Appendix 3: Details of treatment strategies of efficacious interventions

Diet

- Ebbeling et al.[1]

Intervention designed to reduce consumption of sugar-sweetened beverages; 1-yr trial consisted of biweekly home delivery of noncaloric beverages (bottled water and artificially sweetened "diet" drinks), monthly motivational phone calls with parents (30 min/call), and three 20-min check-in visits with adolescent participants

- Racine et al.[2]

Distribution of 3-mo supply of milk to participants, with instructions for the child to drink one full serving each day under parental supervision; 250 g chocolate milk beverage containing 1.4% fat and 183 kilocalories/serving; treatment milk had 3 g clarinol added per serving

Exercise

- Maddison et al.[3]

Participants received upgrade (hardware and games) of existing gaming technology that enabled them to play active video games at home; children encouraged to meet physical activity recommendations (60 min moderate to vigorous physical activity on most days) by supplementing periods of inactivity with active video game play and by substituting periods of traditional nonactive videogame play with the active version

Diet plus exercise

- Lison et al.[4]

Two 1-hour educational sessions led by 2 pediatricians at the hospital; nutritional instruction; participants encouraged to reduce sedentary behaviour; hospital-based group had 5 supervised exercise sessions per week for 6 mo; home-based group instructed to complete all 5 weekly exercise sessions in their home environments

- Nemet et al.[5]

Participants met with dietitian 6 times during 3-mo program; each family instructed to come to first meeting with a 24-h dietary recall; first 45- to 60-min appointment focused on getting acquainted, reasons for childhood obesity, food choices, dietary and cooking habits, understanding motivation for losing weight; shorter (30–45 min) subsequent appointments focused on nutritional education; received a balanced hypocaloric diet, consisting of 5021–8368 kilojoules depending on child's age and weight, reduction of 30% of reported caloric intake or 15% less than estimated daily required intake; intervention participants took part in 1-h training sessions twice weekly; instructed to perform 30–45 min of extra walking or other weight-bearing sport activities at least once per week

- Toulabi et al.[6]

Implemented by nursing and physical education experts; 24-h diet record; face-to-face (1-h weekly sessions) instructions for parents plus educational booklet; eight 45-minute face-to-face nutritional sessions (held twice weekly) for students regarding dietary modification and

Appendix to: Peirson L, Fitzpatrick-Lewis D, Morrison K, Warren R, Ali MU, Raina P. Treatment of overweight and obesity in children and youth: a systematic review and meta-analysis. *CMAJ Open* 2014. DOI:10.1503/cmajo.20140047.

techniques for increasing physical activity plus an education booklet; exercises demonstrated by physical education expert at school in a group, 1 h/d, 3 d/wk for 6 wk

- Weigel et al.[7]

One-year program at local sports centre and health association; divided into 3 age groups; modules for physical activity, nutritional education and coping strategies; offered in 2 sessions of 45–60 min each; 2-h monthly parent-support and feedback meetings; based on dietary approach in Consensus Statement of the Obesity Consensus Working groups; dieticians and psychologists took turns with 4-wk teaching blocks; all sessions performed by trained personnel

Lifestyle

- DeBar et al.[8]

Participants given a package including outlines of evidence-based approaches to weight management for youth and adults, a guide for parents to help teens make healthy lifestyle changes, local resources for weight management and healthy activities, and recommended books and online resources on healthy lifestyle change

- Janicke et al.[9]

Weekly 90-min group sessions held for first 8 wk, then biweekly for next 8 wk; children and parents monitored food intake and physical activity; families taught to categorize foods as red, yellow and green based on “stoplight” approach; increased physical activity promoted through pedometer-based step program; group leaders helped families set daily dietary and physical activity goals

- Lochrie et al.[10]

Children in outpatient family-based lifestyle group offered 8 weekly sessions, followed by 4 bimonthly sessions, then 2 monthly sessions (14 sessions over 6 mo); 60- to 90-min sessions covered topics in nutrition, behaviour modification, psychosocial interventions, physical activity and medical issues related to obesity

- Reinehr et al.[11]

Outpatient lifestyle intervention based on physical activity training, nutrition education and behavioural counselling for child and family; 1.5-h physical activity training session each week over 6-mo intervention period (ball games, jogging, trampoline jumping, dancing, wrestling); instructions on how to make physical activity part of everyday life and how to reduce sedentary screen-time behaviours; 3-mo (six 1.5-h sessions) intensive nutrition and eating behaviour courses for children; individual nutrition counselling; six 1.5-h parent sessions offered

- Sacher et al.[12]

Integrated, multicomponent healthy lifestyle program based on principles of nutritional and sports science, learning and social cognitive theories and the study of therapeutic processes; families engage in weight management through education, skills training and motivational enhancement; 18 sessions delivered over 9 wk (2-h group sessions twice weekly) by 2 leaders and 1 assistant to groups of 8–15 children and their families in community settings such as recreation centres and schools; introduction meeting, 8 sessions on behaviour change; 8 sessions

on nutrition education, 16 physical activity sessions, closing session; free family access to local community swimming pool available for further 12 wk

- Saelens et al.[13]

Computer program at baseline visit; 1 meeting with pediatrician; 1 meeting to discuss phone or mail contact; telephone contact 10–20 min weekly for first 8 calls and biweekly for the last 3 calls; counsellors use detailed scripts to address weight changes; self-monitoring booklets for each week to be completed and mailed back to counsellors

- Savoye et al.[14]

Sessions of 50 min twice weekly for 6 mo (exercise and nutrition/behaviour modification 1 session/wk, 40 min each), then every other week for an additional 6 mo; children and parents attended classes, including nutrition-related topics, together, but behaviour modification classes were held separately; behaviour modification component facilitated by a registered dietician or social worker; exercise component facilitated by exercise physiologists (warm-up, high-intensity aerobic exercise and a cool-down)

- Vos et al.[15]

Seven group meetings for children; 5 parent meetings, 1 family meeting; 2.5-h biweekly session focused on nutritional information (energy balance and healthy eating) and learning about self-control, coping strategies and self-image

Orlistat plus behavioural

- Chanoine et al.[16]

Single-blind, 2-wk placebo lead-in; 52 wk of 120 mg orlistat taken 3 times daily; general guidelines for diet, exercise and behavioural modification were supplied, but each centre was free to use its own strategy; nutritionally balanced, hypocaloric diet with 30% fat, 50% carbohydrate and 20% protein

References

1. Ebbeling CB, Feldman HA, Chomitz VR, et al. A randomized trial of sugar-sweetened beverages and adolescent body weight. *N Engl J Med* 2012;367:1407-16.
2. Racine NM, Watras AC, Carrel AL, et al. Effect of conjugated linoleic acid on body fat accretion in overweight or obese children. *Am J Clin Nutr* 2010;91:1157-64.
3. Maddison R, Foley L, Ni MC, et al. Effects of active video games on body composition: a randomized controlled trial. *Am J Clin Nutr* 2011;94:156-63.
4. Lisón JF, Real-Montes JM, Torró I, et al. Exercise intervention in childhood obesity: a randomized controlled trial comparing hospital-versus home-based groups. *Acad Pediatr* 2012;12:319-25.
5. Nemet D, Barkan S, Epstein Y, et al. Short- and long-term beneficial effects of a combined dietary-behavioral-physical activity intervention for the treatment of childhood obesity. *Pediatrics* 2005;115:e443-9.

6. Toulabi T, Khosh Niyat NM, Amini F, et al. The influence of a behavior modification interventional program on body mass index in obese adolescents. *J Formos Med Assoc* 2012;111:153-9.

7. Weigel C, Kokocinski K, Lederer P, et al. Childhood obesity: concept, feasibility, and interim results of a local group-based, long-term treatment program. *J Nutr Educ Behav* 2008;40:369-73.

8. DeBar LL, Stevens VJ, Perrin N, et al. A primary care-based, multicomponent lifestyle intervention for overweight adolescent females. *Pediatrics* 2012;129:e611-20.

9. Janicke DM, Sallinen BJ, Perri MG, et al. Comparison of program costs for parent-only and family-based interventions for pediatric obesity in medically underserved rural settings. *J Rural Health* 2009;25:326-30.

10. Lochrie AS, Wysocki T, Hossain J, et al. The effects of a family-based intervention (FBI) for overweight/obese children on health and psychological functioning. *Clin Pract Pediatr Psychol* 2013;1:159-70.

11. Reinehr T, Schaefer A, Winkel K, et al. An effective lifestyle intervention in overweight children: findings from a randomized controlled trial on “Obeldicks light”. *Clin Nutr* 2010;29:331-6.

12. Sacher PM, Kolotourou M, Chadwick PM, et al. Randomized controlled trial of the MEND program: A family-based community intervention for childhood obesity. *Obesity* (Silver Spring) 2010;18(Suppl 1):S62-8.

13. Saelens BE, Sallis JF, Wilfley DE, et al. Behavioral weight control for overweight adolescents initiated in primary care. *Obes Res* 2002;10:22-32.

14. Savoye M, Shaw M, Dziura J, et al. Effects of a weight management program on body composition and metabolic parameters in overweight children: a randomized controlled trial. *JAMA* 2007;297:2697-704.

15. Vos RC, Huisman SD, Houdijk ECAM, et al. The effect of family-based multidisciplinary cognitive behavioral treatment on health-related quality of life in childhood obesity. *Qual Life Res* 2012;21:1587-94.

16. Chanoine JP, Hampl S, Jensen C, et al. Effect of orlistat on weight and body composition in obese adolescents: a randomized controlled trial. *JAMA* 2005;293:2873-83.