

# Longitudinal Tracking of Weight Status and Its Relationship to Diet and Physical Activity Patterns among Adolescents in Dubai-UAE

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Prepared for presentation at the Annual  
Society of Behavioral Medicine Meeting,  
Montreal, Canada

April 24, 2009

# Investigators

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# Background

- United Arab Emirates
  - Oil boom
  - Industrialization
  - Cultural transition
- Changing Lifestyle Patterns
- Obesity now a major health issue
- Persistence of weight status between childhood and adolescence of interest

# Purpose of Study

- To examine
  - Tracking of overweight and obesity among 10<sup>th</sup> grade students in Dubai-UAE government schools
  - Develop distinct categories of tracked students, e.g. obese to obese, normal to normal
  - Determine if there are differences in lifestyle behaviors between the different tracking patterns

# Methods

- Permission by Dubai Ministry of Education
- Passive consent approved by Dubai & Tulane
- Weight/height at 1<sup>st</sup> and 5<sup>th</sup> grades extracted from health records
- 10<sup>th</sup> grade data collected in this study

# Methods-Anthropometry

- Height/weight measured by trained UAE government-employed health workers with standardized protocol
- Standard balance beam scale used to measure weight in kg calibrated to 0 daily rounded to nearest 0.1 kg
- Height measured to nearest 0.5 cm using standing height scale

# Methods – Questionnaire

- Structured self-administered questionnaire developed for this study
  - Questions extracted from existing surveys
  - Some adjustments made for cultural specificity
- Measurement domains included
  - Sociodemographic characteristics
  - Sedentary activities (TV-viewing, computer & video game use)
  - Physical activity
  - Dietary habits (snacking, fast food & soft drink consumption)

# Methods – Statistical Analyses

- Pearson correlations calculated between weight status at different grade points
  - ANOVA used to determine differences in lifestyle behaviors between BMI subgroups
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- Tracking defined as persistence of weight status between Grade 1 or 5 and Grade 10
  - Subgroups were:
    - Overweight/obesity
    - Normal weight

# Results – Demographic Data

- 2255 – 10<sup>th</sup> grade students in Dubai
  - 1881 (83.5%) had data in grades 5 and 10
  - 1710 (75.8%) had data in grades 1 and 10

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- Age: Mean = 15.7 yrs; Range = 14-18 yrs
- Majority (82.2%) were UAE nationals
- Majority (63.3%) were female

# Results - Tracking

# Correlation Coefficients\* between BMI at Grades 10 and 5 and between BMI at Grades 10 and 1

<b>Grade 10 vs Grade 5</b>	<b>n</b>	<b>r*</b>
<b>UAE<sup>a</sup></b>		
Male	559	0.774
Female	966	0.778
<b>Non-UAE<sup>a</sup></b>		
Male	170	0.818
Female	158	0.807
<b>Grade 10 vs Grade 1</b>	<b>n</b>	<b>r*</b>
<b>UAE<sup>b</sup></b>		
Male	510	0.308
Female	869	0.423
<b>Non-UAE<sup>b</sup></b>		
Male	154	0.412
Female	149	0.277

\*p<0.001

# BMI Status at Grades 5 and 10 by Nationality and Gender

BMI Status Grade 5		BMI Status Grade 10		
		Normal n (%)	Overweight n (%)	Obese n (%)
UAE Males	Normal	336 (78.9)	74 (17.4)	16 (3.8)
	Overweight	13 (18.6)	24 (31.3)	33 (47.1)
	Obese	4 (6.3)	12 (19.0)	47 (74.6)
UAE Females	Normal	595 (88.4)	63 (9.4)	15 (2.2)
	Overweight	56 (31.1)	84 (46.7)	40 (22.2)
	Obese	10 (8.8)	30 (26.5)	73 (64.6)
Non-UAE Males	Normal	116 (90.0)	12 (9.3)	1 (0.7)
	Overweight	79 (79.0)	12 (12.0)	9 (9.0)
	Obese	0	1 (7.7)	12 (92.3)
Non-UAE Females	Normal	100 (85.5)	14 (12.0)	3 (2.5)
	Overweight	15 (51.7)	9 (31.0)	5 (17.3)
	Obese	0	6 (50.0)	6 (50.0)

<sup>1</sup>Normal = BMI < 25 kg/m<sup>2</sup>

<sup>2</sup>Overweight = BMI > 25 kg/m<sup>2</sup>

<sup>3</sup>Obese = BMI ≥ 30 kg/m<sup>2</sup>

# BMI Status at Grades 1 and 10 by Nationality and Gender

BMI Status Grade 1		BMI Status Grade 10		
		Normal <sup>1</sup> n (%)	Overweight <sup>2</sup> n (%)	Obese <sup>3</sup> n (%)
UAE Males	Normal	317 (66.0)	93 (19.4)	70 (14.6)
	Overweight	5 (26.3)	4 (21.1)	10 (52.6)
	Obese	1 (9.0)	0	10 (91.0)
UAE Females	Normal	586 (73.0)	142 (17.7)	75 (9.3)
	Overweight	6 (14.0)	16 (37.2)	21 (48.8)
	Obese	0	5 (21.7)	18 (78.3)
Non-UAE Males	Normal	109 (77.3)	19 (13.5)	13 (9.2)
	Overweight	2 (28.6)	3 (42.8)	2 (28.6)
	Obese	1 (16.7)	0	5 (8.3)
Non-UAE Females	Normal	101 (73.2)	26 (18.8)	11 (8.0)
	Overweight	5 (55.6)	2 (22.2)	2 (22.2)
	Obese	0	0	2 (100.0)

<sup>1</sup>Normal = BMI < 25 kg/m<sup>2</sup>

<sup>2</sup>Overweight = BMI > 25 kg/m<sup>2</sup>

<sup>3</sup>Obese = BMI ≥ 30 kg/m<sup>2</sup>

Results – Behaviors Associated  
with Weight Groups Tracked  
between Grades 5 and 10

# Mean Monthly Fast Food Restaurant Visits (FFRV) by Tracked Weight Groups (Grades 5 and 10)

Variable	Mean ( $\pm$ SD)	F value	P value
Monthly FFRV alone		4.64	0.031
Overweight/Obese	11.8 (6.5)		
Normal	12.6 (7.3)		
Monthly FFVR with family		4.73	0.03
Overweight/Obese	10.2 (6.4)		
Normal	11.1 (6.6)		
Monthly Total FFVR		5.73	0.017
Overweight/Obese	22.1 (11.2)		
Normal	23.7 (12.2)		

Note: No differences in normal or diet soft drink consumption by tracked weight groups were observed.

# Mean Monthly Snack Consumption between Regular Meals by Tracked Weight Groups (Grades 5 and 10)

Variable	Mean ( $\pm$ SD)	F value	P value
Breakfast & Lunch Overweight/Obese Normal	1.05 (1.0) 1.24 (1.0)	9.62	0.002
Lunch & Dinner Overweight/Obese Normal	1.75 (1.1) 1.56 (1.1)	5.94	0.015
After Dinner Overweight/Obese Normal	1.07 (1.0) 1.27 (1.2)	8.65	0.003

Note: Tracked normal weight students ate significantly more healthy snacks than Tracked overweight/obese students, but there was no difference in consumption of Unhealthy snacks.

# Physical Activity and Sedentary Behavior (hrs/wk) by Weight Groups

- No significant differences were observed between groups for total moderate to vigorous physical activity or for total sedentary behavior.
- Only the use of electronic games was significantly different between weight groups with overweight/obese students playing more games than normal weight students ( $F=5.24$ ,  $p=0.18$ ).

# Conclusions & Implications

- Significant tracking of overweight/obesity between grades 1 and 10 but stronger between grades 5 and 10.
- Educational and prevention strategies, therefore, should begin at early ages, prior to grade 5.

# Conclusions & Implications

- UAE nationals demonstrated greater tracking of overweight/obesity.
- Likely the higher SES status of nationals could influence these lifestyle changes.
- Rigorous prevention programs targeting national students.

# Strengths & Limitations

- Strengths
  - Large sample size
- Limitations
  - Cross-sectional study
  - No survey validation
  - Generalizability limited