Title:
Depression Screening Using the Edinburgh Postnatal Depression Scale for US Fathers of Critically Ill Infants

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Paternal Mental Health
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References:
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Abstract Summary:
Although the Edinburgh Postnatal Depression Scale (EPDS) has been widely used to screen fathers for depression, no studies were found examining its use in U.S. fathers of infants admitted to the neonatal

intensive care unit. This study examined the psychometric properties and structure of the EPDS in this unique setting.

Learning Activity:

LEARNING OBJECTIVES	EXPANDED CONTENT OUTLINE
The learner will be able to discuss the current literature informing the prevalence and impact of maternal and paternal depression; and the gap in knowledge about depression in American fathers of critically ill newborns.	Briefly review the literature: prevalence of depression in mothers and fathers, associated childhood outcomes, and the gap in knowledge about screening U.S. fathers for depression in the neonatal intensive care unit setting.
The learner will be able to describe the Edinburgh Postnatal Depression Scale (EPDS) and its psychometric properties as reported in the literature.	Describe the development of the EPDS, its adoption for screening fathers, validation in international studies, depression thresholds (cut points), and depression prevalence in diverse samples.
The learner will be able to discuss the methods and results of the current study, the psychometric properties of the EPDS, and the instrument's factor structure in this sample of American fathers.	Briefly describe the methods and results of the study. Report the psychometric properties and factor structure of the EPDS. Discuss implications for using the EPDS to screen U.S. fathers for depression in research studies and clinical settings

Abstract Text:

Purpose

The majority of clinical and research attention has been focused on postpartum maternal depression, and to a much lesser extent on psychological distress and depression in fathers. Importantly, postnatal depression in either parent has been associated with poor developmental and behavioral outcomes in children (Treyvaud, Lee, Doyle, & Anderson, 2014). A meta-analysis of 43 international studies examining depression in mothers and fathers during the first postpartum year estimated that 10.4% of men experienced depression, and increased to 25.6% between 3 to 6 months postpartum (Paulsen & Bazemore, 2010). Given the increased risk of morbidity and mortality associated with the birth of a seriously ill infant, mothers of infants admitted to the neonatal intensive care unit (NICU) have been found to have increased rates of postpartum depression compared to mothers of healthy newborns (Tahirkheli, Cherry, Tackett, McCaffree, & Gillaspy, 2014). Only one study (Mackley, Locke, Spear, & Joseph, 2010) was found that examined postnatal depression in U.S. fathers of infants admitted to the NICU, and none were found that measured depression post-hospital discharge. In their review, Tahirkheli and colleagues called upon NICU nurses and other providers to advocate for routine parental depression screening, appropriate referrals and family-centered interventions. However a gap exists in the literature about screening for depression in U.S. fathers in the NICU setting.

The data collection instrument selected for measuring the outcome varies widely in studies of postpartum depression (Paulsen & Bazemore, 2010; Tahirkheli et al., 2014). The Edinburgh Postnatal Depression Scale (EPDS) (Cox, Holden, & Sagovsky, 1987) was originally developed and validated in a sample of U.K. mothers, in response to the limitations of previously developed tools that did not account for normal physical changes postpartum. The EPDS is a 10-item self-report questionnaire with four possible response options for each item (scored from 0 to 3), with seven items reverse scored. Total scores range from 0 to 30, with lower scores indicating less depression. Cox and colleagues established 12/13 as the screening threshold for major depression, with 86% sensitivity and 78% specificity. The EPDS has been

widely adopted for measuring postnatal depression in fathers, often without consideration for varying cultural or gender differences. Furthermore, multiple EPDS depression thresholds, or cutpoints, have been reported in the literature and include screening categories for general anxiety disorder (Edmondson, Psychoiou, Vlachos, Netsi, & Ramchandani, 2010) and borderline depression (Vismara et al., 2016). A recent study conducted in a sample of Italian fathers reported that the EPDS demonstrated a two-factor structure, consisting of depression and distress (Loscalzo, Giannini, Contena, Gori, & Benvenuti, 2015). A descriptive, observational study was conducted in a northeastern U.S. hospital to examine postnatal depression in fathers of infants admitted to the NICU from admission through two months post-hospital discharge. The primary aim of the study was to determine the prevalence of fathers' depression over time. The secondary aim was to examine the structure and psychometric properties of the EPDS in a sample of American fathers of seriously ill newborns.

Methods

The study was approved by the Institutional Review Board in March 2013. It was conducted in a 51-bed NICU that has an average annual admission of 925 infants. An a priori power analysis ($p < .05$, power = .80, moderate effect size) estimated 110 subjects were needed. Allowing for possible attrition, the sample size of 146 was determined. The principal investigator, a staff nurse in the NICU, and a small research team of bedside nurses recruited and enrolled 146 subjects between March 2013 and January 2016. Inclusion criteria were: fathers who were present in the NICU, age 18 years or older, able to speak and read English, and the infant was expected to remain in the NICU for several weeks. Data were collected at the hospital unit or by U.S. mail at baseline within one to two weeks of NICU admission, at hospital discharge and two months post-discharge. Data analysis was supported by two doctoral level nurses on the research team. Data were analyzed using SPSS Statistical Software (version 17.0). Descriptive data were analyzed with frequencies, percentages and measures of central tendency; and additional analyses are described below.

Results

Fathers' average age was 32.5 years and infants' mean gestational age was 31.9 weeks. The majority of fathers were employed (134/146, 92%) and Caucasian (132/146, 91%). Most infants were admitted to the NICU as a result of premature birth (97/137, 70.8%) or for respiratory distress syndrome (17/137, 12.4%). There were 174 infants born to the 146 fathers, including twenty-two sets of twins and three sets of triplets. Fathers of infants who died (6/146, 4.1%) at any time during the study were dropped from data collection. Infants' mean age between baseline and hospital discharge was 8.6 weeks; and between baseline and two months post-discharge was 20.1 weeks.

The EPDS was found to have good internal consistency at each time period (Cronbach's alpha = .835, .797, and .721). Total EPDS mean scores were highest at baseline (M=7.7) and decreased at hospital discharge (M=5.8) and two months post-discharge (M=4.4). EPDS data were not normally distributed and non-parametric tests were used for analysis. EPDS total scores significantly improved between baseline and the other time points (p=.000). Using the EPDS cutpoint of 12/13 as recommended by Cox et al. (1987), prevalence of major depression ranged from 16.3% (23/141), 6.2% (7/113), to 2.0% (2/101) over the three time points. When the cutpoint of 8/9 was employed to capture distress or minor depression (Paulson & Bazemore, 2010; Vismara et al., 2016) prevalence increased over all three time periods (41.1%, 22.1%, 9.9%). EPDS effect sizes were computed using the simple proportional method as described by Paulson and Bazemore (2010), who reported an overall effect size of 0.08, 95% CI [0.05, 0.11] at birth to 3 months postpartum. In this study, the effect size for the 12/13 cutpoint was 0.16, 95% CI [0.10, 0.20] at birth; and 0.06, 95% CI [0.02, 0.11] at about 9 weeks of age (hospital discharge). Using the 8/9 cutpoint, the baseline effect size was 0.41, 95% CI [0.33, 0.49]; and 0.22, 95% CI [0.14, 0.30] at discharge.

Examination of the EDPS item mean scores at baseline showed that fathers' thoughts of self-harm (item 10) were very rare (M=0.29). Four EPDS items (3, 4, 5, and 6) were scored higher (mean score >1.0, possible range 0-3) than the other six items. Fathers reported self-blame (M=1.23), being anxious for no

good reason (M=1.38), feeling scared or panicky (M=1.09), and things getting on top of them (M=1.10) as their most problematic feelings in the past seven days.

An exploratory factor analysis (EFA) was undertaken as described by Loscalzo and colleagues (2015). First, a parallel analysis of 1000 datasets, using principal axis factoring, promax rotation for permutated data and eigenvalue >1, yielded a one factor solution that explained 41.4% of the variance. A two-factor solution was identified when eigenvalues <1 were allowed. The second factor added 13.3%, for 54.7% of the total variance explained. In the two-factor solution, items 3, 4, 5, and 6 formed one factor (designated *distress*) with item loadings of 0.41, 0.87, 0.80 and 0.47 respectively. Five remaining items formed the second factor (designated *depression*) with factor loadings ranging from 0.60 to 0.69. These items (1, 2, 7, 8 and 9) explored fathers' feelings of being able to laugh, looking forward with enjoyment, being unhappy/difficulty sleeping, feeling sad or miserable, and crying due to unhappiness. The 10th item (self-harm) marginally loaded on the second factor with a value of 0.33.

Conclusion

Screening for depression in fathers of infants admitted to the NICU is necessary so that appropriate referrals and interventions may be identified to support both parents and their seriously ill newborns during prolonged hospital admissions and upon their return to home (Tahirkheli et al., 2014). While the EPDS has been widely used in studies investigating maternal and paternal depression, gender and cultural differences in EPDS item responses, threshold scores and prevalence rates need to be carefully considered. To this research team's knowledge, this was the first study in a sample of U.S. fathers to use the EPDS as the outcome measure in a NICU setting, from admission through post-hospital discharge. Documentation of effect sizes, using cutpoints for distress (8/9) and depression (12/13) may inform future research studies. Previous studies have suggested that item 10 (self-harm) is less likely to be self-reported in Western fathers; and this was confirmed in the current study. Similar to Loscalzo and colleagues (2015), this study found a two-factor solution indicating that the EPDS may measure depression and another factor, termed *distress*. Items for self-blame, anxiety, being scared, and being overwhelmed were most often reported by fathers across all time points and formed a factor separate from depression. Further research investigating the psychometric and structural properties of the EPDS is needed in American fathers of seriously ill newborns, prior to adopting this screening instrument in the clinical setting.