Impact of Globalization on Health

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Study background

- Childhood obesity
  - **Cardiovascular disease** risk factors
  - **Obesity and cardio-metabolic consequences** during adulthood
  - 37.2% 6-11 years old children in US are overweight
- Why?
  - Increased time spent in **sedentary activities**, e.g. TV viewing
  - Reduced levels of physical activity
  - Energy-dense diets
- Role of globalization
  - Increased availability of TV, computers and video games at home

Gomez et al. (2007)

More background and aim of study

- Previous studies documented increases in the prevalence of childhood obesity and TV viewing time has been implicated in the increase trends
- Knowledge gap of association between TV viewing time and obesity in **Latin American** children
- Important knowledge for **developing countries** like Colombia where globalization increase TV availability
- **Examine the association between TV viewing and overweight (obesity inclusive) in a representative sample of 5-12 years old Colombian children**

Study Design

- **Participants**: 11,137 children between 5 -12 years old, data were from the National Nutrition Survey in Columbia
- **Sampling method**: A stratified, probabilistic, multi-stage, cluster sampling of households was performed
- **Dependent variable**
  - Weight: measured to the nearest 0.1kg
  - Height: measured to the nearest 1 cm
  - BMI: Weight/(Height)^2 kg/m^2, classify as overweight (BMI >25 kg/m^2 at age 18) or not overweight

Study Design

- **Measurement of TV viewing: questionnaire**
  - E.g. “During the last seven days, did ___(child’s name) watch TV or play video games?” If yes: “How many hours?”
  - <2 hour per day, 2-3.9 hours per day, 4 or 4+ hours per day
- **Covariates**
  - Age (5-8 years, and 9-12 years)
  - Gender (male, female)
  - Urbanization levels (I: <10,000 inhabitants, II: 10,001 -30,000, III: 30,001-100,000, IV: >100,000)
  - Socioeconomic strata (level 1 (lowest) -- level 6, collapsed level 3-level 6 (middle-high) as one group)

Prevalence of overweight

- Overall: 11.1% overweight
- Higher prevalence in
  - Younger children (5-8 yrs)
  - Female
  - Middle to high SES
  - More urbanized areas
  - 2-3.9 hrs/day of TV exposure
- All test results are statistically significant

Table 2: Prevalence of overweight (obesity inclusive) by selected sociodemographic characteristics and television viewing among 11,137 children aged 5 to 12 years. Analysis conducted from the National Nutrition Survey (ENSIN) Colombia. 2005

Characteristics	P*	SE	p
All participants	11.1	0.05	
Age groups, yrs			
5–8	11.3	0.08	< 0.001
9–12	10.9	0.06	
Sex			
Male	10.0	0.08	< 0.001
Female	12.2	0.04	
Socio Economic Status			
Level 1 (Lowest)	5.0	0.08	< 0.001
Level 2	11.8	0.06	
Levels 3 to 6 (Middle-high)	17.2	0.05	
Levels of urbanization			
Level I (rural an urban areas with 10.000 inhs or less)	8.5	0.07	< 0.001
Level II (10.001 to 30.000 inhs)	11.6	0.03	
Level III (30.001 to 100.000 inhs)	14.1	0.09	
Level IV (more than 100.000 inhs)	14.6	0.01	
Television viewing exposure levels			
< 2 hrs/day	8.5	0.05	< 0.001
2 – 3.9 hrs/day	13.5	0.10	
4 or more hrs/day	13.0	0.05	

Associations between TV viewing and overweight

- Odds ratio
  - Quantifies the strength of the association between two events
  - < 2 hrs/day as referent (OR = 1)
- All P values < 0.001
- Strength of association is greater for 2-3.9 hrs/day
  - Except for 2 categories
- Overall positive association between excessive TV viewing and the presence of overweight

	Adjusted OR (95% CI)
Total Population	
2-3.9 hrs/day	1.44 (1.41 - 1.47)
>=4 hrs/day	1.32 (1.30–1.34)
All Males	
2-3.9 hrs/day	1.51 (1.46–1.56)
>=4 hrs/day	1.38 (1.34–1.42)
All Females	
2-3.9 hrs/day	1.39 (1.34–1.44)
>=4 hrs/day	1.29 (1.26–1.32)
Children aged 5-8	
2-3.9 hrs/day	1.19 (1.15–1.22)
>=4 hrs/day	1.32 (1.29–1.36)
Children aged 9-12	
2-3.9 hrs/day	1.78 (1.73–1.84)
>=4 hrs/day	1.40 (1.36–1.43)
Urbanization Lv1 (<10,000 inhabitants)	
2-3.9 hrs/day	1.29 (1.24–1.34)
>=4 hrs/day	1.49 (1.46–1.52)
Urbanization Lv2-4	
2-3.9 hrs/day	1.56 (1.53–1.60)
>=4 hrs/day	1.26 (1.24–1.29)

Table 3: Odds Ratios for overweight (obesity inclusive) by sex, age groups, and urbanization levels among 11,137 children aged 5 to 12 years, Analysis conducted from the National Nutrition Survey (ENSIN) Colombia. 2005

Limitations of study design identified by authors

- Cross-sectional study prevents authors from establishing a causal relationship
- Difficult to administer surveys in low educated populations from developing countries
- Difficult for parents to estimate children's TV viewing time
  - Recall bias, lack of awareness, desire to please, reluctance to tell the truth
  - Typically over-estimated for: older children
  - Typically under-estimated for: children with a TV in their bedroom
  - Typically more accurate for: low SES and rural households

Other limitations identified by authors

- The “more TV → less time for exercise →overweight” pathway may not hold for all cultural and social contexts.
  - E.g. “dangerous neighborhood →parents keep children inside →children get less exercise → overweight”, TV is just a side effect of the issue that causes weight gain
- Other aspects of globalization may be contributing to children being overweight
  - E.g. availability of fast food, food advertising
  - Prevalence of televised fast food advertisements might modify the relationship between TV time and being overweight

Additional limitations

- Discarded 20% of surveys because of incomplete information
  - Excluded children “had significant differences” in SES and TV time vs. included children
  - Investigators “judged that the study’s internal validity will not be affected” because differences were of “low magnitude”
- Could not explain dose-response relationship
- All statistical tests on OR’s were vs. the arbitrary reference group
  - Did *not* test for a directional association between TV time and weight

Table 3: Odds Ratios for overweight (obesity inclusive) by sex, age groups, and urbanization levels among 11,137 children aged 5 to 12 years, Analysis conducted from the National Nutrition Survey (ENSIN) Colombia. 2005

Television viewing exposure levels		Adjusted OR	95% CI	*p*
a	**Total population**			
	< 2 hrs/day	1.00	Referent	
	2 – 3.9 hrs/day	1.44	(1.41–1.47)	< 0.001
	≥ 4 hrs/day	1.32	(1.30–1.34)	< 0.001

Conclusions

- TV viewing is positively associated with the presence of overweight among Columbia children
- Both TV viewing and the prevalence of overweight were positively associated with urbanization level.
- Call for action for the prevention of children becoming overweight in Columbia and Latin America region

Questions?