Journal of Nutrition and Food Security
Shahid Sadoughi University of Medical Sciences
School of Public Health
Department of Nutrition

eISSN: 2476-7425 pISSN: 2476-7417 JNFS 2025; 10(2): 244-247 Website: jnfs.ssu.ac.ir

Prevalence of Overweight and Obesity in Children Aged 6-12 Years in Yazd, Iran in 2022

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ARTICLE INFO

ORIGINAL ARTICLE

Article history:
Received: 6 nov 2024
Revised: 18 jan 2025
Accepted: 18 jan 2025

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Keywords
Obesity; Overweight; Children; Yazd..

ABSTRACT

Background: Obesity is a major public health problem among children and has emerged as a significant public health challenge in the 21st century. It is associated with the risk of complications in childhood and increased morbidity and mortality in adulthood. This study investigated the prevalence of overweight and obesity in children aged 6-12 years in Yazd, Iran in 2022. **Methods:** This cross-sectional study examined 6353 children using cluster sampling to determine the prevalence of obesity among 6-12 years students. **Results**: A total of 654 (9.86%) and 350 (5.50%) of children were obes and overweight, respectively. From 3098 boys, 113 (3.64%) were overweight and 331 (10.68%) were obese. Among 3255 girls, 237 (7.28%) of them were overweight and 323 (9.92%) were obese. Girls were almost twice as likely to be overweight, while there was no significant difference in obesity between boys and girls. **Conclusion:** A significant increase in obesity among primary school students in recent years was observed.

Introduction

Obesity is a major public health problem among children and has emerged as a significant public health challenge in the 21st century. This problem is associated with the risk of complications in childhood and increased morbidity and mortality in adulthood (Timperio *et al.*, 2004).

Today, overweight and obese children face an uncertain future. They are more likely to suffer from type 2 diabetes and heart disease, among many other health problems (Sabin *et al.*, 2015).

Unfortunately, given the negative impact of childhood obesity, the prevalence of obesity has drastically increased in last years. According to the World Health Organization (WHO) and the National Health and Nutrition Examination Survey (NHANES) IV, 16% of children are overweight and 30% are at risk of becoming obese (Akbari and Mohammadi, 2022). In 2022, over 390 million children and adolescents aged 5 to 19 years were

This paper should be cited as: Mirhosseini NA, Lojje H, Emaeili Dahaj F. ***Prevalence of Overweight and Obesity in Children Aged 6-12 Years in Yazd, Iran in 2022.*** *Journal of Nutrition and Food Security (JNFS)*, 2025; 10(2): 244-247.

[DOI: 10.18502/jnfs.v10i2.18535]

overweight and 160 million with obese.

Overweight or obesity in children can be defined by body mass index (BMI) percentile. Obesity and overweight are defined as a BMI above the 95th and 85-95th percentiles, respectively (Yu *et al.*, 2012).

Body fat percentage changes throughout childhood, starting with high levels of obesity in infancy. It decreases for about 5.5 years until the so-called obesity rebound period is reached, during which body fat percentage is typically at lowest level. Then adiposity increases until early adulthood (Robert, 2024).

Individual obesity is the result of a complex interplay of genetically determined body habits, appetite, diet, food intake, physical activity and energy expenditure (Aggarwal and Jain, 2018). Sleep also plays a role in the risk of obesity. Over the past four decades, children and adults have spent less time sleeping. Reasons for these changes may include longer working hours, longer time spent watching television, and a generally faster pace of life (Hart *et al.*, 2011).

Genetic determinants also play a role in individual susceptibility to obesity. An important example is the FTO gene at 16q12, which is associated with childhood obesity, likely due to increased energy intake (Robert, 2024).

Obesity has various causes and can cause various problems. Therefore, it is necessary to monitor its spread over time to better assess the danger. The present study examined the prevalence of obesity among school-age children in Yazd in 2022.

Materials and Methods

This cross-sectional study examined 6353 students using cluster sampling to determine the prevalence of overweight and obesity among 6- to 12-year-old students in Yazd city. The students' weight was measured using a Seca scale (range 0.1–150 kg) without shoes and with little clothing. After every 10 measurements, the accuracy of the scale was checked with a standard weight.

Height without shoes was measured with an altimeter (accuracy 1 mm) while standing so that the back of the head, the front of the back, the hips and the heels were in contact with the altimeter. People were asked to look straight ahead so that the horizontal surface of the external ear canal rotated as little as possible. BMI was calculated in kilograms per square meter (BMI=weight (kg) /height (m)^2)

Then, children's BMI was matched on the BMI curve in relation to age and gender. According to the WHO Child Growth Standards, children with a BMI greater than or equal to 95 were considered obese, and those with a BMI greater than or equal to 85 and less than 95 were considered overweight.

Results

Table 1 shows the prevalence of overweitht and obesity in studied population. As it shows, 6353 children were examined that 654 (9.86%) of the them were obese. Among them, 323 children were girls (49%) and 331 children were boys (51%). Also, 350 children were overweight, including 237 girls (67.7%) and 113 boys (32.3%). Of 3098 boys, 113 (3.64%) were overweight and 331 (10.68%) were obese. Of 3255 girls, 237 (7.28%) were overweight and 323 (9.92%) were obese. The results showed that girls were almost twice as likely to be overweight, while there was no significant difference in obesity between boys and girls.

Table 1. The prevalence of obesity an d overweight by sex.

Sex	Total	Overweight	Obese
Boy	3098 (48.76)[a]	113 (3.64)	331(10.68)
Girl	3255 (51.23)	237 (7.28)	323 (9.92)
Total	6353 (100)	350 (5.50)	645 (9.86)
P-value[b]	<0.0001	<0.0001	<0.0001

[a]: n (%); [b]: Chi square test.

Discussion

Over the last 40 years, a significant increase has been obsreved in the prevalence of overweight and obesity in the pediatric population (Sabin *et al.*, 2015). Today, overweight and obese children face an uncertain future. They are more likely to suffer from type 2 diabetes and heart disease, among many other health problems. As the prevalence of obesity increases in a population, the risk of

[DOI: 10.18502/jnfs.v10i2.18535]

various other health problems in the future also increases. In this study, 9.96% of children were obese and 5.5% of them were overweight.

In a study entitled "Overweight and obesity prevalence in Iranian children aged 8-12 years: A study in Tehran in 2022", the prevalence of overweight and obesity was 20.6% and 14.6%, respectively. The prevalence of obesity was higher in boys than in girls (19.4% *vs.* 10.8%) (Soheilipour *et al.*, 2022). This study was conducted concurrently with the present study. A comparison of the results showed that a larger proportion of students in the capital of Iran suffer from obesity and overweight than in Yazd. There was also no significant difference in obesity in the current study, whereas girls were twice as likely to be overweight. On the contrary, in Tehran, boys appeared to be twice as likely as girls to be obese (Soheilipour *et al.*, 2022).

The prevalence of obesity among school-age children and adolescents aged 6 to 18 years was reported in a systematic review and meta-analysis study in Iran. The prevalence of obesity among Iranian students was 5.89%. The prevalence of obesity was higher in boys than in girls (6.85% versus 5.13). In this study, the highest prevalence of obesity among students was attributable to the northern and northwestern geographical regions at 7.07%, and the lowest prevalence was attributable to the eastern and northeastern regions of the country at 4.25% (Khazaei *et al.*, 2017).

A study in the United States reported the prevalence of obesity among children and adolescents aged 2 to 19 years in 2017-2020. The prevalence of obesity was 12.7% overall and 20.7% in 6- to 11-year-old subgroup (Stohl, 2023).

In a study in Yazd in 1998, the prevalence of obesity among 463 students aged 6 to 10 years was 3.85% (Mozaffari-Khosravi *et al.*, 1999). A study in Yazd on 2,768 children aged 6 and 8 years, reported that 2.40% of children were obese (Mirzaei and Karimi, 2011). Another study in Yazd reported that among 1,400 children aged 14 and 18 years, 3.9% were obese (Mozaffari-Khosravi *et al.*, 2011).

In the present study, 9.86% of children were obese. A comparison of our study with previous studies in Yazd showed a significant increase in obesity among primary school students in recent years. This increase may be due to biological, psychological, social and economic factors (Jebeile *et al.*, 2022, Roberto *et al.*, 2015).

Excessive consumption of energy-dense, micronutrient-poor food, high consumption of sugary drinks, and the pervasive marketing of fast food, as well as significantly increased screen time in these years and sleep deprivation, may be some of the main causes of this growing threat (Dietz Jr and Gortmaker, 1985, Liberali *et al.*, 2020, Miller *et al.*, 2021, Ohkuma *et al.*, 2015, Robinson *et al.*, 2017).

An advantage of this study compared to previous studies is the larger sample size. Previous studies have shown that age groups and school type as a socioeconomic indicator have no influence on the outcome. A limitation of the study is the lack of necessary information to confirm or reject these results (Khazaei *et al.*, 2017). Since diet, sleep, and screen time are considered some of the most important factors for obesity in children, it is recommended that further studies be conducted to investigate the association between these risk factors and the prevalence of obesity in the population.

Conclusion

The present study showed that there has been a significant increase in the incidence of overweight and obesity in primary school students in Yazd, Iran. This increase is mostly due to lifestyle changes, excessive consumption of fast food and as well as the use of mass media and video games.

Acknowledgements

We should thank all of the participants in the current study.

Authors' contributions

Dr. Mirhosseini Conceived and designed the study, Dr.Lojje Wrote the paper, Msc. Esmaeili Dahaj contributed to data collection and assisted with manuscript writing and revision, Dr.Namayande analyzed the data.All authors have read and approved the final manuscript.

[DOI: 10.18502/jnfs.v10i2.18535]

Conflict of interest

The authors declared no conflict of interests.

Funding

This study was funded by Shahid Sadoughi University of Medical Sciences.

References

Aggarwal B & Jain V 2018. Obesity in children: Definition, etiology and approach. *Indian journal of pediatrics*. **85 (6)**: 463-471.

Akbari H & Mohammadi M 2022. The prevalence of obesity in Iranian children: A systematic review and meta-analysis. *Journal of pediatrics review*. **10 (2)**: 93-102.

Dietz Jr WH & Gortmaker SL 1985. Do we fatten our children at the television set? Obesity and television viewing in children and adolescents. *Pediatrics*. **75 (5)**: 807-812.

Hart CN, Cairns A & Jelalian E 2011. Sleep and obesity in children and adolescents. *Pediatric clinics*. **58 (3)**: 715-733.

Jebeile H, Kelly A, O'Malley G & Baur L 2022. Obesity in children and adolescents: epidemiology, causes, assessment, and management. . *Lancet diabetes endocrinol.* **10 (5)**: 351-365.

Khazaei S, et al. 2017. The prevalence of obesity among school-aged children and youth aged 6-18 years in Iran: A systematic review and meta-analysis study. *ARYA Atheroscler*. **13 (1)**: 35-43.

Liberali R, Kupek E & Assis MAAd 2020. Dietary patterns and childhood obesity risk: A systematic review. *Childhood obesity*. **16 (2)**: 70-85.

Miller MA, Bates S, Ji C & Cappuccio FP 2021. Systematic review and meta-analyses of the relationship between short sleep and incidence of obesity and effectiveness of sleep interventions on weight gain in preschool children. *Obesity reviews*. **22 (2)**: e13113.

Mirzaei M & Karimi M 2011. Prevalence of overweight and obesity among the first grade primary students in Yazd. *Journal of Ilam University of Medical Sciences*. **18 (4)**: 43-49.

Mozaffari-Khosravi H, Hosseinzadeh Shamsi Anar M, Shariati Bafghi S & Mozaffari-Khosravi V 2011. Prevalence of eating disorders and obesity in high school girl students in Yazd, 2010-2011. *Toloo-e-behdasht.* **10 (1)**: 38-49.

Mozaffari-Khosravi H, Keshavarz S & Dehkordi H 1999. The prevalence of obesity and its association with obesity in primary school children and their parents in the city during the academic. *Journal of Shahid Sadoughi University of Medical Sciences*. **7 (2)**: 17-24.

Ohkuma T, et al. 2015. Association between eating rate and obesity: a systematic review and meta-analysis. *International journal of obesity*. **39 (11)**: 1589-1596.

Robert K 2024. Nelson Textbook of Pediatrics 22nd Edition.

Roberto CA, et al. 2015. Patchy progress on obesity prevention: emerging examples, entrenched barriers, and new thinking. *Lancet*. **385 (9985)**: 2400-2409.

Robinson TN, et al. 2017. Screen media exposure and obesity in children and adolescents. *Pediatrics*. **140 (Supplement_2)**: S97-S101.

Sabin M, Kao K, Juonala M, Baur L & Wake M 2015. Viewpoint article: Childhood obesity-looking back over 50 years to begin to look forward. *Journal of paediatrics and child health*. **51 (1)**: 82-86.

Soheilipour F, Pishgahroudsari M & Pazouki A 2022. Overweight and obesity prevalence in Iranian children aged 8-12 years; A study in Tehran. *Journal of comprehensive pediatrics*. **13 (3)**: e120827.

Stohl E 2023. Childhood Obesity in the United States. *Ballard brief*. **2023 (2)**: 9.

Timperio A, Salmon J & Ball K 2004. Evidence-based strategies to promote physical activity among children, adolescents and young adults: review and update. *Journal of science and medicine in sport*. **7 (1)**: 20-29.

Yu Z, et al. 2012. Trends in overweight and obesity among children and adolescents in China from 1981 to 2010: a meta-analysis. *PloS one*. **7 (12)**: e51949.

[DOI: 10.18502/jnfs.v10i2.18535]