

Overweight and obesity in children and adolescents with type 1 diabetes in Belgium: A 13-year period observational real-world study

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We investigated the evolution of overweight and obesity from 2008-2021 compared to the general population and examined differences between normal weight, overweight and obese children with T1D.

Methods

- Data were cross-sectionally collected between 2008-2021 from all Belgian pediatric diabetes centers (N=16).
- Youth (<19 years) were classified as having normal weight, overweight or obesity using age and sex-specific BMI cut-offs.
- Data from the general population (1997-2018) were obtained from the nation Health Information Survey (1) and comparison with children with T1D was performed with Chi-square.

Results

- From 2008 to 2021 the prevalence of overweight (17.2% vs 21.3%, p<0.0001) and obesity (5.7% vs 6.8%, p=0.0048) in youth with T1D increased (**Fig.1**).
- In 2018, children with T1D showed a higher prevalence of overweight compared to their non-diabetic peers (21.2% vs. 13.4%, p<0.0001), although the rates of obesity were similar (5.9% vs. 7.3%) (**Fig.1**).

Table 1 Characteristics of Belgian children and adolescents with T1D in 2021, stratified by weight categories[§]

	Normal weight (A) (N = 2520)	Overweight (B) (N = 777)	Obese (C) (N = 249)
Male sex, n (%)	1400 (55.8%)	331 (42.9%) ^A	115 (46.6%) ^A
Age, years, median [IQR]	13.5 [10.3-16.0]	14.0 [11.0-16.2] ^A	14.8 [12.0-16.6] ^{A,B}
At least 1 parent of Caucasian ethnicity*, n/N (%)	1797/2477 (72.5%)	456/767 (59.4%) ^A	124/245 (50.6%) ^A
Mean HbA1c, mmol/mol [± SD], % [± SD]	59 [±9], 7.5 [± 1.3]	62 [±9], 7.8 [± 1.3] ^A	64 [±9], 8.0 [± 1.3] ^A
Presence of psychosocial distress* n/N (%)	655/2509 (26.11%)	237/772 (30.7%)	96/247 (38.9%) ^{A,B}
Insulin scheme			
≤2 injections per day, n/N (%)	49/2463 (1.9%)	7/757 (0.9%) ^A	9/243 (3.7%) ^{A,B}
3 injections per day, n/N (%)	248/2463 (10.1%)	115/757 (15.2%) ^A	43/243 (17.7%) ^A
≥4 per day (basal-bolus regimen), n/N (%)	1400/2463 (56.8%)	439/757 (58.0%)	150/243 (61.7%)
Insulin pump, n/N (%)	766/2463 (31.1%)	196/757 (25.9%) ^A	41/243 (16.9%) ^A
Cardiovascular risks*			
No risk, n/N (%)	1940/2509 (77.3%)	514/772 (66.6%) ^A	118/247 (47.8%) ^{A,B}
One risk present, n/N (%)	531/2509 (21.2%)	219/772 (28.4%) ^A	100/247 (40.5%) ^{A,B}
Two risks present, n/N (%)	38/2509 (1.5%)	39/772 (5.1%) ^A	29/248 (11.7%) ^A

^A p < 0,05 vs. Normal BMI; ^B p < 0,05 vs. Overweight
 Cardiovascular risks were defined as having one of the following condition:
 1. Dyslipidemia : on lipid lowering medication or low density lipoprotein >=130 mg/dL or HDL <=40 mg/dL or triglycerides >=150 mg/dL
 2. Hypertension : on BP lowering medication or above or equal 95th percentile for age, sex, and height for children between 2-18 years

- Girls, children with 2 parents of non-Caucasian ethnicity and older children had a higher prevalence of overweight and obesity.
- Children with overweight or obesity had higher HbA1c, increased cardiovascular risks and were less treated with insulin pump, yet received higher insulin doses/day compared to normal weight children with T1D.
- Youth with obesity presented more psychosocial distress than those with normal weight or overweight.

REFERENCES

1. Health Interview Survey (HIS) is a national survey launched in 1997 and repeated every 4-5 years. The HIS collects information on a wide range of health topics and is coordinated by Sciensano (Institute of public Health of Belgium).

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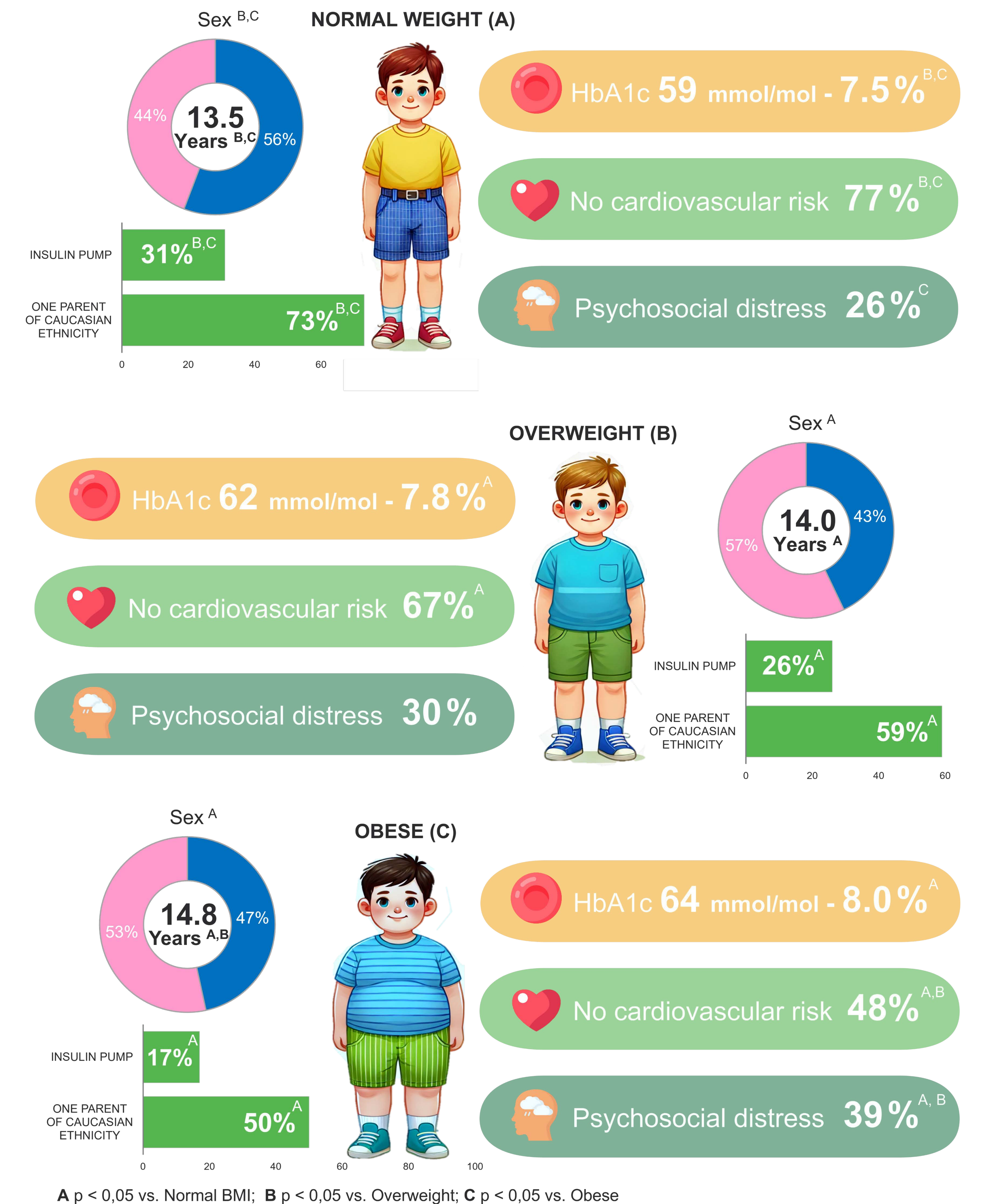
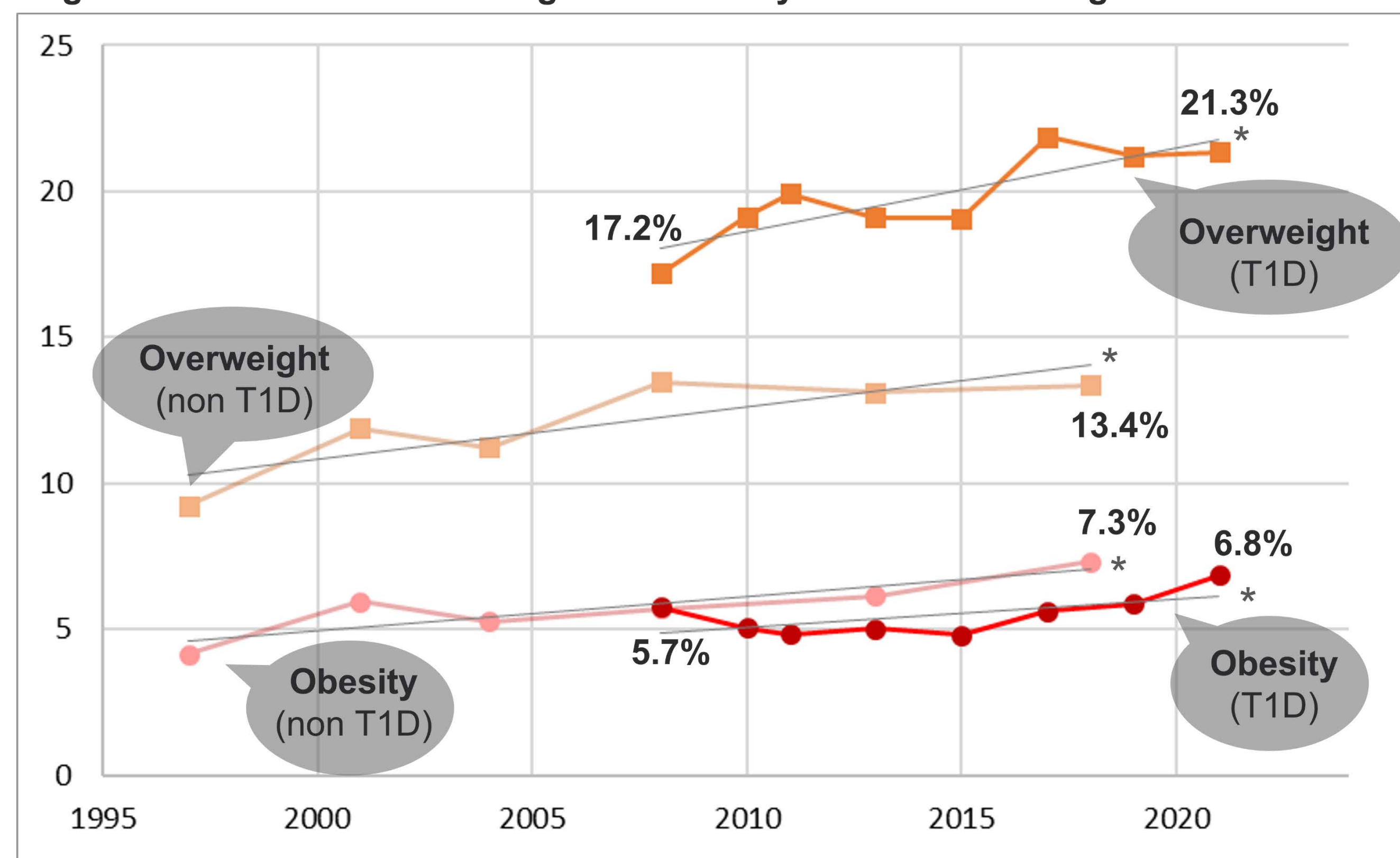


Fig. 1 Evolution of the overweight and obesity in children in Belgium



Conclusion

There is a continuous increase over the past 13 years of overweight and obesity in youth with T1D, a trend also noticed in the general population.

Specific subpopulations presented with additionally elevated prevalence of overweight and obesity. This higher prevalence of overweight and obesity correlates with long-term complications, demonstrating the need for additional weight management interventions in this population.