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Background: A multidisciplinary team (MDT) intervention may improve severe obesity in children through education and life-style change.

Objective and hypotheses: MDT intervention leads to improvements in clinical measures of obesity.

Method: Participants were selected by criteria: <16 years old; BMI >3.5 SDS or BMI >2.5 SDS with obesity-related co-morbidity. Those eligible for intervention were offered either one-to-one dietetic, psychological or combined dietetic and psychology appointments or a group intervention programme (GIP). The GIP was included activity, diet and behavioural interventions. Children and their families attended GIP sessions over 10-13 weeks. Height, weight and post exercise recovery heart rate (RHR) were measured at beginning (T1) and end of the intervention (T2). Participant records were examined for anthropometric measures at referral to endocrinology (T0) and the most recent (T3) date available (March 2016). Scottish Index of Multiple Deprivation (SIMD) was used to assess socio-economic status of families. SIMD 1 is equivalent to the most deprived and SIMD 5 the least deprived socio-economic post-codes in Scotland. BMI SDS was calculated using UK 1990 data.

Results: Of 174 children referred to the service, 146 fulfilled the criteria and 32 opted for GIP. In the GIP group F:M ratio was 24:8 and T1 median (range) age was 8.25 (2.0-15.42) years. GIP uptake was 21.9% of those eligible and engagement with the service was poor. However once engaged the GIP completion rate was 94%.

20/31 (64.5%) families came from the most deprived quintile (post-code unavailable in one) and >80% came from the lower two quintiles (Figure 1; N/A = SIMD score not available).

Similar SIMD distribution was found amongst those referred to the service who were offered appointments for either dietetic, psychology, combined dietetics and psychology or did not attend (DNA'd) the appointment (62.5% SIMD 1 and 20% in SIMD 2). Among those not suitable for intervention the proportion in the lower two quintiles was lower (58%). This was not significantly different (p=0.24) from the "eligible" patients (referred group plus DNA'd).

The median (range) BMI SDS for all referrals (available for 103/146) was +3.7 (2.4-5.8). For those not eligible for the service (n=12) the median (range) BMI SDS was +3.65 (2.95-5.1). This was not significant (p=0.61)

Group intervention children

Median (range; n) BMI SDS for those children opting into the group intervention was: at T0 = +3.7(2.5-5.3; 32), at T1 = +3.6(3.1-4.5; 17), at T2 = +3.53(3.1-4.8; 17) and at T3 = +3.62(3.3-4.3; 15). Although BMI SDS was not significantly different at T2 (p=0.7) it had improved or remained stable in 16/18 (89%) while two participants increased BMI SD (by 0.18, 0.41).

Median (range) maternal BMI at T1 was 38.9 (19.3 - 44.5) kg/m². Maternal BMI also improved in 6/10 with the median (range) BMI improvement was 0.35 (-1.1 - 1.8) kg/m².

The rate of change in BMI SDS (Figure 2) improved in patients completing the group intervention programme compared to the interval preceding the programme from -0.16 to -0.31 although this was not significant (p=0.13). Comparing the programme completers to non-completers there was no significant difference in change in BMI SDS from the start of the programme to T3 (p=0.8).

However median (range) RHR changed significantly from 115 (90-148) to 91 (72-152) in thirteen patients who completed the intervention (Figure 3) with post exercise resting heart rate measured at T1 and T2 (p=0.01).

Figure 1. Proportion of patients who were referred, DNA'd appointment or were not eligible by SIMD quintile

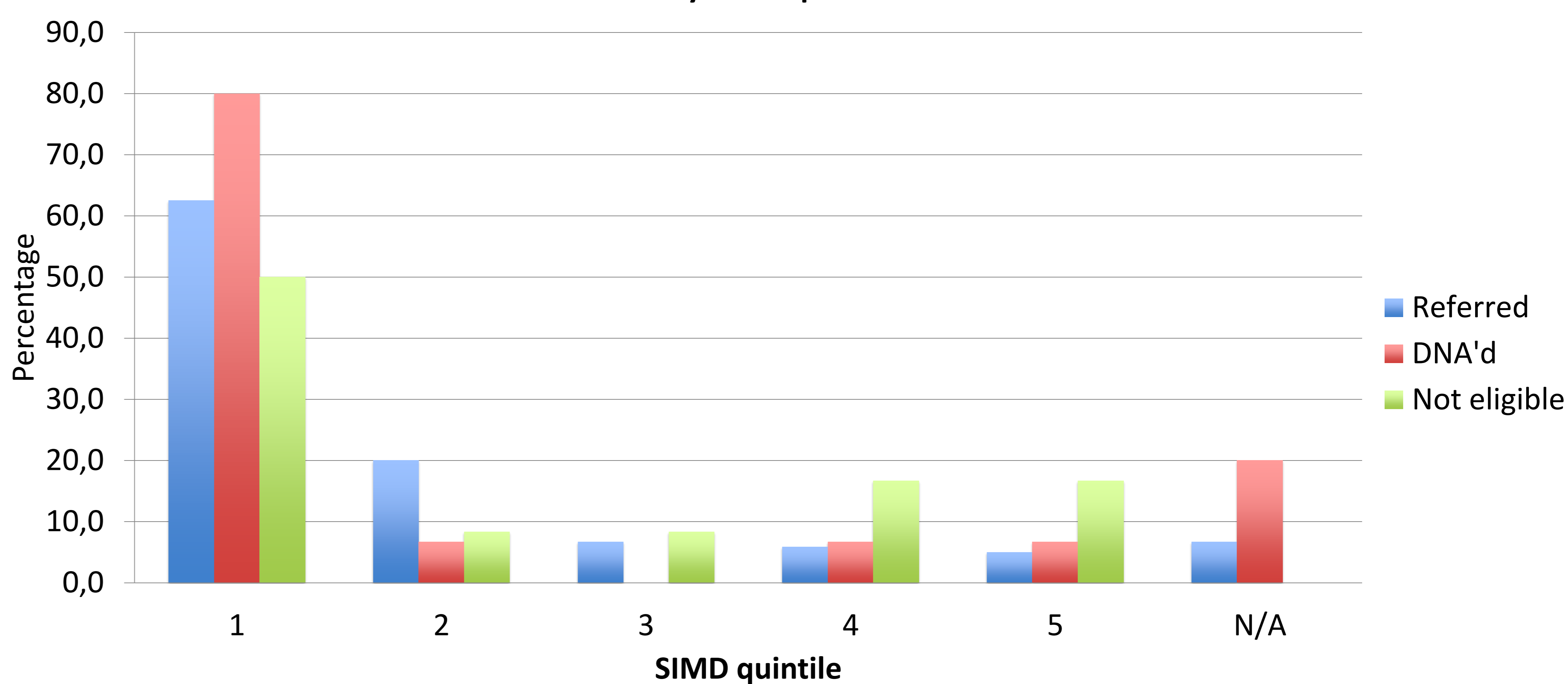


Figure 2. Change in BMI SDS for 17 patients completing the intervention at the four time points T0, T1, T2 and T3.

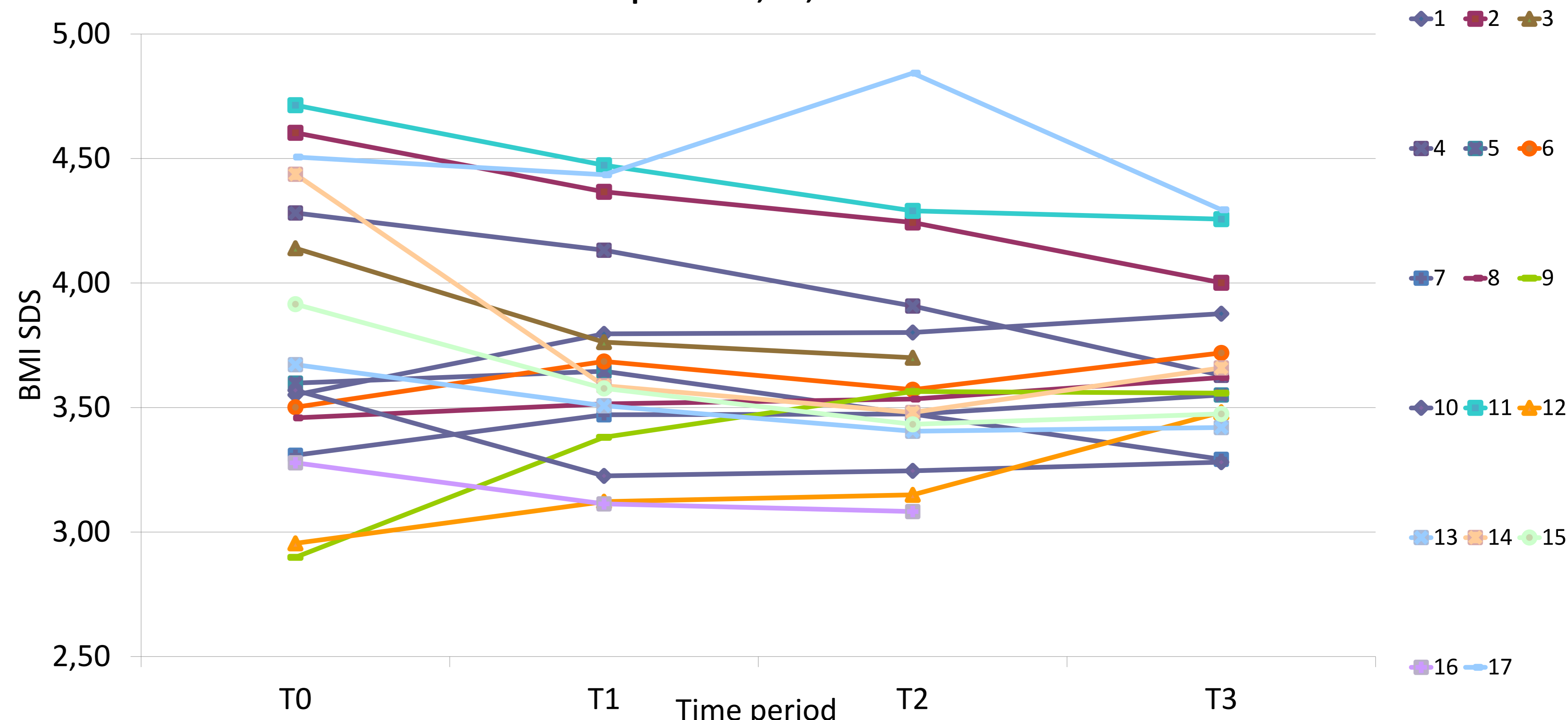
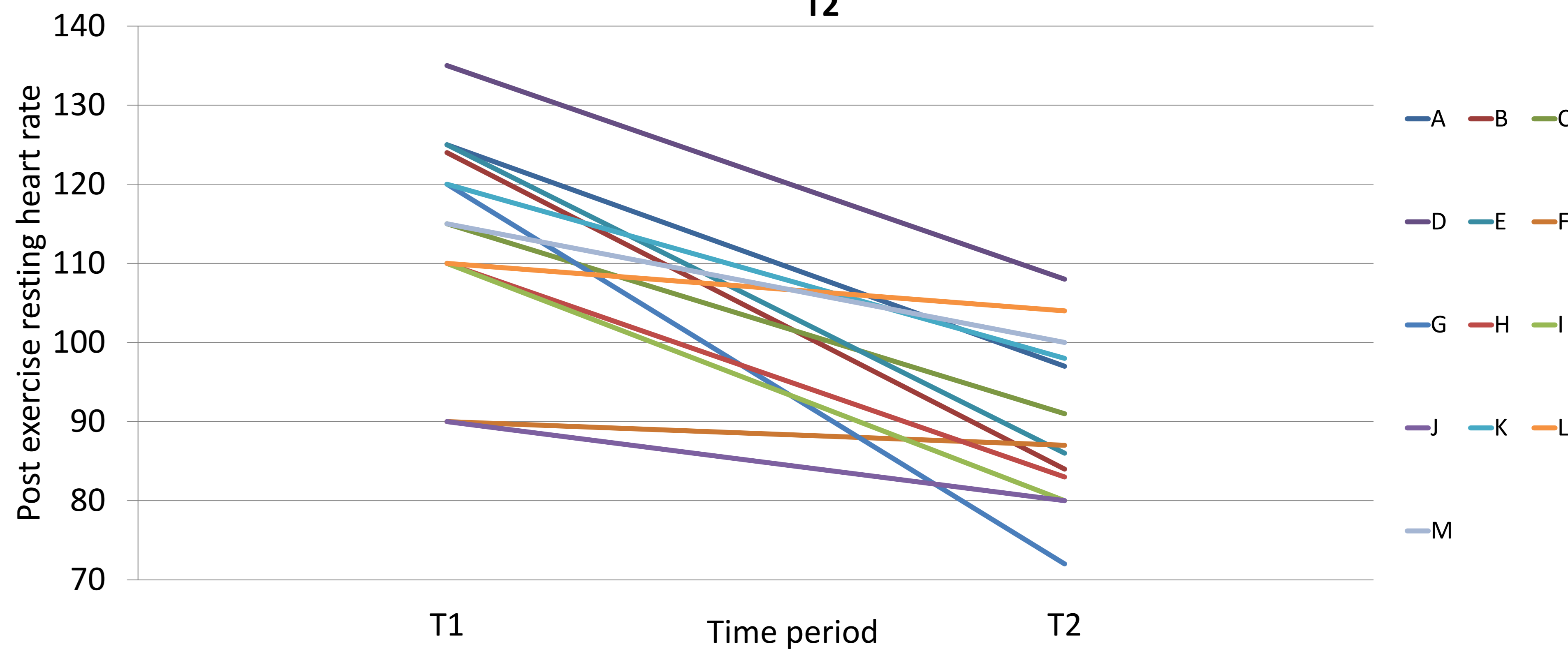


Figure 3. Change in post-exercise RHR in thirteen patients between time points T1 and T2



Conclusion: Deprived areas seem to be at greatest need of childhood obesity management. MDT interventions have a role in the management of obesity. Short term programmes may not reduce BMI SDS, but improvements in RHR suggest a reduction in cardiovascular risk. Engagement of families and children with obesity services remains the biggest challenge, which may be related to low socio-economic status.

Conflict of interest: The authors have nothing to declare