**Perceived social support and women’s empowerment and their associations with pregnancy experiences in anxious women: A study from urban Pakistan**

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**ABSTRACT**

**Objectives**

Psychological distress in pregnancy is associated with adverse postnatal outcomes. We aimed to identify how social support and women’s empowerment are associated with pregnancy-specific daily experiences among women suffering antenatal anxiety in Pakistan.

**Methods**

Data were collected as part of a randomized controlled trial of a psychosocial intervention for antenatal anxiety in a tertiary hospital in Pakistan. We included 594 women in early pregnancy (≤ 22 weeks) who endorsed mild to severe anxiety symptoms. Generalized linear regression models were used to analyze the associations of perceived social support and women’s empowerment in relation to pregnancy-specific daily hassles and uplifts using a culturally adapted and psychometrically validated version of the Pregnancy Experience Scale-Brief.

**Results**

High social support was positively associated with frequency and intensity of positive pregnancy-specific experiences (B = 0.39, 95% CI 0.23–0.54 uplifts frequency; and B = 0.17, 95% CI 0.12–0.22 uplifts intensity), and was inversely associated with frequency of negative pregnancy-specific experiences (B = − 0.44, 95% CI − 0.66, − 0.22). Women’s household empowerment was associated with greater uplifts frequency and intensity (B = 0.55, 95% CI 0.20–0.90 frequency; and B = 0.28, 95% CI 0.17–0.40 intensity). High social support and household empowerment were inversely related to PES hassle-to-uplift ratio scores.

**Conclusions for Practice**

Greater social support and household empowerment were associated with positive pregnancy-specific experiences in the context of antenatal anxiety in Pakistan.

**INTRODUCTION**

Social support and women’s empowerment have recently garnered much interest given their positive associations with a variety of outcomes related to pregnancy and mental health (1-9). Women’s empowerment is defined as the attainability of available resources which in turn can increase one’s ability to make important life decisions despite societal constraints such as gender roles (10). Pregnancy is an important time in women's lives that is associated with joy and positive expectations for many, however, it is also commonly stressful (11) and may be associated with changes in women's empowerment.

Perceived social support is an important resource for dealing with stressful experiences (12). Low social support during times of stress may have an impact on an individual’s self-confidence, coping abilities, and physical and mental health (13). Likewise, less empowered women tend to suffer more from common mental disorders (14). Despite this situation, the fundamental characteristics of social support and women’s empowerment have not been studied in depth in the broader context of stress (15). Specifically, the role social support and empowerment play in the pregnancy experiences of women with symptoms of anxiety is not well understood.

Research from Pakistan suggests that perceived social support in pregnant women who suffer from common mental disorders is associated with a variety of risk factors related to an adverse socioeconomic environment (16, 17). Studies in low and middle-income countries (LMICs) have also shown that less women’s empowerment and mental illness can lead to a negative cycle, whereas an increase in women’s empowerment and family support can reduce depression and stress during pregnancy (18). Women who perceive themselves as having more social support during the pre-natal and post-natal periods have less perinatal depression and better emotional well-being (19).

Given this close relationship between pregnant women’s social support and empowerment with mental health, it is important to understand the role these factors play among women who already display symptoms of anxiety, as their perception and pregnancy experiences might differ from other mothers. Setting-specific factors such as gender equality, and the socio-political context, also influence women’s empowerment (20). It is worth noting that how social support and women’s empowerment are related to pregnancy experiences has not been studied in LMICs or specifically among anxious pregnant mothers. Therefore, we aimed to study how perceived social support and women’s empowerment are associated with pregnancy experiences among anxious pregnant women in urban Pakistan.

**METHODS**

Data were collected from April 2019 to March 2020 at the baseline visit for a larger randomized controlled trial to evaluate a preventive Cognitive Behavioral Therapy-based intervention for perinatal anxiety among expectant women in Rawalpindi District, Pakistan (21, 22). Pakistan is a lower-middle-income country with high rates of neonatal and infant mortality (42 and 62 deaths per 1,000 live births, respectively (23)) and maternal mortality (maternal mortality ratio and pregnancy-related mortality ratio of 186 and 251 deaths per 100,000 live births, respectively (24). Rawalpindi District, located in the northern regions of Punjab Province, includes a mixture of rural, urban, and peri-urban populations typical of a South Asian country with high rates of poverty (29.5% below the poverty line), large household size (6.6 persons on average), low female literacy (46.5%) and a high total fertility rate (3.6 children per woman) (25). Pregnant women were approached consecutively for recruitment, screening, and consent during routine prenatal visits at the Obstetrics and Gynecology Department of Holy Family Hospital (HFH), a large public tertiary care hospital affiliated with Rawalpindi Medical University that provides low-cost prenatal care to a catchment population of more than 7 million. Ethical approval for this research was obtained from the Institutional Review Boards (IRB) of Rawalpindi Medical University, Human Development Research Foundation and the Johns Hopkins Bloomberg School of Public Health. All participants were given verbal and written information about the study prior to recruitment, and provided written informed consent prior to screening and data collection.

Potential participants were first screened for basic inclusion criteria: expectant mother’s age ≥ 18 years, gestational age ≤ 20 weeks, residing within 20 kilometers of HFH with intent to reside in the study area until delivery, and ability to speak Urdu. Secondary eligibility screening involved a validated Urdu adaptation of the Hospital Anxiety and Depression Scale (HADS) (18, 26) and the Structured Clinical Interview for DSM-5 (SCID) (27), a semi-structured interview guide for major psychiatric diagnoses per the DSM administered by trained staff with a master’s degree in psychology. Pregnant women who met basic inclusion criteria and screened positive for at least mild anxiety on the HADS (i.e., scoring ≥ 8 on the HADS anxiety subscale) in the absence of clinical depression or other serious medical conditions were eligible for inclusion. Exclusion criteria were diagnosis of a major depressive episode, severe depression, suicidal ideation, and self-report of present or past psychiatric disorders (e.g., bipolar disorder, schizophrenia) or psychiatric care (e.g., anxiolytic medications, psychotropic drugs).

For eligible women who consented, we conducted interviews by using extended structured questionnaire including sociodemographic questions and psychosocial constructs. Data were collected using a tablet-based electronic form by a team of bachelor’s level psychologists trained and supervised by a senior psychiatrist. Responses were recorded and stored in a de-identified format using the Open Data Kit (ODK) open-source data collection and management software.

***Instruments***

**The Pregnancy Experience Scale – Brief Version (PES-Brief)** – The PES-Brief is a twenty-item measure of maternal positive uplifts and negative hassles experienced in pregnancy (28). Women rate how much each uplift or hassle makes them feel “happy, positive, or uplifted” or “unhappy, negative, or upset” respectively, on a scale from 0 (not at all) to 3 (a great deal). The PES-Brief was translated and adapted to Urdu following WHO guidelines (29). This involved an iterative, four-step process of forward translation focused on cross-cultural and conceptual equivalence, panel review by bilingual experts, back-translation by an independent translator, and lastly, pre-testing using cognitive interviewing in the target population to guide the revision. Unlike the original PES-Brief, after validation the resulting Urdu adaptation included nine uplifts and eleven hassles (Zaidi et al *submitted manuscript)*. Scoring methods were implemented as in the original, yielding six scores: hassle frequency and uplift frequency (counting the number of items endorsed with a rating > 0); hassle intensity and uplift intensity (dividing the sum of item ratings by the respective frequency score); and frequency ratio and intensity ratio (dividing the hassle scores by their corresponding uplift scores).

**The Multidimensional Scale of Perceived Social Support (MSPSS)**

The MSPSS is a 12-item measure of subjective availability of primarily emotional support which has been validated and successfully adapted to the Pakistani context (15, 30). Participants were asked to rate their level of agreement with a series of statements regarding social support from family, friends, and significant others on a Likert scoring scale ranging from 1 (very strongly disagree) to 5 (very strongly agree), with higher mean scores of full (or subscales) indicating greater perceived social support. A recent study from Pakistan showed that support from a husband who also serve as a trustworthy person in pregnancy can be measured effectively by MSPSS (31)

**The Women’s Empowerment Scales**

Women’s empowerment was measured using a composite of two instruments focusing on different dimensions of power. The first scale assessed financial empowerment with two items previously used in rural Rawalpindi (14) (i.e., whether a woman is in possession of a lump-sum of money for day-to-day household expenditures and whether she can make independent decisions about its use). A woman was classified as “empowered” in this domain if she answered yes to both questions. The second scale measured household empowerment with three items previously used elsewhere in South Asia assessing relative freedom from family domination (i.e., whether in the past year family had taken money, land, jewelry, or livestock from her against her will, prevented her from visiting her natal home, or prevented her from working outside the home) (32). A woman was classified as “empowered” in this domain if she answered “no” to all three questions, suggesting she experienced none of the three forms of family domination.

**Statistical analysis**

We examined the bivariate associations between each of the independent variables and two ratios (PES-Brief frequency ratio and intensity ratio). T-tests and Cuzick’s tests for trend were used to compare differences in independent variables by the two ratios. We then examined the means and standard deviations (SD) of continuous outcome and exposure variables (i.e., pregnancy-specific stress and social support) as well as the prevalence of the dichotomized exposure variable (women’s empowerment). Analyses of social support and women’s empowerment in relation to pregnancy-specific stress were based on Generalized Linear Models (GLM). Given the non-normal distribution of pregnancy-specific stress scores, GLM provided flexibility in examining linear relationships between exposure and outcome variables (33). For adjusted models, we included maternal age, education level, family structure, monthly household income, migration status, and parity as covariates. All analyses were conducted using Stata 15.1 (Stata Corp, College Station, TX), and statistical tests were two-sided at the p<0.05 level.

**RESULTS**

**Table 1** presents the bivariate associations between demographic characteristics and PES-Brief frequency and intensity ratios. While women were more likely to be younger (age<25), age was not a significant indicator that differentiated frequency and intensity ratios. Women who had a high level of education (more than grade 12) were more likely to have a lower PES frequency ratio of hassles to uplifts (mean=1.12, SD=0.75) compared to those with lower levels of education (p=0.01). Women in extended family households (living with parents and siblings) were more likely to have a lower PES intensity ratio of hassles to uplifts (mean=1.04, SD=0.31), whereas women in joint family households (living with parents) were more likely to have a higher intensity ratio (mean=1.19, SD=0.43) compared to those living as nuclear families (mean=1.12, SD=0.38, p=0.01). More than half of the women (53.7%) had low monthly household income, defined as less than 20,000 PKR (≈US $125). The majority of women (76.09%) were from the local area, and on average, these women had higher hassles to uplifts frequency (mean=1.22, SD=0.04) and intensity ratios (mean=1.14, SD=0.02) of compared to those who migrated from outside the study area (mean=0.98, SD=0.05, p<0.01 for the frequency ratio; mean=1.02, SD=0.03, p<0.01 for intensity ratio). Multiparous women clearly showed a higher hassle touplift frequency ratio (mean=1.20, SD=0.04) and intensity ratio (mean=1.14, SD=0.02) compared to nulliparous women (mean=1.04, SD=0.03, p=0.02 for the frequency ratio; mean=1.05, SD=0.03, p=0.01 for the intensity ratio).

**Table 2** displays summary statistics of social support, women’s empowerment, and pregnancy-specific stress. The mean total score for social support was 3.26 (SD=0.89) on the MSPSS. Regarding women’s empowerment, 54.9% of women were classified as empowered in domestic finances, whereas 81.1% were empowered with respect to freedom from family domination in their households. The mean uplift and hassle frequency scores were 7.98 (SD=1.72) and 8.41 (SD=2.51), respectively, suggesting that women on average endorsed approximately 8 types of positive stressors on 9 items and 8 types of negative stressorson 11 items included in the questionnaire. The mean uplifts and hassles intensity scores were 2.06 (SD=0.56) and 2.15 (SD=0.48), respectively, indicating that on average women perceived a relatively high intensity of positive and negative stressors. The mean frequency ratio was 1.16 (SD=0.73), and the mean intensity ratio was 1.11 (SD=0.38), indicating that women in our sample on average perceived a greater number and intensity of the pregnancy-specific hassles than uplifts on the PES-Brief.

Adjusting for covariates, high social support was positively associated with PES uplift frequency and intensity (B=0.39, 95% CI: 0.23-0.54 for frequency; and B=0.17, 95% CI: 0.12-0.22 for intensity), and was negatively associated with hassle frequency (B=-0.44, 95% CI: -0.66, -0.22) (**Table 3**). This pattern was largely consistent across the social support subscales. While financial empowerment was not related to any frequency or intensity scores, household empowerment was clearly associated with uplift frequency and intensity (B=0.55, 95% CI: 0.20-0.90 for frequency; and B=0.28, 95% CI: 0.17-0.40 for intensity), suggesting that having household empowerment increased the frequency and intensity of positive experiences during pregnancy.

High social support was inversely related to PES hassle: uplift frequency and intensity ratios, suggesting that social support either decreased negative experiences, increased positive experiences, or both (**Table 4**). Adjusting for covariates, a one-unit increase in MSPSS score, reflecting relatively higher social support, was associated with a 0.18-unit decrease in the PES hassle:uplift frequency ratio (B=-0.18, 95% CI: -0.25, -0.12) and a 0.10-unit decrease in the PES intensity ratio (B=-0.10, 95% CI: -0.13, -0.06). This pattern was similar across the individual MSPSS subscales for social support from family, friends, and significant others. Although being financially empowered was not clearly linked to the PES frequency ratio, it was negatively associated with the intensity ratio after adjustment (B=-0.07, 95% CI: -0.13, -0.01). In contrast, household empowerment was clearly associated with both frequency ratio (B=-0.27, 95% CI: -0.42, -0.13) and intensity ratio (B=-0.14, 95% CI: -0.22, -0.06), suggesting that having freedom from family domination at home was more likely to decrease the frequency and intensity of negative experiences and/or increase the frequency and intensity of positive experiences.

**DISUCSSION**

Our study contributes insights into the role of empowerment and social support on women’s pregnancy experiences in a low-income country. Based on our findings, in Pakistan, household empowerment rather than financial empowerment appears to be more important for women’s pregnancy experiences. We also found that high social support in pregnant women is positively associated with frequency of uplifts and is negatively associated with hassles frequency during the prenatal period. Results also showed that women with higher educational attainment were more likely to have a lower hassles to uplifts frequency ratio i.e. women with high education tend to experience less negative stress, compared to women with low education levels. Furthermore, women living in extended and joint families had a lower intensity of hassles in pregnancy compared to women living in nuclear families.

One important risk factor affecting maternal well-being during and after pregnancy is low social support (34). According to our results, high social support in anxious pregnant women was inversely related to the frequency and the intensity ratio of hassles to uplifts, suggesting that perceived social support during pregnancy can decrease negative stress. Likewise, high social support was positively associated with uplifts frequency and was negatively associated with hassles frequency. Perceived social support is an important resource for dealing with stressful experiences (12), possibly by helping to reduce negative emotions as well as by lowering anxiety (35). A collectivist social structure in the South Asian region, as illustrated in research from India, promotes cooperation and interdependence among family members who are play an active role in caring for each other (36). Consideration of features of Pakistani culture may help lead to possible explanations for why women in our study who had support experienced fewer hassles and more uplifts in the antenatal period. In Pakistan, where families are close-knit, significant others such as husbands and mother-in-laws provide instrumental support by accompanying women to prenatal appointments and providing health advice, which could help to alleviate women’s anxiety (37). Thus, this support may serve as an important resource that can increase uplifts in pregnancy.

Our study also suggests women’s empowerment related to household decision making (defined as having some control over economic resources and being permitted by in-laws to visit the natal home, or to work outside the home) is important for pregnancy experiences. In our study, empowerment related to household decision making was more common (81%) than financial empowerment (55%), indicating that financial empowerment is still not experienced by nearly half of our sample (38). this was also found in a study in Bangladesh among 1305 women under the age of 50 (32).

Our results suggest that household decision-making empowerment was more likely to decrease the frequency and intensity of hassles or to increase uplifts among anxious women. Lack of women’s household decision-making empowerment also contributes to insufficient healthcare seeking behaviors (40). For example, a study using data from the Demographic and Health Survey (DHS) in 31 LMICs showed that women with the highest empowerment were more likely to attend four or more antenatal visits, and have a skilled attendant at birth compared with women with low empowerment (41). As women with more negative pregnancy experiences are also associated with lower empowerment, this suggests that women with these pregnancy experiences may also be less likely to seek care when needed. Or alternatively, it may be that women who do not seek care for problems during pregnancy (and are less empowered to do so) may end up having more negative experiences of pregnancy. Future prospective studies that support causal inference are needed to help understand these mechanisms are needed to determine the direction of association.

Other study findings indicate that women with higher education levels are more likely to have a lower frequency ratio of hassles to uplifts compared to those who have low education levels. A recent review in LMICs indicated that lack of information and misinformation was associated with difficulties in access to antenatal care (42). Another study in the region that used the Bangladesh Demographic and Health Surveys (DHS) showed that women who had secondary or higher education levels had greater odds of attending at least four antenatal care visits (44).

This study’s findings also highlight the critical role of family system; women who were residing in the extended and joint family system showed less intensity of hassles in pregnancy compared to women living in nuclear family structures. Extended family structure might be helpful for women in order to attend antenatal visits, possibly due to more financial, childcare and transport resources. It is possible that these factors increase uplifts in pregnancy generally. These types of support have been recommended in order to achieve positive experiences in pregnancy and higher access to antenatal care (46). Notably, this result remained even while controlling for social support, suggesting that the influence of extending family structure on women’s pregnancy experiences go beyond providing social support (or at least what we were able to measure with social support in our analysis).

On the other hand Jain et al. (2004) in their study has indicated that overall involvement by in-laws may induce depression among pregnant women (50). Quality of relationship of pregnant mothers with other members of their households might affect experiences in pregnancy, which was not addressed in our study. More research is needed to address quality of relationships and family involvement during pregnancy with women empowerment and decision-making which appears to have association with experiences of anxiety (37).

To our knowledge, this is the first study in which women’s social support and empowerment have been studied in relation to experiences in pregnancy in women with symptoms of anxiety in an LMIC. To date, such associations with pregnancy-specific experiences have not been studied in detail (47) despite their importance in the context of child outcomes and in achieving global sustainable development goals. It is likely that these issues are especially important to pregnancy experiences among pregnant women in contexts where large disparities exist and there is poor access to healthcare services (42).

A study limitation was that data were collected at one-time point, making it impossible to infer causality. Further, all participants had at least mild levels of anxiety, limiting the generalizability of these findings to other pregnant women. Given prior research showing that anxiety in pregnant women also affects the decision-making empowerment domain (39), it is possible that the associations we observed may have been intensified in the pregnant women in our study. Therefore, more research is needed to know if these findings also hold for non-anxious women and women who are not pregnant.

Regarding the broader implications of our results, less empowerment is directly related to poor health outcomes and ongoing morbidity during pregnancy (48). Sustainable Development Goal 5 (SDG 5) aims to achieve gender equality and empower all women, and there is a sub-domain (SGD 5.2) which is to address violence against women, including domestic violence. The associations between domestic violence and both empowerment and pregnancy experiences were not addressed in our study despite evidence that women’s empowerment, especially economic empowerment, decreases both domestic violence and stress (49) which could be a source of reducing anxiety in pregnant mothers and increase their positive pregnancy experience. The complex interplay between these factors should be studied in greater depth in the context of future studies using mediation analyses.

Household empowerment and social support were associated with positive experiences in pregnancy. These factors might be helpful to develop effective interventions to improve pregnancy experiences that could be implemented from the time of conception to the first year of the newborn. Further research is needed to explore these associations in non-anxious community samples and to better understand what types of support would be most useful.

**Table 1**. Demographic information of pregnant women (N=594)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | N (%)1 | Frequency ratio  : Hassles/Uplifts,  Mean (SD) | p-value2 | Intensity ratio:  Hassles/Uplifts,  Mean (SD) | p-value2 |
| Mean (SD) |  | 1.16 (0.73) |  | 1.11 (0.38) |  |
| Maternal age |  |  | 0.36 |  | 0.22 |
| ≤25 | 349 (58.75) | 1.14 (0.04) |  | 1.10 (0.02) |  |
| >25 | 245 (41.25) | 1.19 (0.04) |  | 1.14 (0.02) |  |
| Education level |  |  | 0.01 |  | 0.20 |
| ≤ Primary school | 174 (29.29) | 1.25 (0.59) |  | 1.16 (0.40) |  |
| Middle school – matriculation | 261 (43.94) | 1.13 (0.79) |  | 1.10 (0.38) |  |
| ≥ Intermediate | 159 (26.77) | 1.12 (0.75) |  | 1.09 (0.34) |  |
| Family structure |  |  | 0.36 |  | 0.01 |
| Nuclear | 211 (35.52) | 1.21 (0.90) |  | 1.12 (0.38) |  |
| Joint (parents) | 181 (30.47) | 1.18 (0.59) |  | 1.19 (0.43) |  |
| Extended (parents and siblings) | 202 (34.01) | 1.09 (0.62) |  | 1.04 (0.31) |  |
| Monthly household income (PKR) |  |  | 0.10 |  | 0.23 |
| Low (<20,000) | 319 (53.70) | 1.16 (0.62) |  | 1.12 (0.37) |  |
| Middle (20,000-35,000) | 220 (37.04) | 1.17 (0.84) |  | 1.12 (0.38) |  |
| High (>35,000) | 55 (9.26) | 1.11 (0.80) |  | 1.07 (0.42) |  |
| Migration status |  |  | <0.01 |  | <0.01 |
| Local | 452 (76.09) | 1.22 (0.04) |  | 1.14 (0.02) |  |
| Migrant | 142 (23.87) | 0.98 (0.05) |  | 1.02 (0.03) |  |
| Parity |  |  | 0.02 |  | 0.01 |
| Nulliparous | 155 (26.09) | 1.04 (0.03) |  | 1.05 (0.03) |  |
| Multiparous | 439 (73.91) | 1.20 (0.04) |  | 1.14 (0.02) |  |
| Gestational age |  |  | 0.14 |  | 0.77 |
| First trimester (<13week) | 181 (30.47) | 1.23 (0.07) |  | 1.12 (0.03) |  |
| Second trimester (≥13week) | 413 (69.53) | 1.13 (0.03) |  | 1.11 (0.02) |  |
| History of miscarriage or stillbirth |  |  | 0.17 |  | 0.46 |
| No | 253 (42.59) | 1.21 (0.06) |  | 1.13 (0.02) |  |
| Yes | 341 (57.41) | 1.13 (0.03) |  | 1.10 (0.02) |  |

1 Raw frequencies and column percentages are presented.

2 T-tests and Cuzick’s tests for trend were performed to assess differences among categories.

**Table 2**. Summary statistics of social support, and women’s empowerment and pregnancy specific experience (N=594)

|  |  |  |  |
| --- | --- | --- | --- |
| Variables | Mean (SD)  or N (%) | Min. | Max. |
| **Social support** |  |  |  |
| Total score | 3.26 (0.89) | 1 | 5 |
| Subscales |  |  |  |
| Significant others | 3.35 (0.88) | 1 | 5 |
| Family | 3.30 (0.91) | 1 | 5 |
| Friends | 3.14 (0.98) | 1 | 5 |
| **Women’s empowerment** |  |  |  |
| Financial empowerment |  |  |  |
| Not empowered | 268 (45.12) |  |  |
| Empowered | 326 (54.88) |  |  |
| Household empowerment |  |  |  |
| Not empowered | 112 (18.86) |  |  |
| Empowered | 482 (81.14) |  |  |
| **Pregnancy Experience Scale** |  |  |  |
| Uplifts frequency | 7.98 (1.72) | 1 | 9 |
| Hassles frequency | 8.41 (2.51) | 1 | 11 |
| Uplifts intensity | 2.06 (0.56) | 1 | 3 |
| Hassles intensity | 2.15 (0.48) | 1 | 3 |
| Frequency ratio | 1.16 (0.73) | 0.11 | 9 |
| Intensity ratio | 1.11 (0.38) | 0.36 | 3 |

**Table 3**. Generalized Linear Model (GLM) results for maternal social measures (social support and women’s empowerment) in association with frequency and intensity scores of uplifts and hassles during pregnancy

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Frequency | | Intensity | |
|  | Uplifts | Hassles | Uplifts | Hassles |
|  | B (95% CI)1 | B (95% CI)1 | B (95% CI)1 | B (95% CI)1 |
| Social support |  |  |  |  |
| Total score | 0.39 (0.23, 0.54)\*\*\* | -0.44 (-0.66, -0.22)\*\*\* | 0.17 (0.12, 0.22) \*\*\* | 0.01 (-0.04, 0.04) |
| Subscales |  |  |  |  |
| Significant others | 0.33 (0.17, 0.49)\*\*\* | -0.45 (-0.67, -0.23)\*\*\* | 0.14 (0.09, 0.19)\*\*\* | -0.02 (-0.06, 0.03) |
| Family | 0.42 (0.27, 0.57)\*\*\* | -0.44 (-0.65, -0.22)\*\*\* | 0.18 (0.13, 0.23)\*\*\* | 0.01 (-0.03, 0.05) |
| Friends | 0.33 (0.19, 0.47)\*\*\* | -0.35 (-0.55, -0.15)\*\* | 0.16 (0.11, 0.20)\*\*\* | 0.01 (-0.03, 0.04) |
| Women’s empowerment |  |  |  |  |
| Financial empowerment |  |  |  |  |
| Not empowered | Ref |  | Ref |  |
| Empowered | -0.20 (-0.48, 0.08) | -0.06 (-0.45, 0.33) | 0.04 (-0.05, 0.13) | -0.06 (-0.14, 0.01) |
| Household empowerment |  |  |  |  |
| Not empowered | Ref |  | Ref |  |
| Empowered | 0.55 (0.20, 0.90)\*\* | -0.20 (-0.69, 0.30) | 0.28 (0.17, 0.40)\*\*\* | 0.06 (-0.04, 0.15) |

1 Adjusted for age, education level, family structure, monthly income, migration status, and parity.

\* p<0.05, \*\* p<0.01, \*\*\* p<0.001.

**Table 4**. Generalized Linear Model (GLM) results for maternal social measures (social support and women’s empowerment) in association with frequency ratio and intensity ratio scores during pregnancy

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Frequency ratio: Hassles/Uplifts | | Intensity ratio: Hassles/Uplifts | |
|  | Crude | Adjusted1 | Crude | Adjusted1 |
|  | B (95% CI) | B (95% CI) | B (95% CI) | B (95% CI) |
| Social support |  |  |  |  |
| Total score | -0.20 (-0.26, -0.14)\*\*\* | -0.18 (-0.25, -0.12)\*\*\* | -0.11 (-0.14, -0.08) \*\*\* | -0.10 (-0.13, -0.06)\*\*\* |
| Subscales |  |  |  |  |
| Significant others | -0.19 (-0.25, -0.12)\*\*\* | -0.17 (-0.23, -0.10)\*\*\* | -0.10 (-0.14, -0.07)\*\*\* | -0.09 (-0.12, -0.06)\*\*\* |
| Family | -0.21 (-0.27, -0.14)\*\*\* | -0.19 (-0.25, -0.13)\*\*\* | -0.11 (-0.14, -0.08)\*\*\* | -0.10 (-0.13, -0.06)\*\*\* |
| Friends | -0.16 (-0.22, -0.11)\*\*\* | -0.15 (-0.21, -0.09)\*\*\* | -0.09 (-0.12, -0.06)\*\*\* | -0.09 (-0.12, -0.06)\*\*\* |
| Women’s empowerment |  |  |  |  |
| Financial empowerment |  |  |  |  |
| Not empowered | Ref |  | Ref |  |
| Empowered | 0.03 (-0.09, 0.15) | 0.04 (-0.08, 0.16) | -0.09 (-0.15, -0.03)\*\* | -0.07 (-0.13, -0.01)\* |
| Household empowerment |  |  |  |  |
| Not empowered | Ref |  | Ref |  |
| Empowered | -0.29 (-0.44, -0.15)\*\*\* | -0.27 (-0.42, -0.13)\*\*\* | -0.16 (-0.23, -0.08)\*\*\* | -0.14 (-0.22, -0.06)\*\*\* |

1 Adjusted for age, education level, family structure, monthly income, migration status, and parity.

\* p<0.05, \*\* p<0.01, \*\*\* p<0.001.

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