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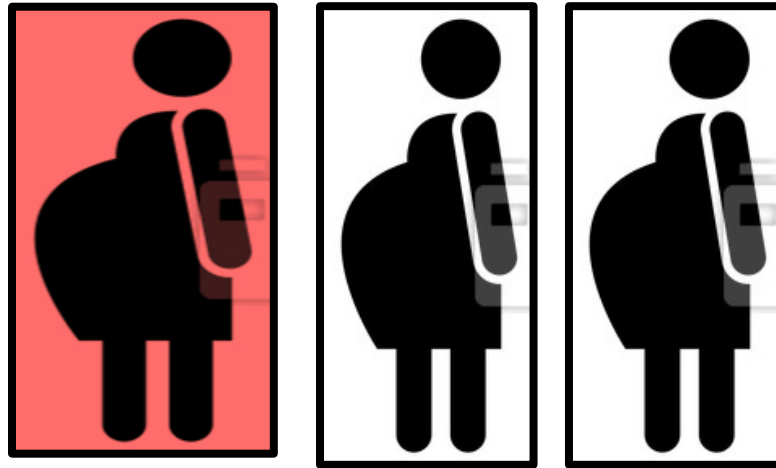
UNIVERSIDAD DE CHILE
Instituto de Nutrición y Tecnología de los Alimentos
Doctor Fernando Monckeberg Barros



Effectiveness of a normative nutritional intervention (diet, physical activity and breastfeeding) on maternal nutrition and offspring growth the CHiMINCs study

Maria Luisa Garmendia, Camila Corvalan, Marcela Araya,
Paola Casanello, Juan Pedro Kusanovic, Ricardo Uauy

Background



- **Pregestational obesity** and **excessive gestational weight gain** predict future risk of obesity as well as associated metabolic conditions for both mother and offspring.
- **Nutritional interventions** during pregnancy have demonstrated their efficacy on reducing gestational weight gain but not on clinical outcomes.
- These studies are usually designed as high-intensity interventions in small sample sizes; thus limiting their **applicability** in clinical practice.

Objective



CHiMINCs

*The CHilean Maternal
Nutrition Cohort Study*

To assess the effectiveness of an intervention that enhances the implementation of updated nutritional health care standards (diet, physical activity, and breastfeeding promotion) during pregnancy on maternal weight gain and infant growth.

- ***Low intensity***
- ***High coverage***

Clinical Trials NCT01916603

BMC Pregnancy Childbirth 2015 Aug 18;15:175 (Protocol)

Methods

- **Design:** cluster randomized controlled trial delivered through the national health care system under standard operating conditions. 12 primary health care centers randomly allocated:
 - Intervention Group: Normative Nutrition Intervention
 - Control Group: Routine Care
- **Primary outcomes:**
 - Adequate gestational weight gain at the end of the pregnancy based on IOM 2009 recommendations;
 - Maternal glycaemic control between 24-28 weeks of pregnancy;
 - Healthy infant growth during the first year of life (according to WHO Child Growth Standards)
- **Participants** were women with less than 15 weeks of pregnancy at their first prenatal visit. Women with high-risk pregnancies or who were underweight were excluded.



Intervention

1. The **training of midwives and dietitians** on:

- weight gain assessment using a chart based on IOM 2009 guidelines;
- updated dietary and physical activity recommendations;
- referral criteria to dietitians;
- how to communicate nutritional messages effectively.



Intervention

- Pregnant women were counselled by midwives regarding **optimal gestational weight gain and healthy nutrition** at each check-up visit (mean:5 visits).
- A **physical activity program** of moderate-intensity for pregnant women, three times at week. Very low attendance (less than 10% of the participants).

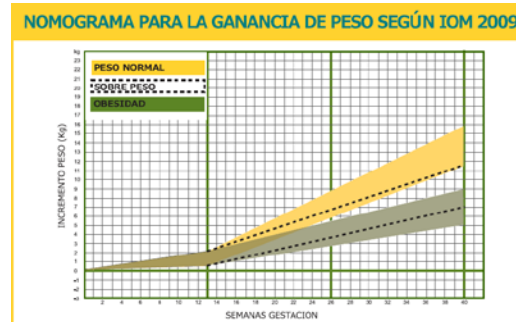


Tabla de Incremento de Peso Gestacional
yecto CHIMINCS

Peso pregestacional	50.0 kg
Peso control actual	50.3 kg
Semanas de gestación control actual	9
Semanas de gestación futuro control	30
Estado nutricional	Normal

Incremento máximo durante el embarazo según el estado nutricional:	11.5 kg - 16.0 kg
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El incremento de peso durante el embarazo es de: 0.3 kg

En este control la paciente se encuentra Dentro del rango

Para el próximo control Debe subir entre el siguiente rango: 0.1 kg - 0.7 kg

El peso del próximo control debe estar entre: 50.4 kg - 51.0 kg



MAMÁ, EL AZÚCAR DE LAS BEBIDAS (BLANCAS Y NEGRAS) Y LOS NÉCTAR PUEDE DAÑAR AL BEBÉ
MIRA TODA EL AZÚCAR QUE CONTIENEN LAS BEBIDAS AZUCARADAS Y LOS NÉCTAR

Tomar bebidas azucaradas aumenta peligrosamente el peso del recién nacido. Un niño que pesa más de 4 kilos al nacer se enfermará más y cuando sea grande tendrá más enfermedades al **CORAZÓN, DIABETES, OBESIDAD Y CÁNCER**

Por eso **¡TOMA AGUA!** Y para variar, puedes darle sabor CON MENTA, LIMÓN, ALBAHACA O MEDIA FRUTA POR VASO



Data collection

Questionnaire: At recruitment

Pregestational weight (self reported)
General characteristics
(sociodemographic, lifestyle, obstetric, morbid)

Electronic clinical records: at the primary health care centers

Weight (measured at each visit)
Height (measured)
Maternal data during pregnancy
Infant data during first year

Maternity records: at the Hospital

Maternal weight before delivery
Type of delivery
Offspring data at birth

Degree of implementation of the intervention

Online surveys to professionals
Phone surveys to pregnant women
Qualitative study Barriers/Facilitators

Baseline characteristics

	Intervention Group	Control Group	p-value
N (%)	2558 (55%)	2060 (45%)	
Age, years	26.3 (6.0)	25.8 (5.7)	0.002
Adolescents, less than 20y (%)	15	17	0.095
Education, 12 years or more (%)	71	69	0.133
Working (%)	45	42	0.057
Gestational age at recruitment	10.9	10.1	<0.001
Pregestational Body Mass Index, kg/m ²	26.9	26.9	0.763
Pregestational nutritional status (%)			0.953
Normal	42.0	42.2	
Overweight	34.1	23.7	
Obese	23.9	24.1	

Gestational weight gain (kg)

Total sample, N= 4392

Subsample, N= 2923

GWG=Weight at delivery/Last weight at the primary health care level - Pregestational weight

GWG=Weight at delivery - Pregestational weight

Gestational age=37 weeks

Gestational age=38.5 weeks

	Intervention Group	Control Group	p-value	Intervention Group	Control Group	p-value
Overall, kg	11.1	12	<0.001	12	13	0.008
Pregestational nutritional status						
Normal, kg	13	13.5	0.059	14	14	0.264
Overweight, kg	11	12	0.080	12	12	0.320
Obese,kg	9	10	0.006	11	10	0.859

Recommended Gestational weight gain (kg)

Total sample, N= 4392

Subsample, N= 2923

***GWG=Weight at delivery/Last weight at the primary health care level - Pregestational weight
Gestational age=37 weeks***

***GWG=Weight at delivery - Pregestational weight
Gestational age=38.5 weeks***

	Intervention Group	Control Group	Intervention Group	Control Group
Below	29.7	26.0	24.1	20.8
Within	31.7	32.7	31.9	35.0
Above	38.7	41.2	44.1	44.3
	<i>P-value= 0.029</i>		<i>P-value= 0.066</i>	

Gestational diabetes

73% of the recruited sample

	Intervention Group	Control Group	p-value
Overall, %	13	11	0.051
Pregestational nutritional status			
Normal, %	8	5	0.025
Overweight, %	14	13	0.441
Obese, %	18	19	0.859

Pending: collect more data and to adjust by pregestational diabetes

At delivery

84% of the recruited sample

	Intervention Group	Control Group	p-value
N	2173 (56%)	1731 (44%)	
Type of delivery, %			
Vaginal	63.1	62.5	0.680
Forceps	16.6	15.1	0.206
Cesarean section	20.3	22.5	0.106

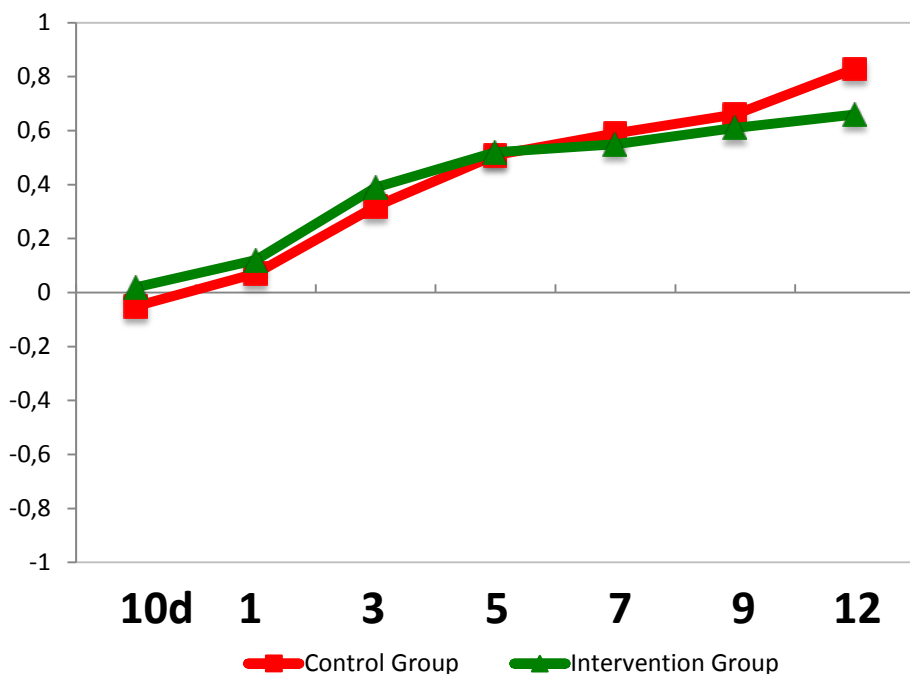
Infant outcomes at birth

84% of the recruited sample

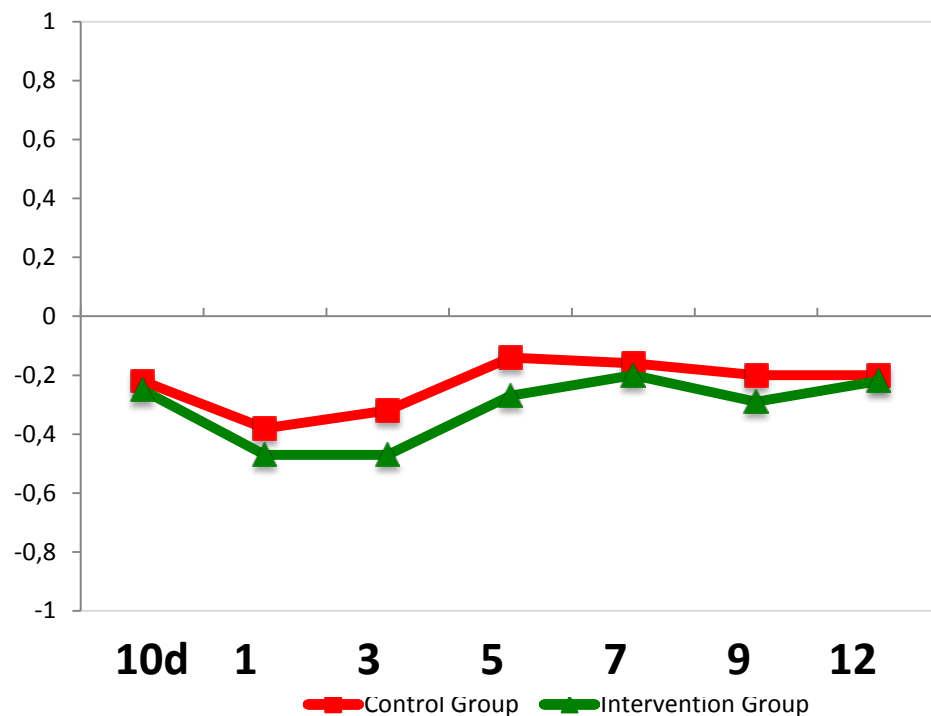
	Intervention Group	Control Group	p-value
N	2156 (55%)	1723 (45%)	
Birthweight, g	3333.2	3359.8	0.170
Length at birth, cm	49.1	49.2	0.206
Macrosomia, %	9.3	8.4	0.317
Large for Gestational Age, %	13.5	12.4	0.340
Low birthweight, %	6.0	4.9	0.088
Small for Gestational Age, %	8.9	8.9	0.996
Apgar 1	8.4	8.3	0.122
Apgar 5	8.7	8.6	0.230

Follow-up of children 0-12 months

Body Mass Index-for-age z-score



Height-for-age z-score



WHO Child Growth Standards

Conclusion



CHiMINCs

- This low-intensity but high coverage intervention at the primary health care level showed a reduction of gestational weight gain. Scalable at population level without many additional resources.
- No effect was found on maternal glycemic control or infant outcomes, which is consistent with findings of other trials.
- The high prevalence of pregestational obesity and its early impact on fetal health reveals the need of obesity prevention strategies in women of childbearing age.



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Investigators

Ricardo Uauy, University of Chile

Maria Luisa Garmendia, University of Chile

Camila Corvalan, University of Chile

Marcela Araya, University of Chile

Paola Casanello, Pontifical Catholic University of Chile

Juan Pedro Kusanovic, Pontifical Catholic University of Chile