



Review article

The effects of multi-component weight management interventions on weight loss in adults with intellectual disabilities and obesity: A systematic review and meta-analysis of randomised controlled trials



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ABSTRACT

Background: Adults with intellectual disabilities have been shown to experience higher rates of obesity in comparison to the general population.

Aim: To examine the effectiveness of randomised controlled trials of multi-component weight management interventions for adults with intellectual disabilities and overweight/obesity.

Methods and procedures: A systematic search of six electronic databases was conducted from database inception to January 2016. Risk of bias was assessed by the Cochrane Collaboration tool. Behavioural change techniques were defined by coding against the Coventry Aberdeen LOnDon REfined (CALO-RE) taxonomy. Meta-analyses were conducted as Weighted Mean Difference (WMD) between intervention and control/comparator intervention.

Outcomes and results: Six randomised controlled trials were included. The interventions did not adhere to clinical recommendations [the inclusion of an energy deficit diet (EDD), physical activity, and behaviour change techniques]. Meta-analysis revealed that current multi-component weight management interventions are not more effective than no treatment (WMD: -0.38 kg; 95% CI -1.34 kg to 0.58 kg; $p = 0.44$).

Conclusion and implications: There is a paucity of randomised controlled trials of multi-component weight management interventions for adults with intellectual disabilities and overweight/obesity. Current interventions, based on a health education approach are ineffective. Future long-term interventions that include an EDD and adhere to clinical recommendations on the management of obesity are warranted.

What this paper adds

Evidence on the effects of weight management interventions in adults with intellectual disabilities and overweight/obesity thus far has included heterogenous study designs and sample populations which limits interpretation of the effect of the intervention due to risk of confounding factors. This review adds to the current literature by including only randomised controlled trials of multi-component weight management interventions. Furthermore, this review also aims to add to the findings of previous narrative reviews by quantifying and providing a more accurate account of the effect(s) of the interventions.

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1. Introduction

The prevalence of obesity is currently of epidemic proportions World Health Organisation (WHO, 2015). Obesity is associated with increasing the risk of numerous chronic diseases including cardiovascular disease, type II diabetes, and some cancers [Scottish Intercollegiate Guideline Network (SIGN, 2010); National Institute of Clinical Evidence (NICE, 2014)].

Adults with intellectual disabilities have consistently been shown to experience higher rates of obesity in comparison to the general population (Bhaumik, Watson, Thorp, Tyrer, & McGrother, 2008; Hsieh, Rimmer, & Heller, 2014; Melville, Hamilton, Hankey, Miller, & Boyle, 2007; Melville et al., 2008). Obesity incidence has been reported to be as high as 50% for adults with intellectual disabilities (NICE, 2014). The aetiology of obesity for this population group is complex with many non-modifiable and modifiable determinants. Rates of overweight and obesity are reported to be higher in specific groups of adults with intellectual disabilities including women (Bhaumik et al., 2008; Melville et al., 2008), adults with mild to moderate level of intellectual disabilities (Emerson, 2005; Melville et al., 2007), and individuals with genetic syndromes including Down syndrome (Hsieh et al., 2014; Melville et al., 2008). Moreover, unhealthy lifestyle habits consistent with those in the general population have been shown to be more prevalent in adults with intellectual disabilities, including increased energy intake through dietary indulgence of readily available, energy dense food, the adoption of sedentary lifestyles and reduced time spent engaged in physical activities (McGuire, Daly, & Smyth, 2007; Finlayson et al., 2009).

Furthermore, the high rates of obesity have shown to exacerbate the already considerable health needs of adults with intellectual disabilities and significantly contribute to their reduced life expectancy (Cooper, Melville, & Morrison, 2004). Therefore, the management of obesity is a major public health priority for this population group (NICE, 2007).

International clinical guidelines on the management of obesity aim to challenge these lifestyle habits by advocating multi-component weight management interventions as the treatment of choice to support individuals to achieve a clinically important weight loss of 5–10% of initial body weight, associated with health improvements [National Institute of Health (NIH, 2000; SIGN 2010; NICE 2014; Yumuk et al., 2015)]. Current recommendations on multi-component weight management interventions include: (i) an energy deficit diet (EDD) of 600 kcal reduction in total energy intake per day, (ii) support to increase physical activity; (iii) behaviour change techniques; (iv) an active weight maintenance component; and (v) a 12-month intervention/follow up period. However, adults with intellectual disabilities experience barriers and have limited access to evidence based health services (NICE, 2007; van Schrojenstein Lantman-de and Walsh, 2008). Moreover, there is insufficient evidence on which to formulate effective weight management interventions for this population group (Spanos, Melville, & Hankey, 2013).

Systematic reviews of studies focussed on lifestyle interventions for the management of obesity in adults with intellectual disabilities have previously been conducted (Doherty, Jones, Chauhan, & Gibson, 2017; Hamilton, Hankey, Miller, Boyle, & Melville, 2007; Jinks, Cotton, & Rylance, 2011; Spanos et al., 2013). However, there are limitations with the current available evidence. These include the limited use of systematic methodology to effectively select and extract the available evidence (Hamilton et al., 2007; Jinks et al., 2011). The identification of intervention components in previous reviews was informed based on information from the study titles and methods of the primary studies and was not based on standardised definitions of behaviour change methods (Doherty et al., 2017; Hamilton et al., 2007; Jinks et al., 2011; Spanos et al., 2013). Recent research has emphasised the importance of elucidating the ‘active ingredients’ of these interventions in order to identify the effective and ineffective components and also to assist with development and implementation of future interventions (Abraham & Michie, 2008; Michie et al., 2011; Michie et al., 2013). A number of taxonomies of behaviour change techniques have been developed to assist with the identification, and characterisation of behaviour change techniques (Abraham & Michie, 2008; Michie et al., 2011; Michie et al., 2013). For example, the Coventry Aberdeen LONDON Refined (CALO-RE) taxonomy developed by Michie and colleagues (2011) consists of a 40-item checklist of behaviour change techniques to help people change their physical activity levels and eating behaviours and therefore is particularly pertinent to defining the intervention components of multi-component weight management interventions. Finally, a limitation identified in previous reviews was the inclusion of heterogeneous study designs, which are, subject to bias and associated with reverse causality (Bowling & Ebrahim, 2005; Flanders, Lin, Pirkle, & Caudill, 1992). In order to facilitate decisions on the most effective approach for weight management for adults with intellectual disabilities, it is important that systematic reviews are based on high quality evidence from randomised controlled trials (Medical Research Council MRC, 2000). The main aim of this study is to fulfil the gaps in the evidence-based identified in previous reviews by synthesising the available evidence on solely multi-component weight management interventions for adults with intellectual disabilities and overweight/obesity. This review will add to previous narrative reviews by conducting a meta-analysis to provide a more accurate and quantitative estimate of the effect of the interventions. Additional objectives also include: to identify the components of the interventions and to determine whether they meet the criteria recommended by clinical obesity guidelines; and to assess if participants achieved a clinically important weight loss of 5–10% of initial body weight.

2. Methods

This study was completed following the guidelines of the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) (Moher, Liberati, Tetzlaff, & Altman, 2009).

2.1. Search strategy

A systematic search of six electronic databases: Medline, Embase, Cochrane Library, Cumulative Index of Nursing and Allied Health Literature (CINHAL), PsychINFO, and Education Resource Information Centre (ERIC) was conducted from 1946 to and

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