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Assessing neighborhood characteristics and their association with maternal stress, depressive symptoms, and well-being in eight culturally diverse cities: A cross-sectional study

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Abstract

Understanding the impact of neighborhood characteristics is crucial given its multigenerational impact. However, there is low availability of validated instruments measuring neighborhood dimensions, particularly in pregnant women, and a lack of cross-country validation of neighborhood-related scales. In this study, we used data from the [masked] study to assess the conceptual and measurement equivalence of the community domains of neighborhood cohesion, intergenerational closure, and neighborhood and social disorder, testing for measurement invariance across eight low- and middle-income countries (LMICs). Following this, we examined patterns of associations with prenatal maternal stress, well-being, and depressive symptoms through the use of nomological networks. We found that the conceptual and measurement equivalence of the neighborhood domains were good across the eight LMICs, although some adjustments had to be made to improve the model fit in two of the sites. Moreover, our results suggest that, in general, higher levels of neighborhood and social disorder, and lower levels of cohesion and intergenerational closure in the community were similarly associated with adverse maternal outcomes across the included sites. The results of this study emphasize the importance of exploring the community context when assessing maternal well-being and supports the need to advocate for community-based interventions that promote safer physical and social environments within maternal programs.

Introduction

Considerable evidence from high-income countries suggests that neighborhood characteristics – such as social disorder, social deprivation, and material deprivation – can have detrimental effects on the mental health and well-being of pregnant women.[1-3] Furthermore, it has been well-established that women who live in disadvantaged neighborhoods have higher risk of adverse outcomes during pregnancy and post-birth, including low birthweight, preterm birth, stillbirth, and infant mortality.[4-6] Understanding the impact of neighborhood characteristics is therefore important given its multigenerational impact.

Neighborhoods are a social structure that encompasses the immediate setting in which individuals are found and that influences their context or behaviours.[7] This assertion builds on an important contribution by Bronfenbrenner,[7] who introduced a bioecological framework to explain children's health and development and who considered that human development takes place within different nested socially organised environments that influence the development of health and well-being through direct and indirect interactions.[8]

The interest in understanding how the community context influences the population's health has increased in recent years.[9,10]. Research has demonstrated that neighborhood-level factors do not operate independently, but interact with individual-level factors, establishing a reciprocal loop.[11] Although the measurement of ecological characteristics of neighborhoods is considerably less established in epidemiology than the measurement of individual-level variables, [10] both are important when exploring the influence of social capita.[12] Constructs such as neighborhood trust and cohesion, neighborhood disorder, and the strength of intergenerational closure are particularly relevant constructs for understanding neighborhood effects on maternal and family well-being.

In the broadest sense, neighborhood cohesion is defined as more of a structural concept, involving participation in local organisations, links between social groups, and implication in collective activities.[13,14] The presence of neighborhood cohesion has been identified as a protective factor for anxiety in mothers of young children.[15] A second concept that has been prominent in social environmental research has been neighborhood disorder, which generally comprises observed or perceived physical and social features of neighborhoods that can undermine the quality of life of residents.[9,16] Research on this factor in the perinatal period is much more limited, though emerging. For instance, low levels of social disorder in neighborhoods during childhood and pregnancy have been associated with lower levels of postpartum depressive symptoms in African American women.[17]A third concept deemed important to understand well-being outcomes from an ecological perspective is intergenerational closure, which refers to the presence of dense networks formed between adults and children in the community.[18] Its impact on well-being has not been explored in neighborhood research to the same extent as other dimensions, especially in pregnant women.

A major concern when exploring neighborhood characteristics is the limited availability of validated instruments[13,19] and the fact that these are rarely validated across different populations, cultures, and languages, hampering the achievement of international surveys and meaningful cross-cultural comparisons.[13] How neighborhoods are organised based on socioeconomic characteristics, social disorder, and exposure to violence is important to assess when comparing culturally diverse settings.[20] In this sense, establishing invariance, that is the equivalence of a concept, is important to support cross-context comparisons that might illuminate which contexts are most in need of interventions and to test hypotheses about the effects of macro-level variables. To this point, there is little evidence of cross-country validation of neighborhood-related scales and the research that exists focuses on high-income countries.[21,22] However, cross-country comparative design has been previously used to gain insights into important issues such as prenatal attachment[23] and depressive

symptoms in pregnant women[24] in low- and middle- income countries (LMICs). There is also limited research on whether social and material features of neighborhoods are similarly associated with constructs of maternal stress, depression, and well-being across societies. Increasing knowledge on the role neighborhoods play in relation to women's well-being during pregnancy is crucial as it represents a unique window of opportunity that can both benefit women and their offspring.

The Current Study

First, we assess the conceptual and measurement equivalence of the community domains of neighborhood cohesion, intergenerational closure, and neighborhood and social disorder, testing for measurement invariance across eight LMICs. Secondly, we examine patterns of associations with prenatal maternal stress, well-being, and depressive symptoms. This research adds to the limited body of knowledge on the association between community characteristics and health outcomes in pregnant women in LMICs, which may inform community-based interventions in different societies. Validating an instrument assessing neighborhood characteristics across cultures may encourage subsequent important cross-cultural comparisons.

Method

Data

This study analysed data from the [masked] data set. The [masked] is a prospective birth-cohort study conducted in eight low and middle-income cities in diverse regions, including Kingston (Jamaica), Koforidua (Ghana), Worcester (South Africa), Cluj-Napoca (Romania), Tarlai Kalan (Pakistan), Ragama (Sri Lanka), Hue (Vietnam), and Valenzuela City (the Philippines). The [masked] was designed to provide high-quality longitudinal evidence to support effective interventions to tackle violence against women and children. The [masked] currently consists of three completed waves of data collection; the first wave – the focus of the current study – was conducted when participating women were in the third trimester of pregnancy.

The [masked] questionnaires were first developed in English and then translated into nine different languages (Urdu, Afrikaans, IsiXhosa, Romanian, Filipino (Tagalog), Sinhala, Tamil, Vietnamese, and Twi) guided by the WHO Guidelines on Translation. The protocol of this study provides further details of the data collection procedures.[25]

Ethics

Ethical approval was obtained following national specific procedures in each of the eight participating study sites and the coordinating site prior to the start of data collection.

Sample

A convenience sampling method was employed to recruit participants through direct contact by the fieldworkers in the clinic waiting room, or by a health worker who would then refer potential participants to the fieldworkers. Recruitment strategies were adapted in each site. Pregnant women were invited to participate in the study if they were: i) in their third trimester of pregnancy (i.e., weeks 29-40); ii) aged 18 and over; iii) residing within the study area and with no plans to migrate during the first three months post-birth; and iv) able to give informed consent. The total baseline sample consisted of 1,208 participants (150 approx. per site) that were on average 28.27 years old (*SD* = 5.81 years, range: 18–48 years). For further participant demographic characteristics see [masked].

Procedure

Eligible women were invited to provide written informed consent in their relevant language. When necessary, alternative means of providing consent were offered, following the WHO's Research Ethics Committee.[25]

Female fieldworkers interviewed participants after receiving 40 hours of standardised in-person training.[25] Baseline data collection started in February 2019 and ended in July 2019. Interviews combined Computer-Aided Personal Interviews (CAPI) and Computer-Assisted Self-Interviewing (CASI) for the more sensitive items. Interview settings varied by site and included primarily the project office or clinic designated space, and the participants' houses.

Measures

Neighborhood characteristics scales.

To measure neighborhood characteristics, an instrument was specifically developed by the [masked] Consortium, with items adopted from existing measures as described below.

Neighborhood cohesion: Five items from Mujahid et al.'s[10] scale ask about presence of support and help, positive relationships, trust, and shared values within the neighborhood. Responses are measured on a four-point Likert scale ranging from 1 (*strongly agree*) to 4 (*strongly disagree*) (Cronbach's alpha = 0.83).

Intergenerational Closure: Four items from Sampson et al.[18] assess intergenerational closure, measured on a four-point Likert scale ranging from 1 (*strongly agree*) to 4 (*strongly disagree*). Items ask about the presence of adults in the neighborhood that watch out children, if these adult figures can be looked up to by children, and relationship among parents (Cronbach's alpha = 0.63).

Neighborhood disorder: Four items from the Neighborhood Disorder Observation Scale[9] assess the dimensions of neighborhood disorder, with a four-point response scale ranging from 1 (*not a problem*) to 4 (*large problem*). Items to measure neighborhood disorder ask about litter in the streets, smells and fumes, noise from traffic or other homes, and traffic and road safety (Cronbach's alpha = 0.80).

Social disorder: Five items from the Neighborhood Disorder Observation Scale[9] assess the dimensions of social disorder, with a four-point response scale ranging from 1 (*not a problem*) to 4 (*large problem*). Items inquire about vandalism, people being drunk on the streets, gangs, fights and arguments on the streets, and whether people are afraid of going out at night (Cronbach's alpha = 0.87).

Nomological net measures.

Perceived Stress Scale (PSS)[26]*:* This 10-item instrument measures how stressful certain life situations are rated by respondents during the last month. Responses were measured on a four-point Likert scale ranging from 1 (*not at all*) to 4 (*nearly every day*) (Cronbach's alpha = 0.76).

WHO (Five) Well-Being index (1998 version) [27]*:* The WHO Well-Being Index is a five-item screening questionnaire to determine subjective psychological well-being of respondents within the past two weeks. Response categories include a six-point Likert scale ranging from 1 (*at no time*) to 4 (*all the time*). (Cronbach's alpha = 0.84).

Patient Health Questionnaire (PHQ-9)[28]*:* To measure the severity of depressive symptoms in the last two weeks, the PHQ-9 employs nine items covering anhedonia, dysphoria, sleep disturbances, fatigue, changes in eating, low self-esteem, concentration difficulties, hypo-or-hyper-active behaviours, and suicide ideation. Response categories include four points ranging from 1 (*not at all*) to 4 (*nearly every day*) (Cronbach's alpha = 0.76).

Analytical strategy

Factorial validity and measurement invariance

To evaluate the factorial structure of the selected measures, we conducted a confirmatory factor analysis including four factors: neighborhood cohesion, intergenerational closure, neighborhood disorder, and social disorder. This factorial structure was fitted individually for each country. Correlations were permitted between the factors, with non-significant correlations removed from the final models. Model identification was specified using the 'marker indicator' method, whereby the loading of one item was fixed to 1 and the variance of the factor was freely estimated. To account for the categorical nature of the items, all models were estimated using the weighted least squares with robust means and variances (WLSMV) estimator. Model fit was evaluated using the comparative fit index (CFI), the Tucker-Lewis index (TLI), the root mean square error of approximation (RMSEA), and the root mean square residuals (SRMR). Good model fit was indicated by CFI $\geq$ .95, TLI $\geq$ .95, RMSEA $\leq$ .06 and SRMR $\leq$ .08; adequate model fit was indicated by CFI $\geq$ .90, TLI $\geq$ .90, RMSEA $\leq$ .08 and SRMR $\leq$ .08.[29-31]

To examine whether the measures operated equivalently across countries, we conducted measurement invariance tests. Importantly, on several of the items, category 4 of response was not endorsed by any participant or was endorsed by very few participants, in at least some of the countries. Therefore, to balance the aim of comparing responses across all eight countries with the aim to maximise scale integrity (i.e., retaining the entire spectrum of possible response choices), we employed the following rule: we collapsed categories 3 and 4 where not more than 10 people endorsed response category 4 in at least 4 of the countries (i.e., 50% of the sites) or where category 4 was not endorsed by any participant in at least 1 country (because such a case impedes invariance testing). Consequently, the social cohesion and intergenerational closure subscales contained 3 categories for the purpose of this analysis, whereas 4 categories were retained for neighborhood and social disorder.

Measurement invariance was tested at three levels: configural, metric, and scalar. First, the configural model – serving as the baseline - inspected the extent to which the same factorial structure (i.e., pattern of loading) was applicable across the eight sites, namely whether the item-to-factor relationships was observed across sites. This is the weakest form of invariance. Secondly, the metric model was specified as a nested model within the configural model, with loadings of corresponding items constrained to be equal across groups. Finally, the scalar model was specified as a nested model within the metric model, with each threshold of each item constrained to be equal across groups, allowing latent factor means to be compared. To ensure model identification, the configural and metric models contained several parameters that were fixed in all groups: (a) the means of all factors were fixed to zero and (b) the item scale factors were fixed to 1. The scalar model retained these fixed parameters only for the 'reference' group. As there was no specific rationale for choosing one country over another as the 'reference' group, this was given by the first country in an alphabetically ordered list of country names (i.e., Ghana).

Configural invariance was achieved if the configural model fitted the data well according to the CFI, TLI, RMSEA and SRMR. Metric invariance was achieved if the fit indicators did not deteriorate by values greater than: .10 for CFI and TLI, .015 for RMSEA and .03 for SRMR.[32] Scalar invariance was achieved if the fit indictors did not deteriorate by values greater than: .10 for CFI and TLI, .015 for RMSEA and .01 for SRMR.[32] In the case of non-invariance, partial invariance was sought by releasing constraints on the loadings (in the metric model) or thresholds (in the scalar model), under guidance from the model modification indices. To retain the maximum level of invariance possible, such modifications were only performed for the countries where non-invariance was observed (i.e., it was possible for an item's thresholds to exhibit invariance across six out of eight countries).

All models were conducted using the software M*plus* v.8.8.[33] To aid the identification of the best possible solution, we employed 10 random starts and 10,000 iterations.

Nomological networks

We obtained Pearson's correlations between all the variables for each of the study sites. Then, we used qgraph with R[34] to create diagrams with the aim of illustrating the association between the four neighborhood characteristics that concern the current study and the maternal outcomes of interest and compare these associations across countries. In the figures, the edge thicknesses are proportional to the magnitude of the Pearson's correlations between variable, which allows visual comparison across study sites.

Results

Descriptive Statistics

Tables I and II provide descriptive statistics for each item of the neighborhood scales and maternal well-being outcomes, respectively, by country, showing some variation in mean levels across sites.

-Insert Tables I and II here-

Internal Consistency

Cronbach's alpha reliability values were acceptable in all countries (A1). When examining internal consistency for each of the four dimensions for each country, we noted that Ghana had low internal reliability for intergenerational closure.

Factorial Validity

Factorial structure

The four-factor structure showed overall good fit to the data (Table III). Fit indicators suggested excellent fit to data from six countries: Jamaica, Philippines, Romania, South Africa, Sri Lanka and Vietnam. However, for Pakistan, the SRMR value fell below its cut-off for adequate fit, with all other fit indicators suggesting excellent fit, and for Ghana, the model fit indices fell slightly below the thresholds for excellent fit, but indicated adequate fit. To avoid model fit improvements driven by sample peculiarities, we accepted this model without further modifications.

No cross-loadings were observed based on inspection of the model modification indices, except for item 3 (i.e., "*People in my neighborhood generally get along well with each other.*") in Ghana, which showed a potential cross-loading from its designated factor of poor neighborhood cohesion to the factor of neighborhood disorder. Given that the model showed overall good fit to the data and to avoid data-driven results, we did not modify this model further.

The pattern of inter-factor correlations indicates country-specific patterns (A2). Strong positive correlations were noted across all eight sites between the neighborhood and the social disorder scales, and between the scales referring to poor neighborhood cohesion and low intergenerational closure. Less good model fit was produced by alternative models comprising (a) two single-order factors applied to items pooled across inter-related scales or (b) a higher structure with second-order factors for disorder (fitted to the first-order factors of neighborhood and social disorder) and social closeness (fitted to the first-order factors of social cohesion and intergenerational closure). Hence, the original four factor structure was retained.

-Insert Table III here-

Cross-country invariance

The factorial structure was similar across all eight countries, enabling measurement invariance tests spanning all locations (A3). The configural model exhibited good fit to the data, indicating that configural invariance was achieved. The addition of constraints imposed on factor loadings did not produce deteriorations in model fit values greater than the cut-off values proposed by Chen.[32] Hence, full metric invariance was achieved, showing that the relative importance of all items in relation to their corresponding factors was retained across all eight countries (A4). Regarding neighborhood cohesion, stronger loadings were observed for the items about social harmony (i.e., help, support and 'getting along') than for the items about mutual trust and shared values. For intergenerational closure, higher loadings were observed for the items about residents' reliability than for the items about how well parents know other adults or children in the neighborhood. Regarding neighborhood disorder, higher loadings were exhibited by the items about the presence of litter, smell and fumes, whereas slightly lower loadings were exhibited by the items about road safety and noise from traffic and homes. Finally, for social disorder, the highest loadings were in relation to the items about vandalism and the presence of gangs, with slightly lower loadings in relation to items reflecting street safety.

The addition of constraints, imposed onto item thresholds, led to a significant deterioration in model fit. Hence, under guidance from model modification indices, threshold constraints were removed in iterative steps. In the final model, threshold constraints were removed for item 5 in the sample from Ghana, for items 14, 15 and 17 (all related to social disorder) in the sample from Jamaica, for item 5 (neighborhood cohesion) and item 6 (intergenerational closure) in the sample from Pakistan, and for item 14 (social disorder) in the samples from Philippines and South Africa – see Table I for item numbers. Under this partial scalar model, all the thresholds of the remaining 13 items were invariant across all eight groups (A4).

Significant variation in people's perceptions of cohesion, intergenerational closure and disorder was observed in all countries (A5). Relative to levels observed in the reference group (i.e., Ghana), neighborhood cohesion was significantly poorer in Jamaica and stronger in Sri Lanka and Vietnam, intergenerational closure levels were significantly lower in Romania, Sri Lanka and Vietnam, neighborhood disorder levels were significantly higher in Jamaica, Philippines, South Africa and Sri Lanka, and social disorder levels were significantly higher in Jamaica and South Africa and lower in Pakistan and Romania.

Nomological Network

We provide the correlations between the four neighborhood factors (i.e., neighborhood cohesion, intergenerational closure, neighborhood disorder, and social disorder) and the three maternal outcomes (i.e., depression, stress, and well-being) in A6. Overall, the patterns of associations were quite consistent, although the intensity of such associations varied across the different countries (Fig. 1).

-Insert Fig. 1 here-

Discussion

Our findings from the invariance analysis suggest that the measures selected to capture neighborhood characteristics are relatively consistent across the eight different countries. This means that the conceptual and measurement equivalence of the community domains of neighborhood cohesion, intergenerational closure, and neighborhood and social disorder is comparable across eight diverse LMICs. Therefore, the use of the scale in question to measure this neighborhood characteristics in LMICs can be supported. However, it should be also noted that the data from the Ghana and Pakistan sites did not fit the data excellently across all fit indicators. Findings from our factorial structure analysis reveals excellent fit to the data for the remaining countries (i.e., Jamaica, Philippines, Romania, South Africa, Sri Lanka, and Vietnam).

Testing psychometric properties of instruments used in the context of maternal well-being across different cultures is crucial for improving global evidence on critical aspects that affect pregnant women's health and well-being. Given that women are particularly vulnerable during pregnancy and the perinatal period,[35] this is a unique window of opportunity for policies to have a large positive impact on changing

maternal trajectories. Furthermore, since neighborhood-level factors have the potential to impact women's health,[1-3] pregnancies and perinatal health outcomes, this period is key for policies that aim to positively impact children's development from the earliest stages.

The nomological networks suggest that there are generally similar patterns of associations between the explored four neighborhood characteristic factors and the three maternal outcomes (i.e., depression, stress, and well-being) and that the directions of these are quite consistent across countries. However, the magnitude of the association varied for some of the factors, which might be associated to culture-specific variables.

Strengths and Limitations

This study has several strengths. First, findings contribute to increase evidence on sociometric assessments of instruments measuring neighborhood characteristics. Second, results from the measurement invariance suggest that the instruments used to measure neighborhood characteristics are adequate for use in LMICs in diverse world regions. Third, the nomological networks increase knowledge on how social and material features of neighborhoods are associated with constructs of maternal well-being outcomes across diverse societies.

However, some limitations should be also acknowledged. First, while the study examines perceived neighborhood characteristics, it was not possible to link the subjective perceptions of participants to neighborhood-level characteristics obtained from, for example, census data. Second, it was necessary to adapt the sampling strategies in each of the study sites for both cultural and practical reasons. Third, despite the utility of nomological networks to assess associations between relevant variables, this is not an in-depth analysis that controlled for confounding variables to stablish meaningful associations. Fourth, it should be noted that the three instruments that captured adverse mental health outcomes (i.e., stress, depression, and well-being) considered slightly different timeframes (i.e., last month, last 2 weeks), which might have led to omitting relevant information that occurred in a different moment of pregnancy. Finally, the definition of "neighborhood" may vary across participants and across cultures.

Conclusion And Implications

Our findings suggest that the studied scales measured the domains of neighborhood cohesion, intergenerational closure, and neighborhood and social disorder comparably across the eight different sites and, therefore, present a valid approach to measure social and material features of neighborhoods in LMICs in diverse world regions. Moreover, our results suggest that, in general, higher levels of neighborhood and social disorder, and lower levels of cohesion and intergenerational closure in the community are associated with adverse maternal well-being outcomes with similar patterns across countries, although with some variations. Findings from this study allows confident comparison of neighborhood characteristics and associated health outcomes using the tested scales.

The results of this study highlight the need to look at the community context, aside from individual and family risk factors to better understand maternal well-being. Furthermore, the study supports efforts to advocate for community-based interventions that promote safer physical and social environments within maternal and child health programs.

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Tables

Table I Neighborhood item and descriptive statistics by country.

	Ghana		Jamaica		Pakistan		Philippines		Romania		South Africa		Sri Lanka		Vietnam	
	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
1. Support	2.12	1.09	2.67	1.10	1.99	1.13	1.93	.85	1.93	.53	2.19	1.08	1.57	.63	1.59	.69
2. Help	2.12	1.05	2.56	1.02	2.00	1.12	1.80	.88	1.79	.59	1.97	1.03	1.66	.67	1.57	.68
3. Get along	1.74	.89	2.81	1.09	1.58	.81	1.80	.85	1.75	.57	2.11	1.06	1.67	.64	1.63	.68
4. Trust	2.63	1.14	3.08	.99	1.97	1.01	2.15	.97	1.87	.55	2.51	1.12	2.16	.84	1.88	.81
5. Values	1.59	.90	3.04	.97	2.92	1.15	2.10	.94	2.17	.63	2.71	1.11	2.17	.81	2.14	.75
6. Look up to	1.73	.99	1.79	.91	2.72	1.21	1.80	.89	1.75	.58	1.93	1.07	1.79	.65	1.84	.75
7. Adults watch out	1.89	1.07	1.92	.97	2.74	1.27	1.52	.71	1.93	.70	1.70	.94	2.08	.89	2.31	1.04
8. Parents know friends	1.96	.98	2.14	1.0	1.90	.98	1.51	.80	1.82	.63	1.65	.93	1.95	.71	2.09	.95
9. Parents know each other	1.77	.91	1.56	.78	1.54	.79	1.43	.67	1.78	.67	1.47	.80	1.74	.61	1.53	.69
10. Litter	1.81	1.08	2.27	1.17	2.26	1.32	2.60	1.17	1.82	.98	2.48	1.23	2.50	1.26	1.75	.82
11. Smells and fumes	1.73	1.05	2.16	1.21	2.14	1.32	2.47	1.25	1.81	1.03	2.28	1.25	2.26	1.29	1.48	.79
12. Noise	2.10	1.13	2.03	1.11	1.75	1.13	2.17	1.17	1.78	.97	2.23	1.20	1.93	1.07	1.71	.92
13. Poor safety	1.93	1.11	1.98	1.08	1.99	1.18	2.13	1.24	2.05	1.04	2.25	1.16	2.10	1.17	1.45	.78
14. Vandalism	1.84	1.11	1.66	.97	1.39	.89	2.30	1.26	1.38	.82	2.16	1.23	1.95	1.19	1.41	.70
15. Drunk people	1.97	1.11	1.76	.97	1.43	.87	2.40	1.23	1.65	.93	2.75	1.23	2.24	1.22	1.53	.75
16. Gangs	1.86	1.10	2.45	1.25	1.32	.82	1.91	1.25	1.45	.82	2.99	1.29	2.08	1.28	1.41	.73
17. Arguments	1.95	1.12	2.66	1.14	1.54	.94	2.10	1.19	1.30	.730	2.83	1.23	2.01	1.16	1.57	.78
18. Afraid of going out	2.26	1.29	2.20	1.28	1.86	1.12	1.96	1.17	1.29	.70	2.93	1.28	1.76	1.16	1.33	.701

Table II Maternal health items and descriptive statistics by country

	Ghana		Jamaica		Pakistan		Philippines		Romania		South Africa		Sri Lanka		Vietnam	
	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
Perceived stress																
1. Upset	1.66	0.84	2.24	1.01	1.74	1.00	1.83	0.90	1.44	0.50	1.99	1.07	1.70	0.62	1.43	0.52
2. Control	1.72	0.94	2.04	1.14	1.55	0.96	1.59	0.78	1.39	0.54	1.69	0.94	1.37	0.66	1.41	0.53
3. Nervous	1.91	0.93	2.16	1.10	1.89	1.17	2.06	0.98	1.89	0.60	1.93	1.11	1.62	0.64	1.67	0.65
4. Confident	2.75	0.86	2.38	1.04	2.16	1.16	1.97	1.12	1.72	0.86	2.32	1.25	1.94	1.20	2.29	1.10
5. Things my way	2.86	0.97	2.70	1.04	2.47	1.16	2.45	1.08	1.69	0.80	2.43	1.14	2.42	1.16	2.35	1.04
6. Coping	1.81	0.83	2.30	1.10	1.82	1.05	1.63	0.87	1.95	0.79	2.11	1.11	1.66	0.88	1.60	0.77
7. Control	2.88	0.92	2.58	1.01	2.46	1.11	2.52	1.10	1.78	0.92	2.52	1.20	2.35	1.19	2.01	1.07
8. On top of things	2.96	1.00	2.77	1.07	3.73	0.70	2.45	1.17	1.59	0.75	2.37	1.16	2.65	1.24	1.79	0.95
9. Angered	1.81	0.91	2.46	1.06	1.75	0.90	2.01	1.06	1.74	0.66	2.42	1.19	1.66	0.80	1.65	0.60
10. Difficulties	1.63	0.90	2.13	1.14	1.86	1.15	1.83	1.04	1.27	0.49	1.91	1.14	1.64	0.91	1.33	0.59
Wellbeing																
1. Cheerful	2.56	1.69	3.28	1.46	2.66	1.85	3.34	1.66	3.86	0.79	3.04	1.57	3.50	1.52	3.43	1.44
2. Calm	2.84	1.70	2.83	1.56	2.76	1.88	3.16	1.69	3.62	1.00	3.55	1.52	3.21	1.55	3.44	1.49
3. Active	2.47	1.63	2.78	1.57	1.99	1.94	3.36	1.72	3.31	1.17	3.40	1.55	3.03	1.63	2.89	1.57
4. Fresh	2.39	1.65	2.56	1.67	2.63	2.04	3.25	1.74	2.91	1.35	3.23	1.64	2.99	1.69	2.92	1.62
5. Filled	2.05	1.59	2.63	1.60	2.34	2.04	3.03	1.80	3.90	0.98	3.11	1.72	3.26	1.61	3.51	1.52
Depressive symptoms																
1. Pleasure	0.89	0.94	1.32	1.07	1.10	1.19	1.07	0.97	0.65	0.59	1.19	1.14	0.70	0.75	0.65	0.61
2. Hopeless	0.77	0.96	1.03	1.04	0.91	1.18	0.80	0.95	0.27	0.52	0.63	1.00	0.63	0.80	0.33	0.58
3. Sleep	1.38	0.99	1.43	1.15	1.35	1.36	1.39	0.99	1.18	0.88	1.37	1.17	1.04	0.88	1.20	0.85
4. Energy	1.39	0.89	1.67	1.05	2.05	1.16	1.22	0.93	1.18	0.76	1.08	1.13	1.04	0.87	0.99	0.77
5. Eating	1.01	0.99	1.26	1.14	1.39	1.34	0.92	1.07	0.85	0.82	1.12	1.16	0.72	0.83	0.81	0.87
6. Failure	0.65	0.91	0.55	0.97	0.37	0.84	0.66	0.92	0.19	0.49	0.33	0.79	0.30	0.58	0.27	0.55
7. Concentrate	0.52	0.85	0.71	1.10	0.37	0.86	0.66	0.93	0.41	0.75	0.38	0.86	0.30	0.64	0.51	0.70
8. Moving	0.48	0.75	0.73	0.99	0.59	0.93	0.56	0.86	0.35	0.58	0.47	0.91	0.47	0.73	0.40	0.61
9. Thoughts	0.32	0.80	0.36	0.83	0.13	0.46	0.17	0.51	0.03	0.16	0.25	0.78	0.17	0.56	0.06	0.33

Table III Model fit information for the four factor models fitted separately to each country					
	CFI	TLI	SRMR	RMSEA	RMSEA 90% CI
Ghana	0.94	0.93	0.11	0.08	[0.07, 0.10]
Jamaica	0.96	0.95	0.07	0.05	[0.03, 0.06]
Pakistan	0.98	0.98	0.10	0.07	[0.05, 0.08]
Philippines	0.99	0.98	0.07	0.05	[0.04, 0.07]
Romania	0.98	0.98	0.08	0.06	[0.04, 0.07]
South Africa	0.98	0.97	0.07	0.06	[0.04, 0.07]
Sri Lanka	0.99	0.99	0.07	0.05	[0.02, 0.06]
Vietnam	0.96	0.96	0.08	0.07	[0.05, 0.08]

Figures

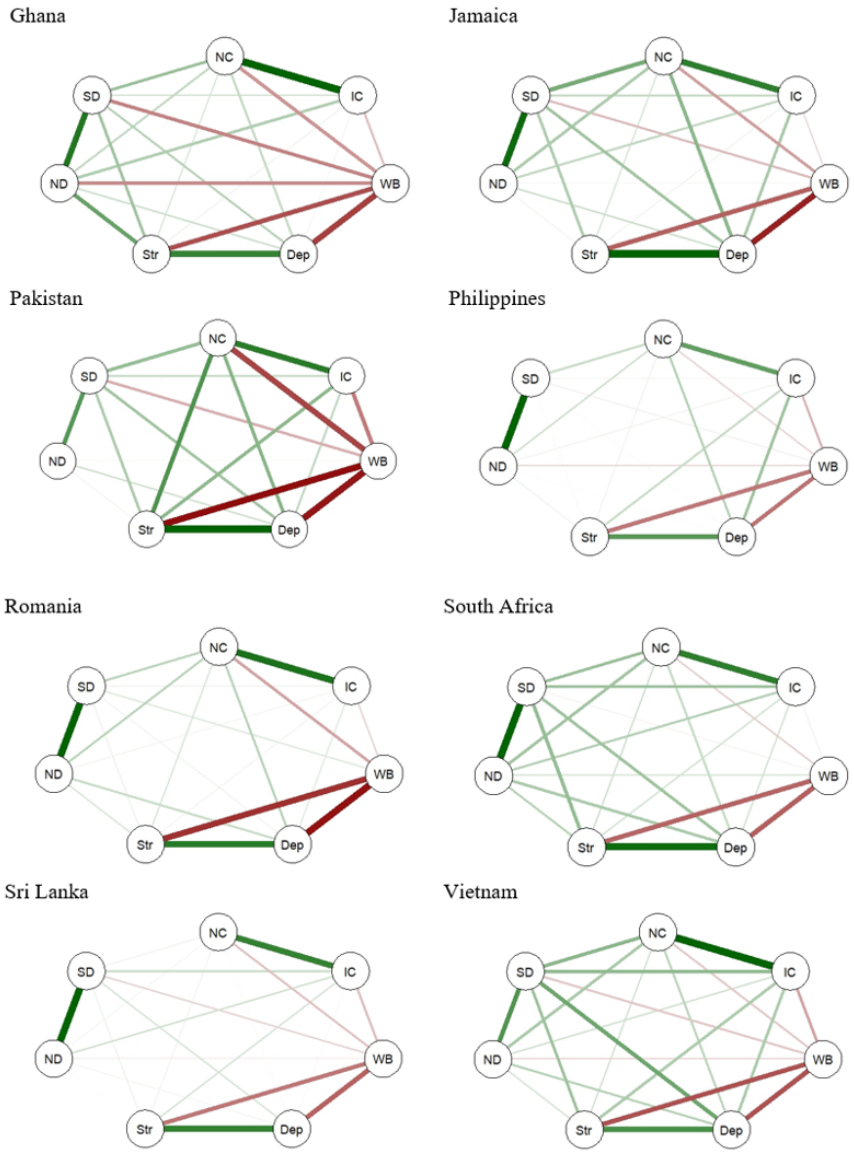

Figure 1

Nomological nets for neighborhood characteristics and maternal outcomes for each of the eight countries

Abbreviations. NC: Neighborhood cohesion; IC: Intergenerational closure; WB: Well-being; Dep: Depression; Str: Stress; ND: Neighborhood disorder; SD: Social disorder.

Note1. Green indicates a positive association and red indicates a negative association.

Note2. Edge thicknesses is proportional to the magnitude of the Pearson's correlations between variables (i.e., Ticker edge means stronger correlation, and vice versa).

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