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## **Treatment of obesity in adolescents, where should interventions focus?**

The upward trend in child and adolescent obesity is of global concern, with up to 16% of 10-17 year olds being classified as obese in some countries<sup>1</sup>. Given the well-established short and long-term health<sup>2</sup> and psychosocial<sup>3</sup> consequences, the increasing prevalence and the impact on social inequalities in health, there is an urgent need to tackle obesity at an early stage.

Several systematic reviews have summarised the evidence on the effectiveness of weight management interventions for child and adolescent obesity<sup>4-6</sup>. In general they highlight methodological limitations, with many previous trials not being adequately powered, and interventions lacking a theoretical framework<sup>6</sup>. Trials are particularly sparse among adolescent populations.

The findings from a trial evaluating the Healthy Eating and Lifestyles Programme (HELP), aimed at weight management in obesity 12-18 year olds, is reported in this issue. This trial addresses many of the limitations in previous studies. The 12-week family based intervention is theoretically informed and the trial was adequately powered to detect clinically important outcomes. However, despite promising findings from a pilot study, the definitive trial found no evidence of benefit in terms of BMI reduction, psychological or metabolic outcomes among those in the intervention group, compared to adolescents receiving a single educational session on health eating and physical activity in a primary care setting.

Comprehensive process measures alongside the trial showed high intervention fidelity, suggesting this was not an explanation for the null findings. Relatively low attrition suggests that the trial was also adequately powered. The authors consider one possible explanation for the findings relates to the highly deprived population that took part. This is partly supported by the findings of another systematic review focusing on weight management interventions among adolescents from disadvantaged backgrounds<sup>7</sup>. The quality of included studies was generally low. Nevertheless, a feature of the interventions showing a beneficial effect on BMI was that they were more experiential rather than educational as in HELP.

Within the wider literature, systematic reviews conclude that lifestyle weight management interventions generally do result in modest weight loss among children and adolescents, at least in the short term<sup>4,5,8</sup>. Evidence on long term outcomes is limited and it is not known whether any short term effects are maintained. A review of child and adolescent weight management studies by the National Institute for Health and Clinical Excellence (NICE) found a small reduction in standardised BMI for children in the intervention compared to those in the control arm at the end of intervention (standardised mean difference = -0.17; CI 95% = -0.30 to -0.04, p = 0.01). However, meta-analysis of data from studies that included a longer term follow up ( $\geq 6$  months) showed a null effect (SMD = -0.07; CI 95% = -0.15 to 0.02, p = 0.12)<sup>4</sup>. Furthermore, even if behavioural interventions resulted in BMI reduction equivalent to the largest upper pooled estimate of effect in meta-analyses (reduction in BMI z-score of 0.3), an adolescent with extreme obesity is unlikely to achieve normal weight by participating<sup>9</sup>. Substantial benefit is only likely if the short term effects are maintained<sup>8</sup>.

A further complication is that the majority of children and adolescents who are obese do not attend or complete weight management programmes. An observational study in five districts in London found that among 285 overweight children identified through school measurements, only a third sought further help, mainly from informal sources<sup>10</sup>. Difficulty in referring and uptake of weight management services by children and their families has also been highlighted by service providers<sup>11</sup> and by NICE<sup>12</sup>. Once recruited, retention of families in programmes is also challenging, with completion rates ranging from 33% to 89% across programmes in one region<sup>13</sup>. Reasons given for non-participation in weight management services mainly relate to lack of time and interest, with some families highlighting the importance of focusing on health rather than obesity<sup>14</sup>. A review of qualitative studies<sup>15</sup> highlighted a range of factors, including lack of recognition of obesity, low motivation, or time pressures, as well as service-related factors such as the timing, duration or location of services posing a barrier. Thus, child and adolescent weight management programmes also need to consider how to improve attendance and retention.

In summary, child and adolescent weight management programmes may be effective in some groups, but uptake and completion rates are low. In particular, evidence on the most effective interventions for more disadvantaged groups is lacking. This group are at

particularly high risk of obesity, and unless interventions focus on deprived sub-groups, inequalities in health will widen. Other interventions, including upstream measures and a greater focus on prevention need to be considered and evaluated.

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