



# Depression Screening Using the Edinburgh Postnatal Depression Scale for U.S. Fathers of Critically Ill Infants

**Lynn Macken, PhD, RN**

**Helen Cyr-Alves, BSN, RN, CCRC**

**Kristiina Hyrkas, PhD, LicNSc, MNSc, RN**

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# Learner Objectives

- To describe the current literature informing the prevalence and effects of maternal and paternal depression, and the gap in knowledge about depression in American fathers of critically ill newborns
- To describe the Edinburgh Postnatal Depression Scale (EPDS) and its psychometric properties reported in the literature
- To discuss the methods and results of the current study, the psychometric properties of the EPDS and the instrument's factor structure in a sample of U.S. fathers

# Background: Perinatal Parental Depression

- Majority of research has been focused on maternal depression
- Postnatal depression in either parent has been associated with poor behavioral and developmental outcomes in children <sup>[1]</sup>
- Prevalence of parental depression <sup>[2]</sup>

Source and Time	Mothers	Fathers
Meta-estimate <sup>a</sup>	23.8%	10.4%
<b>U.S.</b>	<b>29.6%</b>	<b>14.1%</b>
International	19.7%	8.2%
Birth to 3 months	-	7.7%
<b>3 to 6 months</b>	<b>41.6%</b>	<b>25.6%</b>

(<sup>a</sup> first trimester through 1 year post-birth)

# Depression in Parents of Seriously Ill Infants

- Increased prevalence of postpartum depression in mothers of infants admitted to the NICU versus mothers of healthy infants [3]
- One longitudinal study of U.S. fathers of NICU infants [4]

NICU Hospitalization	Day 7	Day 21	Day 35
Depressed fathers	60%	39%	36%

- **Gap**
  - Understanding the prevalence of depression in U.S. fathers of infants admitted to the NICU through post-hospital discharge and home follow-up
    - » Focus on screening for depression using a valid instrument

# Single Center, Observational, Longitudinal Study

- **Purpose:** To describe fathers' depression over time
  - Examine the structure and psychometric properties of the Edinburgh Postnatal Depression Scale (EPDS)
- **Setting:** tertiary care referral center in northeastern U.S.
  - 51-bed NICU with average 925 admissions per year
- **Sample:** 146 fathers, speak/read English, age 18 years or older
  - Infants expected to remain hospitalized at least three weeks
  - Enrollment: March 2013 – January 2016
- **Outcome measure:** EPDS
- **Data Collection:** baseline NICU admission (T1), three weeks from NICU admission (T2), at hospital discharge (T3), and two months after discharge (T4).

# Edinburgh Postnatal Depression Scale (EPDS)<sup>[5]</sup>

- Developed in a sample of U.K. mothers
  - To allow for the normal physiological changes post-childbirth
  - Later adapted for use in fathers
- 10 items: 4 response options scored 0 to 3 (7 items reverse-scored)
- Total scores range from 0 to 30 with lower scores → less depression
- Threshold scores : 12/13 = major depression (women)
  - » 86% sensitivity and 78% specificity
- Validity established compared to Standardized Psychiatric Interview
- Cronbach's  $\alpha = .87$  (women) and  $.81$  (men) <sup>[6]</sup>

# Results: Characteristics

- **Fathers (n=146)**

- Mean age - 32.5 years (range 19 – 59)
- 92% employed, 91% Caucasian, 97% lived with mother/baby
- 4% of fathers had infants who died over the course of the study

- **Infants (n = 174)**

- Mean gestational age - 31.9 weeks (range 23 – 49)
- 71% premature, 13% respiratory distress syndrome
- 4% died during the course of the study
- Mean NICU length of stay – 7.8 weeks ( range 1- 27)
- Mean age two months post-discharge (T4) – 20.1 weeks (range 9 – 50)

# Results: Fathers' EPDS Scores over Time

Time	n	Mdn	M (SD)	95% CI	Min-Max	Cronbach $\alpha$
T1	141	7.00	7.70 (4.78)	6.90, 8.49	0 - 25	.835
T2	113	6.00	6.42 (4.30)	5.61, 7.22	0 - 20	.833
T3	113	5.00	5.81 (3.85)	5.09, 6.52	0 - 17	.797
T4	101	4.00	4.39 (3.23)	3.75, 5.02	0 - 14	.721

- Depression scores were significantly different over the four time periods ( $\chi^2 = 41.75$ ,  $df = 3$ ,  $p = .000$ )
- Depression scores significantly improved between T1 and T2 ( $z = -4.58$ ,  $p = .000$ ) and between T3 and T4 ( $z = -4.63$ ,  $p = .000$ )
- Compared to baseline (T1), depression scores significantly improved ( $p = .000$ ) at each time point



# Threshold Scores: Categorized as “Depressed”

Depression	Threshold	T1	T2	T3	T4
		n (%)	n (%)	n (%)	n (%)
Minor/Distress	EPDS 8/9	58 (41.1)	35 (31.0)	25 (22.1)	10 (9.9)
Major	EPDS 12/13	23 (16.3)	12 (10.6)	7 (6.2)	2 (2.0)

Multiple EPDS cutpoints in the literature based on sex (men vs. women), national culture, and a two-factor structure measuring psychological distress/minor depression in addition to major depression (12/13)

- 8/9 has been suggested by several studies to capture distress or minor depression [7]

# EPDS: Effect Sizes (ES) U.S. Fathers

Depression (threshold)	ES (95% CI)	ES (95% CI)	ES (95% CI)
	T1 (birth)	T3 ( <i>M</i> = 9 weeks)	T4 ( <i>M</i> = 20 weeks)
Minor (8/9)	0.41 (0.33, 0.49)	0.22 (0.14, 0.30)	0.10 (0.04, 0.16)
<b>Major (12/13)</b>	<b>0.16 (0.10, 0.20)</b>	<b>0.06 (0.02, 0.11)</b>	<b>0.02 (0.00, 0.05)</b>

- Effect sizes were computed using simple proportional methods described by Paulson and Bazemore <sup>[2]</sup> who reported ES (fathers):
  - Overall (1<sup>st</sup> trimester – 1 year): 0.10 (0.08, 0.13)
  - Birth to 3 months: 0.08 (0.05, 0.11)
  - 3 to 6 months: 0.26 (0.17, 0.36)

# Exploratory Factor Analysis (EFA)

EFA as described by Loscalzo et al. [8]

- Parallel analysis of 1000 datasets, principal axis factoring, promax rotation for permuted data, eigenvalues  $> 1$  and  $< 1$  were allowed
- (a) One factor solution: 41.4% of the variance
- (b) Two factor solution: 13.3% of variance = **54.7% of total variance**

In studies of Italian [8] and Swedish fathers [9] - only items 1 and 2 loaded on the depression factor

Item	Factor 1	Factor 2
	Factor Loadings	
1. Able to laugh	.80	
2. Look forward	.74	
3. Blame self		.41
4. Anxious, worry		.87
5. Felt scared		.80
6. Getting on top of me		.47
7. Difficulty sleeping	.67	
8. Felt sad	.67	
9. Crying	.60	
10. Thoughts self-harm	.33	

# Two Factors: Item Mean Scores (T1)

## Factor – Psychological Distress

- Items 3, 4, 5 and 6 were the most problematic for fathers over the past seven days

## Factor – Symptoms of Depression

- Remaining six items suggest depressive *symptoms*
- Item 9: so unhappy I've been crying
- 10<sup>th</sup> item: self-harm marginally loaded and lowest mean score

Item number	Mean (SD)
<b>Factor - Psychological Distress</b>	
3. Blame self	1.23 (0.86)
4. Anxious, worry	1.38 (0.91)
5. Felt scared	1.09 (0.91)
6. Getting on top of me	1.10 (0.74)
<b>Factor – Symptoms of Depression</b>	
1. Able to laugh	0.41 (0.61)
2. Look forward	0.36 (0.69)
7. Difficulty sleeping	0.73 (0.84)
8. Felt sad	0.79 (0.73)
9. Crying	0.49 (0.63)
10. Thoughts self-harm	0.21 (0.49)

(Response options 0 – 3 scale)

# Conclusion

- To our knowledge, this was the first study to use the EPDS as the outcome measure in a sample of U.S. fathers from NICU admission through post-hospital discharge.
- While the EPDS has been widely used in studies of maternal and paternal depression, gender and cultural differences in EPDS item responses, threshold scores, and various perinatal timeframes need to be carefully considered when using this instrument for research and/or clinical practice.
- Items for self-blame, anxiety, being scared and being overwhelmed were most often reported by fathers across all time points and formed a factor termed distress, separate from depression.
- Further research investigating the psychometric and structural properties of the EPDS is needed in American mothers and fathers of seriously ill newborns, prior to adopting this instrument in the clinical setting.

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*Thank You!*  
Questions?