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Introduction

- Pain and depression are interrelated, and worse labor pain has been linked to postpartum depression
- limited studies have answered questions about potential relationships between labor and postpartum pain, mood, and important functional recovery elements including parenting outcomes
- The purpose of this study was to explore the relationships between postpartum pain, depression, parent-infant attachment, and parenting self-efficacy

Methods

- *Prospective Longitudinal Observational Study*
- *Population:* healthy, adult, nulliparous women enrolled at the third trimester
- *Baseline:* pain (BPI), depression (EPDS), anxiety (STAI), multidimensional scale of perceived social support (MSPSS) and perceived stress scale (PSS)
- *6 weeks and 3 months postpartum:* EPDS, STAI, BPI, maternal parent infant attachment scale (MPAS), and perceived maternal parenting self-efficacy (PMP-SE) and Ages and Stages Questionnaire (ASQ).
- *Statistical Analysis:* Univariable linear regression and Generalized linear modeling



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Results

- 87 subjects had complete data on parent-infant attachment and parenting self-efficacy data at 3 months.
- Lower "pain right now" scores on postpartum day 1 was associated with higher maternal-infant attachment (MPAS) at 6 weeks postpartum
- Higher depression scores at 6 weeks were also associated with lower MPAS scores at 6 weeks
- Results of the generalized linear modeling revealed relationships between pain, age, anxiety, and depression predictors, and the outcomes of parenting

Table 2. Univariate analyses identifying predictors of maternal-infant attachment (MPAS) and perceived maternal parenting self-efficacy (PMPSE) and 6 weeks and 3 months postpartum.

Maternal Parent Infant Attachment Scale (MPAS) 6 weeks				
Variable (units)	R2	Estimate	Confidence Interval	P-value
Pain right now postpartum day 1	0.061	-1.8	-3.44 to -0.16	0.032*
EPDS 6 weeks	0.10	-1.24	-2.07 to -0.40	0.004*
**Other tested variables			No significant finding	
Maternal Parent Infant Attachment Scale (MPAS) 3 months				
Variable (units)	R2	Estimate	Confidence Interval	P-value
ER89 baseline	0.103	0.239	0.08 to 0.40	0.005*
PSS postpartum day 1	0.083	-0.064	-1.12 to -0.14	0.012*
**Other tested variables			No significant finding	
Parenting Self-Efficacy (PMP-SE) 6 weeks				
Variable (units)	R2	Estimate	Confidence Interval	P-value
**Other tested variables			No significant finding	
Parenting Self-Efficacy (PMP-SE) 3 months				
Variable (units)	R2	Estimate	Confidence Interval	P-value
ER89 baseline	0.06	-0.44	-0.85 to -0.02	0.04*
PCS baseline	0.061	0.88	0.08 to 1.68	0.03*
**Other tested variables			No significant finding	

* P < 0.05
MPAS, maternal parent infant attachment scale. PMP-SE, perceived maternal parenting self-efficacy scale. STAI, state trait anxiety inventory. EPDS, Edinburgh postnatal depression scale. ER89, ego resiliency scale. PCS, pain catastrophizing scale. MSPSS, multidimensional scale of perceived social support scale. PSS, perceived stress scale.
**Tested variables:
Pain right now baseline, Pain right now postpartum day 1, Pain right now 6 weeks, Pain right now 3 months, STAI baseline, EPDS baseline, EPDS 6 weeks, EPDS 3 months, Epidural use, History of Anxiety or Depression, History of Any Mental Illness, ER89 baseline, PCS baseline, MSPSS baseline, PSS postpartum day 1

Conclusion

- We observe a pattern of association between worse postpartum anxiety and acute pain after birth, with worse parenting outcomes including maternal infant attachment and parenting self-efficacy, and with infant development at 6 weeks and 3 months.

Table 3. Exploratory analysis between pain and outcomes of interest using generalized linear modeling.

OUTCOME	MPAS				ASQ-3								PMP-SE			
PERIOD	6 Weeks		3 Months		Gross Motor		3 Months		Personal Social		6 Weeks		3 Months		6 Weeks	
PREDICTOR	EST (STD)	R ²	EST (STD)	R ²	EST (STD)	R ²	EST (STD)	R ²	EST (STD)	R ²	EST (STD)	R ²	EST (STD)	R ²	EST (STD)	R ²
Primary Predictor																
BPI (Short #6)	-0.22(0.142)	0.029	-0.118(0.133)	0.010	- 0.154(0.294)	0.005	1.25(0.314)** *	0.929	-0.083(0.204)	0.002	0.139(0.897)	0.008	-0.375(0.366)	0.013	-0.133(0.342)	0.002
Other Baseline Covariates																
Age	- 0.177(0.075)*	0.067	- 0.173(0.073)*	0.072	- 0.096(0.167)	0.007	-0.561(0.442)	0.617	0.13(0.104)	0.022	-1.06(0.51)	0.590	-0.326(0.195)	0.035	-0.188(0.191)	0.013
MSPSS	0.032(0.025)	0.019	0.025(0.023)	0.016	- 0.074(0.066)	0.024	0.24(0.534)	0.168	-0.019(0.035)	0.004	-0.36(0.526)	0.190	0.042(0.067)	0.005	0.054(0.059)	0.011
STAI	0.053(0.038)	0.022	0.054(0.035)	0.029	0.02(0.074)	0.001	0.357(1.856)	0.036	-0.002(0.056)	0.000	-0.14(0.431)	0.034	0.254(0.1)*	0.073	0.199(0.09)*	0.059
EPDS	- 0.192(0.089)*	0.052	- 0.201(0.089)*	0.062	0.416(0.209)	0.071	0.921(0.684)	0.645	-0.017(0.142)	0.000	1.875(0.535)*	0.804	-0.658(0.255)*	0.075	-0.524(0.229)*	0.063

** Note that bolded p value indicated statistical significance at 95% confidence interval, i.e., * 0.01<=p<0.05, ** 0.001<=p<0.01, *** p<0.001
*** P-value indicates statistical significance at 95% Confidence Interval regarding each covariate to the outcome; R² reflects the accuracy of the model fit