

Socioeconomic deprivation is associated with reduced efficacy of an insulin adjustment education program for patients with type 1 diabetes.



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BACKGROUND

The Dose Adjustment For Normal Eating (DAFNE) course is a five day course which teaches carbohydrate counting and insulin adjustment, aiming to improve glycaemic control (lower HbA1c).¹ A key message is that with appropriate insulin adjustment, patients with type 1 diabetes mellitus (T1DM) can eat a normal diet.

In Scotland, geographic areas are divided into five quintiles of deprivation that are postcode-searchable using the Scottish Index of Multiple Deprivation (SIMD) tool.²

AIM

To investigate the association between socioeconomic deprivation and reduction in HbA1c after attending DAFNE education.

METHODS

In this retrospective observational study, we identified adults with T1DM who had previously attended DAFNE in NHS Lothian, East Scotland.

We extracted age, sex, postcode-based SIMD quintiles and annual HbA1c measurements four years before and after course attendance.

We calculated mean HbA1c before (baseline) and after attendance at DAFNE course, across four annual measurements.

Change in mean HbA1c (mmol/mol) was categorised into three groups: decrease (>-2.5), no change ($<\pm 2.5$), increase ($>+2.5$).

We used multivariable ordinal logistic regression, with baseline mean HbA1c as a covariate, to investigate the association of SIMD quintile with reduction in mean HbA1c.

RESULTS

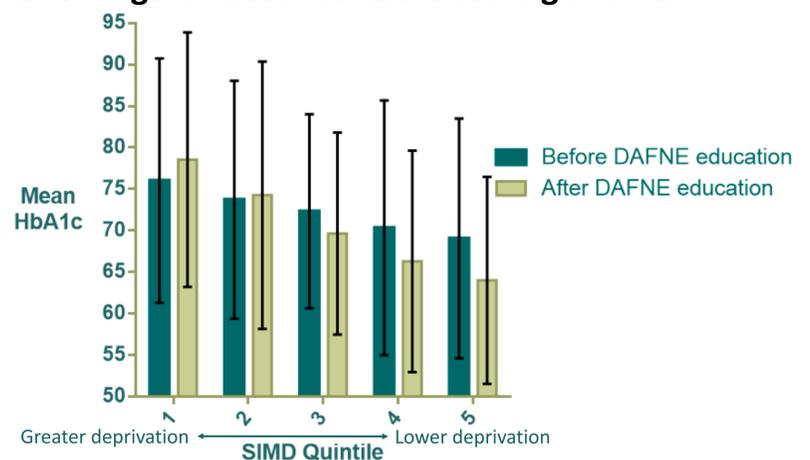
1. Patient Details

	No. of patients	Scottish Index of Multiple Deprivation (SIMD)				
		1	2	3	4	5
Included patients	335 (100%)	36 (10.7%)	67 (20.0%)	60 (17.9%)	80 (23.9%)	92 (27.5%)
DAFNE site						
-St John's Hospital	245 (73.1%)	27 (11.0%)	57 (23.3%)	44 (18.0%)	58 (23.7%)	59 (24.1%)
-Western General Hospital	90 (26.1%)	9 (10.0%)	10 (11.1%)	16 (17.8%)	22 (24.4%)	33 (36.7%)
Age (range)	45.5 (21-91)	41.7	43.8	44.6	47.3	47.1
Sex						
-Male	139 (41.5%)	17 (12.2%)	25 (18.0%)	29 (20.9%)	31 (22.3%)	37 (26.6%)
-Female	196 (58.5%)	19 (9.7%)	42 (21.4%)	31 (15.8%)	49 (25.0%)	55 (28.1%)
Baseline mean HbA1c (range)	71.6 (40-120)	76.0	73.7	72.3	70.3	69.2

3. Multivariable Regression - Higher SIMD quintile (lower deprivation) was associated with reduction in HbA1c.

Variable	Increase (%)	No change (%)	Decrease (%)	OR univariable	OR multivariable	
SIMD quintile	1	18 (50.0)	5 (13.9)	13 (36.1)	ref	ref
	2	32 (47.8)	18 (26.9)	17 (25.4)	1.09 (0.48-2.47, p=0.828)	1.21 (0.53-2.78, p=0.650)
	3	18 (30.0)	14 (23.3)	28 (46.7)	2.33 (1.00-5.56, p=0.052)	2.65 (1.11-6.46, p=0.029)
	4	25 (31.2)	14 (17.5)	41 (51.2)	2.20 (0.98-4.97, p=0.055)	2.75 (1.20-6.40, p=0.018)
	5	20 (21.7)	18 (19.6)	54 (58.7)	3.60 (1.59-8.27, p=0.002)	4.66 (2.00-11.11, p<0.001)
Baseline mean HbA1c	40-60	35 (48.6)	20 (27.8)	17 (23.6)	ref	ref
	60-80	54 (30.9)	41 (23.4)	80 (45.7)	2.12 (1.21-3.73, p=0.009)	2.43 (1.35-4.41, p=0.003)
	80-120	24 (27.3)	8 (9.1)	56 (63.6)	2.52 (1.31-4.92, p=0.006)	3.39 (1.70-6.92, p=0.001)

2. Change in mean HbA1c following DAFNE



Key Findings:

- Across all patients, there was a reduction in the mean HbA1c (mean difference 2.5 mmol/mol).
- Lower SIMD quintile (greater deprivation) was associated with higher baseline mean HbA1c.
- Higher SIMD quintile (lower deprivation) had greater reductions in mean HbA1c.
- On multivariable analysis:
 1. Higher SIMD quintile
 2. Higher baseline mean HbA1c
 were associated with reduction in mean HbA1c.

STRENGTHS & LIMITATIONS

- Strengths: Sample size, two-centre study, patients from diverse socioeconomic background.
- Limitations: Postcode-based deprivation measure (as opposed to individual), lack of hypoglycaemia data.

CONCLUSION

Socioeconomic deprivation was associated higher baseline HbA1c (i.e. worse control) and less reduction in mean HbA1c after DAFNE (i.e reduced efficacy).

Future research could use qualitative/mixed methods to explore causes of this differential benefit, identify barriers, and how best to support patients with T1DM from areas of greater deprivation.

REFERENCES - See QR code (right)

