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ΕΡΕΥΝΗΤΙΚΗ ΕΡΓΑΣΙΑ

Childhood obesity and fitness across urban and non-urban environments
A gender-based perspective

OBJECTIVE **To examine the effects of gender and place of residence (urban versus non-urban) on obesity indicators and physical fitness parameters among primary school students in Eastern Macedonia and Thrace, Greece.** METHOD **The sample included 400 primary school students, classified by gender (boys, girls) and residential area (urban, non-urban). Measurements were taken on body mass index (BMI), body fat percentage, waist circumference, and skinfold thickness at various sites, along with physical fitness parameters, including abdominal muscle strength, running agility-speed, and cardiorespiratory endurance. A multivariate analysis of variance (MANOVA) assessed differences across variables.** RESULTS **Non-urban students exhibited healthier BMI and body fat percentage, along with greater strength and speed performance, likely due to increased physical activity opportunities. No statistically significant differences were found in endurance, suggesting age-related biological maturation plays a greater role.** CONCLUSIONS **The findings of the present study highlight the pivotal influence of the residential environment on the prevalence of childhood obesity and fitness. Strategies to promote physical activity in urban settings and enhance movement-friendly spaces may help improve health outcomes.**

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ΑΡΧΕΙΑ ΕΛΛΗΝΙΚΗΣ ΙΑΤΡΙΚΗΣ 2026, 43(6):753–760

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Παιδική παχυσαρκία και φυσική κατάσταση σε αστικά και μη αστικά σχολικά περιβάλλοντα:
Μια προοπτική με βάση το φύλο

Περίληψη στο τέλος του άρθρου

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Childhood obesity has been a growing concern for the international scientific community over the past three decades due to its multifactorial nature.[1] It poses significant long-term health risks, with morbidity and mortality in adulthood, particularly elevated among individuals diagnosed with obesity and those who were overweight as children, even if they later lost the excess weight.[2] Alongside the global rise in adult obesity, the prevalence of childhood obesity has also increased, adversely affecting physical and mental health. Obesity prevalence follows socioeconomic patterns worldwide, with 5.6% of girls and 7.8% of boys classified as obese.[3] According to the World Health Organization (WHO),[4,5] Greece ranks among the European countries with the highest childhood obesity rates as it holds the third-highest rate of overweight and obese children under five years old and the highest rate among children aged 10–19. Additionally, the European Childhood Obesity Surveillance Initiative[4,6] reports that Greece ranked second among 33 participating countries in childhood overweight and obesity among seven to nine-year-olds, with 42% children affected.

Numerous factors contribute to childhood obesity, including genetic predispositions, inadequate physical

activity, dietary habits, environmental influences, stress, medication use, and insufficient sleep.[7] Social environments that promote sedentary lifestyles, excessive consumption of high-fat and high-calorie foods, and limited physical activity further exacerbate obesity rates.[8] Studies indicate that adolescents in urban areas are more prone to obesity than their rural counterparts.[9]The increased integration of technology into daily life has been associated with declining physical activity among children, particularly those at the threshold of minimum recommended activity levels set by the American College of Sports Medicine (ACSM) and WHO.[5,10] A lack of exercise contributes to obesity-related comorbidities, such as type 2 diabetes, cardiovascular disease, and certain cancers.[11] Conversely, regular physical activity fosters cognitive, emotional, and academic performance improvements while preventing obesity.[12] Public health organizations, including WHO and ACSM, recognize physical inactivity as a critical risk factor for long-term health complications. The combination of a high body mass index (BMI) and physical inactivity has been linked to an increased likelihood of cardiovascular diseases in adulthood.[5] Encouraging physical education programs and extracurricular activities reduces obesity risk and promotes lifelong health-enhancing behaviors.[3]

Socioeconomic, environmental, and behavioral factors influence childhood obesity rates. Mass media and social networks play a pivotal role in promoting Western dietary habits characterized by processed and calorie-dense foods.[7] Moreover, excessive screen time and online gaming contribute to reduced physical engagement, fostering inactivity and unhealthy lifestyle choices.[13] In addition to physical consequences, childhood obesity correlates with psychological complications, such as low self-esteem, social difficulties, anxiety, depression, and rejection experiences, which can persist into adulthood.[12] Government initiatives aimed at addressing childhood obesity have increased over the past decade, with policies focused on modifying children's dietary habits, increasing physical activity, and raising awareness.[14] The Health Education Programs of Greece's Ministry of Education and Sports directly support obesity prevention by equipping children with knowledge and skills to improve their health.[13] Primary schools serve as essential platforms for educating children about positive health behaviors, as emphasized by European Union (EU) strategies targeting childhood obesity.[2] Despite efforts to combat obesity, research regarding childhood obesity trends and fitness parameters among Greek primary school students residing in urban and non-urban areas remains limited. This study seeks to fill this gap by analyzing obesity indicators and physical fitness assessments of primary school students from diverse demographic backgrounds in the region of Eastern Macedonia and Thrace. The region encompasses heterogeneous social groups with varying cultural and socioeconomic characteristics, making it an ideal setting for evaluating the relationship between gender, place of residence, obesity indicators, and fitness parameters.

A comprehensive review of the pertinent literature indicates that the objective of this study is to examine the effects of gender and place of residence (urban versus non-urban) on obesity indicators and physical fitness parameters among primary school students in Eastern Macedonia and Thrace, Greece. Therefore, the following hypotheses are postulated: First, that there will be statistically significant differences between boys and girls with respect to obesity indicators and fitness parameters, and second, that there will be statistically significant differences between children from urban and non-urban areas with respect to obesity indicators and fitness parameters.

MATERIAL AND METHOD

Participants

The study was conducted according to the Declaration of Helsinki and approved by the Institutional Scientific Ethical Committee of Democritus University of Thrace, Greece (DUTH/EC/20216/114, 21 November 2023). The study's sample population included 400 primary school students (52.5% boys) aged 9 to 12 years old from the Eastern Macedonia-Thrace region. Concisely, the study was conducted in a primary school located in the prefectures of Alexandroupolis, Komotini, and Xanthi. For the purpose of conducting survey measurements, children were classified into subgroups based on their gender –that is, boys and girls– and their geographical area of residence, that is, urban or non-urban.

Study design

The survey was conducted from the beginning of February 2024 to May 2024. It was designed as a cross-sectional study, encompassing a total of 400 primary school students from the concluding three grades of primary education (ages 9 to 12). To do so, the researchers first obtained the authorization of the school principals, as well as the parental consent. The study then included a sample of children enrolled in grades four, five, and six. The physical fitness measurements of the students were obtained by physical education scientists, while the fat measurements were obtained by nutritionists.

Instruments

The Seca 777 Digital Column Scale with Eye-Level Display (Seca,

Germany) was utilized to meticulously ascertain the weight and height of the students. The height and weight of the students were used to calculate the body mass index (BMI=body mass/height from standing position^2). The sample was classified according to the scale of Cole.[15] Furthermore, the Gima Digital Caliper (Gima SpA, Milan, Italy) was used to measure the triceps, subcapular, and gastrocnemius skinfolds. Additionally, a tape measure was employed to ascertain the waist circumference of the students, thereby facilitating the calculation of their body fat percentage. This determination was made according to the equations proposed by Slaughter et al,[16] for each sex separately: [Body fat (%)/100]×body mass (kg) and lean body mass [body mass (kg)−fat mass (kg)]. Finally, the fitness parameters were assessed as follows: Abdominal strength was measured by the 30-second supine test with legs bent. A handheld digital chronometer and a portable cardio-tracker (Polar S625× monitor, Kempele, Finland) were utilized to measure 10×5 m shuttle run, the purpose of which was to record running agility and speed. Likewise, 20 m shuttle run test was conducted to record cardiorespiratory endurance.

Statistical analysis

The data for the present study was extracted through the implementation of a statistical analysis, which was carried out using the Statistical Package for Social Sciences (IBM SPSS Statistics), version 26.0 (IBM Co, Ltd, Armonk, NY, USA). The statistics derived herein were obtained through the use of descriptive statistics, including means (M), standard deviations (SD), and frequency analysis, to analyze the given dataset. To investigate the differences in gender (boys versus girls) and place of residence (urban versus non-urban) regarding obesity indicators (BMI and body fat percentage) and fitness parameters (palindromic speed running and palindromic endurance running), a multivariate analysis of variance (MANOVA) was conducted. This statistical approach was selected to assess the simultaneous effect of gender and place of residence on the dependent variables while accounting for possible intercorrelations among them. *Post hoc* (Bonferroni) pairwise comparisons were performed to identify specific differences between groups when significant multivariate effects were detected. The level of statistical significance was set at $p \leq 0.05$.

RESULTS

Descriptive statistics

Preliminary findings from the descriptive analysis indicated that the ratio of male to female subjects in the total sample was 52.50% and 47.50%, respectively. The sample included 140 children from grade 4, which constituted 35% of the total, 126 children from grade 5, which constituted 31.5% of the total, and 134 children from grade 6, which constituted 33.5% of the total. Of these, 202 children (105 boys and 97 girls) were from urban areas, while 198 children (105 boys and 93 girls) were from non-urban areas of Macedonia and Thrace. As indicated in table 1, the aforementioned data are presented in exhaustive detail. With respect to students enrolled in schools situated in both urban and non-urban regions, frequency analysis revealed that 105 boys and 97 girls were attending schools in urban areas, while 105 boys and 93 girls were attending schools in non-urban areas. Additionally, the M and SD of the BMI were examined for boys and girls overall and by region of residence (urban, non-urban). The results of the descriptive statistics indicated that, in the entire sample, boys had a BMI mean for the male subjects 16.87±2.37, while the mean BMI for the female subjects was found to be 16.92±0.43. Furthermore, the mean BMI values for boys and girls residing in urban areas were 17.89±3.1 and 17.67±3.4, respectively. The mean BMI values were determined to be 15.85±2.7 and 16.35±2.9 for boys and girls, respectively, who resided in semi-urban areas.

In consideration of body fat percentage as determined by the measurement of skin folds from the triceps brachii, hypoplacenta, and gastrocnemius regions, no statistically significant discrepancy in body fat percentage was observed between male and female subjects (M=78.0±4.2 and M=76.0±6.2, respectively), irrespective of their geographical location (urban or non-urban). The number of repetitions in the 30-second abdominal flexion exercise was utilized to evaluate the muscle strength of boys and girls, respectively, and the interaction of gender and place of residence. The results of means are delineated separately according to the gender and place of residence factors in conjunction with the abdominal muscle strength assessment test. As illustrated in table 2, a descriptive analysis revealed the mean values associated with the factor's "gender" and "place of residence". The subsequent sections presented the descriptive results related to the endurance factor, delineated by both gender and urban/non-urban residence.

Conductive statistics

A MANOVA analysis was conducted to examine the ef-

Table 1. Descriptive statistics of the sample in relation to gender and grade.

		Frequency	Percentage (%)
Gender	Boys	210	52.50
	Girls	190	47.50
Grade	4th Grade	140	35.00
	5th Grade	126	31.50
	6th Grade	134	33.50

Table 2. The means of the 10×5-meter running speed test were evaluated for gender and geographical area. Also, the means for the factor "endurance" in relation to the factors "gender" and "place of residence".

Speed test				Endurance test			
Urban		Non-urban		Urban		Non-urban	
Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
M	M	M	M	M	M	M	M
32.78	34.50	31.96	33.18	3.01	3.04	3.29	3.10

M: Mean values

fects of gender (boys versus girls) and place of residence (urban versus non-urban) on obesity indicators (BMI and body fat percentage) and fitness parameters (abdominal strength, palindromic speed running and palindromic endurance running). The analysis revealed a statistically significant multivariate main effect of gender, Wilks' Λ=0.85, $F_{(4, 355)}$=5.23, p<0.005, η^2=0.05, indicating that boys and girls differed significantly across the dependent variables. A significant main effect of place of residence was also observed, Wilks' Λ=0.92, $F_{(4, 355)}$=3.76, p=0.001, η^2=0.08, suggesting differences between urban and non-urban students in obesity and fitness indicators. Furthermore, the interaction effect between gender and place of residence was statistically significant, Wilks' Λ=0.95, $F_{(4, 355)}$=2.92, p=0.002, η^2=0.06, indicating that the combined impact of gender and place of residence influenced the dependent variables.

(a) *BMI*. A two-way MANOVA was conducted to examine the effects of gender (boys versus girls) and place of residence (urban versus non-urban) on BMI. The analysis revealed no statistically significant main effect for gender, $F_{(1, 398)}$=0.03, p>0.05, indicating that BMI did not differ significantly between boys and girls. However, a significant main effect for place of residence was observed, $F_{(1, 398)}$=13.25, p<0.001, suggesting that students attending schools in urban areas exhibited higher BMI scores compared to students in non-urban areas, who demonstrated lower and healthier BMI values. The interaction effect between gender and place of residence was significant, $F_{(1, 398)}$=12.24, p<0.002, indicating that the relationship between gender and BMI varied across urban and non-urban locations.

(b) *Body fat percentage*. A two-way MANOVA was conducted to examine the effects of gender (boys verus girls) and place of residence (urban versus non-urban) on body fat percentage. The analysis revealed no statistically significant main effect for gender, $F_{(1, 398)}$=0.04, p>0.05, indicating that boys and girls did not differ significantly in body fat percentage. However, a significant main effect for place of residence was observed, $F_{(1, 398)}$=14.65, p<0.001, suggesting that students attending non-urban schools exhibited lower body fat percentages compared to students in urban schools, who showed higher values. Additionally, a significant interaction effect between gender and place of residence was found, $F_{(1, 398)}$=10.47, p<0.05, indicating that the impact of gender on body fat percentage varied depending on whether students attended school in an urban or non-urban area. Specifically, non-urban girls displayed notably lower body fat percentages compared to urban girls, while differences among boys were less pronounced.

(c) *Muscle strength*. A two-way MANOVA was conducted to examine the effects of gender (boys versus girls) and place of residence (urban versus non-urban) on muscle strength, assessed through the abdominal performance test. The analysis revealed a statistically significant main effect for gender, $F_{(1, 398)}$=14.89, p<0.001, indicating that boys and girls differed significantly in abdominal muscle strength. Additionally, a significant main effect for place of residence was found, $F_{(1, 398)}$=16.55, p<0.001, suggesting that students attending non-urban schools exhibited greater abdominal muscle strength compared to students in urban schools, who had lower scores. The interaction effect between gender and place of residence was statistically significant $F_{(1, 398)}$=11.84, p<0.05, indicating that differences in muscle strength between boys and girls were moderated by place of residence.

(d) *Physical condition – speed*. A two-way MANOVA was conducted to assess the effects of gender (boys versus girls) and place of residence (urban versus non-urban) on speed, measured using the 10×5 m test with change of direction. The analysis revealed a statistically significant main effect for gender, $F_{(1, 398)}$=13.12, p<0.001, indicating that boys exhibited significantly better speed performance than girls. Additionally, a significant main effect for place of residence was found, $F_{(1, 398)}$=15.59, p<0.001, suggesting that students attending non-urban schools outperformed urban students on the

speed test. Furthermore, a significant interaction effect between gender and place of residence was observed, $F_{(1, 398)}$=9.65, p<0.05, indicating that the impact of gender on speed performance varied depending on the students' residential environment. Specifically, while boys consistently performed better than girls across both settings, non-urban boys demonstrated the highest scores overall, and non-urban girls outperformed their urban counterparts, suggesting that the environmental factor played a role in shaping speed-related fitness outcomes.

(e) *Physical condition – endurance*. A two-way MANOVA was conducted to evaluate the effects of gender (boys versus girls) and place of residence (urban versus non-urban) on endurance, as measured by the stamina test. The analysis revealed no statistically significant main effect for gender, $F_{(1, 398)}$=13.12, p>0.05, indicating that boys and girls exhibited similar endurance levels. Furthermore, no significant main effect for place of residence was observed, $F_{(1, 398)}$=15.59, p>0.05, suggesting that students in urban and non-urban schools demonstrated comparable endurance scores. Consistent with these findings, the interaction effect between gender and place of residence was also not significant, indicating that the relationship between gender and endurance did not vary across urban and non-urban areas.

DISCUSSION

This study investigated the relationship between gender and place of residence (urban versus non-urban) in relation to obesity indicators and physical fitness parameters among primary school students in Eastern Macedonia and Thrace, Greece. The findings provided a comprehensive perspective on how environmental and lifestyle factors contribute to childhood obesity and physical fitness disparities. The results revealed significant differences in BMI between students based on their place of residence, with non-urban boys and girls displaying healthier BMI values compared to their urban counterparts. Specifically, the mean BMI values indicated that both boys and girls from non-urban areas maintain lower BMI scores, which can be associated with greater opportunities for physical activity, exposure to natural environments, and less reliance on sedentary indoor entertainment.

In contrast, children living in urban areas exhibited higher BMI levels, suggesting that modern urban lifestyles may contribute to weight gain at an early age. Limited access to open play spaces, increased screen time, dietary habits involving processed foods, and reduced engagement in outdoor recreational activities may be responsible for these higher BMI values. Previous research suggests that urban children, on average, engage in fewer hours of spontaneous outdoor play compared to their non-urban counterparts, leading to lower caloric expenditure and increased weight retention.[10] The body fat percentage findings complement the BMI results, further emphasizing how urban settings may predispose children to higher fat accumulation. Although no statistically significant difference was found in body fat percentage between boys and girls, the interaction effect between gender and place of residence revealed that non-urban girls exhibited notably lower body fat percentages than urban girls, while differences among boys were less pronounced. This could indicate a gender-based disparity in activity engagement, suggesting that non-urban girls may participate in higher-intensity activities that contribute to lower fat accumulation compared to urban girls.[17,18]

The findings also demonstrated significant disparities in muscle strength and speed performance between urban and non-urban students, reinforcing the idea that environmental factors shape physical fitness outcomes. Non-urban students consistently outperformed urban students in abdominal strength and speed tests, suggesting that living in non-urban areas provides children with more movement-oriented activities, better access to nature, and opportunities for active commuting.[19] One possible explanation for higher strength levels in non-urban students is the frequent engagement in physically demanding daily activities such as walking or cycling to school, participating in outdoor sports, and engaging in manual tasks that require repetitive muscle engagement. Research indicates that children in rural and semi-rural environments are more likely to perform unstructured physical activities, such as climbing trees, running on uneven terrain, and engaging in spontaneous play, which collectively contribute to greater muscle endurance and agility.[20] The superior speed performance of non-urban students aligns with these findings, as speed-based fitness is heavily influenced by physical activity frequency, muscle engagement, and mobility patterns. Children living in urban centers often spend more time indoors, engaging in passive entertainment such as video games, online activities, and TV watching. In contrast, non-urban children are more likely to move dynamically, utilizing the available space to engage in games and physical challenges that enhance coordination and movement efficiency.[3]

Interestingly, the endurance parameter did not exhibit significant differences across gender or place of residence.

This aligns with developmental research, which suggests that endurance capacity matures later in adolescence rather than during early childhood. While strength and speed-related fitness parameters improve through active participation in childhood physical activities, endurance development is more dependent on age-related physiological changes, such as cardiovascular adaptation and muscle fiber transformation.[14] Overall, these results highlight the critical role of environmental influences on childhood health and fitness. Non-urban students generally benefit from more diverse physical activity opportunities, including unstructured play, sports participation, active commuting, and spontaneous outdoor engagement. Urban students, by contrast, may experience restricted access to movement-friendly spaces, leading to increased sedentary habits and, consequently, higher BMI and body fat accumulation.[21,22] The observed interaction effects between gender and place of residence suggest that the relationship between fitness and environmental factors may be more complex than previously assumed. For example, the significant interaction in muscle strength and body fat percentage indicates that gender-specific behaviors, cultural expectations, and activity engagement may play a role in shaping fitness and obesity risks across different residential settings.[23] Understanding these interactions could help in designing more tailored interventions aimed at improving physical activity participation for both boys and girls across diverse environments.[24]

The results suggest that promoting physical activity opportunities in urban settings could help mitigate childhood obesity rates and improve fitness levels. Given that strength and speed respond positively to increased physical activity in children aged 9–12, school-based interventions focusing on structured play, sports participation, and movement-friendly urban planning could yield meaningful health benefits. Endurance-related fitness gains may require long-term developmental and biological maturation, emphasizing the importance of continued physical engagement beyond primary school years. Future research and policy development should prioritize the integration of accessible play spaces, recreational areas, and structured physical activity programs into urban planning strategies to mitigate the physical constraints often associated with city living. In parallel, school-based interventions such as mandatory physical education and the promotion of extracurricular sports could play a critical role in enhancing urban students' fitness levels and lowering the risk of obesity. Additionally, to gain a more comprehensive understanding of the multifaceted risk factors contributing to childhood obesity across diverse environments, further studies should explore the interplay of dietary habits, screen time exposure, and socioeconomic conditions.

This study provided valuable insights into the effects of gender and place of residence on childhood obesity and physical fitness; however, several limitations should be considered. First, the cross-sectional design prevents analysis of long-term trends or causality in BMI, body fat percentage, and fitness parameters. Second, self-reported lifestyle factors such as diet, screen time, and sleep habits were not included, limiting the ability to assess their influence on obesity and fitness outcomes. Additionally, while urban and non-urban environments were considered, the study does not account for socioeconomic status, parental education, or access to structured sports programs, which may affect children's health differently within each category. The sample was drawn exclusively from Eastern Macedonia and Thrace, limiting the generalizability of findings to other regions or international populations with different lifestyle patterns. Furthermore, while strength, speed, and endurance were measured, the study did not include daily physical activity levels or biological maturation stages, which may impact endurance development in children. Addressing these limitations in future research could provide a more comprehensive understanding of childhood obesity and fitness trends.

In conclusion, the findings of this study highlighted the influence of gender and place of residence on obesity indicators and physical fitness parameters among primary school students in Eastern Macedonia and Thrace, Greece. BMI was significantly lower in non-urban children compared to their urban counterparts, suggesting that environmental and lifestyle factors play a crucial role in childhood obesity. The greater access to open spaces and physical activity opportunities in non-urban areas appears to contribute positively to healthier body composition, while urban environments may limit movement and encourage sedentary behaviors. Speed and strength were found to be significantly higher in students attending non-urban schools, suggesting that access to outdoor spaces, lower traffic congestion, and shorter commutes may enable more opportunities for physical activity. However, endurance did not show statistically significant differences across gender or place of residence, reinforcing previous findings that stamina develops later in adolescence rather than in early childhood.

Finally, the present study provided valuable insights into the role of environment and physical activity opportunities in shaping childhood health and fitness. Future research

and policy initiatives should explore ways to bridge the activity gap between urban and non-urban students, ensuring equal access to movement-friendly spaces and structured exercise programs for all children.

ΠΕΡΙΛΗΨΗ

Παιδική παχυσαρκία και φυσική κατάσταση σε αστικά και μη αστικά σχολικά περιβάλλοντα: Μια προοπτική με βάση το φύλο

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ΣΚΟΠΟΣ Εξέταση των επιδράσεων του φύλου και του τόπου διαμονής στους δείκτες παχυσαρκίας και στη φυσική κατάσταση σε μαθητές δημοτικού σχολείου στην Ανατολική Μακεδονία και Θράκη στην Ελλάδα. **ΥΛΙΚΟ-ΜΕΘΟΔΟΣ** Το δείγμα περιλάμβανε 400 μαθητές δημοτικού σχολείου, ταξινομημένους κατά φύλο και περιοχή κατοικίας. Οι μετρήσεις περιλάμβαναν εκτίμηση του δείκτη μάζας σώματος (ΔΜΣ), ποσοστό σωματικού λίπους, περιφέρεια μέσης και πάχος δερματοπτυχών, καθώς και παραμέτρους αξιολόγησης της φυσικής κατάστασης (δύναμη, ταχύτητα, αντοχή). Οι διαφορές μεταξύ των μεταβλητών αξιολογήθηκαν με τη χρήση της πολυμεταβλητής ανάλυσης διακύμανσης (MANOVA). **ΑΠΟΤΕΛΕΣΜΑΤΑ** Οι μαθητές που διέμεναν σε μη αστικές περιοχές παρουσίασαν υγιέστερο ΔΜΣ και ποσοστό σωματικού λίπους, καθώς και αυξημένους δείκτες δύναμης και ταχύτητας, πιθανόν λόγω των αυξημένων ευκαιριών σωματικής δραστηριότητας. Δεν βρέθηκαν στατιστικά σημαντικές διαφορές στην αντοχή, γεγονός που υποδηλώνει ότι η βιολογική ωρίμανση που σχετίζεται με την ηλικία διαδραματίζει μεγαλύτερο ρόλο. **ΣΥΜΠΕΡΑΣΜΑΤΑ** Τα ευρήματα αναδεικνύουν τον αντίκτυπο του οικιστικού περιβάλλοντος στην παιδική παχυσαρκία και στη φυσική κατάσταση. Στρατηγικές για την προώθηση της σωματικής δραστηριότητας σε αστικά περιβάλλοντα και η δημιουργία χώρων φιλικών προς την κίνηση μπορεί να συμβάλλουν στη βελτίωση των αποτελεσμάτων για την υγεία.

Λέξεις ευρετηρίου: Διατροφή και άσκηση, Παιδική παχυσαρκία, Ποιότητα ζωής, Φυσική κατάσταση

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