

Synergistic Relationship of Prenatal Hurricane Sandy Exposure and Postnatal Suicidal Ideation on Child Fear During the COVID-19 Pandemic

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Introduction

- Infant avoidance to novel stimuli is associated with expressed parental anxiety.^[1]
- Prior research also found that in-utero exposure to superstorm Sandy was associated with elevated child high-intensity pleasure, approach, perceptual sensitivity, and fearfulness, but reduced cuddliness and duration of orientation at 6 months. Additionally, the combined effect of in-utero Sandy exposure and maternal depression was also associated with greater levels of infant activity, distress, approach, and shorter duration of attention for the same age group. ^[2] ^[3]
- Other findings indicated that mothers with a history of depression and antepartum complications showed lower maternal self-esteem and higher risk of suicidal ideation. As a result, they were less sensitive and responsive to their infant's cues, leading to limited infant affection and involvement with their mothers. ^[4]
- Prior research also shows suicidal ideation among HIV-positive mothers to be associated with poorer child cognitive outcomes across a variety of developmental domains. ^[5]
- The decreased fear response seen in the children without maternal suicidal ideation may be explained by child resilience to early life parental stressors. ^[6] Hanetz-Gamliel et. al., 2020, showed that maternal anxiety mediated the association between perceived COVID-19 threat and child's internalizing behavior, suggesting maternal mental state in response to an external stressor can influence levels of internalizing behaviors like fear in the child, consistent with our findings.
- This study explores the interaction between in-utero superstorm Sandy exposure and postnatal maternal suicidal ideation, and its impact on child fear levels during COVID-19 pandemic.

Results

Figure 1

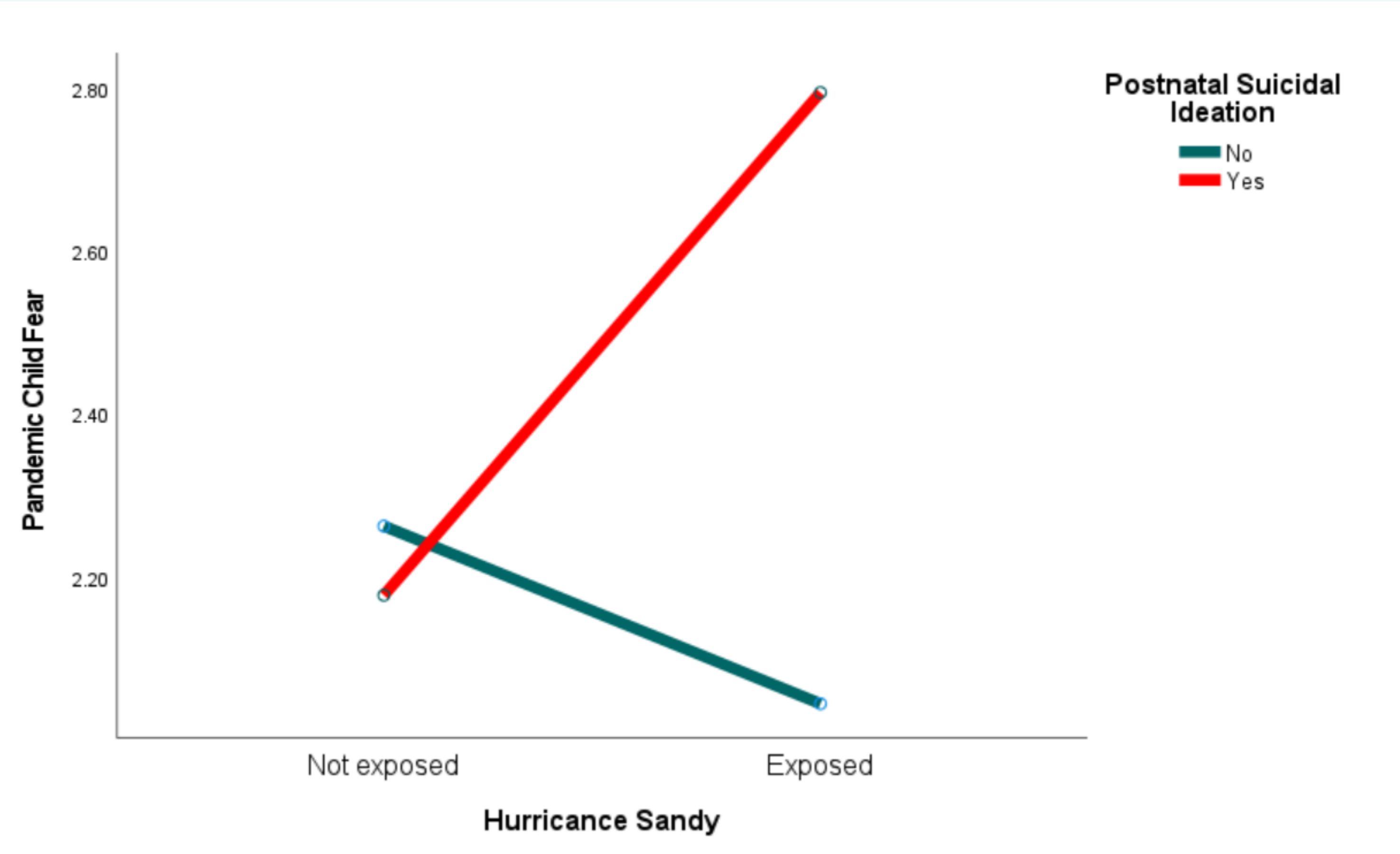


Figure 1: The interaction effect between Mother's Prenatal Hurricane Exposure and Postnatal Suicidal Ideation towards Child Fear during the COVID-19 Pandemic was statistically significant, $F(1, 111) = 3.77, p = .05$

Descriptive Table for Prenatal Hurricane Sandy Exposure and Postnatal Suicidal Ideation toward Pandemic Child Fear

Hurricane Sandy Exposure		Postnatal Suicidal Ideation	Mean	Std. Deviation	N
Not exposed	No		2.26	0.95	59
	Yes		2.18	0.86	29
Exposed	No		2.04	0.92	18
	Yes		2.80	0.91	9

Significant increase in child fear among children with mothers that were exposed to Hurricane Sandy during pregnancy and presented postnatal suicidal ideation.

Results suggest that internalizing behaviors such as child fear are influenced by both internal (suicidal ideation) and external (Superstorm Sandy) maternal stressors, as well as their compounding effects when in tandem.

Methods

Participants:

- 115 mothers and their children were recruited from New York-Presbyterian Queens Hospital and Queens College, CUNY.
- Mothers completed the recruitment package, the Edinburgh Postnatal Depression Scale (EPDS), and SIP's COVID-19 survey.
- Age of children: 5 – 10-year-old
- Gender: 48.7% girls ($n = 59$); 51.3% boys ($n = 56$)

Measures:

- Recruitment package: A tool to collect various demographic information about participants during the initial recruitment process.
- Edinburgh Postnatal Depression Scale (EPDS): A 10-item scale designed to screen for maternal depressive disorders. It includes a question on suicidal ideation
- Child Fear: A 14-item self-reported measure measures the child's worries and fears regarding COVID-19.

Data Analysis:

- A Pearson product-moment correlation was conducted to determine the relationship between Mother's Prenatal Hurricane Sandy Exposure, Mother's Postnatal Suicidal Ideation, and Child Fear during the COVID-19 Pandemic.
- A Factorial ANOVA was conducted to compare the main effects of Mother's Prenatal Hurricane Sandy Exposure and Postnatal Suicidal Ideation, and the interaction of both on Child Fear during COVID-19 Pandemic.

Discussion & Limitations

- A significant interaction was detected between exposure to Superstorm Sandy and maternal suicidal ideation on child's level of fear during the COVID-19 pandemic, $F(1, 111) = 3.77, p = .05$.
- A potential limitation is that child fear was indirectly measured through maternal reports.
- Future studies should consider:
 - direct reporting from children
 - evaluating physiological symptoms of stress and fear (e.g. electrodermal activity, EKG, hormone levels, or cortisol levels).
 - dichotomizing child fear to explore sex/gender differences, particularly as different cultures and ethnic groups may have different perceptions and learned responses to fear based on gender.
 - other environmental factors (e.g. parent income, education, and social support).
- The findings can contribute to the investigation of targeted strategies to mitigate postnatal distress and support families in the post-COVID-19 context.

References

1. Aktar, E., Majdandžić, M., de Vente, W., & Bögel, S. M. (2013). The interplay between expressed parental anxiety and infant behavioural inhibition predicts infant avoidance in a social referencing paradigm. *Journal of Child Psychology and Psychiatry*, 54(2), 144-156.
2. Nomura, Y., Davey, K., Pehme, P. M., Finik, J., Glover, V., Zhang, W., ... & Ham, J. (2019). Influence of in utero exposure to maternal depression and natural disaster-related stress on infant temperament at 6 months: The children of Superstorm Sandy. *Infant mental health journal*, 40(2), 204-216.
3. Zhang, W., Rajendran, K., Ham, J., Finik, J., Buttmann, J., Davey, K., ... & Nomura, Y. (2018). Prenatal exposure to disaster-related traumatic stress and developmental trajectories of temperament in early childhood: Superstorm Sandy pregnancy study. *Journal of affective disorders*, 234, 335-345.
4. Bodnar-Deren, S., Klipstein, K., Fersh, M., Shemesh, E., & Howell, E. A. (2016). Suicidal ideation during the postpartum period. *Journal of Women's Health*, 25(12), 1219-1224.
5. Mebrahtu, H., Sherr, L., Simms, V., Weiss, H. A., Rehman, A. M., Ndlovu, P., & Cowan, F. M. (2020). Effects of maternal suicidal ideation on child cognitive development: a longitudinal analysis. *AIDS and Behavior*, 24(8), 2421-2429.
6. Buttmann, J., Ham, J., Davey, K., Finik, J., Dana, K., Pehme, P., ... & Nomura, Y. (2019). Infant temperament: repercussions of Superstorm Sandy-related maternal stress. *Child Psychiatry & Human Development*, 50(1), 150-162.
7. Hanetz-Gamliel, K., Levy, S., & Dollberg, D. G. (2021). Mediation of Mothers' Anxiety and Parenting in Children's Behavior Problems during COVID-19. *Journal of Child and Family Studies*, 30(11), 2732-2743. <https://doi.org/10.1007/s10826-021-02115-x>