Prevalence and Risk Factors for Depression Among Parents of Children Born Preterm: A Systematic Review of The Evidence Since 2000

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INTRODUCTION

In Manitoba greater than 10% of neonates are born premature, 2% higher than the Canadian average.

- Preterm birth has been associated with increased stress among parents, potentially leading to parental depression.
- Depression in the postpartum period can have significant adverse effects on parental health and the growth and development of their children.

Previous systematic reviews that evaluated depression among mothers of preterm and low birth weight infants reported prevalence's of **40%** (Vigod et al) and **6.6%-43%.** (Eduardo et al.)

- These studies did not assess prevalence of depression beyond the first year of life or depression among fathers following preterm delivery.

AIM and HYPOTHESIS

To determine the prevalence and risk factors of depression among both mothers and fathers of children born preterm in the first five years following preterm birth.

We hypothesize that preterm birth increases the risk of parental depression, and that the prevalence will be different between mothers and fathers.

METHODS

Inclusion Criteria

- Peer-reviewed, published full text studies from the year 2000
- Observational studies (cohort, cross sectional, case-control)
- Enrolled parents of children born preterm (< 37 weeks gestational age)
- Assessed depression using validated clinical scales.
- No language restriction

Exclusion Criteria

Studies that

- Utilized measures evaluating depressive personality patterns or only composite measures of psychological distress
- Used birth weight as a substitution for gestational age
- Provided only combined parental data
- Focused on preterm neonates with genetic syndromes, malformations, or only deceased neonates
- Described depression only after five years following preterm birth
- Did not respond after two email attempts for further data

Search Strategy

- Designed by a knowledge synthesis librarian and peer reviewed using the Peer Review of Electronic Search strategies (PRESS) checklist.
- Databases searched: Medline(Ovid), Embase (Ovid), Web of Science Core Collection(Clarivate), CINHAL with full text (EBSCOhost), PsycINFO and the Cochrane central.
- Search completed: **July 2021**

METHODS

Study Selection

- Two reviewers independently screened all citations and reference lists using a two- step process. (Title/abstract review, then full text review)
- One reviewer extracted the data. A second, reviewed reviewed the data for errors.
- Volunteers from Cochrane Task Exchange portal translated and extracted the data from non-English studies.
- Disagreements were resolved through discussion or with a third reviewer.

Data Analysis

Meta- analysis was conducted

- Using Inverse variance random-effects models in RStudio for prevalence.
- For risk factors using Review Manager.

Subgroup Analysis

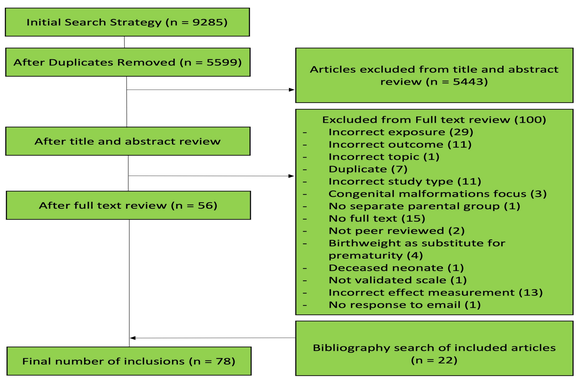
- Regions (African, Eastern Mediterranean, South-East Asian, European, Western pacific Regions, and Region of the Americas)
- Hospital based versus Population based recruitment
- Gestational age (≤ 28, 29-33, and 34-36 weeks gestational age)

We assessed

- Statistical heterogeneity using the I^2 statistic.
- Publication bias where > 10 studies contributed to the pooled estimate.
- Study quality using the National Institute of Health (NIH) quality assessment tool.

RESULTS

Figure 1. Flow Diagram of Study Selection



Baseline Characteristics

The majority of included studies

- Were published from 2014-2020.
- Were English language (n= 65)
- Were from the European Region (n=32), included studies were from 32 countries, across all 5 WHO health regions,
- Were cross-sectional in nature (n=44)
- Had a sample size less then 80, but ranged from 15-37296
- Used the Edinburgh Postnatal Depression scale (n= 45)
- Were of fair quality (n=57) using the NIH quality assessment tool
- Had a single time period (n=49), shortest time period (birth), longest (5y)

RESULTS

Prevalence of depression

- Mothers of preterm infants in the first year of life (n=72), **25.4%** [20.6; 30.8], I^2 = 99.7%
- Mothers of preterm infants in years two to five (n=8), **20.2%** [13.1; 29.9], I^2 = 70.1%,
- Fathers of preterm infants in the first year of life (n=15), **13.4%** [7.9; 21.7], I^2 = 73.7%.
- Fathers of preterm infants in years two to five (n=1), **11.1%** [1.5; 50.0]

Figure 2: Prevalence of depression in mothers in the first year (n=72)

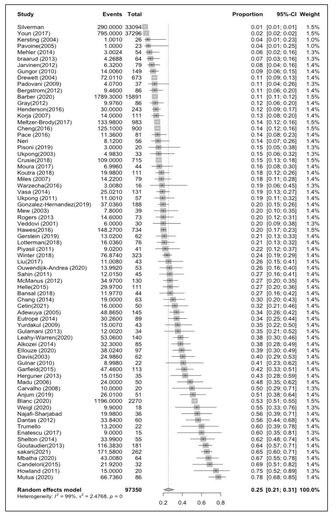


Figure 3: Prevalence of depression in mothers in years 2 to 5 (n=8)

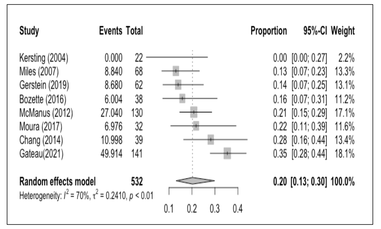
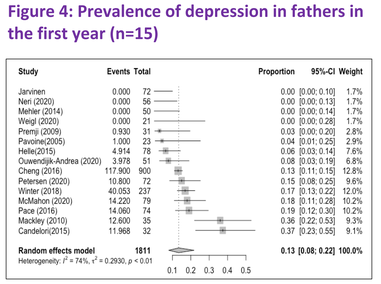


Figure 4: Prevalence of depression in fathers in the first year (n=15)



Factors associated with depression in mothers in the first year

- Lower education, such as primary school only, showed statistically increased risk of depression. OR[95%CI]: **3.5** [1.9; 6.5], p-value < 0.0001, I^2 = 0%
- Parents with relationship difficulties had statistically significant increased risk of depression: OR: **18.1** [2.2; 151.1], p-value = 0.008, I^2 = 0%

Figure 5: Education a Risk Factor for Depression In Mothers in the First Year

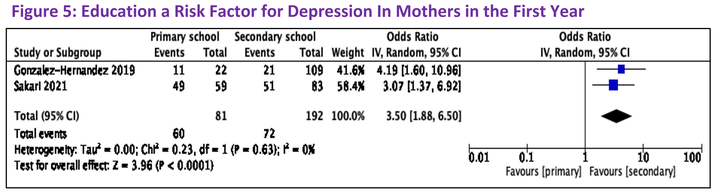
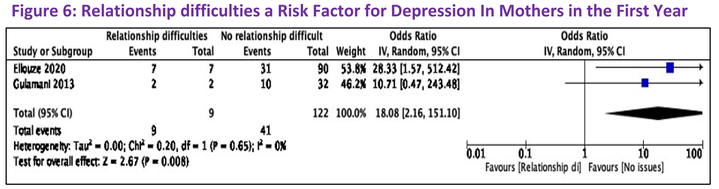


Figure 6: Relationship difficulties a Risk Factor for Depression In Mothers in the First Year



RESULTS

Subgroup Analysis – by regions

Table 1a Mothers of preterm infants in the first year

Region	Prevalence of Depression[95% CI]	p-value
Eastern Mediterranean Region (n=3)	**47.7%** [24.7; 71.9], I^2 = 36.2%	0.0003
African Region (n=8)	**45.7%** [26.2; 66.5], I^2 = 93.3%	
Region of the Americas (n=19)	26.6% [19.3;35.5], I^2 = 95.8%	
Western Pacific Region (n=5)	21.1% [10.7; 37.3], I^2 = 79.7%	
European Region (n=32)	20.9% [14.4;29.5], I^2 = 99.4%	
South – East Asian Region (n=5)	**16.7%** [4.0; 49.1], I^2 = 98.6%	

Table 1b Fathers of preterm infants in the first year

Region	Prevalence of Depression [95% CI]	p-value
Western Pacific Region (n=4)	**17.4%** [9.2; 30.4], I^2 = 99.8%	0.03
Region of the Americas (n=3)	15.7 % [0.8; 81.5], I^2 = 87.1%	
European Region (n=8)	**4.8%** [1.4; 15.3], I^2 = 79.3%	

- Subgroup analysis for gestational age was not possible due to insignificant data.

LIMITATIONS

- Studies showed considerable heterogeneity evaluated through outlier removal, publication bias assessment and subgroup analysis of study design and NIH quality (results not shown)
- We were unable to complete planned subgroup analysis for gestational age as studies included did not fit pre-described gestational age groups of interest.

CONCLUSIONS

- **Mothers and fathers of preterm infants demonstrated increased prevalence of depression in years 1 through 5, with years two through five showing some improvement comparably.**

We recommend screening parents of preterm infants for depression for at least 5 years following preterm birth

- Special consideration should be given for the first two years following preterm birth and for at-risk groups such as those with lower educational status, relationship difficulties or whom are from the African and Mediterranean regions.
- Further research is needed to better quantify the impact of specific gestational age categories on depression.

ACKNOWLEDGEMENTS

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