

LONDON
SCHOOL of
HYGIENE
& TROPICAL
MEDICINE



Patel, V; Rahman, A; Jacob, KS; Hughes, M (2004) Effect of maternal mental health on infant growth in low income countries: new evidence from South Asia. *BMJ*, 328 (7443). p. 820. ISSN 1468-5833
DOI: <https://doi.org/10.1136/bmj.328.7443.820>

Downloaded from: <http://researchonline.lshtm.ac.uk/14839/>

DOI: [10.1136/bmj.328.7443.820](https://doi.org/10.1136/bmj.328.7443.820)

Usage Guidelines

Please refer to usage guidelines at <http://researchonline.lshtm.ac.uk/policies.html> or alternatively contact researchonline@lshtm.ac.uk.

Available under license: <http://creativecommons.org/licenses/by-nc-nd/2.5/>

Effect of maternal mental health on infant growth in low income countries: new evidence from South Asia

Vikram Patel, Atif Rahman, K S Jacob, Marcus Hughes

Impaired infant growth, a major problem in South Asia, may require interventions to improve maternal mental health in addition to current interventions targeting infant nutrition

London School of Hygiene and Tropical Medicine, and Sangath, Goa, India

Vikram Patel
chair
School of Psychiatry and Behavioural Sciences, University of Manchester

Atif Rahman
research fellow
Christian Medical College, Vellore 632002, India

K S Jacob
professor of psychiatry
Institute of Psychiatry, London

Marcus Hughes
research fellow

Correspondence to: V Patel, Sangath, 841/1 Alto Porvorim, Goa, India 403521
vikpat_goa@sancharnet.in

BMJ 2004;328:820-3

Unicef estimates that over 220 million children aged less than 5 years in the developing world have significantly impaired growth.¹ The South Asian region is perhaps worst affected, being home to more than half of all the underweight children in the world.² This article considers the relevance of new evidence on the epidemiology and impact of postnatal depression in South Asia on poor infant growth in low income countries. This evidence shows, for the first time, that a common and potentially treatable mental health problem in mothers is one of the causes of infant failure to thrive. We use this evidence to present a case that child focused interventions, largely aiming to provide supplementary nutrition, may need to be combined with mother focused interventions that target maternal mental health.

Prevalence and risk factors for postnatal depression

Postnatal depression is depressive disorder occurring in the postnatal period and is typically diagnosed about 4-12 weeks after childbirth (see box).

Several recent studies from South Asia have documented substantial rates of postnatal depression.³⁻⁶ Patel et al's cohort study of women attending a district hospital antenatal clinic in Goa, India, reported a prevalence of 23%.⁴ Chandran et al's community cohort study from Tamil Nadu, India, documented prevalence and incidence of 19.8% and 11%, respectively.³ Rahman et al's community cohort study from Pakistan reported a prevalence of 28%.⁶ These studies also showed that depressed mothers had significantly higher levels of disability, and that more than half remained ill for at least six months.

Consistent risk factors for postnatal depression were antenatal psychiatric morbidity, economic deprivation, low education, and marital disharmony. Educa-

tion, support from extended family members, and employment were protective factors. While most of these risk factors have also been demonstrated in developed countries,⁷ the three South Asian studies have also shown the importance of the sex of the newborn infant as a determinant of postnatal depression. The preference for male children is deeply rooted in South Asia. Women are often blamed for the birth of girls, especially if the woman already has a girl child. Such bias and the limited ability of women to control their reproductive health can make pregnancy and the birth of a daughter extremely stressful, contributing to the risk of postnatal depression.

Link between postnatal depression and infant growth

Providing continuous care and attention of children is a demanding task, and poor mental health in mothers might be expected to have adverse consequences on their children's health and development. Several studies in wealthy countries provide compelling evidence that postnatal depression is associated with long term emotional, cognitive, and behavioural problems in children.⁸ The impact on physical development of children has, however, received less attention. In low income countries, maternal competence in child care is likely to have a greater role in a child's physical well-being and survival, especially in the first year of life, as the environment is often more hostile than in wealthy countries. Poverty, overcrowding, and poor sanitation are common, with suboptimal maternal care potentially resulting in a greater risk to a child's physical



Postnatal depression among mothers in low income countries can substantially impair children's growth and development

Diagnostic criteria for postnatal depression (ICD-10)

At least two of the following features must be present for at least two weeks:

- A depressed mood for most of the day
- Loss of interest or pleasure in activities that are normally pleasurable, such as playing with the baby
- Tiredness, decreased energy, and fatigue

Additionally, any four of the following should be present:

- Loss of confidence and self esteem
- Feelings of guilt and blaming oneself
- Recurrent thoughts of suicide or death, including that of the child
- Difficulty in concentration
- Agitation or lethargy
- Sleep disturbance
- Appetite disturbance

Studies from South Asia examining association between maternal mental health and child growth

Study	Study type and location	Subjects	Measure of maternal depression	Child weight outcome	Association of maternal depression (95% CI)
Patel et al 2003 ¹⁰	Hospital based cohort, Goa, India	171 infants, 22% with depressed mothers	EPDS	<5th centile of weight for age	Risk ratio 2.3 (1.1 to 4.7)
Anoop et al ¹¹	Community based case-control, Vellore, Tamil Nadu, India	72 cases, 72 controls	SCID	50-80% v >80% of expected weight for age	Odds ratio 7.4 (1.6 to 38.5)
Rahman et al 2004 ¹²	Clinic based case-control, Rawalpindi, Pakistan	82 cases, 90 controls	SRQ-20	<3rd centile v >10th centile of weight for age	Odds ratio 3.9 (1.9 to 7.8)

EPDS=Edinburgh postnatal depression scale. SCID=structured clinical interview for DSM-IV. SRQ-20=self reporting questionnaire.

health.⁹ Three recent studies have provided new evidence of this (table).

In a cohort study of babies born in a district general hospital in Goa, India, babies who were under the fifth centile for weight at 6 months were 2.3 times more likely to have a mother who was postnatally depressed at six weeks ($P < 0.01$). This association remained significant after adjustment for variables such as birth weight, infant physical health, paternal and maternal education, and breast feeding practices.¹⁰ In a community based case-control study of risk factors for malnutrition in children aged 6-12 months in Tamil Nadu, India, the odds ratio for postnatal depression was 7.4 ($P = 0.01$). This association remained significant after adjustment for maternal intelligence, birth weight, breast feeding, immunisation, and economic status.¹¹ In an immunisation clinic based case-control study of undernutrition (below third centile of weight for age) in infants aged 9 months from Rawalpindi, Pakistan, the odds ratio for high levels of maternal mental distress was 3.9 ($P < 0.01$). The association remained significant after adjustment for birth weight, economic status, maternal age and literacy, infant's sex, and family structure.¹²

Mechanisms linking postnatal depression and failure to thrive

Several possible mechanisms could link maternal depression with their young children's failure to thrive.⁹ The first is through the risks that antepartum depression, a common precursor to postnatal depression, could pose to the unborn infant. Studies suggest that depressed mood during pregnancy is associated with poor attendance at antenatal clinics, low birth weight, and preterm delivery.^{13 14} In wealthy countries it has been shown that depressed women are more likely than non-depressed women to obtain inadequate antenatal care and have increased rates of premature births and lower birth weight infants.¹⁵ In low income countries, where antenatal care is more difficult to access, depression in mothers could influence the level of care received, increasing the incidence of low birth weight, and subsequent infant morbidity and mortality. Depression is also associated with risk taking behaviours such as smoking and unhealthy eating, which could further increase the risks to the fetus.¹⁶

The second set of mechanisms involves the direct impact that depressive symptoms have on the emotional quality of parenting. In developed countries, depressed mothers have been seen to provide less quantity and poorer quality of stimulation for their infants¹⁷ and to be slower in responding and less responsive to them.¹⁸ Depressed mothers are also more likely to have negative views of themselves as parents,

seeing themselves as having less personal control over their child's development, and less able to influence their children positively.¹⁹ Similar findings have been reported in a disadvantaged South African community, where maternal sensitivity in engagement with the infant was found to be significantly poorer in depressed women than non-depressed women.²⁰ Recent evidence from Jamaica suggests that such maternal characteristics as depressed mood, poor parenting, low self esteem, and inability to provide a stimulating environment are associated with undernutrition in children aged 9-30 months.²¹ The emotional quality of parenting may therefore be an important mediator of the effect of postnatal depression on infant growth.

A third potential mechanism linking maternal depression to physical morbidity in children is through its links with negative life events and chronic psychosocial difficulties. Psychosocial adversity in infancy has been associated with poor growth, particularly stunting.²²

Implications for research and policy

Among the many health problems facing families rearing children in low income countries are two common conditions—postnatal depression and infant failure to thrive. Recent research from South Asia provides compelling evidence that failure to thrive is more common in infants whose mothers have postnatal depression. These findings add to the body of evidence indicating that both postnatal depression and failure to thrive may lead to further damaging effects on infants' development.²³⁻²⁵ The hope raised by the new evidence is that the epidemiological overlap might indicate an opportunity for improved intervention, by integrating a stronger psychosocial component into infant health initiatives, targeting mothers and key members of their families.

The prospect for improved interventions can be informed to some extent by the existing literature. Evidence from low income countries shows that postnatal depression can be detected with good sensitivity and specificity using a short screening questionnaire such as the Edinburgh postnatal depression scale.^{4 5} Recent randomised clinical trials from developing countries have shown the efficacy of antidepressants and group psychotherapy for non-puerperal depression.²⁶⁻²⁸ There are few studies of interventions specifically for postnatal depression in low income countries, though there is good evidence for affordable community based treatment for postnatal depression from wealthy countries.^{29 30} However, attempts to show the efficacy of a preventive intervention have so far either failed or been only partially successful.^{31 32}

Public health programmes on child development in low income countries are starting to focus on interventions that promote maternal mental health and appropriate parenting as a means to improve child outcomes. There is some evidence that support and counselling in the antenatal period improve maternal and child health outcomes: for example, a trial from Zambia showed that mothers who received such support took more action to solve infant health problems, an indirect measure of maternal empowerment and problem solving abilities.³³

“Women to women” programmes have increased maternal self esteem and empowerment in Peru.³⁴ A recent pilot study examined the effectiveness of a mother-infant intervention on maternal mental health in an indigent shanty town in South Africa.³⁵ The intervention, which was delivered by locally recruited community health workers, aimed to provide emotional support and to encourage mothers in sensitive responsive interactions with their infant. Preliminary evidence indicates that the intervention could improve mother-infant interaction and infant growth. A randomised controlled trial is currently in progress in Goa, India, to evaluate the effectiveness of community counselling in preventing maternal depression among high risk women; pilot studies have shown marked improvements in mental health status, and early evidence from the main trial suggests a high compliance rate with the intervention (Marcus Hughes, personal communication).

In view of the enormous scale of the problem of childhood failure to thrive in poor countries, and in South Asia in particular, it is evident that nutritional programmes will need to be strengthened to ensure that poor children and their mothers have access to an adequate diet. But, in addition to this, we propose that interventions for preventing and treating postnatal depression may be required, targeted according to known risk factors and delivered as part of a package of services provided during the antenatal and early postnatal period. Above all, the new evidence we have reviewed emphatically shows that maternal mental health is a critical, and previously ignored, factor in the association between social adversity and infant failure to thrive in low income countries.

We acknowledge the support of the Wellcome Trust and MacArthur Foundation for funding the research on maternal and child health in South Asia.

Contributors and sources: The authors are all psychiatrists, working in South Asia on the epidemiology and treatment of postnatal depression. This article was based on the findings of their independent studies, and supplemented by a review of the research on postnatal depression and child outcomes in developing countries.

Funding: VP and AR are supported by Wellcome Trust career development fellowships in clinical tropical medicine; MH is supported by a Wellcome Trust training fellowship in tropical clinical epidemiology.

Competing interests: None declared.

- 1 Unicef. Panel 3: Stunting linked to impaired intellectual development. In: *The state of the world's children 1998: focus on nutrition*. Oxford: Oxford University Press, 1998:16-9. (www.unicef.org/sowc98/panel3.htm, accessed 29 Oct 2003.)
- 2 Bhutta ZA. Why has so little changed in maternal and child health in South Asia. *BMJ* 2000;321:809-12.
- 3 Chandran M, Tharyan P, Muliylil J, Abraham S. Post-partum depression in a cohort of women from a rural area of Tamil Nadu, India. Incidence and risk factors. *Br J Psychiatry* 2002;181:499-504.

Summary points

Rates of childhood undernutrition are high in South Asia

Postnatal depression is a common cause of disability among mothers in south Asia

Antenatal psychiatric morbidity, economic difficulties, marital disharmony, and the sex of the newborn child are determinants of postnatal depression

Infants of mothers who are depressed show poorer growth outcomes than infants whose mothers are not depressed

Ongoing clinical trials will provide information on whether interventions targeted to the prevention or treatment of postnatal depression help improve infant growth outcomes

- 4 Patel V, Rodrigues M, De Souza N. Gender, poverty and post-natal depression: a cohort study from Goa, India. *Am J Psychiatry* 2002;159:43-7.
- 5 Regmi S, Sligl W, Carter D, Grut W, Seear M. A controlled study of post-partum depression among Nepalese women: validation of the Edinburgh postpartum depression scale in Kathmandu. *Trop Med Int Health* 2002;7:378-82.
- 6 Rahman A, Iqbal Z, Harrington R. Life events, social support and depression in childbirth: perspectives from a rural community in the developing world. *Psychol Med* 2003;33:1161-7.
- 7 O'Hara M, Swain A. Rates and risk of postpartum depression—a meta-analysis. *Int Rev Psychiatry* 1996;8:37-54.
- 8 Murray L, Cooper P. Effects of postnatal depression on infant development. *Arch Dis Child* 1997;77:99-101.
- 9 Rahman A, Harrington R, Bunn J. Can maternal depression increase infant risk of illness and growth impairment in developing countries? *Child Care Health Dev* 2002;28:51-6.
- 10 Patel V, De Souza N, Rodrigues M. Postnatal depression and infant growth and development in low-income countries: a cohort study from Goa, India. *Arch Dis Child* 2003;88:34-7.
- 11 Anoop S, Saravanan B, Joseph A, Cherian A, Jacob K. Maternal depression and low maternal intelligence as risk factors for malnutrition in children: a community based case-control study from South India. *Arch Dis Child* (in press).
- 12 Rahman A, Lovel H, Bunn J, Iqbal Z, Harrington R. Mothers' mental health and infant growth: a case-control study from Rawalpindi, Pakistan. *Child Care Health Dev* 2004;30:21-7.
- 13 Hedegaard M, Henriksen TB, Sabroe S, Secher NJ. Psychological distress in pregnancy and preterm delivery. *BMJ* 1993;307:234-9.
- 14 Pagel MD, Smilkstein G, Regen H, Montano D. Psychosocial influences on newborn outcomes: a controlled prospective study. *Soc Sci Med* 1990;30:597-604.
- 15 Copper RL, Goldenberg RL, Das A, Elder N, Swain M, Norman G, et al. The preterm prediction study: maternal stress is associated with spontaneous preterm birth at less than thirty-five weeks' gestation. *Am J Obstet Gynecol* 1996;175:1286-92.
- 16 Milberger S, Biederman J, Faraone SV, Chen L, Jones J. Is maternal smoking during pregnancy a risk factor for attention deficit hyperactivity disorder in children? *Am J Psychiatry* 1996;153:1138-42.
- 17 Bettes BA. Maternal depression and motherese: temporal and intonational features. *Child Dev* 1988;59:1089-96.
- 18 Livingood AB, Daen P, Smith BD. The depressed mother as a source of stimulation for her infant. *J Clin Psychol* 1983;39:369-75.
- 19 Kochanska G, Radke-Yarrow M, Kuczynski L, Friedman S. Normal and affectively ill mothers' beliefs about their children. *Am J Orthopsychiatry* 1987;57:345-50.
- 20 Cooper P, Tomlinson M, Swartz L, Woolgar M, Murray L, Molteno C. Post-partum depression and the mother-infant relationship in a South African peri-urban settlement. *Br J Psychiatry* 1999;175:554-8.
- 21 Baker-Henningham H, Powell C, Walker S, Grantham-McGregor S. Mothers of undernourished Jamaican children have poorer psychosocial functioning and this is associated with stimulation provided in the home. *Eur J Clin Nutr* 2003;57:786-92.
- 22 Montgomery SM, Bartley MJ, Wilkinson RG. Family conflict and slow growth. *Arch Dis Child* 1997;77:326-30.
- 23 Hay D, Pawlby S, Sharp D, Asten P, Mills A, Kumar R. Intellectual problems shown by 11-year old children whose mothers had postnatal depression. *J Child Psychol Psychiatry* 2001;42:871-89.
- 24 Wilensky DS, Ginsberg G, Altman M, Tulchinsky TH, Ben Yishay F, Auerbach J. A community based study of failure to thrive in Israel. *Arch Dis Child* 1996;75:145-8.

- 25 Wright CM. Identification and management of failure to thrive: a community perspective. *Arch Dis Child* 2000;82:5-9.
- 26 Patel V, Chisholm D, Rabe-Hesketh S, Dias-Saxena F, Andrew G, Mann A. The efficacy and cost-effectiveness of a drug and psychological treatment for common mental disorders in general health care in Goa, India: a randomised controlled trial. *Lancet* 2003;361:33-9.
- 27 Araya R, Rojas G, Fritsch R, Gaete J, Simon G, Peters TJ. Treating depression in primary care among low-income women in Santiago, Chile: a randomised controlled trial. *Lancet* 2003;361:995-1000.
- 28 Bolton P, Bass J, Neugebauer R, Verdelli H, Clougherty K, Wickramaratne P, et al. Group interpersonal psychotherapy for depression in rural Uganda. *JAMA* 2003;289:3117-24.
- 29 Holden JM, Sagovsky R, Cox J. Counselling in a general practice setting: controlled study of health visitor intervention in treatment of postnatal depression. *BMJ* 1989;298:223-6.
- 30 Wickberg B, Hwang CP. Counselling of postnatal depression: a controlled study on a population based Swedish sample. *J Affect Disord* 1996;39:209-16.
- 31 Brugha TS, Wheatley S, Taub NA, Culverwell A, Friedman T, Kirwan P, et al. Pragmatic randomized trial of antenatal intervention to prevent postnatal depression by reducing psychosocial risk factors. *Psychol Med* 2000;30:1273-81.
- 32 Elliott SA, Leverton TJ, Sanjack M, Turner H, Cowmeadow P, Hopkins J, et al. Promoting mental health after childbirth: a controlled trial of primary prevention of postnatal depression. *Br J Clin Psychol* 2000;39:223-41.
- 33 Ransjo-Arvidson AB, Chintu K, Ng'andu N, Eriksson B, Susu B, Christensson K, et al. Maternal and infant health problems after normal childbirth: a randomised controlled study in Zambia. *J Epidemiol Community Health* 1998;52:385-91.
- 34 Lanata C. Children' health in developing countries: issues of coping, child neglect and marginalization. In: Leon D, Walt G, eds. *Poverty, inequality and health*. Oxford: Oxford University Press, 2001:137-58.
- 35 Cooper P, Landman M, Tomlinson M, Molteno C, Swartz L, Murray L. The impact of a mother-infant intervention in an indigent peri-urban South African context: a pilot study. *Br J Psychiatry* 2002;180:76-81.

Role of gender in health disparity: the South Asian context

Fariyal F Fikree, Omrana Pasha

South Asia's girls and women do not have the same life advantage as their Western counterparts. A human rights based approach may help to overcome gender related barriers and improve the wellbeing of men, women, and children.

Introduction

Behaviour has an important role in health disparities—for example, young men take greater risks, causing injury and violent death, and men smoke more.¹ In industrialised countries women are born with an advantage; their healthy life expectancy is two years longer and their life expectancy six years longer than those of men.² This advantage is prominent in childhood; girls are more likely to survive the first five years of life than boys.² However, does this female advantage endure in parts of the world where gender discrimination exists? We present the case of South Asia to illustrate the role that gender has on health.

The role of gender in South Asia

From many perspectives women in South Asia find themselves in subordinate positions to men and are socially, culturally, and economically dependent on them.³ Women are largely excluded from making decisions, have limited access to and control over resources, are restricted in their mobility, and are often under threat of violence from male relatives.⁴ Sons are perceived to have economic, social, or religious utility; daughters are often felt to be an economic liability because of the dowry system.⁵

We believe that individual and societal beliefs about and attitudes towards appropriate gender specific roles, and the choices of individuals and households on the basis of these factors, mean that women are disadvantaged with regard to health and health care. There are some instances in which gender differences hurt men's health—for example, men are more likely to be involved in road crashes or occupational accidents as they are more likely to be outside the home or in a workplace than women. However, most of the evidence shows that gender inequalities have led to a systematic devaluing and neglect of women's health.

Summary points

The life advantage for girls and women that characterises the health statistics of industrialised countries is blurred in South Asia

Gender discrimination at each stage of the female life cycle contributes to health disparity, sex selective abortions, neglect of girl children, reproductive mortality, and poor access to health care for girls and women

The violation of fundamental human rights, and especially reproductive rights of women, plays an important part in perpetuating gender inequity

Policy makers, programme managers, health professionals, and human rights workers in South Asia need to be aware of and responsive to the detrimental health effects that gender plays throughout the life cycle

International Program Division, Population Council, 1 Dag Hammarskjold Plaza, New York 10017, USA

Fariyal F Fikree
program associate

Women's and Children's Center, Rollins School of Public Health, Emory University, 1518 Clifton Road, Atlanta, GA 30322, USA

Omrana Pasha
manager, research projects

Correspondence to: F F Fikree ffikree@popcouncil.org

BMJ 2004;328:823-6

Established gender norms and values contribute to the loss of the "female advantage" in South Asia. In contrast to industrialised countries, healthy life expectancy is equal or shorter in women than in men in nearly all these countries. The probability of surviving the first five years of life for girls is equal to or smaller than that for boys (table). The single exception is Sri Lanka, which has indicators that reflect both improved overall health status of the population and a paucity of evidence of female disadvantage. India, Bangladesh, and Pakistan constitute almost 97% of the population in South Asia, and our comments will focus on these countries.