המרכז הבינלאומי ע"ש דניאל אברהם לבריאות ותזונה
The S. Daniel International Center for Health and Nutrition

אוניברסיטת בן-גוריון בנגב
Ben-Gurion University of the Negev

Maternal misperceptions and smoking are major factors associated with overweight and obesity in 5-6 y-old low SES children

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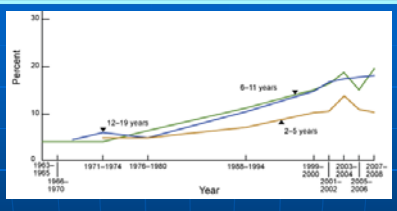
Presenter Disclosures

Vered Kaufman-Shriqui

(1) The following personal financial relationships with commercial interests relevant to this presentation existed during the past 12 months:

No relationships to disclose

Trends in obesity among children and adolescents-United States, 1963-2008



Age (in years)[1]	NHANES 1963-1965 1966-1970[2]	NHANES 1971-1974	NHANES 1976-1980	NHANES 1988-1994	NHANES 1999-2000	NHANES 2001-2002	NHANES 2003-2004	NHANES 2005-2006	NHANES 2007-2008
Total	[3]	5.0	5.5	10.0	13.9	15.4	17.1	15.5	16.9
2-5	[3]	5.0	5.0	7.2	10.3	10.6	13.9	11.0	10.4
6-11	4.2	4.0	6.5	11.3	15.1	16.3	18.8	15.1	19.6
12-19	4.6	6.1	5.0	10.5	14.8	16.7	17.4	17.8	18.1

http://www.cdc.gov/nchs/data/hestat/obesity_child_07_08/obesity_child_07_08.htm

Overweight and Obesity Among Low-Income, Preschool-Aged Children

- One of 7 low-income, preschool-aged children in the United-States is obese
- The overall prevalence of obesity in the United-States in 2008 was 14.6%
- The overall prevalence of overweight and obesity among preschoolers in 2008 was 21.2% in England and 22.2% in Italy

1. http://www.cdc.gov/obesity/childhood/lowincome.html
2. Cattaneo A, Monasta L, Stamatakis E, et al. Overweight and obesity in infants and pre-school children in the european union: A review of existing data. *Obes Rev*. 2009.

Existing evidence

Prospective studies

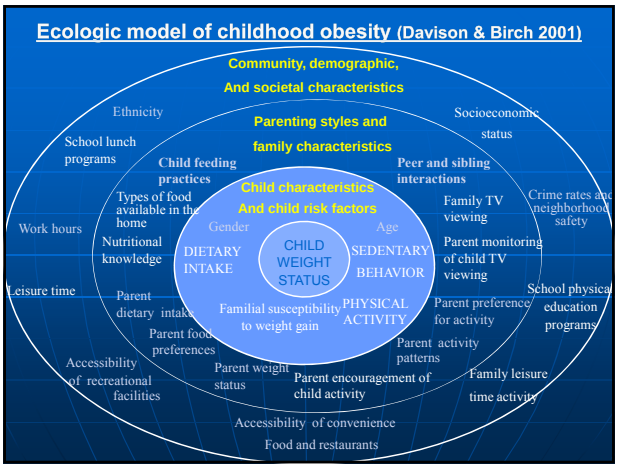
- Low adult education, social class and neighborhood SES are associated to higher rates of childhood obesity and elevated inflammatory levels
- Childhood obesity is associated with elevated risk for chronic conditions such as cardiovascular risk, hypertension and diabetes, respiratory diseases, and musculoskeletal problems

- Pollitte RA. J Epidemiol Community Health. 2008;62(6):484-91
- Pollitte RA. Eur J Epidemiol. 2007;22(1):55-66

Preschool-critical period

- If overweight begins before 8 years of age, obesity in adulthood is likely to be more severe
- Obese preschool children are 2.0-2.6 more likely to become obese adults when compared with non-obese preschoolers
- Obese school-aged children are 6.5 times more likely to become obese adults

Serdula MK*Prev Med*. 1993;22(2):167-177



Methods

Study Design- RCT

- Randomized clinical trial
- 3-month intervention model with follow-up 4 months and 12 months after completion of intervention
- Controlled (physical activity intervention)
- Sample size 240 (80% power $\alpha = 0.05$)

Study Population

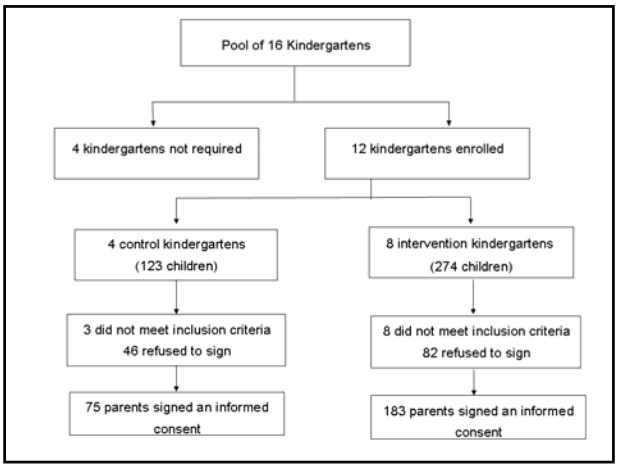
Socioeconomically disadvantaged kindergarten children aged 5-6y and their parents in Beer-Sheva

Inclusion Criteria

- Children from kindergartens defined as Low- SES population (by local municipality)
- Children whose parents agree to participate in the research

Exclusion Criteria

- Children who suffer from any chronic disease
- Children who suffer from developmental problems
- Children who participate in a weight reduction treatment or program
- Children or parents who have any psychiatric problem or diagnosis



Measurements

- Weight and height of children and mothers
- All measurements were taken in the morning, before breakfast, with light clothing and without shoes
- Each measurement was taken twice in order to assure reliability
- Standard scale (Tanita © UM-072), and portable height rod (Seca © 214)
- Calculation of BMI Z-score percentiles for children (WHO growth charts)

Questionnaires

1. BGU Food Frequency Questionnaire (modified for children) . (J Nut 2005;135(3):573-9. Nutr. 2007;10(10):1094-103. Public Health Nutr. 2003;6(4):401-6)
2. Health knowledge and attitudes questionnaire
3. Child health questionnaire (Young MABAT survy, Israel).
4. Socio-demographic questionnaire :from MABAT (Public Health Rev. 2000;28(1-4):23-6)
5. Physical activity and sedentary behaviors: number of hours, frequency and activity type. (Arch Pediatr Adolesc Med. 2004 Apr;158(4):353-7)

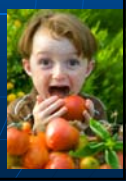
Intervention model

The "Nutrition Enrichment and Healthy Living Model" (NEHLM JDC- ASHALIM)

Integrative model covering a variety of lifestyle issues.

The model was applied to preschool children, their parents, and care givers



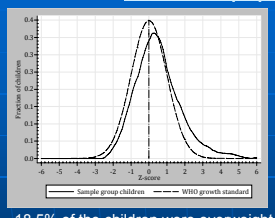


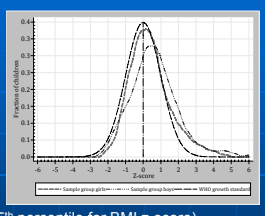
Outcomes



Distribution of BMI-Z-SCORE

reference population WHO





18.5% of the children were overweight (> 85th percentile for BMI z-score)
11.3% of the children were obese (>95th percentile for BMI z-score)

Overall 29.8% of the children were overweight or obese

No difference between boys and girls ($\chi 2$ =187.8, df= 177, p=0.53)

Our findings are similar to the obesity prevalence among low-income, preschool-age American children (2008, PedNSS)

Shapiro-Wilk W and skewness-kurtosis tests ($P < 0.001$ in all normality tests)

Baseline characteristics of study population stratified by children's obesity status

Children	Normal Weight (n=167) Mean±SD	Overweight and Obese (n=71) Mean±SD	P value
Weight (kg)	18.3±2.3	24.6±4.5	<.001*
Height (cm)	109.7±5.7	113.9±5.9	<.001*
Physical activity (h/week)	2.39±1.2	2.59±1.2	0.267
Sedentary hours (h/day)	2.3±1.2	3.0±1.5	0.001*
Sleeping hours (h/night)	9.8±1.3	9.9±1.2	0.36

Maternal perception of child weight in comparison to the actual weight

	Measured weight status of child			
Mother's perception of child's weight status	Normal Weight(%) (n=157)	OVOB (%) (n=62)	Total (%) (219/238)	P value
Accurate perception	57.6	17.7	46.4	
Underestimation	42.4	82.3	53.6	<0.001*

*Significant differences between weight statuses of the children (McNemar test)

[a] Normal weight defined as -2 SD <BMI z-score ≤1SD, overweight and obese defined as BMI ≥1sd BMI z –score based on the new World Health Organization (WHO) growth standard

Multivariate logistic regression

	OR	95% CI	P
Maternal underestimation of child weight status (underestimation vs. accurate estimation)	8.3	2.70-25.01	**<0.001**
Child's daily sedentary hours ≥ 3h/week vs. < 3h/week	1.19	0.435-3.24	0.738
Maternal years of education ≤12 years vs. >12 years	0.43	0.14-1.34	0.147
Living below poverty line Below vs. above poverty line	0.56	0.21-1.53	0.26
Current parental smoking Smoking vs. non smoking	4.21	1.60-11.41	**0.005**
Maternal weight status Healthy weight vs. OVOB	1.64	0.66-4.09	0.29

Conclusions

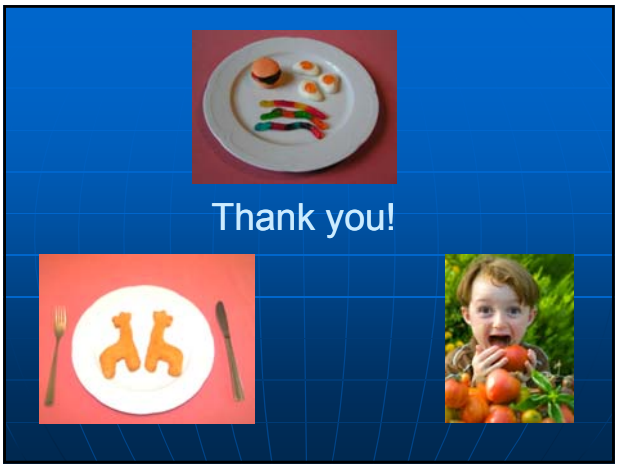
- **Prevalence of obesity among LSES Israeli preschoolers in 2008 was high and was similar to the prevalence reported for LSES U.S preschoolers**
- **Maternal underestimation of child weight status and parental smoking are associated with childhood OVOB among LSES children.**
- **These parameters may help identify children at risk for obesity, and are potentially amenable to intervention.**

Ethics

- The research was approved by the Helsinki Committee of Soroka University Medical Center (No. 4712).
- It was also approved by the Chief Scientist of the Ministry of Education.
- Data were collected with identifiers and identification was omitted during data entry and analysis.
- *Clinical Trial Registration*— http://www.clinicaltrials.gov. Unique Identifier: NCT01071551.

Partners

- JDC, "Ashalim"
- Beer –Sheva Municipality
- Beer - Sheva Ministry of Health
- Ministry of Education
- Ben-Gurion University, Department of Epidemiology, The S. Daniel Abraham International Center for Health and Nutrition


Thank you!