Obesity Medicine 3 (2016) 10–16

Contents lists available at ScienceDirect

Obesity Medicine

journal homepage: http://www.journals.elsevier.com/obesity-medicine

Invited Review

Treatment programs in overweight and obese children: How to achieve lifestyle changes?

Barbara Dieris*, Thomas Reinehr

Vestische Hospital for Children and Adolescents, University of Witten/Herdecke, Germany

ARTICLE INFO

Article history:
Received 6 July 2016
Accepted 11 July 2016

Keywords:
Lifestyle intervention
Obesity
Children
Motivational interviewing
Treatment adherence

ABSTRACT

Lifestyle interventions based on diet, behavioral and exercise interventions are regarded as therapy of choice in overweight and obese children. Its efficiency has been proven by several randomized-controlled trials (RCT) and meta-analyses. Involving parents is crucial for success. Already a stable weight in growing children is associated with an improvement of cardiovascular risk factors and comorbidities of obesity. Particularly younger children and less overweight children profit from lifestyle interventions.

However, in clinical practice the degree of weight loss is only moderate and the success rate two years after onset of intervention is low because of low treatment adherence (<10%). Failures in weight reduction are attributed to a lack of motivation, genetic background, and adaptive changes of basal metabolic rate and satiety hormones in weight loss. Focusing on failures in lifestyle habits leads often to a blaming of patients and their families. Therefore, we present in this review not only the outcome of lifestyle interventions but also proposed techniques to increase treatment adherence. Future research is needed to prove the effectiveness of these communication techniques.

1. Introduction

While the prevalence of childhood overweight and obesity has been increasing for many years around the world (Han et al., 2010), the prevalences are now stable on a high level in the U.S. and Europe affecting up to one fifth of the children (Ogden et al., 2016; van Jaarsveld and Gulliford, 2015). A great proportion of these children tend to become obese adults (Whitaker et al., 1997; Bray, 2002) with the associated cardiovascular comorbidities and increased cancer risk mortality (Baker et al., 2007; Biro and Wien, 2010; Franks et al., 2010; Twig et al., 2016). In conclusion already overweight children have an increased mortality (Baker et al., 2007; Biro and Wien, 2010; Franks et al., 2010; Twig et al., 2016). Additionally, obesity in childhood is associated with many other diseases such as asthma, polycystic ovarian syndrome (PCOS), non-alcoholic fatty liver disease (NAFLD), sleep apnea syndrome, and orthopedic problems (Han et al., 2010). However, the overweight and obese children suffer most notably from poor quality of life and reduced social integration (Han et al., 2010).

In conclusion, effective therapeutic approaches are urgently needed in overweight and obese children. Primarily lifestyle interventions are recommended in guidelines focusing on obese children (Barlow and Dietz, 2002; August et al., 2008). However, the long-term effectiveness of such kinds of interventions in clinical practice is discussed critically due to low treatment adherence (Reinehr et al., 2009a; Hampl et al., in press), and outcomes vary widely between different studies (August et al., 2008; Oude et al., 2009). Low treatment adherence can be attributed not only to the characteristics of the obese children and his/her family but also to the challenges in the communication between therapists and overweight/obese children and their families (Osterberg and Blaschke, 2005). Focusing on failures in lifestyle habits leads to a blaming of patients and their families. Therefore, the scope of this review is to present critically our current knowledge of lifestyle interventions for overweight and obese children and to present useful methods to improve treatment adherence.

2. Concept of lifestyle interventions

Lifestyle interventions for overweight and obese children are usually compromised of diet and exercise interventions using

* Corresponding author. Vestische Hospital for Children and Adolescents, University of Witten/Herdecke, Department of Pediatric Endocrinology, Diabetes and Nutrition Medicine, Dr.-F.-Steiner-Str. 5, 45711 Datteln, Germany.
E-mail address: B.Dieris@kinderklinik-datteln.de (B. Dieris).

http://dx.doi.org/10.1016/j.obmed.2016.07.001
2451-8476/

behavior therapy techniques (Oude et al., 2009; McGovern et al., 2008). Most lifestyle interventions try to reduce the individual calorie intakes by about 30%, even if studies proving this approach are lacking (Oude et al., 2009; McGovern et al., 2008). Currently there is debate about whether a low-fat (usually 30% of calories as fat) or a low-carbohydrate diet is more efficacious (August et al., 2008). A meta-analysis of randomized controlled studies in adults showed that the low-carbohydrate diet resulted in moderately greater weight loss by 6 months but not after 12 months (Nordmann et al., 2006). Of interest, treatment adherence was much more important than kind of diet for treatment success in the long-run (Sacks et al., 2009). At the present time, there is insufficient pediatric evidence to warrant recommending any one diet over another. The only effective diet advices proven by RCTs are the reduction of intakes of sweetened drinks (Muckelbauer et al., 2009; Ebbeling et al., 2012) and the reduction of fast food (Pereira et al., 2005).

Sport sessions to improve physical activity have been recommended for many years as components of lifestyle interventions. The aims are to improve self-confidence and to acquire a positive body image, to improve aerobic and anaerobic fitness as well as muscle strength, and therefore reducing body weight without loss of lean body mass. Sports activities are well accepted by obese children if they are performed in closed groups excluding normal-weight children (Reinehr et al., 2003). However, meta-analyses and many RCTs of physical activity interventions found no effect on BMI in obese children (Oude et al., 2009; McGovern et al., 2008; Stoner et al., in press). Also increasing daily physical activity by walking to school or kindergarten instead of using cars or buses was not associated with a significant weight loss in RCT studies (Martinez et al., 2008; Mo-suwan et al., 1998). On the other side, increased physical activity was associated with an improvement of fitness and cardiovascular risk factors in obese children even without weight loss (Martinez et al., 2008; Puder et al., 2011; Peralta et al., 2009).

In the recent years, many interventions focused on sedentary behavior by reducing media time to treat childhood obesity. Results of the meta-analysis and RCTs demonstrated favorable impacts on BMI of this kind of intervention (McGovern et al., 2008; Epstein et al., 2008; Wahi et al., 2011).

A new medium for lifestyle intervention is the Internet. However, interventions via Internet for obese adolescents have been examined without promising results to date (Doyle et al., 2008; de Niet et al., 2012). Also telephone coaching and electronic contact interventions were not associated with changes of BMI in obese children (Nguyen et al., 2013).

Successful lifestyle interventions are frequently based on behavior therapy including impulse control techniques, self-instruction, cognitive restructuring, development of problem solving strategies, behavior contracts, booster systems, self-reflection curves, and model learning via parents (Flodmark, 2005; Epstein et al., 2001). The effectiveness of behavior therapy approaches have been proven in several RCT studies and meta-analyses (Epstein et al., 1994, 2001). In the recent years, interventions for obese children have moved on to systemic and solution-focused theories as well as family therapy (Flodmark, 2005; Sung-Chan et al., 2012). But little is known which psychological method is most useful (Nowicka et al., 2011).

Interventions involving parents are more effective than interventions solely for overweight or obese children (August et al., 2008; Oude et al., 2009; McGovern et al., 2008; Young et al., 2007; Casazza et al., 2013; Magarey et al., 2011; Okely et al., 2010). Successful lifestyle interventions were always performed as group treatment (Reinehr et al., 2009a; Oude et al., 2009; McGovern et al., 2008; Reinehr et al., 2009b). Group treatment can be more cost-effective than individual approaches and motivation can be increased through the interaction with the group participants.

3. Outcome of lifestyle interventions

Meta-analyses summarizing the findings of >60 RCTs with >5500 children reported in concordance that combined behavioral lifestyle interventions are effective to improve weight status in children at 6 and 12 months follow-up in contrast to standard care or self-help (Oude et al., 2009; McGovern et al., 2008). The degree of overweight reduction and the success rate was higher in children compared to studies in adults (Oude et al., 2009; McGovern et al., 2008; Anderson et al., 2001). The mean reduction of standard deviation score of BMI (BMI-SDS) in lifestyle interventions for obese children 12 months after onset of intervention ranged from −0.29 (95% confidence interval (CI) −0.45 up to −0.14) up to −0.63 (95%CI -0.90 up to −0.43) with better results in children aged 8 to 12 and being less overweight (Reinehr et al., 2009a; Oude et al., 2009; McGovern et al., 2008; Reinehr et al., 2009b; Katz et al., 2008; Savoye et al., 2011). These findings underline the benefits of an early intervention in childhood obesity.

Interestingly, there is only one study in the literature analyzing the impact of lifestyle intervention only in overweight but not obese children (Schaefer et al., 2011). The success rate in this study was high (92%) even one year after the end of a 6 months intervention period (Schaefer et al., 2011). However, further independent and larger studies are needed to prove this promising outcome. On the other side, lifestyle interventions were not successful in extreme obese adolescents (Danielsson et al., 2012; Knop et al., 2015). In summary, particular young and less overweight children profit from lifestyle interventions.

Only very few studies in childhood analyzed the changes of weight status ≥5 years after the end of treatment (McGovern et al., 2008; Vignolo et al., 2008; Epstein et al., 1990; Reinehr et al., 2010). All these studies reported that the achieved weight loss in intervention was sustained 5–10 years in contrast to studies in adults reporting weight regain in the majority of the participants (Anderson et al., 2001).

Interestingly, quality of life improved in obese children participating in lifestyle interventions independent of degree of weight loss (Wille et al., 2010; Finne et al., 2013). However, from a medical point of view, improvement of cardiovascular risk factors and comorbidities of obesity are the primary aim of lifestyle interventions. Already a decrease of BMI-SDS ≥0.25 was associated with improvements of cardiovascular risk factors, intima-media thickness, androgen excess in PCOS and NAFLD as proven by meta-analyses and clinical studies (Reinehr et al., 2009a, in press; Ho et al., 2012; Lass et al., 2011; Reinehr et al., 2009c; Ford et al., 2010).

4. Shortcomings of lifestyle interventions

RCTs likely overestimate the effectiveness of lifestyle interventions in clinical practice (Reinehr et al., 2009a, 2009b). The success-rate (defined by a reduction of >0.25 BMI-SDS) of 129 centers in Europe specialized in outpatient pediatric obesity care treating >20,000 obese children was only 7% after 24 months based on an intention-to-treat analysis (Reinehr et al., 2009a). Most participants (92%) get lost to follow-up (Reinehr et al., 2009a). The same disappointing findings have been reported in the U.S. (Hampl et al., in press). Although assumed and frequently discussed, there are no RCT studies demonstrating an effect of the family's socioeconomic status and of the migration background on the success of lifestyle interventions (Savoye et al., 2011).