

Summary



Summary

Go4it - The effectiveness of a multidisciplinary group treatment for outpatient obese adolescents

Overweight and obesity among children and adolescents in the Netherlands are increasing public health problems. The Fifth Dutch Growth Study shows that between 2008 and 2010 13% of Dutch children were overweight and 2-3% were obese. Obesity in childhood is associated with behavioural and social-emotional problems, an increase in metabolic abnormalities, orthopaedic complications, asthma and negative psychosocial health. At the start of our pilot study in 2004, the usual care of adolescent obesity in the Netherlands was referral to a dietician in the home care setting. A more intensive treatment programme aimed at attaining a healthy lifestyle was not available at that time. For this reason, the departments of paediatric endocrinology, nutrition and dietetics, medical psychology and public and occupational health of the VU University Medical Center Amsterdam the Netherlands, developed a multidisciplinary intervention program for obese adolescents, called Go4it. The effectiveness of the Go4it intervention was studied in a randomised controlled trial.

Go4it study

Obese adolescents (11-18 years) visiting the outpatient paediatric obesity clinic of the VU University Medical Center Amsterdam were randomly assigned to 1) intervention group (Go4it, n = 71) or 2) current regular care i.e. referral to a dietician in the home care setting (controls, n = 51). At baseline their mean weight was 93.6 kg, mean BMI was 33.5 kg/m² and their mean BMI standard deviation score (BMIstds) was 2.9. Of the 122 adolescents, 12 adolescents were overweight and 110 adolescents were obese. Regarding ethnicity, 54 adolescents were of western descent and 68 adolescents were of non-western descent. Adolescents in the intervention group received a multidisciplinary group treatment focusing on: 1) increasing awareness of their current dietary, sedentary and physical activity behaviour (i.e. energy balance behaviour), 2) improving diet, 3) decreasing sedentary behaviour, 4) increasing levels of physical activity, and 5) coping with difficult situations (e.g. parties). Go4it consisted of 7 sessions with an interval of 2-3 weeks. After 6, 14, 26, and 36 weeks, booster group sessions were scheduled in order to encourage the adolescents to maintain or further improve their energy balance eating behaviour and physical activity behaviour and to discuss possible problems or questions. In addition, 2 separate sessions for the parents were organised. Outcome measures included body mass index standard deviation score (BMIstds), body composition, metabolic components and quality of life at 6 and

18 months follow-up. This summary presents the main findings from the Go4it study.

Summary of main findings

Behavioural and social-emotional functioning

As part of the regular care of the obesity clinic completed the obese adolescents the Youth Self Report (YSR) and their parents the Child Behaviour Checklist (CBCL) to assess behavioural and social-emotional functioning of their child. Our sample of obese adolescents experienced serious behaviour problems and social-emotional problems, which was confirmed by their parents. Mean YSR and CBCL scores for all problemscales were significantly higher in our sample of obese adolescents in comparison with a healthy peer group, except for the externalizing scale (including disobedience, aggression, temper tantrums) of the YSR. Parents reported more problems than their adolescents on all problem scales. There were no significant differences between western and non-western adolescents, except for the attention problem scale. The western adolescents scored significantly higher, which was confirmed by the parents (Chapter 2).

Compliance

Compliance during the Go4it study was a big challenge. Of the adolescents assigned to the intervention group, 59% attended at least 5 of the 7 Go4it sessions. Reasons for not attending the Go4it sessions included lack of motivation to change dietary habits, lack of belief of parents in their child's possible success to lose weight, previous unsuccessful dieting experiences, travel distance, and the limited time of working parents and their adolescents. Seventy-two percent of the parents attended the first parent session and 55% attended the second session. In the control group at 6 months follow-up 48% of the adolescents had never visited a dietician, 8% visited a dietician once, 12% twice, 14% three or more times. The main reason for noncompliance in the control group was a lack of motivation because of previous unsuccessful dieting experiences with or without a dietician (Chapter 3).

Effect of the Go4it group treatment after 18 months follow-up

At the 18 months measurement, the Go4it group had a mean decrease of 0.16 BMI_s in comparison to the control group. Ethnicity significantly modified this beneficial treatment effect, with a significant BMI_s reduction of 0.35 in obese adolescents of western descent versus no significant treatment effect in those of non-western descent. There were no significant treatment effects on body composition or metabolic components. Among western adolescents Go4it had also a significant beneficial effect on systolic blood pressure, diastolic blood pressure and HDL cholesterol at 18 months follow-up. Among adolescents in the intervention group who complied well (attended ≥ 5 of the 7 Go4it sessions) a

significant intervention effect on BMIs, waist circumference and HDL was found at 18-months follow-up (Chapter 3).

Quality of Life

Chapter 4 describes the effect of Go4it on Health-Related Quality of Life (HRQoL). HRQoL was examined using the generic reliable and validated Paediatric Quality of Life Inventory™ Version 4.0 (PedsQL™4.0) and the generic Child Health Questionnaire (CHQ). PedsQL™4.0 assesses physical, emotional, social and school functioning while CHQ assesses physical, behavioural, mental and social functioning. Body esteem was examined using the Body Esteem Scale (BES) and assesses general feelings about appearance, weight satisfaction and evaluations of attributions to others about one's body and appearance. Our sample of obese adolescents experienced lower levels of physical and psychosocial well-being scores than a healthy reference group. At 18 months follow-up, we found small but beneficial intervention effects on all subscales of the PedsQL™4.0 and BES questionnaires. Two subscales of the PedsQL™4.0 improved significantly, i.e. physical health and school functioning. Go4it had small but beneficial effects on quality of life of obese adolescents (Chapter 4).

Energy requirements

The ability to predict resting energy expenditure (REE) accurately in overweight and obese adolescents is important to establish reachable goals for dietary intake and weight-loss programs. Energy requirement can be measured by indirect calorimetry. However this method is expensive and therefore often unfeasible in the general dietetic setting. In daily practice predictive equations to determine REE are used as an alternative. There is no consensus on which REE equation to use in adolescents with overweight or obesity. Currently, the FAO/WHO/UNU weight equation for age 10-18 years is the most widely used predictive equation in the Netherlands. Chapter 5 described the validation of the resting energy expenditure equations (REE) in the overweight or obese adolescents who participated in our study using a comparison with indirect calorimetry. The most accurate and precise equation for overweight or obese adolescents was the Molnar equation, which predicted 74% overweight or obese adolescents accurately.

Body composition

Accurate assessment of fat mass (FM) and fat-free mass (FFM) in obese adolescents is necessary for establishing reachable goals for healthy weight loss and evaluation of treatment. One of the main objectives of obesity management is to reduce FM and to preserve FFM during weight loss. Body composition (FFM and FM) can be assessed by dual energy X-ray absorptiometry (DXA). DXA is acknowledged as the standard and most precise method to assess body fat mass, although it can only be used in special setting and requires the use of a

very low dose of radiation. Besides this DXA is time-consuming, expensive; need trained operators and are hardly feasible in most dietetic settings. In contrast to DXA, bioelectrical impedance analyses (BIA) is a commonly used, safe and simple, portable, non-invasive, inexpensive technique that needs minimal operator training, making it appropriate for use in daily clinical practice. The BIA method is based on the conduction of electrical current in the body and differences in electrical conductivity between the fat and water components of the body. The electrical resistance and reactance together with body weight and height can reliably estimate body composition. In order to assess FFM with BIA, several FFM-BIA equations have been developed. Chapter 6 describes the validation of the BIA and the related FFM prediction equations (FFM-BIA) among obese adolescents compared to FFM measured by DXA (FFM-DXA). The most accurate and precise equation for FFM was the Gray equation, which predicted FFM accurately in 63% of obese adolescents. This is still not at an acceptable accuracy level. Thus, DXA measurement remains the method of choice for FFM in obese adolescents (Chapter 6).

Conclusion

In conclusion, the studies in this thesis demonstrated that the Go4it intervention showed a significant beneficial effect on BMI_{sds} and quality of life at 18 months follow-up. Larger benefits were achieved among adolescents of western ethnicity: in this subgroup significant treatment effects were observed on BMI_{sds}, systolic and diastolic blood pressure, and HDL cholesterol level at 18 months follow up. Among the adolescents in the intervention group who complied well (attended ≥ 5 of the 7 Go4it sessions) a significant intervention effect on BMI_{sds}, waist circumference and HDL was found at 18-months follow-up. Still we believe there are some adjustments needed to implement the Go4it intervention, such as better tailoring to non-western ethnicities, adding a physical activity program, and a location closer to their home environment to improve the results of the Go4it intervention.