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Case Study

Immigrant maternal depression and social networks. A multilevel Bayesian spatial logistic regression in South Western Sydney, Australia ☆

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ABSTRACT

The purpose is to explore the multilevel spatial distribution of depressive symptoms among migrant mothers in South Western Sydney and to identify any group level associations that could inform subsequent theory building and local public health interventions. Migrant mothers (n = 7256) delivering in 2002 and 2003 were assessed at 2–3 weeks after delivery for risk factors for depressive symptoms. The binary outcome variables were Edinburgh Postnatal Depression Scale scores (EPDS) of >9 and >12. Individual level variables included were: financial income, self-reported maternal health, social support network, emotional support, practical support, baby trouble sleeping, baby demanding and baby not content. The group level variable reported here is aggregated social support networks. We used Bayesian hierarchical multilevel spatial modelling with conditional autoregression. Migrant mothers were at higher risk of having depressive symptoms if they lived in a community with predominantly Australian-born mothers and strong social capital as measured by aggregated social networks. These findings suggest that migrant mothers are socially isolated and current home visiting services should be strengthened for migrant mothers living in communities where they may have poor social networks.

1. Introduction

We have previously reported on individual level psychosocial predictors of postnatal depression in South Western Sydney (Eastwood et al., 2011) and proposed that the findings were consistent with group-level socioeconomic deprivation, neighbourhood environment, social capital and ethnic diversity having causal effects on postnatal depressive symptomatology and other perinatal outcomes. In that study migrant mothers had a higher risk of depressive symptoms.

The finding is consistent with previous individual-level studies of maternal depression among recent migrants to Australia (Brown and Lumley, 2000; Brown et al., 1994;

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Lansakara et al., 2009; Williams and Carmichael, 1985). Of direct relevant to this study are the findings of Stuchbery and colleagues (1998) who undertook a study of Vietnamese, Arabic and Anglo-Celtic mothers in South West Sydney specifically to examine which deficits in their social support network were associated with postnatal depression among mothers of a non-English speaking background. Among Vietnamese mothers low mood was associated with a poor quality relationship with their partner and a perceived need for more practical support from him. For Arabic women low mood was associated with a perceived need for more emotional support from their partners. The authors noted the importance of postnatal rituals which involve support from extended family. In their study 64 percent of Vietnamese and 61 percent of Arabic women did not have their mothers with them.

In an analysis of 70 studies on culture and postnatal depression social support was identified as important. Specifically the review highlighted the importance of the woman's perception of support (Bina, 2008). It is apparent that for migrant women expectations and availability of support plays an important role in relation to depressive symptoms at least at the individual level.

There is strong empirical evidence to support the proposition that individual-level social networks protect mothers from depression (Beck, 2001; Bennett et al., 2004; Cox et al., 1982; Gotlib et al., 1991; O'Hara and Swain, 1996; O'Hara, 1995; O'Hara et al., 1984; Seguin et al., 1999; Zajicek, 1981). Little is known, however, of the role played by group-level social networks, or social capital. At the aggregated level social networks, or social capital, is a group attribute that makes available certain types of resources (i.e. information, instrumental resources and social reinforcement) to members of the group, or community. Members of the group may, however, also be denied access to those resources. Of interest to us, therefore, was the role that may be played by group-level social networks in predicting depressive symptoms among migrant mothers (Kawachi et al., 2008b, p. 3).

The study reported here uses multilevel Bayesian hierarchical spatial modelling techniques to explore spatial relationships between aggregated postnatal depressive symptoms and aggregated social support networks among migrant mothers, while controlling for individual level covariants. The study is part of a critical realist mixed method program of research that aims to build a theoretical model of the mechanisms by which multilevel factors might influence the developmental origins of health and disease.

2. Methods

2.1. Study design

The analysis reported here is part of an exploratory ecological study of aggregated rates of self-reported postnatal depressive symptoms in South Western Sydney Area Health Service from 2002–2003. The main 2002–2003 study (n = 15,389) utilises a sub-sample of a larger dataset collected from 1998–2006. The study included: individual level logistic regression (Eastwood et al., 2012a) and non-linear principal component analysis (Eastwood et al., 2012b), cluster analysis (Eastwood et al., 2013a), ecological factor analysis, visualisation of maps of co-variants, ecological likelihood and Bayesian linear regression (Eastwood et al., 2013b), and Bayesian spatial and multi-level analysis. The results of a multilevel Bayesian spatial analysis of migrant mothers (n = 7256) are reported here. There were no significant findings in the multi-level analysis of Australian-born mothers.

2.2. Study setting

The setting is all suburbs in four local government areas (LGAs) in South West Sydney, New South Wales, Australia. The individual-level data available for study was coded by suburb of residence. The suburb of residence was chosen as the closest group-level administrative unit to naturally occurring local neighbourhood environments. There were 101 suburbs available to study using the 2001 Census maps.

The area has a diverse multicultural population with 28.4% of the population born overseas compared with 17.8% for the rest of NSW. Twenty percent of infants are born to women from South East, North East or Southern Asia. The area also has substantial social disadvantage with lower education attainment and lower income levels then other parts of NSW. Based on composite socio-economic indices, approximately two-thirds of the area is significantly disadvantaged.

2.3. Outcome variable

From 2000 a routine survey of mothers with newborn infants, the Ingleburn Baby Information System (IBIS), was commenced. The survey included the Edinburgh Postnatal Depression Scale (EPDS) (Cox et al., 1987), which has been widely used to study individual-level maternal perinatal depressive symptoms. The EPDS was administered at the time of first well baby visits. Both EPDS >9 and EPDS >12 are supported by previous studies as screening cut-off points in English-speaking populations (Buist et al., 2002; Cox et al., 1987) to indicate need for further assessment and, with EPDS >12, to signal the probability of meeting formal diagnostic criteria for depressive illness. The EPDS has been validated for a number of other languages and ethnic groups (Cox and Holden, 2003). South Western Sydney studies have found that Vietnamese and Arabic translations of EPDS were acceptable to the women and appear to be suitable screening instruments for distress and depression (Barnett et al., 1999). In this study the EPDS was administered to non-English speaking mothers through interpreters.

2.4. Individual level independent variables

The IBIS survey contains 45 items which are both clinical (e.g. weight) and parental self-report in nature. Forty variables were selected for exploratory data analysis based on prior knowledge, the findings of published research and the findings of the qualitative arm of the main study. The individual level covariates included in the multilevel models were those identified in the final parsimonious models