International Journal of Biomedical and Clinical Sciences
Vol. 3, No. 1, 2018, pp. 1-6
http://www.aiscience.org/journal/ijbcs

Impact of a Three Years Multi-Approach Intervention on Childhood and Adolescent Obesity at School Setting

Waleed Al Faisal*, Hamid Y. Hussein, Nusaiba Al Behandy

Health Affairs Department, Primary Health Care Services Sector, Dubai Health Authority, Dubai, UAE

Abstract

Background: Obesity and overweight are recognized as major global public health phenomena. Its long term consequences are many of wide variety of chronic conditions including high blood pressure, type 2 diabetes, stroke, cardiovascular disease, and certain forms of cancer; which in turn are primary drivers of healthcare spending, disability, and deaths, childhood obesity is complex and multidimensional, which has been identified as a public health priority. Objectives: To assess the impact of a multi-approach population-based childhood obesity intervention over three years at school population in Dubai. Methodology: Follow up was conducted on about 260000 students in the age range of 5-18 years (grades 1–12) over about 180 private schools in Dubai in three consequence academic years 2014-2015, 2015-2016 and 2016-2017. BMI measurement as per WHO growth charts was used at the beginning of each academic year (September). Wide variety of interventions have been designed an applied like health promotion, school nutritional education activities, Food labelling, happy schools initiatives, 10/10 initiative physical activity platform, parents awareness, students health file initiative, City Makers (blue team initiative), community participation (private –public partnership, Governmental stockholders intersect oral collaborations school canteen policy and guideline. Results: The current study revealed that about 10.1% of the total students in private schools in Dubai in the academic year 2014-2015 were obese. The study showed that the prevalence of obesity among student population at private schools in Dubai during the academic year 2015-2016 was 9.88%. The study reflected that prevalence of obesity among student population at private schools in Dubai during the academic year 2016-2017 was 8.9%. The study revealed that the trend of obesity prevalence among students population at private schools in Dubai is declining over that last three academic years (2014-2015, 2015-2016 and 2016-2017) showing that about 1.2% total reduction during the three years period of applying effective intervention program. Conclusion: Multi approach public health intervention for childhood obesity is significantly successful in producing weight reduction in the short and long term, by bringing stakeholders on board and implementing effective intervention program with wide variety of tasks. Maintaining intervention need to be revised, re assessed, monitored and there is a need for strengthening sustainable long-term approach through governmental and nongovernmental accountability.

Keywords

Obesity, Intervention, Population Based, School Setting

Received: October 30, 2017 / Accepted: November 14, 2017 / Published online: January 25, 2018

1. Background

Obesity and overweight are recognized as major global public health phenomena. [1, 2] Its long term consequences are many of wide variety of chronic conditions including high blood pressure, type 2 diabetes, stroke, cardiovascular disease, and certain forms of cancer; [3] which in turn are primary drivers of healthcare spending, disability, and deaths.

* Corresponding author
E-mail address: wldalfaisal@gmail.com (W. Al Faisal)

[4, 5] Evidence shows that there are significant difficulties associated with treating obesity once it has been established. [4, 6] It is also acknowledged that obese children and adolescents may grow into obese adults, [2, 7] making the conditions very complex to manage. Due to seriousness of health impacts of childhood obesity, the management of childhood obesity has been identified as a public health priority. [8, 9] It is also recognized that obesity decreases the quality of life and life expectancy considerably [4, 8] and accounts for billions of dollars in the provision of healthcare. [9] Early intervention to obesity prevention has been identified to be the most realistic, efficient, and cost-effective approach to effective management of obesity. [4]

Childhood obesity is complex and multidimensional which needs to be addressed by using a comprehensive approach which incorporates addressing obesity determinants such as education, social, religious beliefs, and cultural issues. Community participation has to be at the center of health promotion actions so as to enable people to identify their needs and generate their own solutions in a sustainable way. Family and community involvement in the management of childhood obesity as a neglected area of research and have called for more family-based interventions. [10] Specifically, experts suggest that intervening in the family system may provide greater change and longer sustainability of change in the child because of the ability of the family to shape child behaviors on a daily basis. [11, 12]

Effective interventions for prevention and control of childhood and adolescent overweight and obesity should be considered for different aspects. Experts recommend encouraging specific eating and physical activity behaviours through multiple approach interventions. [13-23]

The purpose of this study is to assess the state of overweight and obesity in the light of the application of a wide range of interventions targeting childhood and adolescent overweight and obesity in the last three years, in order to determine the success of these interventions and inform research and policy in the next years.

2. Objectives

To assess the impact of a multi-approach population based childhood obesity intervention over three years at school population in Dubai.

3. Methodology

Follow up was conducted on about 260000 students in the age range of 5-18 years (grades 1 –12) over about 180 private schools in Dubai in three consequence academic years 2014-2015, 2015-2016 and 2016-2017. BMI measurement as per WHO growth charts was used at the beginning of each academic year (September). Wide variety of interventions have been designed an applied like health promotion, school nutritional education activities, Food labelling, happy schools initiatives, 10/10 initiative physical activity platform, parents awareness, students health file initiative, City Makers (blue team initiative), community participation (public-private partnership, governmental stockholders intersect oral collaborations school canteen policy and guideline.

4. Results

The current study revealed that about 8.7% of the total students population in private schools in Dubai in the academic year 2014-2015 were obese, and about 1.4% of the total students were morbid obese. A total of 10.1% of all students were obese of different severity as reflected by table 1.

Table 1. Obesity and overweight among Students population in private schools in Dubai in th academic year 2014-2015.

Grade	Gender	Nationality	Underweight	%	Normal	%	Overweight	%	Obese	%	Morbid obese	%	Total
G 1-4	M	UAE	521	10	3613	69.4	611	11.7	429	8.2	30	0.6	5204
		Ex.	2943	8.3	25529	71.9	4325	12.2	2616	7.4	66	0.2	35479
	F	UAE	433	10.1	2959	68.9	569	13.2	317	7.4	19	0.4	4297
		Ex.	2892	8.5	25292	74.7	3780	11.2	1849	5.4	58	0.2	33871
Total			6789	8.6	57393	72.8	9285	11.8	5211	6.6	173	0.2	78851
G 5-8	M	UAE	222	5.1	2765	63.9	794	18.3	509	11.8	40	0.9	4330
		Ex.	1411	5.2	18465	67.8	4241	15.6	3006	11	117	0.4	27240
	F	UAE	210	5.8	2313	63.5	646	17.7	425	11.7	47	1.3	3641
		Ex.	1236	4.8	18945	73.1	3619	13.9	2065	7.9	66	0.3	25931
Total			3079	5	42488	69.5	9300	15.2	6005	9.8	270	0.4	61142
G 9-12	M	UAE	151	5.3	1758	61.6	481	16.8	315	11	150	5.3	2855
		Ex.	688	3.6	13294	69.9	2913	15.3	1911	10	221	1.2	19027
	F	UAE	156	6.2	1637	65.5	406	16.2	246	9.8	55	2.2	2500
		Ex.	568	3	14173	75.3	2615	13.9	1295	6.9	182	0.9	18833
Grand Total			1563	3.6	30862	71.4	6415	14.8	3767	8.7	608	1.4	43215

The study showed that the prevalence of obesity among student population at private schools in Dubai during the academic year 2015-2016 was 9.05% and about 0.83% of the total students were morbid obese. A total of 9.88% of all students were obese of different severity as reflected by figure 1.

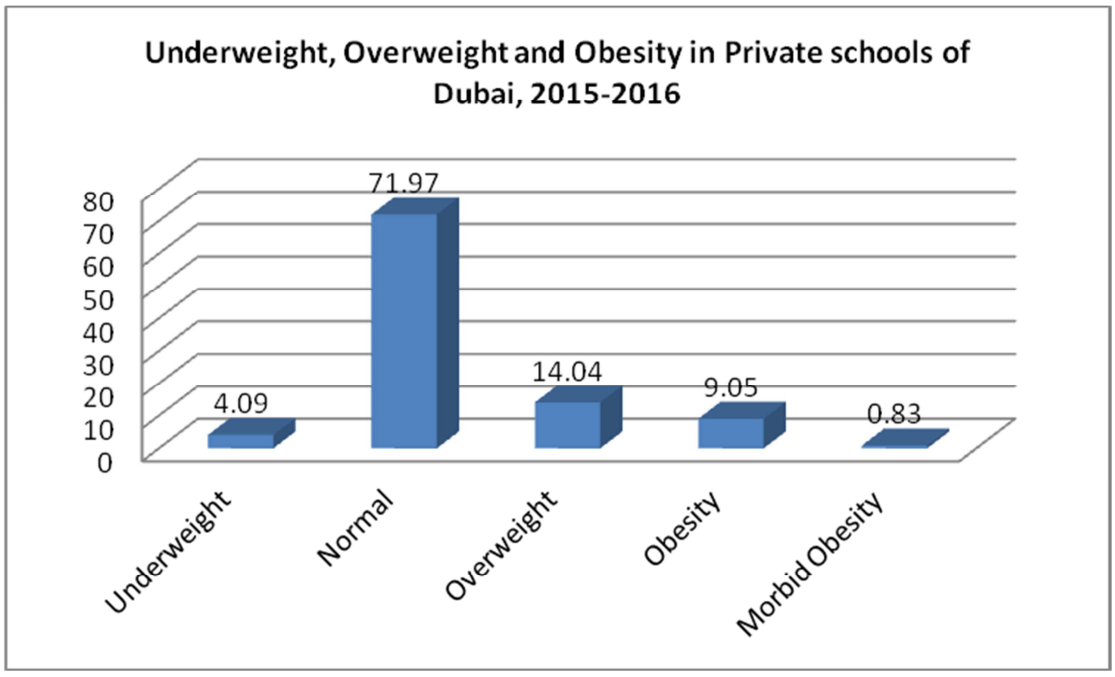

Figure 1. Prevalence of obesity among Students population at private schools in Dubai for the academic year 2015-2016.

The study showed that the prevalence of obesity among student population at private schools in Dubai during the academic year 2016-2017 was 8.2% and about 0.7% of the total students were morbid obese. A total of 8.9% of all students were obese of different severity as reflected by figure 2.

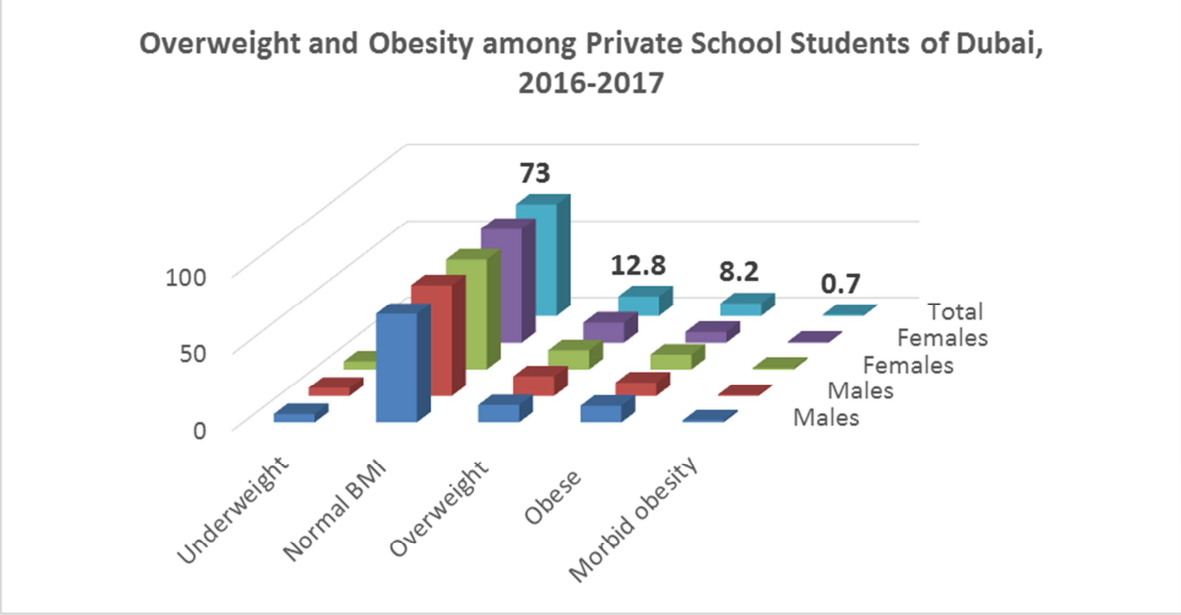

Figure 2. Prevalence rate of obesity among student population at private schools in Dubai for the year 2016-2017.

The study revealed that the trend of obesity prevalence among students population at private schools in Dubai is declining over that last three academic years (2014-2015, 2015-2016 and 2016-2017) showing that about 1.2% total reduction during the three years period of applying effective intervention program as shown in figure 3.

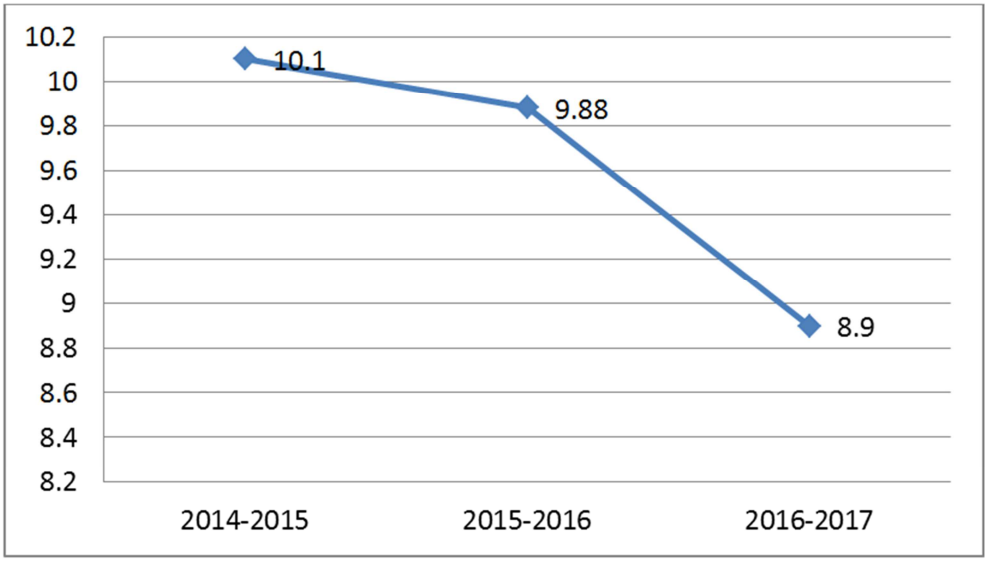

Figure 3. Obesity prevalence trend across the last three academic years of intervention (2014-2015, 2015-2016.2016-2017).

5. Discussion

The prevalence of obesity in this study was less compared to another study results conducted in Saudi Arabia, which showed that the overall prevalence of obesity in children and adolescents from 5 to 18 years was 11.3%. Among the age group of 5-12 years, the prevalence of obesity was 11.0 in females and 7.8% in males. Among the age group of 13-18 years, the prevalence of obesity was 12.1% in female and 13.8% in males. Schools in Saudi Arabia should be an important avenue for addressing childhood obesity by following a multilevel strategy starting from home including raising the awareness of parents regarding obesity issues. It should incorporate strategies that encourage adopting healthy dietary patterns and being physically active. [24, 25]

The study showed that reduction in the prevalence of childhood obesity among student population at private schools in Dubai was 1.2% over three year of comprehensive intervention program implementation. Some other studies showed that there are no effects on anthropometric index. However, they had resulted in dietary habits or physical fitness improvement. One explanation for this can be self-reported dietary intake and physical activity data. By other words, children may not pay attention to the instruction they were given. [26-33] On reverse there was noticed reduction in this study telling that the multi approach intervention may be more effective than individual approach.

The current study showed that the multi intervention approaches through applying different intervention strategies was significantly effective in prevention and management of childhood obesity which managed to reduce obesity prevalence in 1.2% among study population over three successive years. This results was similar to many other results reflected by different international studies which were stated that as always emphasized, to be effective, physical activity should be considered as an enjoyable fun, and should be integrated into daily lifestyle. Obesity causes mental problems in children and adolescents, [34] so behaviour therapy seems to be vital. It sounds that group treatment is more successful than individual ones; [35, 36] specifically when parents are engaged. Counsellors should persuade children and adolescents to eat breakfast, to have structured meal plan to increase consumption of fruits, vegetables, and family meals, as well as to decrease the intake of sweetened beverages, calorie-dense foods, and eating out, as well as reducing the sedentary behaviours and the screen time. [37, 38] Counsellors also need to teach families about healthy shopping and cooking habits

Current study revealed that school-based obesity prevention and control programs are suggested to be feasible and effective; because students spend a considerable part of their time in school, moreover teachers and peers can be engaged in such programs. These kinds of programs can improve health behaviours in a large target group. They are characterized by nutritional education and changes in dietary habits, as well as increase in physical activity through structured programs. Findings of various studies proposed that the effects of such interventions will be preserved for several years after intervention. [39, 40]

6. Conclusion

Multi approach public health intervention for childhood obesity is significantly successful in producing weight reduction in the short and long term, by bringing stakeholders

on board and implementing effective intervention program with wide variety of tasks. Maintaining intervention need to be revised, re assessed, monitored and there is a need for strengthening sustainable long term approach through governmental and nongovernmental accountability.

Conflict of Interest

The authors declare that they do not have any conflict of interest.

References

[1] Al-Othaimeen AI, Al-Nozha M, Osman AK. Obesity: An emerging problem in Saudi Arabia. Analysis of data from National Nutritional Survey. East Mediterr Health J 2007; 13: 441-7.

[2] Lobstein T. Prevalence and trends of childhood obesity. In: Crawford D, Jeffrey R, Ball K, Brug J, editors. Obesity Epidemiology. 2nd ed. London: Oxford University Press; 2010. p. 3.

[3] Musaiger AO. Overweight and obesity in the Eastern Mediterranean Region: Can we control it? East Mediterr Health J 2004; 10: 789-93.

[4] Obesity: Preventing and managing the global epidemic. Report of a WHO consultation. World Health Organ Tech Rep Ser; 2000. p. 100-42.

[5] Sturm R. The effects of obesity, smoking, and drinking on medical problems and costs. Health Affairs 2002;21: 245-53.

[6] Lobstein T, Baur L, Uauy R. IASO International. Obesity in children and young people: A crisis in public health. Obesity Rev 2004; 5: 4-85.

[7] El-Hazmi MA, Warsy AS. The prevalence of obesity and overweight in 1-18-year-old Saudi children. Ann Saudi Med 2002; 22: 303-7.

[8] Amin TT, Al-Sultan AI, Ayub A. Overweight and obesity and their relation to dietary habits and socio-demographic characteristics among male primary school children in Al-Hassa, Kingdom of Saudi Arabia. Eur J Nutr 2008; 47: 310-8.

[9] World Health Organization. Childhood overweight and obesity. Available from: http://www.who.int/dietphysicalactivity/childhood/en/[Last accessed 2017 sept10].

[10] U.S. Department of Health and Human Services. The Surgeon General's call to action to prevent and decrease overweight and obesity. Rockville, MD: Office of Disease Prevention and Health Promotion; Centers for Disease Control and Prevention, National Institutes of Health; 2001.

[11] Berge JM. A review of familial correlates of child and adolescent obesity: What has the 21st Century Taught us so Far? Internat J Adolesc Med Health. 2009; 21(4): 16.

[12] Kitzmann KM, Beech BM. Family-based interventions for pediatric obesity: methodological and conceptual challenges from family psychology. J Fam Psychol. June 2006; 20(2): 175–189.

[13] Procter KL. The etiology of childhood obesity: A review. Nutr Res Rev. 2007;20: 29–45.

[14] Marcus MD, Levine MD, Kalarchian MA, Wisniewski L. Cognitive behavioral interventions in the management of severe pediatric obesity. Cogn Behav Pract. 2003; 10: 147–56.

[15] Barlow SE, Expert Committee. Expert committee recommendations regarding the prevention, assessment, and treatment of child and adolescent overweight and obesity: Summary report. Pediatrics. 2007; 120(Suppl 4):S164–92.

[16] Knowlden AP, Sharma M. Systematic review of family and home-based interventions targeting paediatric overweight and obesity. Obes Rev. 2012; 13: 499–508.

[17] Tounian P. Programming towards childhood obesity. Ann Nutr Metab. 2011;58(Suppl 2): 30–41.

[18] Higgins V, Dale A. Ethnicity and childhood overweight/obesity in England. Pediatr Obes. 2012; 7: E22–6.

[19] D'Auria JP. Weighing in: Prevention of childhood overweight and obesity. J Pediatr Health Care. 2011; 25:E26–30.

[20] Haynos AF, O'Donohue WT. Universal childhood and adolescent obesity prevention programs: Review and critical analysis. Clin Psychol Rev. 2012; 32: 383–99.

[21] Roy M, Millimet DL, Tchernis R. Federal nutrition programs and childhood obesity: Inside the black box. Rev Econ Househ. 2012;10: 1–38.

[22] Huus K, Ludvigsson JF, Enskär K, Ludvigsson J. Risk factors in childhood obesity-findings from the All Babies In Southeast Sweden (ABIS) cohort. Acta Paediatr. 2007;96: 1321–5.

[23] Pelone F, Specchia ML, Veneziano MA, Capizzi S, Bucci S, Mancuso A, et al. Economic impact of childhood obesity on health systems: A systematic review. Obes Rev. 2012; 13: 431–40.

[24] Musaiger AO. Overweight and obesity in Eastern mediterranean region: Prevalence and possible causes. J Obes 2011; 2011: 2-17.

[25] El-Mouzan MI, Foster PJ, Al Herbish AS, Al Salloum AA, Al Omer AA, Qurachi MM, *et al*. Prevalence of overweight and obesity in Saudi children and adolescents. Ann Saudi Med 2010; 30: 203-8.

[26] Bayer O, von Kries R, Strauss A, Mitschek C, Toschke AM, Hose A, et al. Short- and mid-term effects of a setting based prevention program to reduce obesity risk factors in children: A cluster-randomized trial. Clin Nutr. 2009; 28: 122–8.

[27] Neumark-Sztainer D, Story M, Hannan PJ, Rex J. New Moves: A school-based obesity prevention program for adolescent girls. Prev Med. 2003; 37: 41–51.

[28] Thivel D, Isacco L, Lazaar N, Aucouturier J, Ratel S, Doré E, et al. Effect of a 6-month school-based physical activity program on body composition and physical fitness in lean and obese schoolchildren. Eur J Pediatr. 2011; 170: 1435–43.

[29] Caballero B, Clay T, Davis SM, Ethelbah B, Rock BH, Lohman T, et al. Pathways: A school-based, randomized controlled trial for the prevention of obesity in American Indian schoolchildren. Am J Clin Nutr. 2003;78: 1030–8.

[30] Bean MK, Wilson DB, Thornton LM, Kelly N, Mazzeo SE. Dietary intake in a randomized-controlled pilot of NOURISH: A parent intervention for overweight children. Prev Med. 2012;55: 224–7.

[31] Taveras EM, Gortmaker SL, Hohman KH, Horan CM, Kleinman KP, Mitchell K, et al. Randomized controlled trial to improve primary care to prevent and manage childhood obesity: The High Five for Kids study. Arch Pediatr Adolesc Med. 2011; 165: 714–22.

[32] Looney SM, Raynor HA. Are changes in consumption of “healthy” foods related to changes in consumption of "unhealthy" foods during pediatric obesity treatment? Int J Environ Res Public Health. 2012;9: 1368–78.

[33] Waling M, Lind T, Hernell O, Larsson C. A one-year intervention has modest effects on energy and macronutrient intakes of overweight and obese Swedish children. J Nutr. 2010; 140: 1793–8.

[34] Lofrano-Prado MC, Antunes HK, do Prado WL, de Piano A, Caranti DA, Tock L, et al. Quality of life in Brazilian obese adolescents: Effects of a long-term multidisciplinary lifestyle therapy. Health Qual Life Outcomes. 2009; 7: 61.

[35] Kalavainen MP, Korppi MO, Nuutinen OM. Clinical efficacy of group-based treatment for childhood obesity compared with routinely given individual counseling. Int J Obes (Lond) 2007; 31: 1500–8.

[36] Garipağaoğlu M, Sahip Y, Darendeliler F, Akdikmen O, Kopuz S, Sut N. Family-based group treatment versus individual treatment in the management of childhood obesity: Randomized, prospective clinical trial. Eur J Pediatr. 2009; 168: 1091–9.

[37] Barlow SE, Expert Committee. Expert committee recommendations regarding the prevention, assessment, and treatment of child and adolescent overweight and obesity: Summary report. Pediatrics. 2007; 120(Suppl 4): S164–92.

[38] Gately PJ, King NA, Greatwood HC, Humphrey LC, Radley D, Cooke CB, et al. Does a high-protein diet improve weight loss in overweight and obese children? Obesity (Silver Spring) 2007; 15: 1527–34.

[39] Lubans DR, Morgan PJ, Callister R, Collins CE, Plotnikoff RC. Exploring the mechanisms of physical activity and dietary behavior change in the program x intervention for adolescents. J Adolesc Health. 2010; 47: 83–91.

[40] Plachta-Danielzik S, Landsberg B, Lange D, Seiberl J, Müller MJ. Eight-year follow-up of school-based intervention on childhood overweight – The Kiel Obesity Prevention Study. Obes Facts. 2011; 4: 35–43.