



Effects of a Training Program on Lifestyle Modification for Adolescents Identified with Overweight

Wenbo Song

ABSTRACT

The effectiveness of a 4-session, a training program intervention in improving lifestyle in adolescents was evaluated. Participants were 39 adolescents identified with overweight. Participants were randomly assigned to a training or a control group. Response to the program was found to be dependent on baseline levels of overweight. Only adolescents with high overweight showed a significant increase in perceived efficient lifestyle. The findings show that a rather short training program of 4 sessions can protect adolescents with overweight from an increase in perceived inefficient lifestyle during the public health concern.

Key Words: Lifestyle, Adolescents, Overweight, Group Discussion

DOI Number: 10.14704/nq.2017.15.4.1147

NeuroQuantology 2017; 15, 4:174-179

174

Introduction

Obesity is a common problem in general health that growing trend has become one of the major concerns of global health (Antipatis and Gill, 2001). According to WHO estimates, there will be over 700 million obese people by 2015 (WHO, 2011; Chan and Woo, 2010). Obesity and overweight are among the fifth causes of death in the world, and medical sources emphasize that obesity and overweight in adulthood are a major risk factor for many types of diseases, such as type 2 diabetes, coronary artery disease, hypertension, gallstones, sleep apnea, osteoarthritis, hypertrophy and some cancers, and even depression (WHO, 2011; Guh *et al.*, 2009; Pi-Sunyer, 2010).

Obesity can have undesirable effects on the ability of individuals to experience an active and dynamic life (Reynolds and McIlvane, 2009; Divakar *et al.*, 2016). According to available documentation, it can be noted that obesity problems are very complicated and not limited to

physical deterioration or cause, because obesity and its medical problems can affect the ability of people to have an active and effective life (Guh *et al.*, 2009). Obese people do not have the ability to live fully active because obesity affects their physical and psychosocial performance (Tsai *et al.*, 2004).

Many medical and psychosocial complications of obesity and overweight in children and adolescents and the heavy burden imposed on society emphasize the importance and necessity of management and prevention in these sensitive ages (Spear *et al.*, 2007). Formation and behavior change in childhood and adolescence is far easier than adulthood (Klimstra *et al.*, 2010; Harisa and Alanazi, 2015). In addition, given the possibility of regular and regular contact with adolescents in educational settings, schools can play an active and effective role in promoting their health (Kropski *et al.*, 2008). Trainings aimed at preventing high-risk behaviors and

Corresponding author: Wenbo Song

Address: School of Physical Education, Jilin Normal University, Siping, 136099, China

e-mail ✉ 10042938@qq.com

Relevant conflicts of interest/financial disclosures: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Received: 02 November 2017; **Accepted:** 7 December 2017



unhealthy habits in the early years of life should emphasize the learning of a healthy lifestyle, because the unhealthy lifestyle is the cause of many illnesses and disorders (McKee *et al.*, 2010). A healthy lifestyle is a way of life that provides, maintains and promotes the health and well-being of the individual (Reeves and Rafferty, 2005).

Applying a healthy lifestyle, developing health habits to prevent diseases, improving life quality, increasing the life expectancy and improving physical and mental health should be started from the time of conception (Ebrahimi *et al.*, 2017). Studies of the Center for Disease Control and Prevention have shown that 80% of the risk of cardiovascular disease as well as 70% of deaths from heart attacks can be reduced through changes in lifestyle (CDCP, 2003).

Although several methods have been proposed for the treatment of obesity, learning the right lifestyle and behavior change program is always the best way to prevent obesity (Schalkwijk *et al.*, 2015; Gao *et al.*, 2017). Research has also shown that behavioral change programs are effective not only in the treatment of obesity, but also in reducing stress resulting from it and improving the sense of adequacy and body image (Butryn, Webb and Wadden, 2011; Turan *et al.*, 2017). In adolescence, a transitional period of adolescent behavioral patterns develops (Lenz, 2001), so doing educational interventions in this era can be very helpful (Corder *et al.*, 2017).

The current study

The current study aimed to evaluate the effects of a group discussion with a photo view on lifestyle modification in obese adolescents. The variables negative emotions, availability, social pressure, physical discomfort and positive activities were used as indicators of perceived efficient lifestyle to control weight (Clark, Abrams and Niaura, 1991). We expected an increase in the variables negative emotions, availability, social pressure, physical discomfort and positive activities in the control group, but not in the training group.

Methods

Participants

Forty five adolescents from four clinic centers were assessed for eligibility if from 12 to 15 years old, with a diagnosis of undesirable BMI [BMI = 21 is desirable for the age group 17-19, 22 for the age group 19-24, 23 for the age group 24-34, 24 for the age group 34-44, 25 for the age group 44-54,

26 for the age group 54-64, and 27 for the age group over 64]. Adolescents with overweight were excluded if: diagnosed with physical and mental illness that would limit participation in the group discussion; missing more than one session during the program. Our participants consisted of 39 adolescents with overweight. We broadly equivalent the training and control groups across a range of demographic variables: age, weight, height, BMI and gender. There were twenty adolescents with overweight (14 boys and 6 girls) in the training group and nineteen (11 boys and 8 girls) in the control group. There were slightly more boys with a mean age 13.2 (SD \pm 1.65).

Procedure

This study was approved by a center for disease control in China. Five clinics were invited to take part in the study, but four of them agreed to do. Participants in the training group received a group discussion with a photo view, but participants in the control group received no intervention. There was no drop out.

Intervention

The group discussion was conducted in the form of 15-sub groups, including 60-minutes four sessions with photo view. Table 1 shows the content of the program based on the needs assessment and relying on previous studies.

Measures

Participants in both groups completed the Weight Efficacy Lifestyle Questionnaire Short Form (WEL-SF) (Clark, Abrams & Niaura, 1991). The scale determines the degree of confidence in avoiding eating in a variety of circumstances. WEL-SF consisted of 20 items with ranged from zero (uncertain) to 9 (very sure). Empirical evidence supported the reliability and validity of WEL-SF (Flølo *et al.*, 2014; Ames *et al.*, 2015).

Design and analyses

The study utilized a randomized control trial design in which the researcher adopted to minimize group differences. To prove the hypothesis of this research, the group discussion with a photo view protects adolescents identified with overweight from an increase of negative emotions, availability, social pressure, physical discomfort and positive activities during the public health concern, a two-way MANOVA analyses were employed. There were no differences concerning age, weight, height, BMI and gender between the groups.



Table 1. The program based on the needs assessment and relying on previous studies

Session	Content	Aim
1	Why not stay fat?	Definition of obesity and overweight, reasons for obesity, relation between obesity and illness, importance of obesity prevention, food pyramid and way to calculate BMI
2	What makes us obese?	Distinction between healthy and unhealthy people, physical activity and inactivity, computer games, overeating and bad nutritional habits, watching television, stress and nervousness, mistake habits in holidays
3	Positive and negative attitudes about obesity and overweight	Priority for obesity prevention, ability to treat obesity, more disease susceptibility of obese people in the near future, obesity dangers, stimulating factors identification for eating)
4	First, each student receives an illustrated booklet, which is painted on the cover with a food pyramid. Each page of this booklet is included a message in line with a healthy lifestyle. Then, the student is obliged to write a daily note about the different nutritional behaviors such as snack consumption, harmful snacks such as chocolate, chips and puff, or exercise hours, and report the progress to the research team at the beginning of the meeting. Positive behaviors are encouraged. The weight of adolescents is recorded on a chart.	Increasing self-efficacy to prevent obesity

Results

Overweight and obesity will: 1) decrease for adolescents receiving the group discussion with a photo view, relative to those in the control group, 2) decrease more for the training group adolescents initially scoring high on overweight than for those initially scoring low on overweight.

Table 2 shows the results of the data analyses of this study. As can be seen, we observed a significant 3-way interaction effect between time, group (training or control groups) and group discussion. Simple effects, before and after the group discussion program effects for the training and control groups on the group discussion with a photo view, were examined.

Table 2: Mixed design MANOVAs for overweight and obesity scores at pre-test and post-test in the training or control groups

Source	df	F	p	η ² p
Time	1	8.49	0.004	0.16
Group	1	3.11	0.08	0.52
Time × Group	1	2.08	0.19	0.02
Time × Discussion	1	0.34	0.61	0.002
Time × Group × Discussion	1	4.75	0.03	0.09
Error	34			

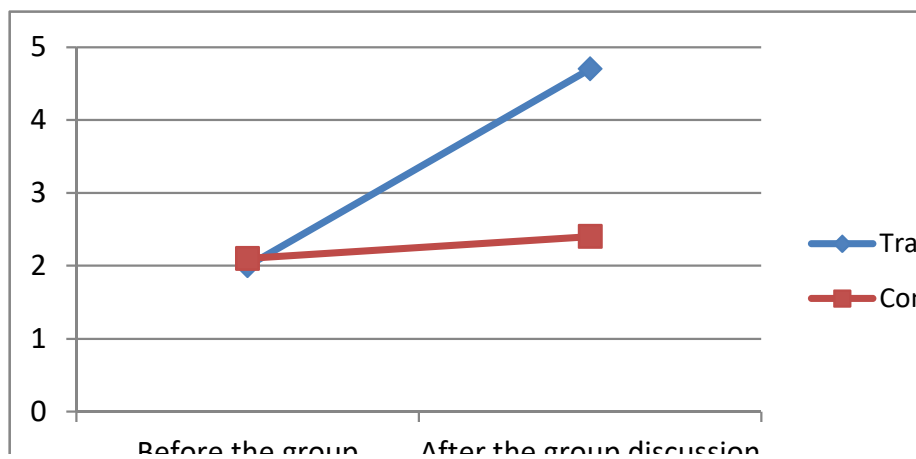


Figure 1. Pre-posttest differences in perceived efficient lifestyle for adolescents with high overweight in the training and



control groups

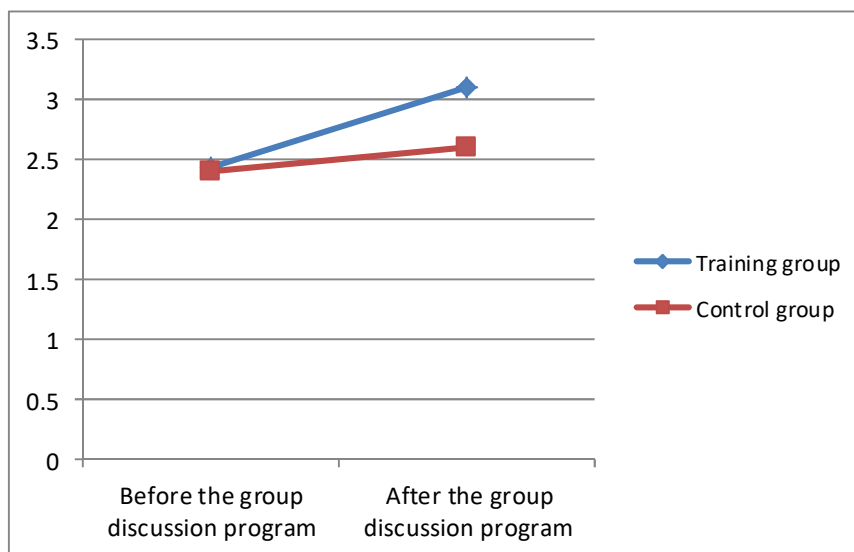


Figure 2. Pre-posttest differences in perceived efficient lifestyle for adolescents with low overweight in the training and control groups

The results show the mean differences in perceived efficient lifestyle scores of adolescents with high overweight scores, above the median at before the group discussion program. Perceived efficient lifestyle increased significantly from before to after the group discussion program for those with high overweight adolescents who received the group discussion program, but for participants in the control group it did not significantly increase (Fig. 1). The results in figure 2 show that the mean differences in perceived efficient lifestyle scores of adolescents with low overweight scores are below the median at before the group discussion program. For participants with low overweight who received the group discussion program, there was not a statistically significant effect of the program.

Discussion

This study was designed to evaluate the effects of a group discussion with a photo view on perceived efficient lifestyle for adolescents identified with overweight. A randomized control trial design was employed. Hypothesized effects of the group discussion program and interactions with initial levels of overweight and obesity were tested for the adolescents.

Key findings

The program was found to have a differential effect on perceived efficient lifestyle for adolescents identified with overweight, depending on their initial level of overweight. Adolescents whose overweight score was high at

the start of the program only showed significant increases in perceived efficient lifestyle if they received the targeted group discussion program. Adolescents whose overweight score was low at the start of the program showed an overall increase in perceived efficient lifestyle whether they were in the program or control group.

The findings of after the intervention for the adolescents with high overweight in the training group indicate significant improvements in nutritional habits and behaviors affecting overweight and obesity, such as eating in a standing position, eating while watching TV, eating while sleeping, eating between main meals, eating snacks during hunger, and fast eating, which is consistent with the findings of McAleese and Rankin (2007). Many studies show that diverse individual factors, including demographic variables, attitude, individual beliefs and environmental and social factors, affect physical activity (Thogersen-Ntoumani, 2009; Martin et al., 2007; Ball et al., 2006; Gyurcsik et al., 2006). Perceived benefits and barriers to regular physical activity are two positive and negative cognitive factors. To increase the level of physical activity in children and adolescents, understanding a set of the most important and effective individual, environmental and social factors associated with physical activity is necessary in order to design interventions and to overcome the obstacles and problems facing physical activity (Robbins et al., 2006). Since the main goal of the current study was to determine the impact of a training program on lifestyle

modification for adolescents identified with overweight, it seems that the identified needs were more effective in preventing overweight and obesity in adolescents with high overweight.

Limitations and future directions

We acknowledged a number of limitations in this study. The first limitation is that there was no possibility to control all factors affecting the lifestyle associated with obesity in adolescents, such as economic, cultural and family factors. So obviously, we cannot expect changes to be measured in terms of weight loss. The second limitation is that the evaluation period could be longer for assessing the intervention outcomes.

References

- Antipatis VJ, Gill TP. Obesity as a global problem. International textbook of obesity, John Wiley & Sons Ltd, 2001:3-22.
- Ames GE, Heckman MG, Diehl NN, Grothe KB, Clark MM. Further statistical and clinical validity for the weight efficacy lifestyle questionnaire-short form. *Eating Behaviors* 2015; 18:115-9.
- Ball K, Salmon J, Giles-Corti B, Crawford D. How can socio-economic differences in physical activity among women be explained? A qualitative study, *Women Health* 2006; 43(1): 93-113.
- Butryn ML, Webb V, Wadden TA. Behavioral treatment of obesity. *The Psychiatric Clinics of North America* 2011; 34(4):841-59.
- Center for Disease Control and Prevention, Healing Heart, Website Prevent, Reverse Heart Disease, The heart risk factor 2003; Available at: <http://www.heartdisease/risk/factor/healingheart.html>.
- Chan RS, Woo J. Prevention of overweight and obesity: how effective is the current public health approach. *International Journal of Environmental Research and Public Health* 2010; 7(3):765-83.
- Clark MM, Abrams DB, Niaura RS. Self-efficacy in weight management. *Journal of Consulting and Clinical Psychology* 1991; 59: 739-44.
- Corder K, Winpenny E, Love R, Brown HE, White M, van Sluijs E. Change in physical activity from adolescence to early adulthood: a systematic review and meta-analysis of longitudinal cohort studies. *British Journal of Sports Medicine* 2017: 1-17.
- Divakar DD, John J, Al Kheraif, AA, Mavinapalla S, Ramakrishnaiah R, Vellappally S, Hashem MI, Dalati M, Durgesh BH, Safadi RA, Anil S. Sex determination using discriminant function analysis in Indigenous (Kurubas) children and adolescents of Coorg, Karnataka, India: A lateral cephalometric study. *Saudi Journal of Biological Sciences* 2016; 23(6): 782-8.
- Ebrahimi L, Masoumi M, Hojjati AH, Firozjaie RA, Abdi M. Comparing the Quality of Life and Emotional Intelligence among Patients with Psychosomatic Disease (Type 2 Diabetes) and Healthy Individuals. *NeuroQuantology* 2017; 15(3): 12-19.
- Flølo TN, Andersen JR, Nielsen HJ, Natvig GK. Translation, adaptation, validation and performance of the American weight efficacy lifestyle questionnaire short form (WEL-SF) to a Norwegian version: a cross-sectional study. *PeerJ* 2014; 2:e565.
- Gao W, Baig AQ, Ali H, Sajjad W, Farahani MR. Margin based ontology sparse vector learning algorithm and applied in biology science. *Saudi Journal of Biological Sciences*, 2017; 24(1): 132-8.
- Guh DP, Zhang W, Bansback N, Amarsi Z, Birmingham CL, Anis AH. The incidence of co-morbidities related to obesity and overweight: a systematic review and meta-analysis. *BMC Public Health* 2009; 9(1):88.
- Gyurcsik NC, Spink KS, Bray SR, Chad K, Kwan M. An ecologically based examination of barriers to physical activity in students from grade seven through first-year university. *Journal of Adolescent Health* 2006;38(6):704-11.
- Harisa GI, Alanazi FK. The beneficial roles of *Lupinus luteus* and lifestyle changes in management of metabolic syndrome: A case study. *Saudi Pharmaceutical Journal*, 2015; 23(6): 712-5.
- Klimstra TA, Hale III WW, Raaijmakers QA, Branje SJ, Meeus WH. Identity formation in adolescence: change or stability?. *Journal of Youth and Adolescence* 2010; 39(2):150-62.
- Kropf JA, Keckley PH, Jensen GL. School-based obesity prevention programs: an evidence-based review. *Obesity* 2008; 16(5):1009-18.
- Lenz B. The transition from adolescence to young adulthood: a theoretical perspective. *The Journal of School Nursing*. 2001; 17(6):300-6.
- Martin KR, Schoster B, Shreffler JH, Meier A, Callahan LF. Perceived barriers to physical activity among North Carolinians with arthritis: findings from a mixed-methodology approach. *North Carolina Medical Journal* 2007; 68(6): 404-12.
- McAleese JD, Rankin LL. Garden-based nutrition education affects fruit and vegetable consumption in sixth-grade adolescents. *Journal of the American Dietetic Association* 2007; 107(4): 662-5.
- McKee MD, Deen D, Maher S, Fletcher J, Fornari A, Blank AE. Implementation of a pilot primary care lifestyle change intervention for families of pre-school children: lessons learned. *Patient Education and Counseling* 2010; 79 (3):299-305.
- Pi-Sunyer X. The medical risks of obesity; *Postgraduate Medicine* 2009; 121 (6): 21-33. Available in PMC. 2010.
- Reeves MJ, Rafferty AP. Healthy lifestyle characteristics among adults in the United States, 2000. *Archives of Internal Medicine* 2005; 165(8):854-7.
- Reynolds SL, McIlvane JM. The impact of obesity and arthritis on active life expectancy in older Americans. *Obesity* 2009; 17(2):363-9.
- Robbins LB, Gretebeck KA, Kazanis AS, Pender NJ. Girls on the move program to increase physical activity participation. *Nursing Research* 2006; 55(3):206-16.
- Schalkwijk AA, Bot SD, de Vries L, Westerman MJ, Nijpels G, Elders PJ. Perspectives of obese children and their parents on lifestyle behavior change: a qualitative study. *International Journal of Behavioral Nutrition and Physical Activity* 2015; 12(1):102.
- Spear BA, Barlow SE, Ervin C, Ludwig DS, Saelens BE, Schetzina KE, Taveras EM. Recommendations for treatment of child and adolescent overweight and obesity. *Pediatrics* 2007; 120(Supplement 4):S254-88.
- Thøgersen-Ntoumani C. An ecological model of predictors of stages of change for physical activity in Greek older



- adults. *Scandinavian Journal of Medicine & Science in Sports* 2009;19(2):286-96.
- Tsai WL, Yang CY, Lin SF, Fang FM. Impact of obesity on medical problems and quality of life in Taiwan. *American Journal of Epidemiology* 2004; 160(6):557-65.
- Turan I, Demir S, Kilinc K, Burnaz NA, Yaman SO, Akbulut K, Mentese A, Aliyazicioglu Y, Deger O. Antiproliferative and apoptotic effect of *Morus nigra* extract on human prostate cancer cells. *Saudi Pharmaceutical Journal*, 2017; 25(2): 241-8.
- World Health Organization. Obesity and overweight: fact sheet, 2011. URL:<http://www.thehealthwell.info/node/82914>. 2012.

