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Child mental health and maternal depression history in Pakistan.

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Abstract

Purpose: We address the significant gaps in knowledge of prevalence and correlates of Child Mental Health (CMH) problems outside of high income countries. We describe the prevalence of CMH problems and their correlates with a focus on the association with maternal depression in a sample of seven year old children in rural Pakistan.

Methods: This study was nested in a long-term follow up of a perinatal depression intervention together with a reference group of non-depressed women, yielding a population representative sample.. The Total Difficulties (TD) and component scores of the Strength and Difficulties Questionnaire (SDQ) were used to measure emotional and behavioral difficulties.

Results: The mean SDQ TD score was 10.6 (standard deviation=8.3), with 12.5% of children categorized as “abnormal” using standard cut-offs. Boys had a roughly 1 point higher (worse) SDQ TD score than girls (p-value=0.04). Children of mothers who were depressed prenatally as well as currently had SDQ TD scores 2.87 points higher than children whose mothers were not depressed at either time point (p-value<0.01). This association was stronger for boys. There was no evidence of elevated SDQ TD score among children whose mothers were depressed only prenatally or only currently. Some deviations from this pattern were observed with specific components of the SDQ.

Conclusions: In this low-resource, South Asian setting, we found evidence of elevated levels of emotional and behavioral problems, highlighting the need for effective interventions. Given the strong association of CMH with maternal depression, any intervention efforts should give strong consideration to maternal mental health.

Keywords

Child mental health; socio-emotional development; maternal depression; strengths and difficulties questionnaire; gender differences

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Introduction

Unmet mental health needs for individuals in low and middle income countries (LMIC) are increasingly acknowledged [1]. However, efforts toward understanding the prevalence of mental ill health while increasing the availability of evidence based treatments have largely focused on adult mental health [1,2]. Children in LMIC also have high rates of unmet psychological needs with at least 10 to 20% estimated to have mental health difficulties [3,4,2]. Moreover, only a small fraction of these children ever receive any psychological care [5,2].

The high prevalence of child mental health (CMH) problems is worrisome because socio-emotional and behavioral problems that emerge early in childhood and are strong predictors of adult neuropsychiatric risk, physical health problems, earlier mortality, as well as challenging the well-being of society [6,1]. This makes CMH problems especially salient targets for prevention, early detection, and effective intervention.

In South Asia, where an estimated 40% of the population is under 18, the need to understand the prevalence and determinants of child mental health (CMH) is urgent [7,8]. However, remarkably little is known about the prevalence, risk factors, and etiology of child mental health problems in the region [9]. The best estimates from studies conducted in the South Asia region suggest a prevalence of CMH problems of 20% or more [10,4,11,12]. Due to the presence of political conflict as well as natural disasters in the region, a substantial portion of the CMH literature has focused on youth with known risk factors, for example, children living near the 2004 Tsunami have PTSD rates ranging from 30–71% [12,13].

Maternal or caregiver mental health is one of the most consistent correlates of CMH problems, together with markers of lower socioeconomic status and negative life events [10,14,15,2,16,17]. The impact of maternal depression on CMH is thought to start early in development and persist throughout the child's life [18–23]. Although chronic, unremitting, depression appears to be most deleterious, the impact of depressive episodes during specific developmental periods, such as prenatally, independent of postnatal maternal depression remains less well understood [24,25]. Efforts at understanding how different patterns of maternal mental health problems early in the child's life may affect CMH problems may yield important information about preventing the onset of problems in the child [26,27,16]. The literature is inconclusive about this. Moreover, very few studies in South Asia have examined the pattern of maternal depression over time on CMH.

CMH studies from India, Sri Lanka, and Bangladesh that are based on general outpatient clinic, community, or school based samples report CMH problems affecting 1.8% to 21% of children [14,28,11,29,4,30–33]. Specific to Pakistan, Syed and colleagues conducted a study of 5–11 year old children in private and public/community schools. Utilizing the Strengths and Difficulties Questionnaire (SDQ) they report that 34% of the parents rated their children in the 'abnormal' category in the Total Difficulties (TD) score [34,35]. Furthermore, the factors most strongly associated with a worse SDQ score included male gender and attending a community school (vs. a private school). Lassi and colleagues examined child

mental health within the context of two different orphanages and found that 33% of the children were identified as being in the abnormal category of the TD score as rated by their foster mothers [36]. Within a more clinical setting, 55% of children of parents with an identified psychiatric illness in Lahore, Pakistan were rated as having “abnormal” scores on the SDQ, compared with 28% from a control group of children from a neighboring school [37].

Our paper has two aims. First, we describe the levels and correlates of emotional and behavioral difficulties, as measured with the Strengths and Difficulties Questionnaire (SDQ), in a population representative sample of children in rural Pakistan. Second, we examine the association of maternal depression, assessed at 2 time points, prenatally and when the child was 7 years old, on CMH.

Methods

Study Participants

This community based epidemiological study tracks a birth cohort sampled from two rural sub-districts of Rawalpindi, Pakistan (population 600,000). This sample was part of a cluster randomized controlled trial of a perinatal depression intervention called the Thinking Healthy Programme (THP), conducted in 2005–2007 [38]. The trial recruited depressed women in the third trimester of pregnancy and followed them till twelve months postnatal. These women resided in 40 Union Councils, which also formed the unit of randomization for the original trial. Baseline maternal inclusion criteria consisted of being 16–45 years old, married, and free of serious medical illness.

In total, 3518 pregnant women were assessed for depression using the Structured Clinical Interview for DSM-IV Disorders (SCID), with 903 eligible women meeting diagnostic criteria (24%). The recruitment rate into the intervention was 93%. Of these 903 women, 705 mother-child dyads were interviewed at child age 12 months at the end of the THP trial [38]. The current study took place when the children were approximately 7 years old and we re-enrolled the mother-child dyads from the trial. We also enrolled 300 mother-child dyads from the list of prenatally non-depressed mothers who were screened out of the THP trial. These dyads were matched on village for each prenatally depressed dyad and then randomly selected from the list. Details of the re-enrollment procedures are described in detail elsewhere [39]. For the current study household interviews with the mother-child dyads were conducted March 2013-January 2014.

The current analysis therefore consists of 585 children of mothers who were diagnosed with depression during their third trimester of pregnancy and 300 children of women who were not depressed at the time of the third trimester assessment. This sampling strategy oversamples high risk children relative to the underlying population. So as to estimate levels of child mental health problems representative of the overall population from which the sample was drawn, we use sample weights to appropriately balance the analytical contributions of children born to mothers who were and were not depressed prenatally based on the original prevalence of depression of 24.21%. This weighting strategy effectively reduces the analytical contribution of a child born to a woman who was depressed prenatally

relative to the contribution of a child born to a woman who was not depressed prenatally. Since the sampling strategy is based on the mother, the result is a sample of children born to a population representative sample of mothers who were pregnant in 2005/2006.

Ethical approval was attained for all study activities from the Institutional Review Boards (IRBs) of the Human Development Research Foundation in Islamabad, Pakistan, and Duke University in the Durham, North Carolina, United States.

Measures

The Strength and Difficulties Questionnaire (SDQ) was used to measure socio-emotional development [40–42]. This parental response measure has been used extensively globally and has been used and validated in Pakistan [34,43,44]. A Total Difficulties (TD) score is generated by summing the scores for indicators of difficulties in four behavioral and emotional areas: emotional, conduct, hyperactivity and peer problem scales. The possible range of the TD score is 0–40. A pro-social scale is also included. We present mean values for each scale as well as the proportion of children who fall into the normal/borderline/abnormal categories as defined by Goodman and colleagues [42]. These categories were originally created so that approximately 80% of children would fall in the normal category, 10% borderline, and 10% abnormal and are not meant to necessarily be indicative of a specific diagnosis [42].

Maternal depression for all women in the sample was available at two time points: in the third trimester of pregnancy and during the follow-up study approximately 7 years later. Both assessments relied on the same Structured Clinical Interview for DSM-IV Disorders (SCID) which inquires about depressive symptoms in the past two weeks [45]. The SCID has been widely used in community epidemiological research in numerous cross-cultural settings, including Pakistan [46]. The two depression assessments were used to create a categorical variable with four values, named: “never depressed”, “only depressed prenatally”, “only depressed currently” at the time of the study, and “depressed at both times” prenatally and during current study. In the present analysis, it is not possible to differentiate women who were depressed at both times into those who have been depressed through the intervening period from those who have been depressed episodically.

Several socio-demographic factors were included in the analysis based on their prior association with maternal depression and CMH in the literature. These include household socio-economic status (SES), which is a relative ranking defined as the overall financial status of the household compared to other households within the same village, ranging from richest to poorest, as determined by the community health worker assigned to that village. Family structure was categorized as either nuclear or joint/extended. Additional variables of interest include maternal age and education. Index child related variables include age, gender, current grade enrolment, and number of siblings.

Analysis

After presenting raw numbers in Table 1 to describe the study sample, all other findings presented in the table and text incorporate sampling weights resulting from the oversampling of prenatally depressed women, which allows the results to be interpreted as population

representative. Initial comparisons between groups were conducted using Chi-sq and t-tests. Joint F-tests for overall group comparisons, and pairwise tests for specific comparisons were used in Table 2. The final model was a linear regression (StataCorp, College Station, Texas), with clustering at the level of Union Council. The main exposure of interest was pattern of depression (never, only prenatally, only currently, both time points) and the outcomes of interest were the SDQ TD score as well as each of its individual component scales. All models include adjustments for child gender, family structure, SES, mother's age, mother's education, and an indicator variable for interviewer.

Results

Of the 705 mother-child dyads who were included in the original trial analysis at 12 months post-partum, 584 (82.8%) were interviewed in 2013. Of the dyads not assessed, 106 women moved and could not be located; 4 women died; 7 children died; 2 children were severely developmentally disabled, and 2 women were ineligible due to psychosis. With the addition of 300 dyads of mothers who were not depressed prenatally, complete data were available on 884 children. The maternal reported mean child age was 7.6 (range 6.6 to 8.5), with just under half (47.7%) female (Table 1). The median level of education was currently enrolled in 2nd grade, and less than 1% of children were not enrolled in school. The children had an average of 3 siblings, and more than half lived in a joint/multiple family household. At the time of the survey, 14.9% of mothers were currently depressed, 24.2% were depressed prenatally, and 6.6% were depressed at both time points. Children who lived in families with a depressed mother were more likely to be classified as poor, with less educated parents and a higher number of siblings.

Table 2 presents mean SDQ Total Difficulties (TD) together with the component scales and their unadjusted associations with multiple socio-demographic risk factors. The mean sample SDQ TD score was 10.6 (SD=5.1). Consistent with prior literature, boys had higher SDQ TD scores than girls as well as higher Conduct and Hyperactivity scores. There was no gender difference in Peer Problems, while girls had higher Emotional Problem and somewhat higher Pro-social scores. Maternal education and number of siblings was not associated with the TD score or any of the SDQ components.

Children who lived in nuclear families had a marginally higher TD score, which was driven by higher Hyperactivity and Peer Problems scores, when compared with those living in a multi-family or extended household. Socioeconomic status was also correlated with SDQ scores: the Emotional Problems scale showed the strongest association with SES with a 1 point difference between the poor and rich groups (2.16 vs. 1.16, p-value for difference=0.001).

Maternal depression emerged as a strong correlate of higher SDQ TD and component scales. Children whose mothers were depressed at both prenatally and currently had the highest SDQ TD scores, 12.81 (SD=9.1). The SDQ scores decreased in a step-wise fashion for children whose mothers were only depressed currently at 11.21 (SD=3.5) to 10.79 (SD=8.4) among those whose mothers were depressed only prenatally. For comparison, children of mothers who were not depressed at either time point had an SDQ TD score of 10.24

(SD=3.3). Pair-wise comparisons using t-tests between the never depressed vs. depressed at both time points and the depressed only prenatally vs. at both time points are significant at $p<0.05$.

Table 3 presents the percent of children in the normal, borderline, and abnormal categories and their correlates. Overall, 12.4% of the children were rated in the abnormal category on the TD score. The gender difference is large, with 15.4% of boys falling in the abnormal range for the SDQ TD score, compared to 9.2% of girls. The highest prevalence of problems was observed in the Conduct Problems category, where 47.1% of boys and 34.7% of girls were in the abnormal category. Current maternal depression was associated with a large and meaningfully higher likelihood of a child falling into the abnormal SDQ TD category, with 21.8% of children of currently depressed mothers in the abnormal category, compared with 10.8% of children of currently non-depressed mothers.

In Table 4, we present multivariate models of maternal depression patterns and SDQ scores, after adjusting for potential confounders, including gender of the child, mother's age, mother's education, family structure, and household SES. Only children whose mothers were depressed at both time points had significantly elevated SDQ TD scores, by 2.87 points ($se=0.60$, $p\text{-value}<0.01$), when compared with children of mothers who were not depressed neither prenatally nor currently. Among the component scores, this pattern was consistent for Conduct Problems and Hyperactivity. Depression pattern was not associated with Peer Problems. For Emotional Problems, the presence of either episode of depression was associated with an increased score relative to those with neither prenatal, nor current, depression. Female gender was associated with almost a point lower TD score ($\beta=-1.03$, $se=0.42$, $p\text{-value}=0.042$, a pattern observed with Conduct Problems, Hyperactivity, although, in the opposite direction, with Emotional Problems and the Pro-social score. Of the remaining risk factors, socioeconomic status continued to predict SDQ scores. Living in a nuclear family was marginally associated with a 0.75 higher SDQ TD score ($se=0.41$, $p\text{-value}=0.07$). Neither maternal age nor maternal education were associated with SDQ scores, although we note that education is correlated with socioeconomic status, so it may have an impact that is absorbed by the SES control. The full set of coefficients from Table 4 are presented in Appendix Table 1.

Finally, we also examined whether the magnitude of the association between maternal depression and SDQ scores differed for boys vs. girls. Boys whose mothers were depressed prenatally and currently had SDQ TD scores that were 4.47 points ($se=0.9$, $p\text{-value}<0.01$) higher when compared with boys of mothers not depressed at either time point. In comparison, the difference in SDQ TD scores among girls was almost negligible at, 1.09 points ($se=0.68$, $p\text{-value}=0.12$, interaction term $p<0.01$). This pattern was largely consistent across components with the difference between boys of mothers who were depressed prenatally and currently vs. who were not depressed at either time point being larger than among girls.

Discussion

In this community based sample of school aged children, the mean SDQ Total Difficulties score was 10.6, with 12.5% of children scoring within the abnormal category of the SDQ TD. Consistent correlates of higher SDQ TD scores included male gender, low family socioeconomic status and maternal depression. Specifically, children of mothers who were depressed prenatally and during the current study had significantly elevated total SDQ scores, after adjusting for potential confounders. Furthermore, the impact of maternal depression was stronger on boys' problem scores as compared to girls'.

The mean of 10.6 and an estimate of 12.5% of behavioral and emotional problems in this sample is somewhat higher compared to community based estimates from the US or UK but lower than previous studies in Pakistan using the SDQ [47,48]. For example, the UK based norm for a group of 5–15 year olds, as well as Japanese 7–9 year olds, is a mean of 8.4, while for American 4–7 year olds the mean is 7.4 [47]. In the Pakistan context for example, Syed and colleagues reported a 34% prevalence in a school based sample of 5–11 year olds [35,34]. One potential explanation for the difference between the two studies is that the school based sample was likely to be more high-risk: the response rate of 45% in that study suggests that parents who were more concerned about their children's behavioral issues could have been more likely to participate. This is much less of a concern in our study because our sampling strategy is based on a cohort of women who were originally enrolled during pregnancy. Other studies from Pakistan have reported the prevalence of 33% CMH problems among children living in orphanages [36] and 35% among children attending a pediatric outpatient clinic; [44] these could also be considered more high risk samples in comparison to the general population. The mean TD score in both the school sample and the pediatric clinic study was 14.4, compared with our mean of 10.6. However, risk factors show similar patterns across studies with factors such as female gender and higher socioeconomic status predicting lower SDQ scores.

A wide range in CMH problem estimates is not surprising given that previous studies use multiple approaches of defining and measuring CMH problems in addition to being drawn from a range of samples. The interpretation of differences in the distribution of SDQ scores across countries has been the subject to debate [49]. What makes the comparisons more difficult is the lack of representativeness of the data. Our estimate of 12.5% of CMH problems is closer to several studies from other South Asian countries, although many of these relied on instruments other than the SDQ. The majority of estimates among children 4–11 years old from community or school samples from India, Sri Lanka and Bangladesh fall between 5.7% [14] and 19.2% [30], with multiple estimates in between [32,31,4,11].

Gender differences

Boys in our sample had higher TD, Conduct Problems, and Hyperactive scores than girls, while girls had higher Emotional Problems scores and also higher (better) Pro-social scores. We observed no gender differences in the Peer Problems component. While these gender differences are largely consistent with previous studies in LMIC and HIC countries, there is also some evidence of cross-cultural variation in both component scores across gender as well as the factor structure of the SDQ components themselves for boys and girls [50–54]

[55,23]. Furthermore, the strength of the association between maternal depression and worse SDQ scores, as well as socioeconomic status and SDQ scores, was much stronger for boys than for girls. The literature on boys' vs. girls' sensitivity to adverse risk factors, including maternal mental health, suggests that the association may vary across specific risk factors as well as age of the child during exposure to the risk factor [23,36,56–58]. For example, the study comparing children across two types of orphanages in Pakistan found that girls' SDQ scores were more sensitive than boys' to type of orphanage and living status of parents [36]. Another recent study suggests that boys' SDQ TD scores at age 7 are more sensitive to alcohol consumption during pregnancy than girls' scores [59]. Exploring such differences further may shed light into the specific ways that boys' and girls' development is impacted by exposure to varying psychosocial stressors, including maternal depression, in early childhood.

Maternal mental health

This is the first study to our knowledge from South Asia utilizing maternal depression data from both the prenatal period and in middle childhood (mean child age 7.6). We found that only the presence of multiple depression episodes, as defined by the presence of prenatal and current depression, is associated with higher levels of CMH problems. Our difference of 2.87 points in TD that is associated with maternal depression is similar to commonly reported effect sizes from parenting interventions. For example, a study in Japan showed a reduction of the TD score from 12.2 to 10.6 resulting from a positive parenting program[60], while another intervention among preschoolers in the US lead to a drop in scores from 12.6 to 10.8[40]. Another study on the impacts of the Japanese 2011 earthquake and tsunami on children reported that TD scores of 4th-6th grade children were elevated by 2.5 points 30 months after the disaster[61]. Additionally, according to Goodman's original criteria, the borderline category reflects a score between 14–16, so a change of over 2 points is enough to change the characterization of a child from the high end of normal to the low end of the abnormal group [42]. In contrast, a 7.2 point difference was observed when comparing children visiting a psychiatric clinic with controls in the Samad et al study in Pakistan[44]. Of the SDQ component scores, the one exception we observed was with the Emotional Problems score, which was elevated among children of mothers who were depressed at one point, either prenatally or currently. The deleterious impact of maternal depression on child development is a well-established finding from other Asian countries as well as other LMIC and HIC contexts [14,36,62,63,17]. However, previous studies typically do not use population-representative data, and research on the differential impact of the specific timings of depression episodes during a child's first decade of life on various socio-emotional outcomes has found conflicting evidence about the independent role of prenatal vs. post-natal depression [64–66].

Researchers have argued that a focus on depression trajectories themselves is crucial, especially since chronic or recurrent depression is likely to affect multiple developmental windows, with implications for multiple socio-emotional developmental domains [63,24,58]. Our findings that it is the chronic (or recurrent) pattern of maternal depression that is associated with the highest behavioral and emotional problems support the notion of cumulative risk on the one hand, and resilience on the other [67]. A single episode of

depression either prenatally or during childhood does not appear to substantially increase childhood risk; children appear to be resilient to the negative impact of this smaller dose of maternal depression exposure. The Emotional Problems score (especially among boys) was an exception to this pattern.

Although this was not the main goal of our analyses, our findings are largely not consistent with the fetal programming hypothesis which suggests independent effect of prenatal depression on child development. This is not surprising given the emerging evidence that it may be prenatal anxiety (vs. depression) that is most strongly correlated with child socio-emotional outcomes independent of postnatal symptoms [68–71]. Given the high co-occurrence of anxiety and depression symptoms, future research would benefit from assessing both types of symptoms prenatally. Finally, the presence of multiple depression episodes (prenatally and currently) may be indicative of chronic maternal depression which may, in turn, point to underlying genetic risk. The genetic contribution to child CMH likely reflects multiple mechanisms, including through variations in sensitivity to the environment as well as epi-genetic processes [17].

Methodological Considerations

There are several methodological considerations to keep in mind while interpreting these findings. The current analysis relies solely on the SDQ to indicate child mental health problems, making it subject to the limitations of using only one tool with 25 maternal reported items. Prior studies suggest there can be discrepancies between SDQ derived ‘caseness’ compared to clinical interviews, suggesting that the SDQ may not be, by itself, the most appropriate proxy of the presence of a disorder [72]. This is one of the reasons why we did not utilize this feature of the SDQ. Also, for the current analysis we used the published cutoff for the abnormal category to be most consistent with cross-cultural literature. Samad and colleagues [44] provide a one point higher cutoff of 17/18 for the Total Difficulties score, which would result in the percent of children in the abnormal category decreasing to 10.5% in our sample. Our emphasis on differences by risk factors in raw scores vs. categories nonetheless yielded results consistent with studies relying on the abnormal categorization [14]. Concerns have also been raised about the cross-cultural validity of the SDQ itself, pointing to low internal consistency levels of some of the component scales as well as different factor structure in different cultural contexts [49,54]. The SDQ is also mother reported, and there is evidence that depressed mothers may over-report their children’s emotional and behavioral problems, a bias that can be reduced with effective interviewer training [73,74]. However, we do not expect this to significantly bias our findings as our main finding is not with current maternal depression. Our findings are correlational and we are not able to make any causal statements about the true role of maternal depression on child mental health problems. Because our sample was very homogenous in age we were not able to examine changes in SDQ scores according to age. Finally, using the objective prenatal assessment of depression allowed us to not have to rely on retrospective accounts of depressive symptoms, which could have been biased by current depressive symptoms.

Conclusions

This study contributes to our growing knowledge of child mental health and its correlates cross-culturally. We found evidence of elevated levels of emotional and behavioral problems, highlighting the need for effective, and affordable, interventions in this low-resource setting [2]. A recent study in India revealed that 48% of mothers believed that mental health problems are treatable with another 48% being unsure,[14] suggesting that there is openness to interventions. Given the strong association of CMH with maternal depression, any intervention efforts should give strong consideration to maternal mental health.

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Appendix

Appendix Table 1:
Multivariate Models of Maternal Depression History and SDQ Scores – Full Set of Coefficients for Table 4*

SDQ Sum	TD		Conduct Problems			Emotional Problems			Hyperactivity			Peer Problems			Pro social score				
	beta	se	p-value	beta	se	p-value	beta	se	p-value	beta	se	p-value	beta	se	p-value	beta	se	p-value	
Depression:																			
never depressed	ref		ref		ref		ref		ref		ref		ref		ref		ref		ref
only depressed prenatally	0.59	0.32	0.07	-0.04	0.15	0.77	0.53	0.14	0.00	0.03	0.18	0.87	0.07	0.11	0.53	0.14	0.19	0.46	0.46
only depressed currently	1.04	0.72	0.15	-0.20	0.23	0.39	0.91	0.28	0.00	0.11	0.43	0.79	0.22	0.28	0.44	0.48	0.40	0.23	0.23
depressed at both times	2.87	0.60	0.00	0.65	0.24	0.01	1.13	0.25	0.00	0.85	0.27	0.00	0.24	0.15	0.11	-0.11	0.30	0.71	0.71
Child female gender	-1.03	0.42	0.02	-0.54	0.17	0.00	0.51	0.16	0.00	-0.97	0.21	0.00	-0.03	0.14	0.84	0.46	0.17	0.01	0.01
Family Structure:																			
Joint / Extended & Multiple Households	ref		ref		ref		ref		ref		ref		ref		ref		ref		ref
Nuclear	0.75	0.41	0.07	-0.06	0.19	0.75	0.09	0.15	0.55	0.46	0.19	0.02	0.26	0.11	0.02	0.06	0.20	0.77	0.77
SES Rating by LHW:																			
Poor & Poorest	ref		ref		ref		ref		ref		ref		ref		ref		ref		ref
Moderate	-0.85	0.46	0.07	-0.25	0.17	0.15	0.01	0.16	0.97	-0.41	0.23	0.09	-0.20	0.15	0.20	0.38	0.27	0.17	0.17
Richest & Rich	-1.68	0.75	0.03	-0.47	0.29	0.11	-0.35	0.29	0.23	-0.30	0.37	0.42	-0.56	0.25	0.03	0.30	0.34	0.38	0.38
Maternal Age	-0.01	0.04	0.84	-0.02	0.02	0.44	-0.02	0.02	0.33	0.01	0.02	0.51	0.01	0.01	0.26	0.02	0.01	0.11	0.11
Maternal Education	0.04	0.07	0.59	0.00	0.03	0.95	-0.02	0.02	0.27	0.05	0.03	0.10	0.01	0.02	0.40	0.03	0.03	0.27	0.27
Interviewer Fixed Effects:																			
Interviewer No. 6 (Median No. of Interviews)	ref		ref		ref		ref		ref		ref		ref		ref		ref		ref
Interviewer No. 1	0.58	1.15	0.62	-0.21	0.40	0.60	0.58	0.34	0.09	0.80	0.52	0.13	-0.59	0.29	0.05	2.69	0.48	0.00	0.00
Interviewer No. 2	-2.88	1.11	0.01	-1.49	0.41	0.00	-0.27	0.25	0.29	-0.11	0.60	0.85	-1.01	0.34	0.01	2.82	0.64	0.00	0.00
Interviewer No. 3	-1.63	1.09	0.14	-0.39	0.37	0.31	0.40	0.30	0.19	-1.03	0.45	0.03	-0.62	0.30	0.05	3.44	0.43	0.00	0.00
Interviewer No. 4	0.99	1.15	0.39	0.19	0.38	0.61	0.15	0.26	0.56	-0.15	0.47	0.75	0.79	0.32	0.02	3.58	0.41	0.00	0.00
Interviewer No. 5	1.90	0.95	0.05	1.06	0.37	0.01	0.85	0.22	0.00	0.37	0.46	0.43	-0.37	0.29	0.20	1.75	0.41	0.00	0.00
Interviewer No. 7	0.98	1.02	0.34	0.71	0.39	0.08	-0.24	0.30	0.43	0.11	0.43	0.79	0.40	0.31	0.20	3.46	0.48	0.00	0.00
Interviewer No. 8	-2.31	1.26	0.07	-0.18	0.40	0.65	0.44	0.34	0.20	-2.39	0.52	0.00	-0.19	0.42	0.65	3.57	0.48	0.00	0.00
Interviewer No. 9	2.79	1.19	0.02	0.85	0.57	0.14	1.16	0.35	0.00	0.68	0.69	0.33	0.09	0.34	0.79	1.87	0.63	0.01	0.01

* models additionally adjust for clustering and sample weights.

References

1. Prince M, Patel V, Saxena S, Maj M, Maselko J, Phillips MR, Rahman A (2007) Global mental health 1 - No health without mental health. *Lancet* 370 (9590):859–877 [PubMed: 17804063]
2. Kieling C, Baker-Henningham H, Belfer M, Conti G, Ertem I, Omigbodun O, Rohde LA, Srinath S, Ulkuer N, Rahman A (2011) Global Mental Health 2 Child and adolescent mental health worldwide: evidence for action. *Lancet* 378 (9801):1515–1525. doi:10.1016/s0140-6736(11)60827-1 [PubMed: 22008427]
3. Srinath S, Kandasamy P, Golhar TS (2010) Epidemiology of child and adolescent mental health disorders in Asia. *Current Opinion in Psychiatry* 23 (4):330–336. doi:10.1097/YCO.0b013e32833aa0c1 [PubMed: 20489643]
4. Srinath S, Girimaji SC, Gururaj G, Seshadri S, Subbakrishna DK, Bhola P, Kumar N (2005) Epidemiological study of child & adolescent psychiatric disorders in urban & rural areas of Bangalore, India. *Indian Journal of Medical Research* 122 (1):67–79 [PubMed: 16106093]
5. Patel V, Flisher AJ, Hetrick S, McGorry P (2007) Mental health of young people: a global public-health challenge. *Lancet* 369 (9569):1302–1313 [PubMed: 17434406]
6. Ban L, Gibson JE, West J, Tata LJ (2010) Association between perinatal depression in mothers and the risk of childhood infections in offspring: a population-based cohort study. *Bmc Public Health* 10. doi:10.1186/1471-2458-10-799
7. UNICEF (2012) South Asia. <http://www.unicef.org/infobycountry/southasia.html>. Accessed September 19, 2014 2014
8. Patel V, Flisher AJ, Nikapota A, Malhotra S (2008) Promoting child and adolescent mental health in low and middle income countries. *J Child Psychol Psychiatry* 49 (3):313–334. doi:10.1111/j.1469-7610.2007.01824.x [PubMed: 18093112]
9. Baxter AJ, Patton G, Scott KM, Degenhardt L, Whiteford HA (2013) Global Epidemiology of Mental Disorders: What Are We Missing? *Plos One* 8 (6). doi:10.1371/journal.pone.0065514
10. Sarkar S, Sinha VK, Prahraj SK (2012) Depressive disorders in school children of suburban India: an epidemiological study. *Soc Psychiatry Psychiatr Epidemiol* 47 (5):783–788. doi:10.1007/s00127-011-0383-7 [PubMed: 21533600]
11. Malhotra S, Kohli A, Arun P (2002) Prevalence of psychiatric disorders in school children in Chandigarh, India. *Indian Journal of Medical Research* 116:21–28 [PubMed: 12514974]
12. Catani C, Jacob N, Schauer E, Kohila M, Neuner F (2008) Family violence, war, and natural disasters: a study of the effect of extreme stress on children's mental health in Sri Lanka. *BMC Psychiatry* 8:33. doi:10.1186/1471-244x-8-33 [PubMed: 18454851]
13. John PB, Russell S, Russell PS (2007) The prevalence of posttraumatic stress disorder among children and adolescents affected by tsunami disaster in Tamil Nadu. *Disaster management & response : DMR : an official publication of the Emergency Nurses Association* 5 (1):3–7. doi: 10.1016/j.dmr.2006.11.001 [PubMed: 17306747]
14. Bele SD, Bodhare TN, Valsangkar S, Saraf A (2013) An epidemiological study of emotional and behavioral disorders among children in an urban slum. *Psychol Health Med* 18 (2):223–232. doi: 10.1080/13548506.2012.701751 [PubMed: 22783928]
15. Chiu YN, Gau SS, Tsai WC, Soong WT, Shang CY (2009) Demographic and perinatal factors for behavioral problems among children aged 4–9 in Taiwan. *Psychiatry Clin Neurosci* 63 (4):569–576. doi:10.1111/j.1440-1819.2009.01979.x [PubMed: 19497002]
16. Parsons CE, Young KS, Rochat TJ, Kringelbach ML, Stein A (2012) Postnatal depression and its effects on child development: a review of evidence from low- and middle-income countries. *British Medical Bulletin* 101 (1):57–79. doi:10.1093/bmb/ldr047 [PubMed: 22130907]
17. Stein A, Pearson RM, Goodman SH, Rapa E, Rahman A, McCallum M, Howard LM, Pariante CM (2014) Effects of perinatal mental disorders on the fetus and child. *Lancet* 384 (9956):1800–1819 [PubMed: 25455250]
18. Walker SP, Wachs TD, Gardner JM, Lozoff B, Wasserman GA, Pollitt E, Carter JA, Int Child Dev Steering G (2007) Child development in developing countries 2 - Child development: risk factors for adverse outcomes in developing countries. *Lancet* 369 (9556):145–157 [PubMed: 17223478]

19. Patel V, Rodrigues M, DeSouza N (2002) Gender, Poverty, and Postnatal Depression: A Study of Mothers in Goa, India. vol 159. First published. doi:10.1176/appi.ajp.159.1.43
20. Murray L, Cooper PJ (1997) Effects of postnatal depression on infant development. *Arch Dis Child* 77 (2):99–101 [PubMed: 9301345]
21. Hussain MFA, Nauman F Maternal mental distress: A risk factor for infant under nutrition in developing countries. *J Pak Med Assoc* 60 (4):329–329
22. Affonso DD, De AK, Horowitz JA, Mayberry LJ (2000) An international study exploring levels of postpartum depressive symptomatology. *J Psychosomat Res* 49 (3):207–216
23. Goodman SH, Rouse MH, Connell AM, Broth MR, Hall CM, Heyward D (2011) Maternal Depression and Child Psychopathology: A Meta-Analytic Review. *Clin Child Fam Psychol Rev* 14 (1):1–27. doi:10.1007/s10567-010-0080-1 [PubMed: 21052833]
24. Campbell SB, Morgan-Lopez AA, Cox MJ, McLoyd VC, Natl Inst Child Hlth Human Dev E (2009) A Latent Class Analysis of Maternal Depressive Symptoms Over 12 Years and Offspring Adjustment in Adolescence. *J Abnorm Psychol* 118 (3):479–493. doi:10.1037/a0015923 [PubMed: 19685946]
25. Dawson G, Ashman SB, Panagiotides H, Hessel D, Self J, Yamada E, Embry L (2003) Preschool outcomes of children of depressed mothers: Role of maternal behavior, contextual risk, and children's brain activity. *Child Dev* 74 (4):1158–1175 [PubMed: 12938711]
26. Almond P (2009) Postnatal depression : A global public health perspective. *Perspect Public Health* 129 (5):221–227 [PubMed: 19788165]
27. Rahman A, Patel V, Maselko J, Kirkwood B (2008) The neglected 'm' in MCH programmes - why mental health of mothers is important for child nutrition. *Trop Med Int Health* 13 (4):579–583. doi:10.1111/j.1365-3156.2008.02036.x [PubMed: 18318697]
28. Khairkar P, Pathak C, Lakhkar B, Sarode R, Vagha J, Jagzape T, Damke S, Saoji N (2013) A 5-Year Hospital Prevalence of Child and Adolescent Psychiatric Disorders from Central India. *Indian J Pediatr* 80 (10):826–831. doi:10.1007/s12098-013-1120-x [PubMed: 24026914]
29. Pillai A, Patel V, Cardozo P, Goodman R, Weiss HA, Andrew G (2008) Non-traditional lifestyles and prevalence of mental disorders in adolescents in Goa, India. *Br J Psychiatry* 192 (1):45–51. doi:10.1192/bjp.bp.106.034223 [PubMed: 18174509]
30. Samarakkody D, Fernando D, McClure R, Perera H, De Silva H (2012) Prevalence of externalizing behavior problems in Sri Lankan preschool children: birth, childhood, and sociodemographic risk factors. *Soc Psychiatry Psychiatr Epidemiol* 47 (5):757–762. doi:10.1007/s00127-011-0377-5 [PubMed: 21476011]
31. Khan NZ, Ferdous S, Islam R, Sultana A, Durkin M, McConachie H (2009) Behaviour Problems in Young Children in Rural Bangladesh. *Journal of Tropical Pediatrics* 55 (3):177–182. doi:10.1093/tropej/fmn108 [PubMed: 19066172]
32. Mullick MSI, Goodman R (2005) The prevalence of psychiatric disorders among 5–10 year olds in rural, urban and slum areas in Bangladesh. *Soc Psychiatry Psychiatr Epidemiol* 40 (8):663–671. doi:10.1007/s00127-005-0939-5 [PubMed: 16091858]
33. Hossain MD, Ahmed HU, Chowdhury WA, Niessen LW, Alam DS (2014) Mental disorders in Bangladesh: a systematic review. *BMC Psychiatry* 14. doi:10.1186/s12888-014-0216-9
34. Syed EU, Hussein SA, Mahmud S (2007) Screening for emotional and behavioural problems amongst 5–11-year-old school children in Karachi, Pakistan. *Soc Psychiatry Psychiatr Epidemiol* 42 (5):421–427. doi:10.1007/s00127-007-0188-x [PubMed: 17450455]
35. Syed EU, Hussein SA, Haidry SEZ (2009) Prevalence of emotional and behavioural problems among primary school children in Karachi, Pakistan - multi informant survey. *Indian J Pediatr* 76 (6):623–627. doi:10.1007/s12098-009-0072-7 [PubMed: 19390811]
36. Lassi ZS, Mahmud S, Syed EU, Janjua NZ (2011) Behavioral problems among children living in orphanage facilities of Karachi, Pakistan: comparison of children in an SOS Village with those in conventional orphanages. *Soc Psychiatry Psychiatr Epidemiol* 46 (8):787–796. doi:10.1007/s00127-010-0248-5 [PubMed: 20571756]
37. Imran N, Sattar A, Amjad N, Bhatti MR (2009) PSYCHOLOGICAL PROBLEMS IN CHILDREN OF PARENTS WITH MENTAL ILLNESS: A COMPARATIVE STUDY FROM LAHORE, PAKISTAN. *Pak J Med Sci* 25 (6):895–900

38. Rahman A, Malik A, Sikander S, Roberts C, Creed F (2008) Cognitive behaviour therapy-based intervention by community health workers for mothers with depression and their infants in rural Pakistan: a cluster-randomised controlled trial. *Lancet* 372 (9642):902–909 [PubMed: 18790313]
39. Maselko J, Sikander S, Bhalotra S, Bangash O, Ganga N, Mukherjee S, Egger H, Franz L, Bibi A, Liaqat R, Kanwal M, Abbasi T, Noor M, Ameen N, Rahman A (2015) Impact of an Early Perinatal Depression Intervention on Longer-term Child Development Outcomes. *Lancet Psychiatry* (in press)
40. Lakes KD, Vargas D, Riggs M, Schmidt J, Baird M (2011) Parenting Intervention to Reduce Attention and Behavior Difficulties in Preschoolers: A CUIDAR Evaluation Study. *J Child Fam Stud* 20 (5):648–659. doi:10.1007/s10826-010-9440-1 [PubMed: 22003279]
41. Vostanis P (2006) Strengths and Difficulties Questionnaire: research and clinical applications. *Current Opinion in Psychiatry* 19 (4):367–372. doi:10.1097/01.yco.0000228755.72366.05 [PubMed: 16721165]
42. Goodman R (1997) The strengths and difficulties questionnaire: A research note. *Journal of Child Psychology and Psychiatry and Allied Disciplines* 38 (5):581–586
43. Syed EU (2007) Comparing the Urdu version of Strengths and Difficulties Questionnaire (SDQ) and the Child Behavior Checklist (CBCL) in a sample of 5–11 year old school children in Karachi, Pakistan. *Journal of the Pakistan Psychiatric Society* 4 (1):15–18
44. Samad L, Hollis C, Prince M, Goodman R (2005) Child and adolescent psychopathology in a developing country: testing the validity of the Strengths and Difficulties Questionnaire (Urdu version). *International Journal of Methods in Psychiatric Research* 14 (3):158–166. doi:10.1002/mpr.3 [PubMed: 16389892]
45. First MB, Spitzer RL, Gibbon M, Williams JB (2002) Structured Clinical Interview for DSM-IV-TR Axis I Disorders, Research Version, Non-patient Edition. (SCID-I/NP) Biometrics Research, New York Psychiatric Institute, New York
46. Gorman LL, O'Hara MW, Figueiredo B, Hayes S, Jacquemain F, Kammerer MH, Klier CM, Rosi S, Seneviratne G, Sutter-Dallay AL, Grp T-P (2004) Adaptation of the Structured Clinical Interview for DSM-IV Disorders for assessing depression in women during pregnancy and post-partum across countries and cultures. *Br J Psychiatry* 184:S17–S23. doi:10.1192/bjp.184.46.s17
47. SDQ W (2012) SDQ Normative Data <http://www.sdqinfo.org/g0.html>. Youth in Mind. <http://www.sdqinfo.org/g0.html>. Accessed Nov 28, 20122012
48. Bourdon KH, Goodman R, Rae DS, Simpson G, Koretz DS (2005) The strengths and difficulties questionnaire: US normative data and psychometric properties. *J Am Acad Child Adolesc Psychiatry* 44 (6):557–564. doi:10.1097/01.chi.0000159157.57075.c8 [PubMed: 15908838]
49. Goodman A, Heiervang E, Fleitlich-Bilyk B, Alyahri A, Patel V, Mullick MSI, Slobodskaya H, dos Santos DN, Goodman R (2012) Cross-national differences in questionnaires do not necessarily reflect comparable differences in disorder prevalence. *Soc Psychiatry Psychiatr Epidemiol* 47 (8): 1321–1331. doi:10.1007/s00127-011-0440-2 [PubMed: 22033632]
50. Niclasen J, Teasdale TW, Andersen AMN, Skovgaard AM, Elberling H, Obel C (2012) Psychometric Properties of the Danish Strength and Difficulties Questionnaire: The SDQ Assessed for More than 70,000 Raters in Four Different Cohorts. *Plos One* 7 (2). doi:10.1371/journal.pone.0032025
51. Shibata Y, Okada K, Fukumoto R, Nomura K (2015) Psychometric properties of the parent and teacher forms of the Japanese version of the Strengths and Difficulties Questionnaire. *Brain Dev* 37 (5):501–507. doi:10.1016/j.braindev.2014.08.001 [PubMed: 25172302]
52. Sagatun A, Lien L, Sogaard AJ, Bjertness E, Heyerdahl S (2008) Ethnic Norwegian and ethnic minority adolescents in Oslo, Norway. *Soc Psychiatry Psychiatr Epidemiol* 43 (2):87–95. doi: 10.1007/s00127-007-0275-z [PubMed: 17994176]
53. Klein AM, Otto Y, Fuchs S, Reibiger I, von Klitzing K (2015) A prospective study of behavioral and emotional symptoms in preschoolers. *Eur Child Adolesc Psych* 24 (3):291–299. doi:10.1007/s00787-014-0575-2
54. Liu SK, Chien YL, Shang CY, Lin CH, Liu YC, Gau SSF (2013) Psychometric properties of the Chinese version of Strength and Difficulties Questionnaire. *Compr Psychiat* 54 (6):720–730. doi: 10.1016/j.comppsy.2013.01.002 [PubMed: 23433222]

55. Muris P, Meesters C, Eijkelenboom A, Vincken M (2004) The self-report version of the Strengths and Difficulties Questionnaire: Its psychometric properties in 8- to 13-year-old non-clinical children. *Br J Clin Psychol* 43:437–448. doi:10.1348/0144665042388982 [PubMed: 15530213]
56. Piccinelli M, Wilkinson G (2000) Gender differences in depression - Critical review. *Br J Psychiatry* 177:486–492 [PubMed: 11102321]
57. Kendler KS, Gardner CO (2014) Sex Differences in the Pathways to Major Depression: A Study of Opposite-Sex Twin Pairs. *Am J Psychiatry* 171 (4):426–435. doi:10.1176/appi.ajp.2013.13101375 [PubMed: 24525762]
58. Cents RAM, Diamantopoulou S, Hudziak JJ, Jaddoe VWV, Hofman A, Verhulst FC, Lambregtse-van den Berg MP, Tiemeier H (2013) Trajectories of maternal depressive symptoms predict child problem behaviour: The Generation R Study. *Psychol Med* 43 (1):13–25. doi:10.1017/s0033291712000657 [PubMed: 22490169]
59. Niclasen J, Andersen AMN, Teasdale TW, Strandberg-Larsen K (2014) Prenatal exposure to alcohol, and gender differences on child mental health at age seven years. *J Epidemiol Community Health* 68 (3):224–232. doi:10.1136/jech-2013-202956 [PubMed: 24218073]
60. Fujiwara T, Kato N, Sanders MR (2011) Effectiveness of Group Positive Parenting Program (Triple P) in Changing Child Behavior, Parenting Style, and Parental Adjustment: An Intervention Study in Japan. *J Child Fam Stud* 20 (6):804–813. doi:10.1007/s10826-011-9448-1
61. Usami M, Iwaware Y, Watanabe K, Kodaira M, Ushijima H, Tanaka T, Harada M, Tanaka H, Sasaki Y, Okamoto S, Sekine K, Saito K (2014) Prosocial Behaviors during School Activities among Child Survivors after the 2011 Earthquake and Tsunami in Japan: A Retrospective Observational Study. *Plos One* 9 (11). doi:10.1371/journal.pone.0113709
62. Ashman SB, Dawson G, Panagiotides H (2008) Trajectories of maternal depression over 7 years: Relations with child psychophysiology and behavior and role of contextual risks. *Dev Psychopathol* 20 (1):55–77. doi:10.1017/s0954579408000035 [PubMed: 18211728]
63. Bureau JF, Easterbrooks MA, Lyons-Ruth K (2009) Maternal depressive symptoms in infancy: Unique contribution to children's depressive symptoms in childhood and adolescence? *Dev Psychopathol* 21 (2):519–537. doi:10.1017/s0954579409000285 [PubMed: 19338696]
64. Waters CS, Hay DF, Simmonds JR, van Goozen SHM (2014) Antenatal depression and children's developmental outcomes: potential mechanisms and treatment options. *Eur Child Adolesc Psych* 23 (10):957–971. doi:10.1007/s00787-014-0582-3
65. Betts KS, Williams GM, Najman JM, Alati R (2015) THE RELATIONSHIP BETWEEN MATERNAL DEPRESSIVE, ANXIOUS, AND STRESS SYMPTOMS DURING PREGNANCY AND ADULT OFFSPRING BEHAVIORAL AND EMOTIONAL PROBLEMS. *Depression and Anxiety* 32 (2):82–90. doi:10.1002/da.22272 [PubMed: 24788841]
66. Korhonen M, Luoma I, Salmelin R, Tamminen T (2014) Maternal depressive symptoms: Associations with adolescents' internalizing and externalizing problems and social competence. *Nord J Psychiatr* 68 (5):323–332. doi:10.3109/08039488.2013.838804
67. Rutter M (2012) Resilience as a dynamic concept. *Dev Psychopathol* 24 (2):335–344. doi:10.1017/s0954579412000028 [PubMed: 22559117]
68. Van den Bergh BRH, Mulder EJH, Mennes M, Glover V (2005) Antenatal maternal anxiety and stress and the neurobehavioural development of the fetus and child: links and possible mechanisms. A review. *Neurosci Biobehav Rev* 29 (2):237–258. doi:10.1016/j.neubiorev.2004.10.007 [PubMed: 15811496]
69. Van den Bergh BRH, Marcoen A (2004) High antenatal maternal anxiety is related to ADHD symptoms, externalizing problems, and anxiety in 8-and 9-year-olds. *Child Dev* 75 (4):1085–1097. doi:10.1111/j.1467-8624.2004.00727.x [PubMed: 15260866]
70. Barker ED, Jaffee SR, Uher R, Maughan B (2011) THE CONTRIBUTION OF PRENATAL AND POSTNATAL MATERNAL ANXIETY AND DEPRESSION TO CHILD MALADJUSTMENT. *Depression and Anxiety* 28 (8):696–702. doi:10.1002/da.20856 [PubMed: 21769997]
71. Davis EP, Sandman CA (2012) Prenatal psychobiological predictors of anxiety risk in preadolescent children. *Psychoneuroendocrinology* 37 (8):1224–1233. doi:10.1016/j.psyneuen.2011.12.016 [PubMed: 22265195]

72. Goodman A, Heiervang E, Fleitlich-Bilyk B, Alyahri A, Patel V, Mullick MS, Slobodskaya H, Dos Santos DN, Goodman R (2012) Cross-national differences in questionnaires do not necessarily reflect comparable differences in disorder prevalence. *Social psychiatry and psychiatric epidemiology* 47 (8):1321–1331. doi:10.1007/s00127-011-0440-2 [PubMed: 22033632]
73. Maoz H, Goldstein T, Goldstein BI, Axelson DA, Fan JY, Hickey MB, Monk K, Sakolsky D, Diler RS, Brent D, Kupfer DJ, Birmaher B (2014) The Effects of Parental Mood on Reports of Their Children's Psychopathology. *J Am Acad Child Adolesc Psychiatry* 53 (10):1111–1122. doi: 10.1016/j.jaac.2014.07.005 [PubMed: 25245355]
74. Boyle MH, Pickles AR (1997) Influence of maternal depressive symptoms on ratings of childhood behavior. *J Abnorm Child Psychol* 25 (5):399–412. doi:10.1023/a:1025737124888 [PubMed: 9421748]

Table 1:

Characteristics of Population Sample (unweighted numbers and weighted percentages and means)

	Overall Sample	
	<u>unweighted n/N or mean*</u>	<u>Weighted % or mean*</u>
Female Gender	436/885	47.6%
Age (mean)	7.57 (SD: 0.12)	7.57 (SD: 0.11)
School Attendance:		
Kindergarten	66/885	8.00%
First Grade	182/885	19.20%
Second Grade	385/885	41.10%
Third Grade	244/885	31.00%
Not in School	8/885	0.80%
Family Structure:		
Nuclear	403/885	42.2%
Joint / Extended & Multiple Households	482/885	57.8%
Mother's Age (mean)	34.51 (SD: 5.74)	34.2 (SD: 5.40)
Mother's Education:		
None	323/885	32.60%
1 to 5	259/885	26.80%
6 to 10	255/885	31.90%
11 or more	48/885	8.70%
No. of siblings:		
Less than 3	307/885	38.15%
3 or more	578/885	61.53%
SES of household:		
Richest & Rich	62/885	9.1%
Moderate	453/885	51.5%
Poor & Poorest	370/885	39.4%
Mother's current depression status:		
Not Depressed	693/885	85.1%
Depressed	192/885	14.9%
Mother's Prenatal depression status:		
Not Depressed	300/885	75.8%
Depressed	585/885	24.2%
Overlap in Mother's Depression Status:		
Never Depressed	267/885	67.43%
Depressed prenatally but not currently	426/885	17.65%
Depressed currently but not prenatally	33/885	8.33%
Depressed both prenatally and currently	159/885	6.59%

* n/N represents the number of individuals in a particular group out of the number in the study sample; Population weighted % or mean incorporates sampling weights so that values are representative of entire study area population

Table 2 - SDQ Total Difficulties and Component Scores By Demographic Characteristics and Maternal Depression History*

	SDQ Total Difficulties		Conduct Problems		Emotional Problems		Hyperactivity		Peer Problems		Pro-Social	
	Mean (SD)	p-value difference	Mean (SD)	p-value difference	Mean (SD)	p-value difference	Mean (SD)	p-value difference	Mean (SD)	p-value difference	Mean (SD)	p-value difference
Overall Sample	10.59 (5.11)	na	3.25 (2.04)	na	1.92 (1.82)	na	3.47 (2.60)	na	1.95 (1.51)	na	7.61 (2.48)	na
Gender:												
Male	11.03 (5.1)	0.05	3.49 (2.01)	<0.01	1.67 (1.67)	<0.01	3.90 (2.77)	<0.001	1.97 (1.44)	0.88	7.41 (2.58)	0.07
Female	10.12 (5.0)		2.98 (2.04)		2.19 (1.95)		3.00 (2.29)		1.94 (1.58)		7.82 (2.33)	
Family Structure:												
Nuclear	11.17 (5.45)	0.05	3.24 (2.2)	0.96	2.03 (1.97)	0.25	3.8 (2.81)	0.02	2.1 (1.65)	0.04	7.56 (2.54)	0.79
Joint / Extended & Multiple Households	10.17 (4.82)		3.25 (1.93)		1.84 (1.71)		3.23 (2.42)		1.85 (1.4)		7.64 (2.43)	
Mother's Education:												
none	10.7 (5.52)	0.68	3.23 (2.17)	0.58	2.14 (2.05)	0.18	3.34 (2.59)	0.56	1.99 (1.71)	0.37	7.6 (2.67)	0.5
1 to 5	10.82 (5.12)		3.42 (1.98)		1.82 (1.84)		3.55 (2.71)		2.03 (1.5)		7.42 (2.76)	
6 to 10	10.53 (4.78)		3.12 (2)		1.91 (1.72)		3.58 (2.57)		1.92 (1.43)		7.69 (2.3)	
11 or more	9.67 (4.35)		3.22 (1.71)		1.45 (1.15)		3.3 (2.13)		1.7 (0.96)		7.9 (1.5)	
No. of siblings of index child:												
Less than 3	10.44 (4.75)	0.61	3.04 (1.79)	0.11	1.79 (1.67)	0.26	3.71 (2.67)	0.13	1.91 (1.39)	0.59	7.84 (2.25)	0.14
3 or more	10.68 (5.33)		3.38 (2.19)		2.00 (1.91)		3.32 (2.52)		1.99 (1.58)		7.46 (2.61)	
SES Rating by LHW:												
Richest & Rich	9.15 (4.57)	0.05	3.00 (1.66)	0.21	1.16 (1.36)	<0.01	3.29 (2.42)	0.28	1.70 (1.20)	0.38	8.32 (1.51)	<0.01
Moderate	10.25 (4.76)		3.11 (2.02)		1.87 (1.83)		3.34 (2.58)		1.93 (1.45)		7.92 (2.32)	
Poor & Poorest	11.37 (5.55)		3.48 (2.14)		2.16 (1.86)		3.68 (2.64)		2.05 (1.65)		7.03 (2.77)	
Current maternal depression status:												
Not Depressed	10.36 (4.82)	0.02	3.23 (1.98)	0.54	1.80 (1.70)	<0.001	3.40 (2.44)	0.18	1.93 (1.43)	0.28	7.60 (2.37)	0.96
Depressed	11.92 (6.52)		3.35 (2.28)		2.64 (2.33)		3.84 (3.46)		2.10 (1.90)		7.62 (3.03)	
Prenatal depression status:												
Not Depressed	10.35 (3.37)	<0.01	3.23 (1.36)	0.55	1.76 (1.14)	<0.001	3.42 (1.75)	0.23	1.94 (0.99)	0.63	7.61 (1.65)	0.91

	SDQ Total Difficulties		Conduct Problems		Emotional Problems		Hyperactivity		Peer Problems		Pro-Social	
	Mean (SD)	p-value difference	Mean (SD)	p-value difference	Mean (SD)	p-value difference	Mean (SD)	p-value difference	Mean (SD)	p-value difference	Mean (SD)	p-value difference
Depressed	11.34 (8.71)		3.30 (3.40)		2.42 (3.41)		3.62 (4.20)		1.99 (2.64)		7.59 (4.12)	
Overlap in Depression Status:												
Never Depressed	10.24 (3.34)	<0.01	3.25 (1.39)	0.06	1.67 (1.13)	<0.001	3.4 (1.71)	0.06	1.92 (0.98)	0.68	7.57 (1.66)	0.16
Depressed pre-natally but not currently	10.79 (8.4)		3.14 (3.33)		2.27 (3.26)		3.42 (4.08)		1.96 (2.64)		7.75 (3.98)	
Depressed currently but not pre-natally	11.21 (3.51)		3.03 (1.09)		2.48 (1.09)		3.58 (2)		2.12 (1.04)		7.97 (1.56)	
Depressed both pre-natally and currently	12.81 (9.05)		3.75 (3.49)		2.82 (3.69)		4.16 (4.39)		2.07 (2.65)		7.17 (4.4)	

* based on weighted statistics

Table 3 -

SDQ Total Difficulties and Component Normal/borderline/abnormal groups By Demographic Characteristics and Maternal Depression History*

	SDQ Total Difficulties			Conduct Problems			Emotional Problems			Hyperactivity			Peer Problems		
	% normal	% borderline	% abnormal	% normal	% borderline	% abnormal	% normal	% borderline	% abnormal	% normal	% borderline	% abnormal	% normal	% borderline	% abnormal
Overall Sample	70.49%	17.07%	12.44%	41.63%	17.20%	41.17%	81.42%	9.43%	9.15%	75.81%	10.65%	13.54%	69.85%	13.08%	17.06%
Gender:															
Male	68.39%	16.17%	15.43%	37.39%	15.54%	47.07%	85.31%	8.64%	6.05%	68.06%	12.09%	19.86%	71.34%	12.41%	16.25%
Female	72.80%	18.05%	9.15%	46.30%	19.03%	34.68%	77.14%	10.30%	12.57%	84.33%	9.07%	6.60%	68.23%	13.83%	17.95%
Family Structure:															
Nuclear	66.07%	19.25%	14.68%	42.05%	18.18%	39.77%	79.21%	9.91%	10.88%	72.20%	11.51%	16.29%	75.30%	12.48%	12.22%
Joint / Extended & Multiple Households	73.72%	15.47%	10.80%	41.33%	16.48%	42.19%	83.04%	9.08%	7.89%	78.44%	10.02%	11.54%	72.13%	13.57%	14.30%
Maternal Education:															
none	71.88%	14.26%	13.86%	42.52%	16.72%	40.76%	74.97%	13.86%	14.41%	80.36%	8.48%	11.17%	73.28%	7.57%	19.15%
1 to 5	68.09%	21.45%	10.46%	38.04%	16.28%	45.67%	83.93%	10.46%	6.25%	74.95%	9.23%	15.82%	63.69%	18.79%	17.52%
6 to 10	71.30%	16.85%	11.84%	43.28%	17.91%	38.81%	84.10%	7.09%	8.81%	71.84%	14.61%	13.56%	69.33%	13.96%	16.71%
11 or more	69.70%	14.91%	15.39%	43.28%	19.22%	37.50%	87.97%	9.14%	2.89%	75.95%	8.66%	15.39%	77.89%	12.97%	9.14%
No. of siblings of index child:															
Less than 3	72.75%	17.13%	10.12%	42.10%	20.85%	37.05%	10.12%	83.79%	8.72%	71.43%	11.56%	17.01%	70.66%	13.85%	15.49%
3 or more	69.08%	17.03%	13.89%	41.34%	14.92%	43.74%	13.89%	79.94%	9.87%	78.54%	10.08%	11.37%	69.35%	12.61%	18.04%
SES Rating by LHW:															
Richest & Rich	78.78%	3.68%	17.54%	48.34%	20.76%	30.89%	17.54%	90.32%	3.23%	74.19%	13.36%	12.45%	75.10%	10.13%	14.77%
Moderate	74.19%	17.68%	8.12%	44.79%	16.37%	38.84%	8.12%	82.35%	8.71%	78.18%	9.12%	12.70%	71.59%	11.56%	16.85%
Poor & Poorest	63.74%	19.36%	16.90%	35.96%	17.46%	46.58%	16.90%	78.13%	11.80%	73.07%	12.02%	14.90%	66.38%	15.76%	17.87%
Current maternal depression status:															
Not Depressed	71.94%	17.27%	10.79%	42.20%	17.42%	40.39%	10.79%	82.72%	9.36%	76.92%	10.65%	12.43%	70.56%	12.38%	17.06%
Depressed	62.22%	15.93%	21.84%	38.41%	15.96%	45.63%	21.84%	73.99%	9.82%	69.47%	10.63%	19.90%	65.81%	17.12%	17.07%
Prenatal depression status:															
Not Depressed	71.33%	17.33%	11.33%	41.33%	18%	40.67%	11.33%	84.33%	9.00%	75.67%	10.67%	13.67%	70.00%	13.33%	16.67%
Depressed	67.86%	16.24%	15.90%	42.56%	14.70%	42.74%	15.90%	72.31%	10.77%	76.24%	10.60%	13.16%	69.40%	12.31%	18.29%

	SDQ Total Difficulties			Conduct Problems			Emotional Problems			Hyperactivity			Peer Problems		
	% normal	% borderline	% abnormal	% normal	% borderline	% abnormal	% normal	% borderline	% abnormal	% normal	% borderline	% abnormal	% normal	% borderline	% abnormal
Overlap in Depression Status:															
Never Depressed	71.91%	17.98%	10.11%	41.20%	18.35%	40.45%	85.02%	8.61%	6.37%	76.40%	10.86%	12.73%	70.79%	12.36%	16.85%
Depressed pre-natally but not currently	72.07%	14.55%	13.38%	46.01%	13.85%	40.14%	73.94%	12.21%	13.85%	78.87%	9.86%	11.27%	69.72%	12.44%	17.84%
Depressed currently but not pre-natally	66.67%	12.12%	21.21%	42.42%	15.15%	42.42%	78.79%	12.12%	9.09%	69.70%	9.09%	21.21%	63.64%	21.21%	15.15%
Depressed both pre-natally and currently	56.60%	20.75%	22.64%	33.33%	16.98%	49.69%	67.92%	6.92%	25.16%	69.18%	12.58%	18.24%	68.55%	11.95%	19.50%

* based on weighted statistics

Table 4:

Multivariate Models of Maternal Depression History and SDQ Scores *

	TD		Conduct Problems		Emotional Problems		Hyperactivity		Peer Problems		Pro social score								
	beta	se	P- value	beta	se	P- value	beta	se	P- value	beta	se	P- value							
Depression:																			
never depressed	ref		ref	ref	ref	ref	ref	ref	ref	ref	ref	ref							
only depressed prenatally	0.59	0.32	0.07	-0.04	0.15	0.77	0.53	0.14	0.00	0.03	0.18	0.87	0.11	0.53	0.14	0.19	0.46		
only depressed currently	1.04	0.72	0.15	-0.20	0.23	0.39	0.91	0.28	0.00	0.11	0.43	0.79	0.22	0.28	0.44	0.48	0.40	0.23	
depressed at both times	2.87	0.60	0.00	0.65	0.24	0.01	1.13	0.25	0.00	0.85	0.27	0.00	0.24	0.15	0.11	-0.11	0.30	0.71	
Child female gender	-1.03	0.42	0.02	-0.54	0.17	0.00	0.51	0.16	0.00	-0.97	0.21	0.00	-0.03	0.14	0.84	0.46	0.17	0.01	
Family Structure:																			
Joint / Extended & Multiple Households	ref		ref	ref	ref	ref	ref	ref	ref	ref	ref	ref	ref	ref	ref	ref	ref	ref	ref
Nuclear	0.75	0.41	0.07	-0.06	0.19	0.75	0.09	0.15	0.55	0.46	0.19	0.02	0.26	0.11	0.02	0.06	0.20	0.77	
SES Rating by LHW:																			
Poor & Poorest	ref		ref	ref	ref	ref	ref	ref	ref	ref	ref	ref	ref	ref	ref	ref	ref	ref	ref
Moderate	-0.85	0.46	0.07	-0.25	0.17	0.15	0.01	0.16	0.97	-0.41	0.23	0.09	-0.20	0.15	0.20	0.38	0.27	0.17	
Richest & Rich	-1.68	0.75	0.03	-0.47	0.29	0.11	-0.35	0.29	0.23	-0.30	0.37	0.42	-0.56	0.25	0.03	0.30	0.34	0.38	

* models additionally adjust for clustering, sample weights, interviewer, maternal age and maternal education.