Physiological Aspects of Maternal Mental Health

Investigating the use of wearable technology in mental health research

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INTRODUCTION

Healthy family and child development are strongly linked to maternal stress physiology and parenting practices, with strong implication for how a mother's biology may impact and be impacted by stress in the home.

AIM

We explore the potential relationship between maternal physiological processes and parenting behaviours over a one-week period using wearable health monitors.

We hypothesized that maternal heart rate, sleep duration and physical activity derived from wearable health monitors would be associated with the self-report measures of parenting stress, over-reactive discipline styles and positive parenting behaviour.

METHOD

Participants

138 mothers parenting children between the ages of 18-36 months (M=26.06, SD=5.343) who were experiencing moderate to severe anxiety and depression were recruited to participate in a ten week parenting intervention. No participant had engaged in self harm within the last six months or a suicide attempt within the past year prior to intervention.

Self-Report Measures

Self reported parenting stress, strategies and discipline styles was measured using three online questionnaires .

- Parenting Stress Index, Fourth Edition (PSI-4)
- The Parenting Scale; subscale of Over-Reactivity
- The Parenting Young Children Questionnaire (PARYC)

Wearable Devices

Fitbit Inspire 2 watches were used to collect participant heart rate, sleep duration and daily steps over one week.

Statistical Analysis

A Multiple regression analysis was used to test the relationship between the physiological measures and parenting behaviour.

RESULTS

The multiple regression analysis revealed a significant relationship between parental stress and the physiological measures collected [R^2 = .121, F(3,63) = 2.877 , p= .043]. The multiple regression also revealed that the physiological measures were significantly associated with both maternal over-reactivity [R^2 =.127 , F(3,63) = .3.065, p= .034] and positive parentings behaviours [R^2 = .165, F(3,63) = 4.139 , p=.010]. Heart rate was the only significant predictor for each regression (Figures 1-3). The regression models between the physiological measures and proactive [R^2 = .015, F(3,63) = .315, p = .815] and limit setting behaviour [R^2 = .016, F(3,63) = .331, p =.803] were not significant.

Figure 1: Regression Scatterplots for Independent Predictor of Heart Rate (DV = Parenting Stress)

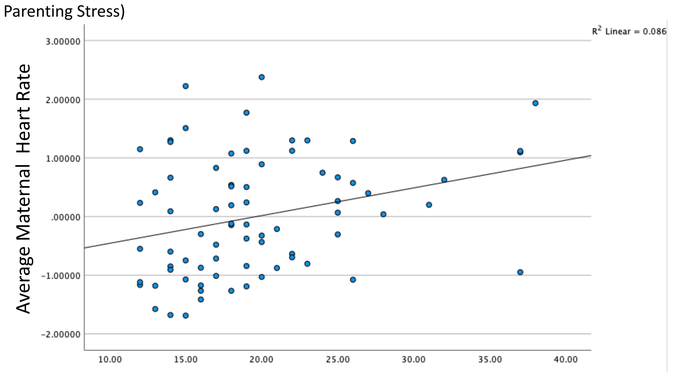


Figure 2: Regression Scatterplots for Independent Predictor of Heart Rate (DV = Over Reactivity)

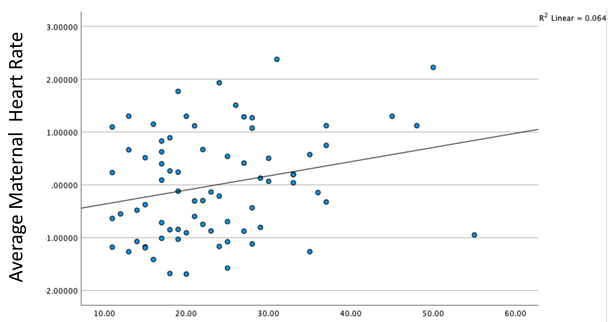
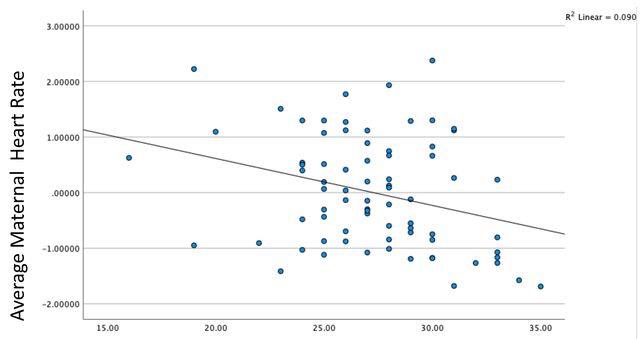


Figure 3: Regression Scatterplots for Independent Predictor of Heart Rate (DV = Positive Parenting Beahviour)



FUTURE STUDIES

Future studies may investigate the relationship between physiological measures and parenting stress, over-reactivity, and parenting strategies using observational methodology to obtain more reliable measures of these behaviours. Additionally, future studies may look to covary out physical activity from the measurement of maternal heart rate. Furthermore, this study was conducted using a sample of participants actively seeking treatment for their symptoms. It is unclear how this may impact the generalizability of such results.

CONCLUSION

Results demonstrate a significant relationship between maternal physiological processes assessed via wearable health monitor and self-reported parenting behaviour. The results extend laboratory findings to a real-world context and speak to the potential relevance of heart rate as an indicator of parenting behaviours. Such findings can be used to better inform parental and mental health interventions by helping identify parents who may be most in need of service

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CHRD CHILD HEALTH RESEARCH DAYS

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