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Research paper

Effect of the 2015 Nepal Earthquakes on symptoms of common mental disorders among women who are pregnant

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ABSTRACT

Background: Antenatal mental health problems are of concern globally not only because of the burden and limits to participation experienced by women but also because of risks for foetal neurocognitive development and adverse birth outcomes. The aim was to describe the indicative prevalence of and risk and protective factors for clinically-significant symptoms of antenatal common mental disorders (CMDs) among women who experienced the 2015 Nepal earthquakes during pregnancy.

Methods: A population-based cross-sectional study in Bhaktapur, one of 14 districts highly affected by the 2015 Nepal earthquakes. The primary outcome, clinically significant symptoms of CMDs, was ascertained using the Nepali validation of the Edinburgh Postnatal Depression Scale (EPDS-N). In order to investigate potential trauma reactions, a subset of EPDS items as indicators of trauma symptoms was constructed. Standardised instruments and study-specific questions were used to measure potential risk and protective factors. Data were collected in individual structured interviews by trained health researchers. Hierarchical multiple linear regression models were used to establish risk and protective factors for clinically significant symptoms of CMDs and indicators of post-earthquake trauma reaction.

Results: Overall, 497/498 eligible pregnant women provided complete data. We found that 21.9% (95% CI, 18.4; 25.8) of participants had EPDS-N scores > 12 and another 17.1% (95% CI 13.9; 20.7) scored 10–12 indicating a high prevalence of clinically significant CMD symptoms. In total, 20 factors were included in the final hierarchical multiple linear regression model and together explained 33.3% of the variance in EPDS total scores; seven factors, including earthquake experiences and lifetime experience of intimate partner violence, increased risk and five including having income-generating work and a kind, and encouraging partner were protective. The association between earthquake experiences and the indicators of trauma symptoms was not significant in the hierarchical multiple linear regression analysis.

Limitations: The EPDS has not yet been formally validated in Nepal for use during pregnancy. Data were collected 6 months post-earthquake, so we were not able to capture the experiences of women who had spontaneous or induced abortions or premature births in the immediate aftermath of the earthquake.

Conclusions: In addition to the restoration of antenatal and obstetric services, the mental health of women who are pregnant requires specific consideration and interventions after natural disasters. This should take into account the additional adverse impact of violence perpetrated by an intimate partner.

1. Introduction

Earthquakes can occur in any country and with little warning, but their impact is much greater in resource-constrained nations. After emergency assistance for survivors, the priority for governments and humanitarian organisations is generally rebuilding infrastructure and providing essential goods and services for people who have lost housing and livelihoods. The World Health Organisation's guidance for maternal and newborn health in humanitarian crises focuses on the equipment and skills needed for safe births and newborn care (WHO, 2016). The mental health of women who are pregnant or have recently given birth (the perinatal period), has not to date been a primary focus of post-disaster policies or interventions (Ren et al., 2014).

The term 'common mental disorders' (CMD) has been used increasingly to describe non-psychotic mental health conditions including depressive, anxiety, adjustment and somatoform disorders which are not distinguishable in primary health care, including in resource-constrained settings (Goldberg and Huxley, 1992). The term perinatal CMD

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refers to depressive and anxiety disorders, which are the most common mental health problems, occurring during pregnancy or the postpartum year. CMD among pregnant women is recognized as a significant public health problem worldwide, with an estimated population prevalence of about 10% in high-income settings and 16% in low-and lower-middle-income countries (Fisher et al., 2012). It is plausible that emotional states and reduced functioning following an earthquake are more accurately conceptualised as reactions to a traumatic event, but most psychological symptoms are the same as those indicating depressive or anxious states.

There is some evidence of the impact on the pregnancy mental health of women living in high- or middle-income nations of experiencing an earthquake. Seven studies—five from China and two from Japan—have investigated pregnancy mental health in this context. Following the 1999 Taiwan earthquake, Chang et al. (2002) found that 29.2% of participants were experiencing 'minor psychiatric morbidity' (Chinese Health Questionnaire-12 (CHQ-12) score > 3). Lau et al. (2011), Qu et al. (2012) and Dong et al. (2013) conducted studies at different intervals after the 2008 Sichuan China earthquake. They reported prevalence on the basis of scores on a Chinese translation of the Edinburgh Postnatal Depression Scale. These ranged from 7.1% (cut off (unadjusted) score ≥ 14) (Lau et al., 2011) to 40.8% (95% CI, 35.5; 46.4) as having 'major depression' (cut off score ≥ 10) (Qu et al., 2012). In the same study, Qu et al. (2012) also reported that 12.2% (95% CI, 9.0; 16.4) had 'PTSD' (modified Chinese translation of the Impact of Events Scale score ≥2). Ren et al. (2015) conducted a study after the 2013 China earthquake and found that 35.2% had scores ≥ 14 on the Chinese EPDS.

Hibino et al. (2009) assessed 99 women who were pregnant during or immediately after the 2007 earthquake in Japan with the EPDS and found that 13.1% had scores > 9 which is higher than rates among pregnant women from a non-disaster-affected site in Japan (Kitamura et al., 2006). Watanabe et al. (2016) recruited 670 women who were pregnant and directly exposed to the 2011 Great East Japan earthquake and 6475 pregnant women from a non-affected area. Pregnant women from the earthquake affected area had significantly higher psychological stress (4.6%, Kessler 6-item psychological distress scale score > 13) than those from the non-affected area (3.1%).

Among these studies, four examined at least one aspect of earthquake experiences as a predictor of pregnancy mental health. Significant associations were found between 'the intensity of the earthquake' ($r = 0.16$; $p < 0.01$) and higher EPDS scores (Hibino et al., 2009); and 'death of a relative' ($p = 0.005$) and 'starvation during pregnancy' ($p = 0.001$) with higher CHQ-12 scores (Chang et al., 2002). Ren et al. (2015) reported that 'having a relative injured' in the earthquake contributed to an 11.1% average increase in EPDS scores. Qu et al. (2012) found that pregnant women who saw 'people trapped' or experienced 'death of a family member' were more likely to have Post Traumatic Stress Disorder (OR 1.80; 95% CI, 1.43; 2.26) but not higher depressive symptoms.

Some studies examined other known risk and protective factors in addition to earthquake experiences. Reproductive factors such as pregnancy-related stress (OR, 1.19; 95% CI, 1.12; 1.27) (Qu et al., 2012), unplanned pregnancy (OR, 1.65; 95% CI, 0.96; 2.85) (Qu et al., 2012), or being multiparous (aOR, 2.47; 95% CI, 1.18; 5.17) (Lau et al., 2011) were associated with worse pregnancy mental health. Having a 'poor marital relationship' (Lau et al., 2011) was a risk factor, while having support from her husband (Dong et al., 2013) and supportive family relationships (OR, 0.84; 95%CI, 0.73; 0.98) (Qu et al., 2012) were protective. Personality factors such as higher 'avoidance of dealing with stressful situation' known as 'negative coping'(Ren et al., 2015) and 'existing anxiety about an earthquake' ($r = 0.5$; $p < 0.01$) (Hibino et al., 2009) were risk factors and higher 'positive coping' defined as active problem-solving in stressful situations'(Ren et al., 2015) was protective. Watanabe et al. (2016) assessed the history of mental health problems as a potential risk for pregnancy mental health but did not report an association.

These studies, all from high- and middle-income nations have several methodological limitations. While four examined some aspect of earthquake experience as a risk factor, none used a comprehensive, standardised assessment. All studies used self-report symptom scales—five the EPDS (Dong et al., 2013; Hibino et al., 2009; Lau et al., 2011; Qu et al., 2012; Ren et al., 2015), one the CHQ-12 (Chang et al., 2002) and one the K6 (Watanabe et al., 2016)—to assess antenatal mental health. Diverse cut-off scores: EPDS ≥10 for three (Dong et al., 2013; Hibino et al., 2009; Qu et al., 2012) and ≥14 for two studies (Lau et al., 2011; Ren et al., 2015)—were used to ascertain clinically significant symptoms. Moreover, three studies (Hibino et al., 2009; Lau et al., 2011; Ren et al., 2015) used an EPDS cut off score, which had not been established in a local formal validation against diagnostic interviews among pregnant women. While intimate partner violence (IPV) is a known risk factor for perinatal mental health problems among women (Fisher et al., 2012), none of these studies considered IPV. There are no data from a low-income nation.

The aim was to describe the indicative prevalence of clinically significant symptoms of antenatal common mental disorders (CMD symptoms) and risk and protective factors for these among women who experienced the 2015 Nepal earthquakes during pregnancy.

2. Methods

2.1. Study design

Population-based cohort study of pregnancy mental health and pregnancy outcomes following exposure to an earthquake. The baseline data are reported here.

2.2. Study setting

On 25th April 2015, a major earthquake (Richter Scale 7.8) and many aftershocks in Nepal led to over 9000 deaths, 23,000 serious injuries, destruction of nearly a million houses, displacement of 2.4 million people, food insecurity for around one million people and exacerbation of existing socio-political and economic problems (WHO, 2015). UNFPA (2015) estimated that 126,000 pregnant women were affected directly.

Of the 75 districts in Nepal, Bhaktapur was one of the 14 most severely affected. In Nepal's Central Region, Bhaktapur is a UNESCO-designated World Heritage Site of major cultural, historical, and religious significance. About 304, 000 people of diverse ethnicities live in 6 rural and urban sub-administrative divisions (CBS, 2012).

2.3. Participants

Inclusion criteria were to be a pregnant woman aged at least 15 years, living in Bhaktapur District and pregnant during the 2015 Earthquakes. Exclusion criteria were multiple gestations, being unable to speak Nepali, having a cognitive disability, who were outside of Bhaktapur at the time of major 2015 Earthquakes, or moved to Bhaktapur to live after the earthquakes.

2.4. Data sources

Data were collected by individual structured fixed-response-option interviews incorporating standardised tools and study specific questions. The interview schedule was translated into Nepali, culturally verified for comprehensibility, pilot tested among 12 women meeting inclusion criteria apart from living in Bhaktapur and back-translated into English.

2.4.1. Primary outcome

CMD symptoms were assessed by the Edinburgh Postnatal

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