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Impact of a participatory intervention with women’s groups on psychological distress among mothers in rural Dhanusha, Nepal: analyses from a cluster-randomised trial

Kelly Clarke, Naomi Saville, Bhim Shrestha, Michael King, David Osrin, Dharma Manandhar, Anthony Costello and Audrey Prost

Contact: k.clarke.09@ucl.ac.uk
Outline

• Why focus on maternal mental health?

• Results from a secondary analysis of the Dhanusha cluster-randomised trial of a participatory intervention with women’s groups

• Conclusions and next steps
What is maternal mental health and what are maternal mental disorders?

Maternal mental disorders

- Mental illness in pregnancy and up to 1 year postnatally
- Depression and anxiety are the most common maternal mental disorders
- Screening tools (e.g. GHQ-12 and SRQ-20) measure psychological distress, a proxy for common mental disorders

Maternal consequences (Senturk et al., 2012; Rahman et al., 2004)

- Impairment, disability and potentially mortality

Infant consequences (Patel et al., 2004; Black et al., 2007; Cooper et al., 1999)

- Low birth weight, shorter breastfeeding duration, undernutrition, diarrhoea, stunting, reduced maternal-infant bonding and mental development
Rates of perinatal common mental disorders are highest in low and lower middle-income countries

- Low and lower middle-income countries: 16% (95% CI 15.0%, 16.8%) in pregnancy, 20% (19.2%, 20.6%) in the postnatal period (Fisher et al., 2012)

- High income countries: 10% in pregnancy and 13% in the postnatal period (Hendrick, 1998; O’Hara and Swain, 1996)
What interventions are available in low resource settings?

• Few interventions and none in low-income countries (Clarke et al., in press; Rahman et al., 2013)

• Psychological and health promotion interventions to address risk factors

• Interventions delivered by non-mental health specialists are needed and can be beneficial (Clarke et al., in press; Rahman et al., 2013)

• Calls for integration of mental health interventions into existing maternal and child health programmes (Hanlon et al. 2012; Rahman 2013)
What interventions are available in low resource settings?

Women’s groups practicing participatory learning and action in India, Bangladesh, Malawi and Nepal

from Tripathy et al., 2010, Lancet
Potential mechanisms of women’s groups for maternal mental health

Women’s groups: participatory learning & action

Group mechanisms:
- Identifying problems & solving them in a group and community context
- Engaging with group & community members
- Addressing determinants of maternal & child health

Community mechanisms:
- Improved problem-solving skills
- Increased social support
- Improved maternal & neonatal health

Reduction in PCMDs

No mental health content!
Impact of women’s groups on maternal depression: findings from the Ekjut trial

Reduction in neonatal mortality over 3 years:
OR 0.68 (95% CI 0.59, 0.78)

Reduction in moderate depression in Year 3:
OR 0.43 (0.23-0.80) using K10

... ARE WOMEN’S GROUPS HAVING AN IMPACT ON MATERNAL MENTAL HEALTH IN OTHER SETTINGS?

Results and photo from Tripathy et al. (2010) Lancet
Women’s groups and maternal mental health in Dhanusha district, Nepal
Dhanusha district, Nepal

- High poverty
- Low literacy (male 65%, female 42%)
- Conservative Hindu communities
- Lack of health services
- 1 hospital for >670 000
- No public mental health facilities

- No resident psychiatrists
- Treatment gap for mental disorders
- Prevalence of postnatal depression in Nepal 5-12%  
  (Ho-Yen et al., 2006; Nepal et al., 1999; Regmi et al., 2002)
- Leading cause of death among Nepalese women of reproductive age is suicide  (Suvedi et al., 2009)
Dhanusha cluster-randomised trial design

- Evaluated in a cluster-randomised controlled trial
- Clusters were Village Development Committees (VDCs)
- Mean VDC population was 6692
- Two interventions tested - Sepsis management and Women’s groups - through a factorial design
- Sepsis management involved training female community health volunteers (FCHVs) to manage neonatal sepsis during home visits
- Primary outcome was neonatal mortality and postnatal psychological distress was an additional outcome
- Only evaluated the impact of the women’s groups on distress
Dhanusha cluster-randomised trial design

102 clusters
Janakpur municipality excluded
8 conflict-affected clusters excluded
14 clusters with population < 4000 excluded

79 clusters
Random selection of remaining clusters

60 clusters
Stratification by population
and first randomisation
STRATA 1 = 8 largest VDCs
STRATA 2 = remaining VDCs

30 clusters
Women’s group intervention

30 clusters
Second randomisation

15 clusters
Women’s group intervention & Sepsis management intervention

15 clusters
Sepsis management intervention

15 clusters

15 clusters
Women’s group intervention in Dhanusha

- Groups in 30 clusters, 9 groups per cluster, 270 in total
- Groups facilitated by an FCHV and supported by a co-facilitator
- Women of reproductive age targeted but groups open to all
- Participatory learning and action cycle: maternal and newborn health; nutrition and perinatal feeding practices
- Strategies: community engagement, social dramas, home visits, clean delivery kits, emergency funds
- Effects beyond group members and the impact was measured at a community level

- Control arm had access to usual perinatal care
- Both arms received health facility strengthening
Measuring distress in the Dhanusha cluster randomised trial

- To assess impact we interviewed all resident mothers in the study clusters who gave birth during the trial (April 2008 - April 2011)
- Interviewers visited the homes of mothers who had given birth around 6 weeks postpartum
- General Health Questionnaire (GHQ-12) included in the final 18 months of the trial (N=9080)
- GHQ-12 validated in Nepal and previously used to measure PCMDs (Koirala et al., 1999; Navarro et al., 2007; Shelton et al., 2009)
- Distress therefore assessed once around 6 weeks postpartum
- Mothers with neonatal deaths were not screened
Flow chart

60 clusters randomised with stratified allocation
414,105 estimated population
6,692 mean cluster population (range 3,852 - 17,093)
Excluded 2,096 mothers visiting from outside study area

30 clusters allocated to intervention
30 clusters given the intervention
9,803 births

Excluded from analyses:
0 clusters
4,661 births predating collection of GHQ-12 data
397 births associated with a neonatal or infant death
12 births associated with a maternal death
28 second or third births in a multiple birth
17 subsequent births to the same mother

18 interviewed after one year postpartum
61 excluded from analysis due to missing GHQ-12 data

Total number analysed for GHQ-12 outcome
4609

30 clusters allocated to control
30 clusters not given the intervention
9,650 births

Excluded from analyses:
0 clusters
4,577 births predating collection of GHQ-12 data
423 births associated with a neonatal or infant death
10 births associated with a maternal death
34 second or third births in a multiple birth
11 subsequent births to the same mother

25 interviewed after one year postpartum
97 excluded from analysis due to missing GHQ-12 data

Total number analysed for GHQ-12 outcome
4473
## Participant characteristics

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Control (%) N=4473</th>
<th>Intervention (%) N=4609</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Maternal age in years</strong> (N=9080)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean (SD)</td>
<td>23.9 (4.9)</td>
<td>23.7 (4.9)</td>
</tr>
<tr>
<td><strong>Caste</strong> (N=9082)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Advantaged</td>
<td>76 (1.7)</td>
<td>98 (2.1)</td>
</tr>
<tr>
<td>Less advantaged</td>
<td>1406 (31.4)</td>
<td>1361 (29.5)</td>
</tr>
<tr>
<td>Not advantaged</td>
<td>2194 (49.1)</td>
<td>2316 (50.3)</td>
</tr>
<tr>
<td>Disadvantaged</td>
<td>797 (17.8)</td>
<td>834 (18.1)</td>
</tr>
<tr>
<td><strong>Ethnicity</strong> (N=9082)</td>
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<td></td>
</tr>
<tr>
<td>Plains origin</td>
<td>4313 (96.4)</td>
<td>4414 (95.8)</td>
</tr>
<tr>
<td>Hills origin</td>
<td>160 (3.6)</td>
<td>195 (4.2)</td>
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<tr>
<td><strong>Religion</strong> (N=9078)</td>
<td></td>
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<tr>
<td>Hindu</td>
<td>4026 (90.0)</td>
<td>4075 (88.5)</td>
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<tr>
<td>Non-Hindu</td>
<td>446 (10.0)</td>
<td>531 (11.5)</td>
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<tr>
<td><strong>Maternal education</strong> (N=8983)</td>
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<td></td>
</tr>
<tr>
<td>Higher secondary and higher</td>
<td>334 (7.6)</td>
<td>309 (6.8)</td>
</tr>
<tr>
<td>Secondary</td>
<td>323 (7.3)</td>
<td>392 (8.6)</td>
</tr>
<tr>
<td>Primary/pre-primary/non-formal</td>
<td>546 (12.3)</td>
<td>620 (13.6)</td>
</tr>
<tr>
<td>No schooling</td>
<td>3222 (72.8)</td>
<td>3237 (71.0)</td>
</tr>
<tr>
<td><strong>Husband’s education</strong> (N=9011)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Higher secondary and higher</td>
<td>856 (19.3)</td>
<td>836 (18.3)</td>
</tr>
<tr>
<td>Secondary</td>
<td>627 (14.2)</td>
<td>770 (16.8)</td>
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<tr>
<td>Primary/pre-primary/non-formal</td>
<td>896 (20.2)</td>
<td>989 (21.6)</td>
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<tr>
<td>No schooling</td>
<td>2052 (46.3)</td>
<td>1985 (43.3)</td>
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<tr>
<td><strong>Parity</strong> (N=9046)</td>
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<tr>
<td>1-2 children</td>
<td>2602 (58.4)</td>
<td>2683 (58.5)</td>
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<tr>
<td>3-4 children</td>
<td>1457 (32.7)</td>
<td>1480 (32.2)</td>
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<tr>
<td>5 or more children</td>
<td>396 (8.9)</td>
<td>428 (9.3)</td>
</tr>
<tr>
<td><strong>Received antenatal care</strong> (N=9031)</td>
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<td></td>
</tr>
<tr>
<td>Satisfactory care</td>
<td>978 (22.0)</td>
<td>1034 (22.6)</td>
</tr>
<tr>
<td>Some care</td>
<td>2055 (46.2)</td>
<td>2028 (44.3)</td>
</tr>
<tr>
<td>No care</td>
<td>1417 (31.9)</td>
<td>1519 (33.2)</td>
</tr>
<tr>
<td><strong>Ever attended a women’s group meeting</strong> (N=9064)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>23 (0.5)</td>
<td>786 (17.1)</td>
</tr>
</tbody>
</table>
Prevalence of postnatal psychological distress and mean and median GHQ-12 scores

<table>
<thead>
<tr>
<th></th>
<th>Control</th>
<th>Intervention</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mothers (N)</td>
<td>4473</td>
<td>4609</td>
<td>9082</td>
</tr>
<tr>
<td>Prevalence GHQ-12 score&gt;5 (%)</td>
<td>451 (10.1)</td>
<td>435 (9.4)</td>
<td>886 (9.8)</td>
</tr>
<tr>
<td>Mean GHQ-12 score (SD)</td>
<td>2.3 (2.4)</td>
<td>2.1 (2.4)</td>
<td>2.2 (2.4)</td>
</tr>
<tr>
<td>Median GHQ-12 score (IQR)</td>
<td>2 (0-4)</td>
<td>1 (0-3)</td>
<td>1 (0-3)</td>
</tr>
</tbody>
</table>

PREVALENCE OF DISTRESS=9.8%
Impact of the women’s group intervention on postnatal psychological distress

<table>
<thead>
<tr>
<th></th>
<th>Ratio of mean GHQ-12 scores (N=9082) (control:intervention)</th>
<th>95% CI</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Unadjusted</strong>*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>WG intervention</td>
<td>0.68</td>
<td>0.53 - 1.23</td>
<td>0.127</td>
</tr>
<tr>
<td><strong>Adjusted</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>WG intervention</td>
<td>0.77</td>
<td>0.45 - 1.31</td>
<td>0.337</td>
</tr>
<tr>
<td>Sepsis intervention</td>
<td>0.70</td>
<td>0.44 - 1.10</td>
<td>0.122</td>
</tr>
<tr>
<td>WG*Sepsis</td>
<td>1.25</td>
<td>0.66 - 2.35</td>
<td>0.496</td>
</tr>
</tbody>
</table>

* t-test of log transformed cluster mean GHQ-12 scores, adjusted for stratification and weighted by inverse cluster variance

** linear generalised estimating equation regression model including sepsis management allocation variable and interaction term, using log transformed GHQ-12 outcome
Plausible explanations for the null result

• Was the impact seen in the Ekjut trial an effect of reducing neonatal mortality? Preliminary analyses suggest no impact on mortality in Dhanusha

Coverage

• 16% pregnant women attending in Dhanusha versus 55% in the Ekjut trial in the final year
• Attendance lower for younger women and those with 1-2 children
• Qualitative work suggests they were not permitted or they were too busy to attend
Plausible explanations for the null result

• Risk factors for distress were not addressed by women’s groups
• Different set of risk factors in Dhanusha and eastern India or were groups mechanisms were different?

Power
• Prospective sample size calculation underestimated clustering of GHQ-12 scores
• The trial was only powered to detect upwards of a 45% reduction in GHQ-12 prevalence
• Feasible but optimistic
• Enhanced power due to analysis of a continuous outcome
Conclusions

• Women’s groups are a cost-effective method to engage with disadvantaged women (Prost et al., 2013)

• Integrate mental health content into participatory learning and action cycle, and cover predictors of maternal mental illness (e.g. domestic violence, son preference)

• Deliver psychological therapy through the groups (Bolton et al., 2003; Rojas et al., 2007; Gao et al., 2010)

• Individually delivered interventions - Thinking Healthy Programme - but cost effectiveness? (Rahman et al., 2008)
Thanks to MIRA