

Prediabetes in children and adolescents in Israel: a large-scale retrospective cohort study

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Objective: Prediabetes refers to glucose levels that are above normal but below the threshold for diabetes. Monitoring glucose dysregulation phenotypes is crucial to identify children at risk for early-onset type 2 diabetes. This study aimed to determine the prevalence of impaired fasting glucose (IFG) and increased glycated hemoglobin A1c (HbA1c) among Israeli children and adolescents without diabetes.

Methods: A retrospective cohort study of children aged 5–18 years from three central Israeli districts from 2010 to 2020 was conducted. Data retrieved from the electronic patient medical files included age, sex, sector, socioeconomic status (SES), body mass index (BMI), fasting plasma glucose, and HbA1c levels. IFG was defined as fasting glucose 100–125 mg/dL; increased HbA1c as 5.7–6.4%.

Results: Of the 19,654 participants (54% male), rates of obesity were higher in the 10–14-year-old group (44.1%). Prevalence of IFG and/or elevated HbA1c was highest among morbidly obese individuals across all ages. Notably, low SES was associated with increased odds for IFG in children aged 5–9 years, and increased odds for prediabetic parameters among adolescents (10–18y). Children from the Arab sector had consistently higher adjusted odds of prediabetes compared to other groups.

Table 1 Demographic and clinical characteristics of the study population by age groups

Characteristic	Total N=19654	5-9 years N=3919 (20%)	10-14 years N=8952 (45.5%)	15-18 years N=6783 (34.5%)	p-value
Sex (%)					
Male	10604 (54.0%)	2126 (54.2%)	4900 (54.7%)	3578 (52.7%)	
Female	9050 (46.0%)	1793 (45.8%)	4052 (45.3%)	3205 (47.3%)	0.043
Sector (%)					
Secular Jews	12126 (61.7%)	2566 (65.5%)	5519 (61.7%)	4041 (59.6%)	
Religious Jews	645 (3.3%)	129 (3.3%)	275 (3.1%)	241 (3.6%)	
Arabs	5703 (29.0%)	1018 (26.0%)	2621 (29.3%)	2064 (30.4%)	
NA	1180 (6.0%)	206 (5.3%)	537 (6.0%)	437 (6.4%)	<0.001
Weight status (%)					
Normal weight	7358 (37.4%)	1597 (40.8%)	2961 (33.1%)	2800 (41.3%)	<0.001
Obesity	2625 (13.4%)	407 (10.4%)	1157 (12.9%)	1061 (15.6%)	<0.001
Morbid obesity	9671 (49.2%)	1915 (48.9%)	4834 (54.0%)	2922 (43.1%)	<0.001
Mean BMI (SD), kg/m²					
	23.09 (5.96)	19.18 (4.59)	23.13 (5.64)	25.30 (5.93)	<0.001
Mean BMI percentile (SD)					
	76.43 (31.69)	73.57 (33.79)	78.85 (30.81)	74.90 (31.36)	<0.001
Socioeconomic status					
Low	3724 (38.6%)	526 (33.8%)	1725 (38.3%)	1473 (41.0%)	<0.001
Medium	2732 (28.3%)	485 (31.1%)	1256 (27.9%)	991 (27.6%)	
High	3197 (33.1%)	547 (35.1%)	1521 (33.8%)	1129 (31.4%)	
Research group (%)					
IFG	7056 (35.9%)	1278 (32.6%)	2834 (31.7%)	2944 (43.4%)	<0.001
Increased HbA1c level	9188 (46.7%)	2010 (51.3%)	4472 (50.0%)	2706 (39.9%)	
IFG & Increased HbA1c level	3410 (17.4%)	631 (16.1%)	1646 (18.4%)	1133 (16.7%)	

Conclusions: Significant disparities exist in prediabetes risk among Israeli youth, influenced by sex, age, obesity, sector, and SES. Findings support the use of targeted, age- and sector-specific strategies for early identification and prevention, including glucose screening and efforts to address social determinants of health in pediatric care.

