

Comparison of current trends in obesity in patients with type 1 diabetes in Nottingham with a historical cohort and national data

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BACKGROUND AND AIMS

Background:

Obesity is a growing epidemic and a major cause of morbidity and mortality². Maintaining a healthy weight is of greater importance for diabetics due to the increased risk of microvascular and macrovascular complications³.

There has been suggestion that type 1 diabetic children are more likely to be obese than their peers⁴.

Aims:

To compare the BMI z-score of children with Type 1 Diabetes (T1DM) in Nottingham to current national and local background paediatric populations and to identify factors associated with increased BMI.

METHODS

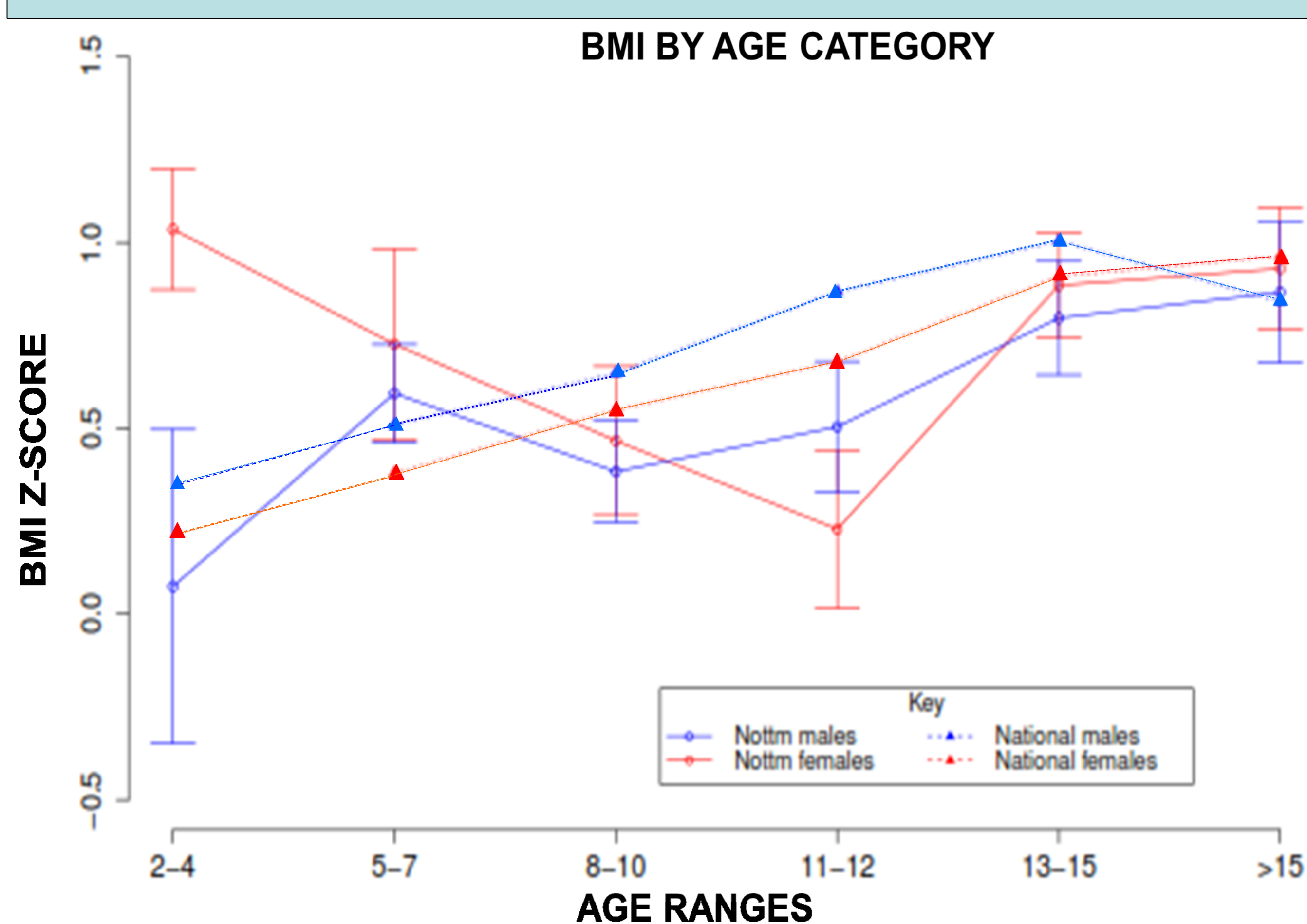
- A retrospective observational cohort study of patients with T1DM aged 2-15 years under the care of the paediatric diabetes team at Nottingham Children's Hospital, between April 2013 and March 2014.
- Mean BMI-z-score for the year was computed in R, utilising publically available LMS data from the UK 1990 cohort.
- This was compared with BMI z-score of age-matched children from a) the Health Survey for England (HSE) data for the same year b) our 2008 audit data C) the National Child Measurement Programme (NCMP).^{1,5}
- Overweight and obesity was defined as a BMI>85th (BMI z-score >1.0) and >95th (BMI z-score >1.6) centiles, respectively.

RESULTS 1

1140 clinic entries were analysed relating to 253 patients.

- The mean±SEM BMI-z-score was 0.62±0.004, with 16% of patients being obese and a further 15.2% overweight, similar to national rates [15.2% and 14.2% (HSE)]¹(figure 1).

Figure 1: BMI z-scores comparing national averages (HSE data¹) with local population



- The highest BMI z-score was in 2-4 year old females (1.03±0.16).
- Young female patients (2-10yr) had a higher mean z-score than age-matched males (0.63±0.13 vs 0.44±0.46, p=0.24) but this did not reach significance.
- No gender trend was noted in older children (11-15yr).

RESULTS 2

- Compared to 2008 data, obesity rates and mean BMI-z-score had improved (26.3% vs 16.05% obese, p=0.005; mean BMI z-score 1.0 vs 0.62), p<0.001).

Table 1: Summary data of obesity prevalence comparing national averages* with local population

Survey Year	2-10 year olds		11-15 year olds		2-15 year olds	
	2008/09	2013/14	2008/09	2013/14	2008/09	2013/14
Number of local C&YP with T1DM	98	86	164	157	262	243
BMI-Z-score mean (range/ SEM)	1.0 (-1.5 to 4.2)	0.53 (0.083)	1.1 (-1.9 to 3.8)	0.66 (0.084)	1.0 (-1.9 to 4.2)	0.62 (0.0039)
Obesity local prevalence	24/98	11/86	45/164	28/157	69/262	39/243
Obesity National rates ¹	24.5%	12.8%	27.4%	17.8%	26.3%	16.05%
Overweight National rates ¹	13.9%	12.4%	19.5%	19.9%	16%	15.2%
Overweight local prevalence	13.4%	13.2%	15.7%	16.0%	14.3%	14.2%

* National HSE published data¹ compared with Local Data of children and young person (C&YP) with T1DM. Abbreviation SEM : Standard error of mean

Table 2: National (NCMP) vs Local obesity rates in two age group vs study population

	England	Notts City	Notts County	Local C&YP with T1DM	England	Notts City	Notts County	Local C&YP with T1DM
2008/09					2013/14			
Reception	9.6%	10.0%	8.9%	25.5% (12/47) CI 13.9-40.3	9.5%	10.7%	7.9%	15.4% *(2/13) CI 1.92-45.45%
Year 6	18.3%	22.6%	17.6%	12.1% (4/33) CI 3.4-28.2	19.1%	23.4%	17.54%	12.2% (6/49) CI 4.6-24.8%

Comparison of current data with published data from National child measurement programme⁵. Abbreviation CI : confidence interval.

*Current data on obesity was insignificant as only 2/13 patients were obese.

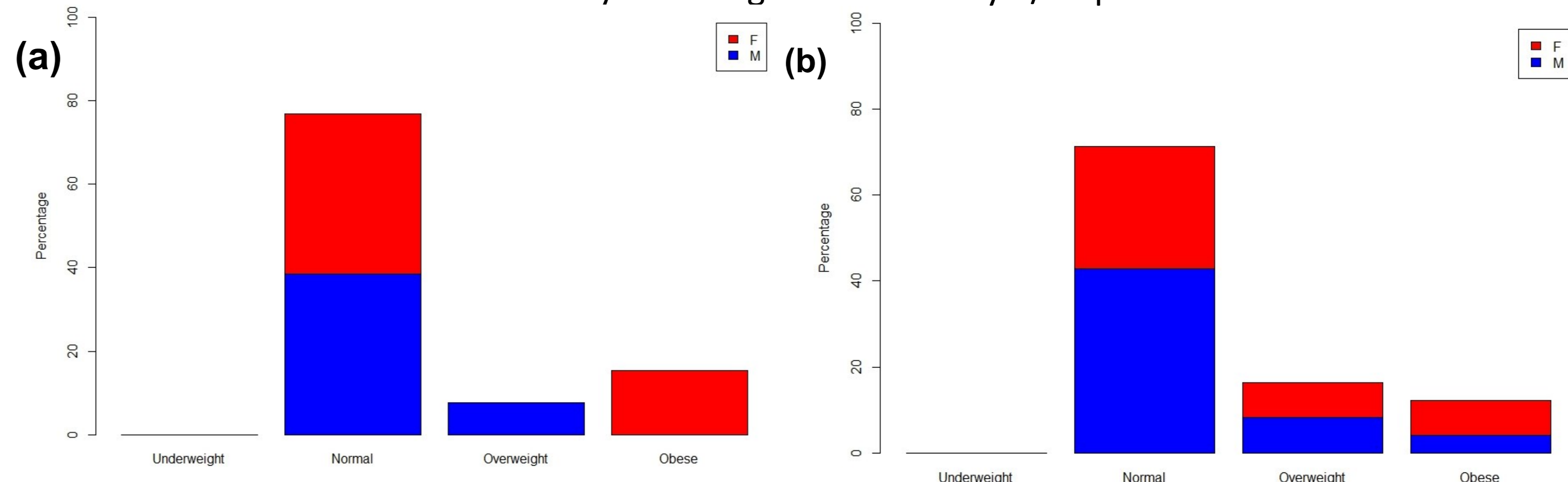


Figure 2: Histograms of weight category of T1DM children in (a) reception & (b) year 6, by gender

CONCLUSIONS

Both prevalence of obesity and mean BMI-z-score in T1DM in Nottingham have improved significantly over the last 5 years and are now comparable to the national background population. In contrast to previously published evidence, the children with T1DM in Nottingham are not obese compared to the general population. A number of changes have been introduced locally since 2008 of which key changes include; change from BD insulin regimen to multiple daily injections and all patients receiving dietetic support, better targeted management leading to fewer hypoglycaemic episodes (and therefore fewer rescue treatments) which may have contributed to this improvement. Dietary education at schools may have contributed to trends nationally.

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