San Bernardino County Public Health

Baby’s Optimal Nutrition with Ultimate Support

BONUS Program
Breastfeeding and Its Impact on Childhood Obesity

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Outline

Breastfeeding/childhood obesity
1. IDEFICS study
2. National Survey of Children’s Health study
3. NHANES study
4. CLASS II study
5. Nordic- systematic review
6. WHO- systematic review

Obesity implications and complications in childhood and beyond
Breastfeeding Research: What Is Known

» Breastfed babies less likely to have:
  ~ Respiratory infections
  ~ Diarrhea
  ~ Constipation
  ~ Ear infections
  ~ Allergies and eczema
  ~ Asthma
  ~ Childhood cancer
  ~ Sudden Infant Death Syndrome
1. IDEFICS study

» Identification and prevention of dietary- and lifestyle-induced health effects in children and infants (IDEFICS) study

» Population: 16,224 children aged 2-9 yrs from Italy, Estonia, Cyprus, Belgium, Sweden, Hungary, Germany and Spain.

» Results:

~ Exclusive breastfeeding for 4-6 months was protective of overweight/obesity when compared with children never exclusively breastfed*

~ Exclusive breastfeeding for 6 months offered slightly more protection than 4 and 5 months combined**

*(OR 0.73, 95% CI 0.63, 0.85) ,**(OR 0.71, 95 % CI 0.58, 0.85)
2. National Survey of Children’s Health

» Hansstein, 2015, cross-sectional data analysis

» *Population:* 8207 children ages 2-5 yrs from households in rural and urban US

» *Measures:* Parent-reported BMI, breastfeeding initiation and duration
2. National Survey of Children’s Health

Results:

~ At age 2-5 yrs, breastfed children had 8.9% lower probability of being obese compared to children never breastfed*

~ Children breastfed < 3 months had 4.7% higher probability of being obese compared to children breastfed ≥ 3 months**

*(p < .001)**(p = .013)
3. CLASS II Study

» 2011 Children’s Lifestyle and School-performance Study II, a cross-sectional, population based survey

» Population: 5,560 students in Nova Scotia, Canada (age 10-11, 5th grade)
3. CLASS II Study

» Measures:
• Parent-reported infant feeding behaviors,
• Food frequency questionnaire
• Measured height, weight.

» Results: Children formula fed or combination fed for <6 months were more likely to be overweight/obese relative to children only breastfed*

*(OR 1.29, 95% CI 1.04-1.60 and OR 1.35, 95% CI 1.09-1.69, respectively)
4. NHANES Study

» Holmes et al 2011 analysis of National Health and Nutrition Examination Survey

» Population: 2568 children

» Measures: Feeding habits for first 4 months of life, BMI percentile at age 2-6 yrs
4. NHANES Study

» Results: at age 2-6 years
  • Exclusive breast feed infants had a lower risk of overweight/obesity
  • Combination breast feeding/formula and fully formula-fed infants were at comparable risk of overweight/obesity

» Factors: Combination feeding
  • Ethnicity - Latino, African-American
  • SES - poorer families*
  • Maternal - HS education/non-US birth

*(P < .0001)
5. Nordic Systematic Review

» Part of 5th revision of Nordic Nutrition Recommendations

» *Methods*: Systematic literature review of 24 quality assessed papers on growth, overweight, obesity
5. Nordic Systematic Review

» **Grade 1 evidence**: Longer duration of exclusive breastfeeding or any breastfeeding associated with a protective effect against overweight/obesity in childhood/adolescence

» **Grade 2 evidence**: Exclusive breastfeeding for > 4 months associated with slower weight gain during later infancy compared with those exclusively breastfed for < 4 months

» **Grade 3 evidence**: Breastfeeding protective against overweight/obesity in adulthood
6. WHO review


Results:
• Breastfed individuals less likely to be overweight/obese*
  • socioeconomic status, parental anthropometry, age at assessment, year of birth, and study design did not modify the effect of breastfeeding
6. WHO Review

» *Possible biological mechanisms:*

~ Lower protein intake and reduced energy metabolism among breastfed infants
~ Different hormonal responses to feeding
~ Breastfed infants adapt more readily to new foods.
Obesity’s childhood complications

» Cardio-metabolic risk factors
» Nonalcoholic fatty liver disease
» Compromised perceived quality of life
» Depression
» Behavioral disorders
» Lower Self-esteem
Childhood CVD risk factors

» Population: NHANES data subset of 3,644 children aged 3-6 years

» Findings: Increased BMI and WC associated with elevated CRP levels in African-American children, Latino boys, and non-Latino white girls
Obese children become obese adults

Simmonds, et al 2015 systematic review and meta-analysis, 8 countries, 15 prospective cohort studies

Population: 200,777

Measures: BMI in child, teen, adults

Results:
- Obese children/teens = 5x more likely obese as adults normal weight peers
- 55% of obese children -> obese teen
- 80% of obese adolescents -> obese adults
- 70% remain obese over age 30
Trajectory of childhood obesity

» Childhood obesity associated in adulthood with:
  ~ Obesity (Simmonds et al. 2015)
  ~ Diabetes (Al Mamun et al. 2009)
  ~ Asthma (Burgess et al. 2007)
  ~ Metabolic syndrome (Schmidt et al. 2011)
  ~ Increased left ventricular mass (Tapp et al. 2014)
Breastfeeding

» First Food for health
» Infants will not object
» Upstream intervention
» Long term benefits
» Strike against future adult obesity
References


References


References


Gillman et al 2006

» Aim: To assess the association of breastfeeding with adolescent obesity within sibling sets
» Population: 5614 sibling sets from cohort of 16,539 U.S. children age 9-14 yrs
» Measures: Mother-reported duration of breastfeeding, Patient-reported weight and height
» Results: 6-8% decrease in the odds of overweight for a 3.7-month increment in breastfeeding duration
» Similar results for within-family and overall analysis