Effectiveness of Integrated Maternal Nutrition Package on Birth Weight in Rwanda

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Background

• Low Birth Weight (LBW) predicts neonatal and infant morbidity and mortality
• In Rwanda, 7% infants born LBW (RDHS 2019-20)
• Maternal malnutrition during pregnancy contributes to LBW
• Nutrition interventions focused on changing norms and behaviors during pregnancy can improve maternal nutrition and newborn birthweight
Gikuriro Project integrated package and targeted outcomes

- Dietary diversity
- Meal frequency
- ANC attendance (early, 4+, with partner)
- Iron/Folic Acid supplements
- Health seeking by pregnant women

- Reduced diarrheal disease prevalence
- Increased adoption of hygiene behaviors

- Increased consumption of nutritious food especially Animal Source Food (ASF)
- Kitchen gardens
- Bio-intensive agriculture techniques (BIAT)

- Village Nutrition schools (VNS) to improve nutrition specific behaviors
- Farmer field & learning schools promote diverse production for consumption

- Community Based Environmental Health Promotion and improved water access
- Savings and Internal Lending Communities (SILC) for financial access
- Increased consumption of nutritious food especially Animal Source Food (ASF)
Study : Materials and methods

• Post program **quasi experimental intervention-control** study: November 2020-June 2021

• Adapted structured questionnaire

• Measurements:
  • MUAC
  • BMI
  • Weight gain
  • Hemoglobin
  • Dietary Diversity Score (mothers)
  • Birth weight

• Participant written consent obtained

• IRB approval from the University of Rwanda

• Data analysis performed using SPSS 25 and Chi squared, T test and Multivariate logistic regression

• Publication: Habtu et al. 2022 : [10.1111/mcn.13367](10.1111/mcn.13367)
Socio demographic, obstetric and lifestyle characteristics

• Mother-baby pairs:
  • Intervention: 551
  • Control: 545

• Intervention and control groups comparable on basic socio demographic and obstetric characteristics:
  • sex of the baby
  • maternal age
  • marital status
  • religion
  • education
  • occupation
  • family size
  • number of pregnancies
  • birth spacing

• Significantly higher lifestyle risk characteristics in the control group:
  • smoking during pregnancy (4.2% vs 1.1%; p=0.001)
  • passive smoking exposure during pregnancy (15.8% vs 7.6%; p<0.001)
Results: Maternal Nutritional and Birth Weight Status by Study Group

<table>
<thead>
<tr>
<th>Health Issue</th>
<th>Intervention %</th>
<th>Control %</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Birth weight</td>
<td>3.4</td>
<td>10.3</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Maternal anemia (Hb &lt;11g/dl)</td>
<td>10.5</td>
<td>23.7</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Maternal MUAC at delivery (&lt;23cm)</td>
<td>3.4</td>
<td>14.5</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Maternal BMI in first trimester (&lt;18.5kg/m²)</td>
<td>1.8</td>
<td>5.5</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Low maternal Dietary Diversity Score</td>
<td>18.3</td>
<td>25.7</td>
<td>0.003</td>
</tr>
</tbody>
</table>

P-value indicates significance level of differences between groups.
Key outcomes

• Significantly lower risk of low birth weight in newborns in the intervention group (AOR = 0.23; 95%CI = 0.12–0.43; p < 0.001).

• Low birth weight prevalence 66.99% lower in the intervention group

• Mean birth weight 219g higher in the intervention group

• Improved maternal nutritional status correlated with reduced low birth weight
Gikuriro endline evaluation results

**Dietary diversity among women**

**HH Food consumption score**

![Graph showing dietary diversity among women and HH Food consumption score]
Factors contributing to success

• Integration: Health (ANC, PNC, supplement), nutrition specific and sensitive interventions reaching same program participants

• Evidence based interventions
Factors contributing to success

• Targeting behavior change and adoption of practices in all technical areas
• Multiple community volunteer cadres as agents of change
• Male involvement

Challenges

• It takes massive effort and time to move from knowledge to adoption of practices.
Murakoze ◊ Thank you
Merci

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Access the full publication here: