

## Viewpoint

# The neglected 'm' in MCH programmes – why mental health of mothers is important for child nutrition

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## Summary

In most societies, mothers are the primary providers of nutrition and care to young children. This is a demanding task, and poor physical or mental health in mothers might be expected to have adverse consequences on their children's health, nutrition and psychological well-being. Child nutrition programmes do not adequately address maternal mental health. In this article, we consider the evidence from less developed countries on whether maternal mental health influences child growth, with respect to evidence from both observational studies and from clinical trials. We estimate how much of the burden of undernutrition might be averted in one setting, and propose that promoting maternal mental health and treating maternal mental illness offer important new opportunities to tackle the twin scourges of maternal ill-health and child undernutrition.

**keywords** maternal health, nutrition, mental health, child growth, developing countries

## Introduction

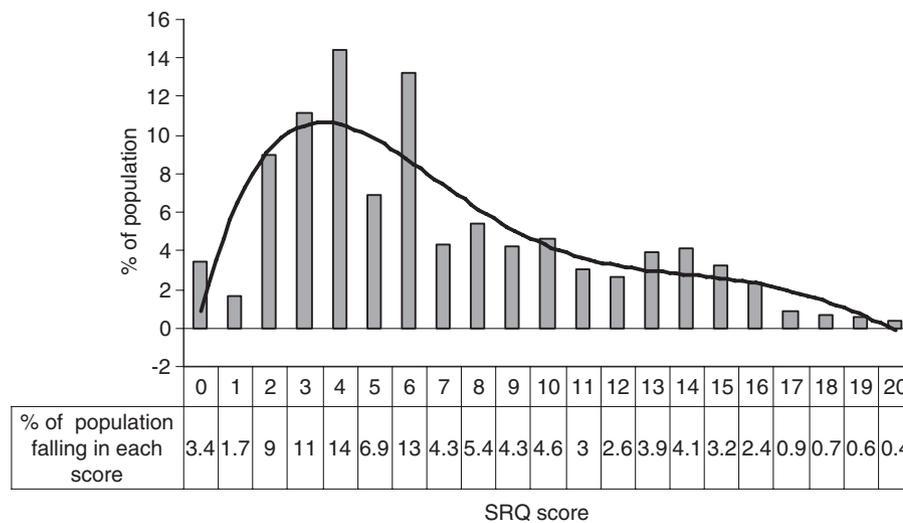
More than 50 years ago, the *Lancet* reported a naturalistic experiment, carried out in two post-war German orphanages, showing that a loving matron was a stronger predictor of children's weight gain than additional food rations (Widdowson 1951). The author concluded that 'harsh and unsympathetic handling may seriously curtail growth rates in children' and warned nutritionists to be attentive to psychological factors that could 'ruin even the most perfectly planned nutritional investigation'. In addition to other measures, this historic lesson has been an important component of child nutrition and development programmes in developed countries. But the role of maternal mental health in less developed countries, which house most of the world's children and shoulder nearly the entire global burden of child undernutrition (as well as much of the burden of maternal mental ill-health), has been almost entirely neglected.

Nutritional status of children is likely to be influenced by several factors such as food security, the health environment, availability of health care and feeding and care practices. In the present study, we consider the evidence from less developed countries on whether maternal mental health influences child growth. We estimate how much of the

burden of undernutrition might be averted in a south Asian setting (from where much of the evidence is derived) by addressing maternal mental health and propose that promoting maternal mental health and treating maternal mental illness offer important new opportunities to address the twin scourges of maternal ill-health and child undernutrition.

## What is maternal mental health?

We used the WHO definition of mental health (Herrman *et al.* 2006) to define maternal mental health as 'a state of well-being in which a mother realizes her own abilities, can cope with the normal stresses of life, can work productively and fruitfully and is able to make a contribution to her community'. This broad definition is critical in understanding the ability of a mother to assess and respond to her own needs and those of her newborn. It is also evident that 'good mental health' or 'well-being' is not the same as an absence of mental illness. In considering the impact of maternal mental health and child nutrition, we focus on maternal depression as the key risk factor because depressive disorders are by far the most common mental disorder and have the most robust evidence base of an association with child nutritional outcomes.

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**Figure 1** Distribution of symptoms of depression in a sample of Pakistani women during the third pregnancy trimester (derived from Rahman *et al.* 2004).

Symptoms of depression [measured using questionnaires such as the WHO Self-Reporting Questionnaire (SRQ) which gives a score out of 20 (WHO 1994)] are distributed asymmetrically in a population (Figure 1). At the extreme end of this positively skewed curve, a small proportion of mothers may suffer from a clinically significant depressive disorder (as defined in diagnostic systems such as ICD10) on the basis of a combination of severity, impact and duration criteria. At the other end of the distribution, a substantial proportion of mothers may be described as being in good mental health. In between are a large proportion of mothers whom we may refer to as 'distressed' because they are neither clinically depressed nor can be considered to be in good mental health. The distress experienced by these mothers is also associated with undernutrition, as elaborated in the following section.

#### Is poor maternal mental health associated with child undernutrition?

First, we consider whether clinically defined depressive disorder is associated with child nutritional outcomes. In the recent Lancet Series on Global Mental Health, we reviewed the evidence on the association between maternal depression and child nutrition (Prince *et al.* 2007). Key findings of our review are that, in low-income countries, the prevalence of maternal depression is estimated at 15–25%. Two prospective studies from Pakistan and India suggest that maternal antenatal depression increases the risk of a low birth weight baby, and four studies (two case-control and two prospective cohort studies) have

demonstrated strong and independent associations between post-natal maternal depression and infant undernutrition at 6 months. Such associations have not been observed in Ethiopian and South African samples, while research from developed countries suggests that such an association occurs only in low socio-economic groups (Stewart 2007). Thus, socio-economic and socio-cultural factors may interact in determining the effect of maternal mental health on child nutrition. It has been argued that South Asian women have poorer social status and are less empowered than women elsewhere (Harpham *et al.* 2005). In such an environment, a depressed mother may find it even harder to ensure appropriate nutrition for her child.

Next, we consider the association between maternal depressive symptoms and child nutritional outcomes. A systematic review of research in the last 10 years suggests that the association between maternal depressive symptoms, measured with questionnaires such as the WHO SRQ (WHO 1994), and infant undernutrition is especially strong in low socio-economic populations where women face greater adversities and are less empowered (Stewart 2007). It could be hypothesized that in such populations, the high prevalence of maternal depressive symptoms would have a population level effect on the nutritional status of children. Reductions in levels of maternal depressive symptoms could thus lead to population level reduction of undernutrition in children. To estimate the impact of reducing maternal mental distress on child undernutrition, we carried out a modelling exercise using data from a population-based study in Pakistan.

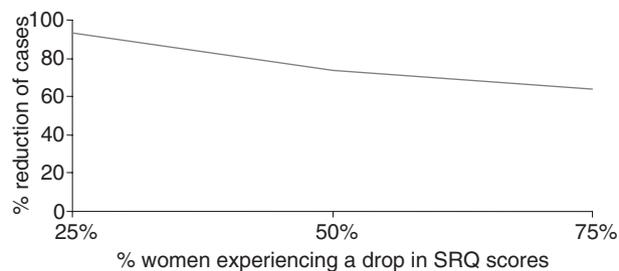
### Impact of promoting maternal mental health on child undernutrition – modelling data from Pakistan

Using our data from Pakistan (Rahman *et al.* 2004), we estimated an expected reduction in underweight cases among 6-month-old infants resulting from improving mental health throughout the entire population. Sample weights were used to achieve a sample of women representative of the underlying population of mothers, from which they were originally drawn. We divided mothers into six groups based on their antenatal scores on the 20-item WHO SRQ (WHO 1994; Table 1). Each of the categories encompassed a 3-point range of the SRQ (0–2, 3–5, etc) with the exception of the highest two categories that were combined due to decreasing cell size (15–20).

We estimated the increase in risk of underweight in each ascending group, and then modelled the expected change in the overall per cent of underweight infants if 25%, 50% or 75% of the women in each category moved to the category below it. This magnitude of change is well within the range of what one would expect resulting from even a simple psychosocial mental health intervention. The results suggest that a 25%, 50% and 75% downward shift in the number of women will reduce the prevalence of underweight by 7%, 26% and 36%, respectively (Figure 2).

**Table 1** Association between antenatal SRQ group and prevalence of underweight at 6 months in Pakistani mothers

Categories of antenatal SRQ scores	Percent of mothers in group	Percent of infants underweight at 6 months
0–2	14.0	5.3
3–5	32.4	10.9
6–8	22.9	9.7
9–11	11.8	15.5
12–14	10.4	19.3
15–20	8.2	27.3



**Figure 2** Percent reduction in cases of underweight infants.

There are a number of possible mechanisms through which maternal depressive symptoms could be linked to poor infant growth: mental stress during pregnancy is associated with poor foetal growth (animal and human studies indicate that these outcomes might be mediated by the maternal hypothalamic–pituitary–adrenal axis (Wadhwa 2005), but other mechanisms could include maternal undernutrition and poor self-care (Rahman *et al.* 2002); post-natal depressive symptoms and depression leads to early cessation of breastfeeding (Henderson *et al.* 2003) – the reasons for this are not clear and could be psychological, physiological or both; post-natal depression is associated with higher rates of infant diarrhoea (Rahman *et al.* 2007), which may indicate infant care deficiencies in a demanding environment; mother–infant interactions are disturbed by depression (Cooper *et al.* 1999) and the consequent poor quality of stimulation provided to the child could interfere with optimal development (as might have been the case in the German orphanage).

### The need for population level interventions for maternal mental health in developing countries

Although 'promoting mental and social development by responding to a child's needs for care, and through talking, playing and providing a stimulating environment' is included as a key goal in the community component of the Integrated Management of Childhood Illnesses strategy (Hill *et al.* 2004), maternal mental health is not explicitly addressed. Furthermore, existing preventive strategies such as breastfeeding and early infant feeding counselling, hygiene promotion, immunization, health education and health seeking behaviours are all directed towards the mother. The effect of these programmes is therefore related to the functional capacity of the mothers, their receptivity to the message and their ability to take up the intervention offered, all of which will be influenced by their mental health. In developed countries, midwives or health visitors can play an effective role in preventing maternal depression by providing individualized care from pregnancy to the post-natal period of the mother (Ogrodniczuk & Piper 2003). Elements of such care include social support, brief individual or group psychotherapy and extended home visits for vulnerable families. Greater social support and better psychosocial health facilities for antenatally depressed mothers in low-income communities can lead to improved neonatal outcomes (Zimmer-Gembeck & Helfand 1996; Feldman *et al.* 2000).

In developing countries, two types of mother-focused interventions had beneficial effects on child outcomes through mechanisms which, we propose, are related to promotion of maternal mental health. First, the recent

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Lancet Series on Child Development documented a number of randomized controlled trials comparing psychosocial interventions with nutritional interventions in Jamaica, China, South Africa and Bangladesh. Interventions that focus on strengthening mother–child interactions (e.g. through play) are more effective than nutrition interventions alone in improving child growth and development (Engle *et al.* 2007). For example, the Jamaican study showed that children who received psychosocial stimulation in the first year of life continued to show a range of health benefits more than 10 years later (Walker *et al.* 2006). Such interventions also have significant benefits for maternal depression (Baker-Henningham *et al.* 2005). The second approach is that of 'empowering' mothers: a participatory group intervention reduced neonatal mortality in a cluster randomized controlled trial in an impoverished area of south Asia by more than 30% (Manandhar *et al.* 2004). According to the authors, the key to success was the remarkable capacity and altruism of the lay women who facilitated the women's group activities and moved each group through a purposeful cycle of assessment, sharing experiences, planning, action and reassessment. This empowered and motivated mothers to take control of key health measures for themselves and their children. Empowerment may be conceptualized as consonant with the definition of good mental health defined earlier. There is, as yet, no trial directly examining the impact of a maternal depression intervention on child nutrition outcomes in developing countries, but one of us (AR) is currently leading such a study in rural Pakistan. The intervention, based on the principles of cognitive behavioural therapy, has been successfully integrated by community health workers and is acceptable to mothers, thus demonstrating that psychological interventions can be implemented in low-income disadvantaged environments (Rahman 2007).

**The way forward**

There is strong evidence linking maternal depression in the general population to infant undernutrition, and there is sufficient evidence that interventions targeting some aspect of maternal mental health (i.e. greater social support, empowerment through individual or group therapy or promotion of mother–infant interaction) positively influence the health of the infant. Because this association is not confined to mothers with clinical depression, but extends to a larger group of mothers with sub-optimal mental health, we propose that maternal mental health is a critical mediator between social adversity and poor infant growth. Thus, we argue for the need to develop, and to integrate within health systems at a population level,

low-cost interventions promoting maternal mental health to reduce the burden of child undernutrition. The first component of such an intervention might be to improve recognition of maternal mental distress by health workers during pregnancy and in the post-natal period. Locally validated questionnaires, such as the WHO's SRQ (WHO 1994) or the Edinburgh Post-natal Depression Scale (EPDS) (Cox & Holden 1994) could be used for this purpose. Secondly, interventions should be developed, which can be integrated seamlessly into the work of community and MCH workers, with an aim to engage with these mothers, empower them, and provide support, practical help and advice on child development in a psychologically therapeutic manner. Thirdly, there is an urgent need to rigorously evaluate the effect of such interventions (on the mother and the infant) and refine them as appropriate so that they are culturally relevant and firmly grounded in evidence.

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