postpartum care, routine screening for indicators of PP should also be strongly advised, as this may improve the ability to manage the disease in a timely manner. Compared to conventional referral techniques, we think that implementing the PPES in maternal healthcare facilities may significantly boost the detection of PP. In addition, there is a need to extend the focus of postpartum mental health research to include the history of childhood maltreatment trauma. Our findings suggest that both depression and anxiety experienced by postpartum females can be potential targets for strategies aiming at preventing PP in those with a history of child abuse. Moreover, the present results provide promising avenues for further investigation in this area. Future longitudinal research along the psychosis continuum is required to expand our understanding of the PP clinical entity. It is important to evaluate the attenuated forms of psychotic symptoms that may be supported at a subclinical level.

Besides, there are several mediators to be tested in future studies as a possible intervention for PPEs. Further research is necessary in the social and cultural elements of PPEs, since cross-national and cross-cultural variability may be found in both PEs [61] and postpartum psychiatric disorder [62]. The significant mediating role of PA and PD on the association between childhood adversities and PPEs among postpartum females may offer additional therapeutic avenues to help attenuate various postpartum mental health issues.

Limitations

The study has certain limitations. Because self-reported instruments were used in this study to assess study variables, the results may have been overstated [63, 64]. It is imperative that future research include organized or semi-structured clinical interviews for assessment purposes. Moreover, the snowball technique may introduce selection bias, meaning that the sample is not representative of the entire population. Future research should examine the mediating effects of various confounding variables that were not taken into account in this study, such as personal or family history of mental health disorders, drug and alcohol abuse, and pregnancy complications, as they may be important factors in the relationship between our variables. Moreover, fear of childbirth, the sex of the baby, the APGAR score, the presence of spouse, and social support were not included in the questionnaire, which are important factors associated with perinatal mental disorders. Another limitation of the study is that a structured diagnostic interview schedule was not used and it was not conducted face-to-face. In addition, when retrospective information is questioned, there may be incorrect recall or failure to provide information.

Conclusion

This is the first study examining the mediating role of PD and PA on the association between childhood trauma and PPEs. Both PD and PA have been discovered to act as intermediaries in the relationship between childhood trauma and PPEs. Furthermore, psychological child abuse was more directly and powerfully correlated to PPEs than other types of abuse, shedding the light on the detrimental consequences of early bullying and intimidation later in life. Therefore, there is a need for targeted therapies that treat childhood trauma and all of its manifestations, such as anxiety and depression, which may help PP symptoms resolve. Future longitudinal studies using larger samples of postpartum females should investigate the risk factors related to PPEs in order to safeguard the mother and the child and to improve their well-being.

Acknowledgements
The authors would like to thank all participants.

Author contributions
FFR, HB and SH designed the study; FFR and DEH drafted the manuscript; DEH collected the data; SH carried out the analysis and interpreted the results; DM reviewed the paper for intellectual content; all authors reviewed the final manuscript and gave their consent.

Funding
None.

Data availability
All data generated or analyzed during this study are not publicly available due the restrictions from the ethics committee. Reasonable requests can be addressed to the corresponding author (SH).

Declarations

Ethics approval and consent to participate
The Lebanese International University School of Pharmacy's ethics committee authorized the study protocol (Reference # 2023RC-019-LIUSOP). All participants in the study provided written informed consent; submitting a soft copy online was regarded as equivalent to obtaining written consent.

Consent for publication
Not applicable.

Competing interests
The authors declare no competing interests.

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Received: 29 June 2024 / Accepted: 13 August 2024
Published online: 29 August 2024

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