Prevalence of asthma symptoms and association with obesity, sedentary lifestyle and sociodemographic factors: Data from the Hellenic National Plan for the Assessment, Prevention and Treatment of Childhood obesity

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INTRODUCTION

- Emerging evidence suggests that asthma symptoms and obesity in children show similar trends in the last few decades
- Overweight/obese asthmatic children experience greater limitation of physical activity, while insufficient physical activity increases the risk for overweight/obesity, perpetuating the vicious cycle of asthma, exercise-induced broncho-constriction, decreased physical activity and increased body weight.
- In Greece a greater than 4-fold increase in the prevalence of childhood asthma and wheezing has occurred over the last 25 years.
- Similarly an increase in the prevalence of overweight has been observed over the last decades and has been associated by some investigators with increases in asthma prevalence.

AIM

- To evaluate the prevalence of asthma symptoms and to assess its association with obesity and sociodemographic factors in a **representative sample** of school children **from all over Greece**

PATIENTS AND METHODS

- Cross-sectional study conducted from 10/2012-12/2013 (ESPA,MIS 301205)
- A pre-selected, representative elementary school cohort (N=11,751 age range 5.8-12.5years) was derived, using stratification and PPS methodology.
- Parents responded to questionnaires and students were measured with high sensitivity methods (height to 0.1cm,weight to 0.1kg)
- BMI was calculated and IOTF cut offs were used to classify the children.
- Socio-economic status index was calculated (SES index range 0-13) on years of parental education, rented vs owned residence, m2/person ,number of vehicles
- Time spent on sedentary activities (e.g., watching television, working on a computer, playing video games) was assessed by the questionnaire which has been previously validated
- The approved Greek version of the International Study for Asthma and Allergies in Childhood (ISAAC) core questionnaire was employed.
- Asthmatic symptoms were treated as the main factor (dependent variable) for the analysis and the following variables were tested as potential risk factors for asthmatic symptoms:
  - sex,
  - rural-urban status (urban; semi-urban vs. rural),
  - overweight/obese (vs. normal weight),
  - age (years),
  - latitude of the prefecture (degrees),
  - SES index and
  - sedentary activities (hours).
- Two-step procedure was followed, namely univariate and multivariate logistic regression analysis.
- At the multivariate analysis, only the factors that were proven significant at the univariate approach were entered (backward selection of variables).
- The level of statistical significance was set at 0.05. Statistical analysis was performed using STATA/SE version 13 (Stata Corp., College Station, TX, USA).

Table 1. Characteristics of the study population (n=11,751).

Parameters	N (%)
Asthmatic symptoms	
Yes	3643 (31.0)
No	8108 (69.0)
Rural –Urban status	
Urban	3765 (32.1)
Semi-urban	3470 (29.5)
Rural	4516 (38.4)
BMI status	
Normal weight	7473 (63.6)
Overweight	3050 (26.0)
Obese	1228 (10.5)
Continuous variables	mean±SD (range)
Age (years)	9.1±1.7 (5.8-12.5)
Latitude (degrees)	39.0±1.6 (35.2-41.2)
SES index	7.2±2.3 (0-13)
Sedentary activities (hours/week)	6.4±3.9 (0-36)

Table 2. Results of the univariate logistic regression analysis regarding risk factors for the asthmatic symptoms in the examined population (n=11,751)

	Prevalence of asthmatic symptoms in the compared groups	Category or increment	OR (95% CI)	P
Male sex	1926/5798 vs. 1717/5953	Male vs. female	1.22 (1.13-1.33)	<0.001
Rural-urban status				
Urban	1225/3765 vs.1395/4516	Urban vs. rural	1.08 (0.98-1.18)	0.109
Semi-Urban	1023/3470 vs.1395/4516	Semi-urban vs. rural	0.94 (0.85-1.03)	0.174
BMI				
Overweight	996/3050 vs. 2222/7473	Overweight vs. normal weight	1.15 (1.05-1.25)	0.003
Obese	425/1228 vs. 2222/7473	Obese vs. normal weight	1.25 (1.10-1.42)	0.001
Age	Not applicable	1 year increase	0.97 (0.95-0.99)	0.006
Latitude	Not applicable	1 degree increase	0.99 (0.97-1.02)	0.653
SES index	Not applicable	1 point increase	1.01 (0.99-1.03)	0.435
Sedentary activities (hours)	Not applicable	5 hours increase	1.08 (1.02-1.14)	0.004

Table 3. Results from the logistic multivariate analysis regarding risk factors for asthmatic symptoms in the examined population (n-11

	Category or increment	OR (95% CI)	p
Sex	Male vs. female	1.22 (1.13-1.33)	<0.001
BMI			
Overweight	Overweight vs. normal weight	1.13 (1.03-1.25)	0.010
Obese	Obese vs. normal weight	1.27 (1.11-1.46)	<0.001
Age (yrs)	1 year increase	0.96 (0.94-0.98)	<0.001
Sedentary activities (hours)	5 hours increase	1.07 (1.01-1.13)	0.013

CONCLUSIONS

- In conclusion from all studied parameters, the presence of asthma symptoms was related to overweight/obesity and sedentary lifestyle irrespectively of socioeconomic or regional (urban vs rural) factors.
- In Greek literature PANACEA study revealed prevalence of asthmatic symptoms in 27.6% of boys and in 20.4%of girls, which was associated with weight gain and absence of physical activity
- In ISAAC study (1994) the presence of asthmatic symptoms was associated with weight gain, reduced physical activity, socioeconomic factors and to a lesser extent to regional factors
- These findings underline the necessity of planning public health policies towards preventing childhood obesity and enhance physical activity in pediatric populations