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Article

Socioeconomic status indicators and common mental disorders: Evidence from a study of prenatal depression in Pakistan

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ABSTRACT

There is growing interest in the relationship between socioeconomic status (SES), poverty, and mental health in low and middle-income countries (LMIC). However, it is not clear whether a gradient approach focused on a wider SES distribution or a binary poverty approach is more salient for mental health in LMIC. Yet this distinction has implications for interventions aimed at improving population health. We contribute to the literature by examining how multiple indicators of socioeconomic status, including gradient SES and binary poverty indicators, contribute to prenatal depression symptoms in a LMIC context. Prenatal depression is an important public health concern with negative sequela for the mother and her children. We use data on assets, education, food insecurity, debt, and depression symptoms from a sample of 1154 pregnant women residing in rural Pakistan. Women who screened positive for depression participated in a cluster randomized controlled trial of a perinatal depression intervention; all women were interviewed October 2015-February 2016, prior to the start of the intervention. Cluster-specific sampling weights were used to approximate a random sample of pregnant women in the area. Findings indicate that fewer assets, experiencing food insecurity, and having household debt are independently associated with worse depression symptoms. The association with assets is linear with no evidence of a threshold effect, supporting the idea of a gradient in the association between levels of SES and depression symptoms. A gradient was also initially observed with woman's educational attainment, but this association was attenuated once other SES variables were included in the model. Together, the asset, food insecurity, and debt indicators explain 14% of the variance in depression symptoms, more than has been reported in high income country studies. These findings support the use of multiple SES indicators to better elucidate the complex relationship between socioeconomic status and mental health in LMIC.

Introduction

There is a growing interest in the relationship between socioeconomic status (SES), poverty, and mental health in lower and middle income countries (LMIC) (Lund et al., 2010, 2011; Burns, 2015). Recent reviews confirm that lower socioeconomic status is correlated with worse mental health outcomes (Lund et al., 2010, Coast, Leone, Hirose & Jones, 2012), although the findings are not unequivocal (Das, Do, Friedman, McKenzie & Scott, 2007). For example, there is evidence that studies using domains such as education or financial stress yield more consistent results than those using income or expenditures (Araya, Lewis, Rojas & Fritsch, 2003). However, as this body of evidence grows, a distinction that is often overlooked is that between the construct of socioeconomic status, measured often as a gradient, and poverty, a binary indicator of deprivation below a demarcated threshold. Indeed, the terms SES and poverty are often used interchangeably (Lund et al., 2010). The failure to distinguish between SES and poverty may potentially explain differences in findings, and has implications for policies aimed at improving population health.

In general, SES, or socioeconomic position (SEP), refers to a person's

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position in their community's social hierarchy; it reflects a person's access to key social and economic resources, including money, power, and social connections (Glymour, Avendano & Kawachi, 2014). SES exists on a continuum, or a gradient, and is usually understood as having multiple dimensions. Commonly used indicators of SES are occupation-based measures, income, expenditures, education, wealth/assets, as well as various composite measures (Galobardes, Shaw, Lawlor, Davey Smith & Lynch, 2006). Research from high income countries (HIC) has shown a clear gradient in the SES-health association, in that there are health benefits of belonging to every higher step on the SES ladder (Hemingway, Nicholson, Stafford, Roberts & Marmot, 1997, Lorant, Deliege et al., 2003). A discussion of poverty, on the other hand, focuses on those at the very bottom of the SES continuum. Poverty is a binary construct; the level below which "society deems it unacceptable to live", a level of deprivation that prevents an individual from participating in normal life (Smith, 1776). Commonly used binary indicators of poverty in LMIC are living on less than $1 or $2 a day or home overcrowding, as well as qualitative indicators such as food insecurity. SES indicators can be dichotomized in a way to identify those who are most disadvantaged, i.e. poor, such as having no education vs. at least some education, or belonging to the bottom quintile of an income/expenditure distribution vs. everyone else.

The question of whether gradient indicators of SES or absolute poverty are most salient for mental health is important in that they may imply different mechanisms operating to influence health and, in turn, different potential policy solutions. If poverty is the key driver of negative health outcomes then interventions focused on the poorest in society would have the largest beneficial impact in reducing the burden of disease (i.e. the 'high risk strategy' (Rose, 1985)). However, if lower SES negatively impacts mental health relative to each higher step of the SES ladder, as has been found in HICs, then a broader strategy may be necessary to have the largest impact.

The majority of existing research on this topic focuses on Common Mental Disorders (CMDs) such as depression and anxiety. We extend this research by focusing our analysis on depression among women during the prenatal period, estimated to affect at least 16% of women in LMIC (Fisher et al., 2012). The majority of women who are depressed prenatally remain depressed postnatally (Rahman & Creed, 2007) and depression during this perinatal period has been linked with other health problems for the mother as well as with multiple negative developmental outcomes for her offspring (Brown & Lumley, 2000, Galler et al., 2004, Rahman, Iqbal, Bunn, Lovel & Harrington, 2004, Gelaye, Rondon, Araya & Williams, 2016, Maselko, Sikander et al., 2016). Therefore, a better understanding of the relationship between socioeconomic status and depression during pregnancy can inform efforts to improve the mental health of mothers as well as to improve the developmental trajectories of their children.

The goal of this paper is to examine the relationship between multiple indicators of socioeconomic status, especially gradient SES and binary poverty indicators, and prenatal depression symptoms in a LMIC context. To do so, we use data from a community sample of pregnant women residing in rural Pakistan. First, we examine the association of multiple indicators of SES and poverty with prenatal depression symptoms. Finally, we conduct an exploratory analysis to see whether each SES and poverty indicator uniquely predicts depression symptoms, independent of the other indicators.

Methods

Sample

The data for the analysis come from the baseline data collection wave (during the prenatal period) of a cluster randomized controlled trial (c-RCT) of a perinatal depression intervention, the Thinking Healthy Peer Delivered Plus (THPP+) program. The study is situated in a rural area of Pakistan; sample recruitment and trial details are described elsewhere (Sikander et al., 2015, Turner et al., 2016). Briefly, all pregnant women living in 40 village clusters (half of which were randomized to the intervention and half to the control arm) were screened for depression during their third trimester of pregnancy using the Patient Health Questionnaire-9 cutoff score of 10 or greater (Kroenke, Spitzer & Williams, 2001). In order to be eligible to participate, women needed to be married, plan to reside in the study area, understand one of the study languages (Urdu, Punjabi, or Potohari), and not require immediate medical attention. All eligible women who screened positive were invited to participate in the c-RCT and an equal number of non-depressed women in each village were recruited to participate in the follow-up study. About one out of every three non-depressed women in the villages were recruited, resulting in a 1:1 ratio of women who screened positive for depression and those who did not. After the baseline prenatal interview, women in the intervention clusters began the program; and all women were interviewed during the postnatal period. The results presented in the current paper use data from the 1154 women in the baseline sample, all of whom were interviewed during third trimester of pregnancy prior to the start of the intervention.

Measures

Gradient indicators of socioeconomic status (SES)

Household assets index score. Data on assets were collected based on the Demographic and Health Survey (DHS) wealth index approach (Rutstein & Johnson, 2004). Questions cover domains such as ownership of land/home, animals, various household durable goods (TV, car, etc.), as well as items relating to type of home materials, access to water and sanitation. Asset data are considered one of the more valid and reliable indicators of SES, especially in LMIC, where data on factors such as income or expenditures are often unreliable (Kolenikov & Angeles, 2004).

As recommended in the literature, an "asset index" was generated rather than using each asset variable separately (Filmer & Pritchett, 2001, Kolenikov & Angeles, 2004, Vyas & Kumaranayake, 2006, Kolenikov & Angeles, 2009, Howe, Galobardes et al., 2012). To do so, categorical asset variables with more than 2 levels were transformed in to binary variables based on natural groupings agreed to by the study team (e.g. the 5 types of floor materials were combined to distinguish floors made of tiles and chips/terrazzo from all other types of flooring such as cement, bricks and mud). Using a preliminary cut of the data, items for which most (> 90%) or few (< 10%) owned the asset were excluded as these variables provided minimal information to distinguish between women in the study. Because the proportion of variance explained was important, the polychoric correlation principle components approach was applied to the remaining 22 binary assets using the polychoricpca command in Stata (version 14.1) (Kolenikov & Angeles, 2004). In simulations (Kolenikov & Angeles, 2009), this approach has been shown to perform better than the traditional principal components approach which uses correlations based on multivariate normality of the assets (Filmer & Pritchett, 2001). The first principal component was used as the asset index (Filmer & Pritchett, 2001); it explained 41% of the overall variability in assets. Specifically, it was used in a standardized form by subtracting the weighted mean and dividing by the weighted standard deviation (see *Analysis* for details of the weighting). This approach was preferred to that commonly used whereby study participants are classified in to three groups (e.g. "poor" the lowest 40%, "middle" the next 40%, and "rich" the top 20%).

Education. Each woman reported years of education completed for herself and her husband. Both values were recoded into the following categories of years to correspond to key thresholds for completion: none, primary (1–5), middle (6–8), secondary (9–10), higher secondary (11–12) and tertiary (> 12). We coded the education variable categorically rather than continuously to be comparable to other