



Rapid report

Depressive symptoms among Dutch pregnant women after the crash of flight MH17: the PRIDE Study



Marleen M.H.J. van Gelder PhD^{a,b,*}, Richelle Vlenterie MSc^a, Nel Roeleveld PhD, MSc^{a,c}

^a Department for Health Evidence, Radboud Institute for Health Sciences, Radboud University Medical Center, Nijmegen, The Netherlands

^b Radboud REshape Innovation Center, Radboud University Medical Center, Nijmegen, The Netherlands

^c Department of Pediatrics, Radboudumc Amalia Children's Hospital, Radboud University Medical Center, Nijmegen, The Netherlands

ARTICLE INFO

Article history:

Received 23 October 2015

Accepted 16 November 2015

Available online 13 December 2015

Keywords:

Depression

Disaster

Perinatal mental health

Pregnancy

PRIDE Study

Psychological distress

Introduction

A recent study by Truijens et al. [1] suggested that national disasters may lead to emotional responses among pregnant women. They found higher mean Edinburgh Depression Scale (EDS) scores in the first month after the crash of Malaysian Airways flight MH17 on July 17, 2014, among women in the third trimester of pregnancy compared with women with similar characteristics who completed the EDS in the same summer period 1 year earlier. Because research on this topic is scarce, but may have implications for prenatal care, we replicated this study in an independent cohort of Dutch pregnant women.

Methods

For this study, we used data from the PRIdence and Infant DEvelopment (PRIDE) Study, an ongoing, prospective cohort study in The Netherlands that has been described in detail elsewhere [2]. In short, pregnant women were included in early pregnancy (before 17 weeks of gestation) by their prenatal care provider and completed questionnaires at enrollment, in gestational weeks 17

and 34, and 2 and 6 months after the estimated date of delivery. To assess depressive symptoms during pregnancy, the prenatal questionnaires included either the Hospital Anxiety and Depression Scale (HADS; at enrollment and third prenatal questionnaire) [3] or the EDS (second prenatal questionnaire) [4].

We included two groups of pregnant women in the present study: 235 exposed PRIDE Study participants who completed a prenatal questionnaire between July 18 and August 18, 2014 (within 1 month after the MH17 crash), and 231 unexposed participants who completed a prenatal questionnaire between July 18 and August 18, 2012, or July 18 and August 18, 2013. Only women who completed all questions of the HADS subscales or EDS were included in the analyses. We compared the scores on the HADS and EDS in each phase of pregnancy between the exposed and unexposed women while controlling for maternal age, level of education, parity, and smoking during pregnancy using linear regression analysis. In addition, we used logistic regression analysis to study the associations between exposure to the MH17 crash and cutoff scores on the HADS depression subscale and the EDS indicating depression (≥ 8 and ≥ 10 , respectively). The statistical analyses were performed using IBM SPSS, version 20 (IBM Corp., Armonk, NY).

Results

None of the women in our cohort exposed to the MH17 crash reported loss of a relative or close friend in the MH17 crash.

* Corresponding author. Department for Health Evidence (HP 133), Radboud University Medical Center, P.O. Box 9101, 6500 HB Nijmegen, The Netherlands. Tel: +31-243666126; fax: +31-243613505.

E-mail address: Marleen.vanGelder@radboudumc.nl (M.M.H.J. van Gelder).

Table 1

Scores on the HADS and EDS among pregnant women after the MH17 crash (exposed) and pregnant women participating in the PRIDE Study before 2014 (unexposed)

Questionnaire	Exposed		Unexposed		P	
	n	Mean (SD)	n	Mean (SD)	Crude	Adjusted*
HADS (at enrollment)						
Anxiety subscale	98	5.8 (2.4)	81	5.4 (2.0)	.34	.61
Depression subscale	97	3.2 (2.8)	82	2.4 (2.0)	.03	.12
EDS (gestational week 17)						
Total score	49	4.2 (3.6)	50	4.0 (3.7)	.78	.73
HADS (gestational week 34)						
Anxiety subscale	83	4.8 (2.2)	77	4.6 (1.8)	.46	.50
Depression subscale	84	3.8 (2.8)	79	3.1 (2.3)	.08	.38

* Adjusted for maternal age, level of education, parity, and smoking during pregnancy.

Compared with unexposed women, exposed women seemed to have higher scores on the HADS depression subscale completed at enrollment and in gestational week 34 (Table 1). However, these differences diminished after correction for confounding and were not statistically significant ($P > .05$). We did not observe differences in EDS scores in gestational week 17 between exposed and unexposed women.

Based on the HADS completed at enrollment, 9.4% of exposed women and 2.5% of unexposed women were classified as depressed (adjusted odds ratio [aOR] = 4.1, 95% confidence interval [CI] = 0.8–20.4) while this was the case for 11.9% of exposed and 3.8% of unexposed women at gestational week 34 (aOR = 2.4, 95% CI = 0.6–10.1). The percentage of women with elevated EDS scores in gestational week 17 did not differ between those exposed to the MH17 crash (8.2%) and the unexposed women (12.0%; aOR = 0.5, 95% CI = 0.1–2.2).

Discussion

Although not statistically significant, our results are in line with Truijens et al. [1] suggesting an increase in depressive symptoms among women in the third trimester of pregnancy after the MH17 crash compared with women who completed the questionnaire in earlier summer periods. In addition, we saw elevated depression scores and an increased risk of depression among women in the first 4 months of pregnancy. However, neither of the studies had the statistical power to detect a clear association between the MH17 crash and HADS or EDS scores indicating depression.

Some methodological differences exist between our study and the study by Truijens et al. [1]. We analyzed the impact of the MH17 crash at different points in pregnancy using the HADS instead of the EDS in two of our three prenatal questionnaires. The EDS is the most commonly used screening instrument for perinatal depression [5], whereas the HADS seems the most appropriate, although it has not formally been validated in an obstetric population [6]. In addition, we did not include July 17, the day of the MH17 crash, in the exposure period as the impact of the disaster was not immediately clear and we did not know whether the questionnaire was completed before or after hearing of the crash. To increase study

power, we supplemented the unexposed group from 2013 with PRIDE Study participants who completed a prenatal questionnaire in the summer of 2012. The latter two modifications from the Truijens study did not alter our results (data not shown).

Goto et al. [7] reported more depressive symptoms among women pregnant at the time of the Fukushima nuclear disaster living in the region in which the power plant was located compared with women living in less affected regions. No increased risks of adverse pregnancy outcomes were observed after the Fukushima and MH17 disasters and among U.S. women pregnant at the time of the September 11 attacks [1,7,8]. Smits et al. [9] reported a slightly lower birth weight among infants of Dutch women pregnant during the September 11 attacks. However, more large-scale studies are needed on the associations between maternal depressive symptoms in postdisaster and normal settings and perinatal and neurodevelopmental outcomes.

In conclusion, a nationwide disaster such as the MH17 crash may have impact on mental health of pregnant women, but the evidence is inconclusive. Our results did not provide robust support for the hypothesis of an association between national disasters and depressive symptoms among women in the third trimester of pregnancy, but they may point toward psychological effects among women in the early stages of pregnancy. As pregnant women are vulnerable to developing depressive symptoms which may lead to adverse pregnancy outcomes, additional monitoring and mental health support should be considered after indirect exposure to a disaster.

Acknowledgments

The PRIDE Study is supported by grants from the Netherlands Organisation for Health Research and Development (ZonMw; 36011020 and 836012001).

References

- [1] Truijens SE, Boerekamp CA, Spek V, van Son MJ, Oei SG, Pop VJ. Increased levels of depressive symptoms among pregnant women in The Netherlands after the crash of flight MH17. *Am J Epidemiol* 2015;182:426–30.
- [2] Van Gelder MM, Bretveld RW, Roukema J, Steenhoek M, van Drongelen J, Spaanderman ME, et al. Rationale and design of the PRegnancy and Infant DEvelopment (PRIDE) Study. *Paediatr Perinat Epidemiol* 2013;27:34–43.
- [3] Zigmond AS, Snaith RP. The Hospital Anxiety and Depression Scale. *Acta Psychiatr Scand* 1983;67:361–70.
- [4] Bergink V, Kooistra L, Lambregtse-van den Berg MP, Wijnen H, Bunevicius R, van Baar A, et al. Validation of the Edinburgh Depression Scale during pregnancy. *J Psychosom Res* 2011;70:385–9.
- [5] Kozinszky Z, Dudas RB. Validation studies of the Edinburgh Postnatal Depression Scale for the antenatal period. *J Affect Disord* 2015;176:95–105.
- [6] Bocquet C, Deruelle P. Quelles échelles psychométriques utiliser pour évaluer l'état psychologique de la femme enceinte? *J Gynecol Obstet Biol Reprod (Paris)* 2014;43:587–92.
- [7] Goto A, Bromet EJ, Fujimori K. Immediate effects of the Fukushima nuclear power plant disaster on depressive symptoms among mothers with infants: a prefectural-wide cross-sectional study from the Fukushima Health Management Survey. *BMC Psychiatry* 2015;15:59.
- [8] Perlman SE, Friedman S, Galea S, Nair HP, Eros-Sarnyai M, Stellman SD, et al. Short-term and medium-term health effects of 9/11. *Lancet* 2011;378:925–34.
- [9] Smits L, Krabbendam L, de Bie R, Essed G, van Os J. Lower birth weight of Dutch neonates who were in utero at the time of the 9/11 attacks. *J Psychosom Res* 2006;61:715–7.