

A 3-Years-Follow-Up Study of the Effect of the Weight Control Program on KAP and Behavior among Overweight and Obese School Children in Nonthaburi Province

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Objective: To evaluate the outcome of a program on behavioral change to control weight on overweight and obese students at a primary school in 2013. The present study aimed to find whether the Knowledge Attitude Practice (KAP) and behavior on weight control from the behavioral change program were sustained.

Material and Method: This cross-sectional study was performed on overweight and obesity (OWOB) students in a primary school between June 2013 and July 2016. At the first visit in 2013, the affected students, parents, health education teachers, and food retailers were educated about the Behavior Change Program. They were then given 3-month interventions. Weight and height of the participants were recorded before and after interventions. The present study collected information on behaviors and factors associated with weight control of the affected students and parents at the two schools in July 2016 for comparison. Descriptive statistics, independent t-test, and Chi-square test were used for analysis.

Results: Review of the Behavior Change Program in 2013 showed that after three months-interventions 18% and 24% of 50 students had reduction and weight stability, respectively. The present study could follow 45 students. The comparison group consists of 50 students from another school who were matched by private-own type included capacity of the school, students of the same age group, and study classes. The analysis showed that three years after the program, the intervention group had more interest in weight control, and scored higher on food consumption behavior. Parents of the intervention group were older, had higher education, chronic illness, knowledge scores on food consumption and physical activities, and had higher parental attitude scores.

Conclusion: The behavior change program resulted in 42% weight control. The present study found that sustained behavior and significant factors were personal factor (interest to control weight), behavioral factor about food consumption, and parental factors of older age, more chronic illness, higher education, better knowledge on food consumption and physical activities, and better attitude.

Keywords: Health behavior change to control weight, Overweight and obesity

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Overweight and obesity (OWOB) have reached epidemic and pandemic level around the world. The World Health Organization (WHO) estimated that in 2005 over 1 billion were overweight and 300 million were obese, where in 2015, 1.5 billion people worldwide would be overweight or obese⁽¹⁾. Thai Population Health Report in 2014 revealed that obesity in Thailand was ranked second from 10 Asian countries. Children obesity was scaling up and found at least one from ten during the past 2 decades⁽²⁾. Children and young people are of the most worrisome groups of OWOB.

Obesity is extremely resistant to treatment. Eating, and physical activity habits learned in children are very difficult to change. Information about healthy food choices should highlight the need to reduce fat and to increase dietary fiber and complex carbohydrates. Individuals as well as parents, government, schools, communities, the medias, and the food and beverage industries all have responsibilities in health promotion for the prevention of obesity⁽³⁾.

Many studies^(4,5) showed that there were several behavioral change programs such as participating action projects to reduce childhood obesity in Thai primary school. The Society of Pediatric Nutrition of Thailand and The Royal College of Pediatricians of Thailand⁽⁶⁾ recommended guideline of behavior modification program as one of the measures for weight control. The program could effectively help obese children to control weight. In 2013, Khaisaeng

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subdistrict hospital had conducted a behavioral change program at Lek-Komate school, Nonthaburi province. The program was based on Social cognitive theory, developed by Albert Bandura⁽⁷⁾. The program held workshop on prevention and correct health behavior related to affected students with the assistance of parents, teachers, and school food entrepreneurs. It trained them about healthy food choices, physical activity, and emotion management. The present study was designed to find out whether any behavioral changes were sustained and what were the factors associated with weight control.

Material and Method

Subjects

The behavioral change program was conducted at Lek-Komate Private Primary School between June 2013 and July 2016. Fifty OWOB students enrolled in the program and 45 students could be followed. A comparison sample of 50 students were selected from Udom-Suksa Private Primary school. Both schools are private, with similar capacity, and cater to the middle socio-economic class. The present study used the case-control method. This study employed inclusion criteria so that both groups were comparative in most aspects as age group, gender, and body mass index (BMI), matched to each other. The OWOB students were free from any complications obstacles to the program, able to communicate, understood the questions well enough, with availability of relevant parental information, with permission to participate in the program granted from their parents. Participants' demographic data such as gender, age, education level, family history of obesity, exercise habit, weight, and height were collected. The same information was collected in the second school as comparison group. The information of the program in 2013 was reviewed three years later by the present research via questionnaires issued in July 2016. Conclusion of the study process is shown in Fig. 1.

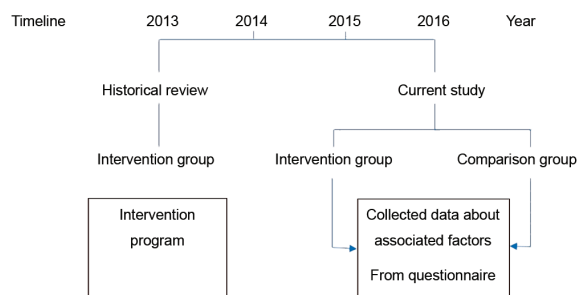


Fig. 1 The study process.

WHO⁽⁸⁾ definition of OWOB in children between age 5 to 19 years is abnormality of excessive fat accumulation that may impair health of children. Overweight is BMI-for-age greater than one standard deviation above the WHO Growth Reference median. Obesity is greater than two standard deviations above the WHO Growth Reference median.

The behavioral change program

Behavior modification on this weight control program based on the Social Cognitive Theory composed of: 1) Health promotion knowledge about food, nutrition, and physical activity for school children to achieve normal growth. 2) Knowledge to key stakeholders namely, parents, teachers for cooperative participation in prevention, and correcting problems on OWOB among school children. 3) To decrease health risk factors of obesity and consequent complications. 4) Team education for transition from an integrated behavior-based to school-based comprehensive system to promote nutritional health of children. 5) Training, making provision of integrated nutritional education for children and their parents to help forming skills and behaviors for children. This included making healthy food and physical activity choices within a healthy life style, with emotional management program. 6) Support for healthy eating habits and physical activity by school and family.

Questionnaires

The main objective of the present study is to see if the changes in behavior were sustained after intervention for three years. The Transtheoretical Model (TTM)⁽⁹⁾ that focused on stages of change, proposed that people move through a series of stages when modifying behavior. This model was applied to develop questionnaires for exploring the determinants related to weight reduction after three years of the program intervention. Questionnaires composed of two major parts as 1) Student part: Demographics, Knowledge, Attitude, and Practice for 10, 10, 15, and 22 questions respectively. 2) Parent part: Demographics, Knowledge, Attitude, and Practice for 10, 10, 15, and 23 questions respectively. Pretest was not done due to limitation of time and cases.

Ethical review

The research proposal was approved by the Department of Health Research Review Board, altogether with parental permission.

Data analysis

Data were analyzed using SPSS version 18.0 for windows. Frequency, percentage, mean, and standard deviation were used to describe personal factors of both students and parents. Chi-square test or Fisher's exact test analyses were conducted to determine the statistical significance of group differences. An independent t-test was conducted to compare the mean score between groups. The statistical significance level was set at <0.05.

Results

Ninety-five students participated in the current study, 45 students from the intervention group (IG) and 50 students from the comparison group (CG). Personal factors of the IG and the CG were shown in

Table 1. Both groups were similar in general profiles as age group, gender majority, average BMI, living status, no chronic illness, knowledge accessibility from public media, and obese family member. IG was significantly more interested in weight control program.

Characteristics of parents

Parents of both groups were similar in majority female gender, occupation, interested and providing care about food choices and physical activity, and knowledge accessibility from public media. Parents of IG were significantly different in older, had higher education, chronic illness, knowledge scores on food consumption and physical activities, and higher attitude scores as shown in Table 2.

Table 1. Comparison of personal factors of intervention group and comparison group (n = 95)

Variables	Intervention school		Comparison school		p-value [#]
	Number	%	Number	%	
Age (years)					
9	10	22.2	6	12.0	0.542
10	15	33.3	18	36.0	
11	14	31.2	16	32.0	
12	6	13.3	10	20.0	
Sex					
Male	28	62.2	34	68.0	0.555
Female	17	37.8	16	32.0	
Primary education level					
4	17	37.8	11	22.0	0.136
5	13	28.9	13	26.0	
6	15	33.3	26	52.0	
Residential					
Father-mother	43	95.6	44	89.8	0.254*
Relatives	2	4.4	5	10.2	
Interesting in weight control					
Yes	41	91.1	38	76.0	0.049
No	4	8.9	12	24.0	
Information receiving					
Ever	35	77.8	37	74.0	0.668
Never	10	22.2	13	26.0	
Personal chronic illness					
Yes	10	22.2	8	16.0	0.440
No	35	77.8	42	84.0	
Obese family member					
Yes	29	64.4	37	74.0	0.313
No	16	35.6	13	26.0	
BMI (kg/m ²)	25.14 ^M	5.20 ^S	25.33 ^M	4.68 ^S	0.853 ^{Ti}

BMI = body mass index

[#] Chi-squared test; statistic significant $p < 0.05$

* Fisher's exact test, ^{Ti} Independent t-test

^M Mean, ^S Standard deviation

Both groups were similar in knowledge scores about food consumption and physical activity, and attitude scores about obesity as shown in Table 3.

Parents of both groups were similar in average BMI, practice scores about food consumption, and physical activity. Parents of IG were significantly different in higher scores of knowledge about food

Table 2. Comparison of parental factors of intervention group and comparison group

Variables	Intervention school		Comparison school		p-value [#]
	Number	%	Number	%	
Age					
Less than 40 years	8	23.5	24	48.0	0.040
40-49 years	17	50.0	13	26.0	
50 years or more	9	26.5	13	26.0	
Sex					
Male	9	26.5	10	20.0	0.487
Female	25	73.5	40	80.0	
Occupation					
Civil officers/state employ	7	25.0	6	13.0	0.402
Private sector employee	13	46.4	23	50.0	
Others	8	28.6	17	37.0	
Graduation					
Primary school	4	13.8	10	21.3	0.023
High school	10	34.5	27	57.4	
Bachelor or more	15	51.7	10	21.3	
Interesting in weight control					
Yes	28	84.8	45	90.0	0.480
No	5	15.2	5	10.0	
Information receiving					
Ever	28	84.8	40	80.0	0.574
Never	5	15.2	10	20.0	
Personal chronic illness					
Yes	6	18.8	23	46.0	0.012
No	26	81.2	27	54.0	
Obese family member					
Yes	16	50.0	31	62.0	0.284
No	16	50.0	19	38.0	
BMI (kg/m ²)	25.19 ^M	4.39 ^S	26.40 ^M	5.48 ^S	0.305 ^{T1}

[#] Chi-squared test; statistic significant $p < 0.05$

* Fisher's exact test, ^{T1} Independent t-test

^M Mean, ^S Standard deviation

Table 3. Comparison of BMI, knowledge, attitude, and factors contributing to promote behavior about food consumption and physical activity of two groups (n = 95)

Variables	Intervention school		Comparison school		t	p-value
	Mean	SD	Mean	SD		
Students						
Knowledge score	5.91	1.64	5.40	1.88	1.405	0.163
Attitude score	42.40	5.47	41.72	4.44	0.657	0.513
Parents						
Knowledge score	6.47	1.43	5.60	1.55	2.488	0.015
Attitude score	45.60	4.30	43.06	4.34	2.544	0.013
Practical score	41.04	3.85	40.64	4.96	0.447	0.660
Factors contributing to promote behavior	8.38	2.15	8.84	2.83	-0.889	0.376

Table 4. Comparison of difference in behavior about food consumption between two groups after intervention

Study groups	n	Mean	SD	t	p-value
Intervention	41	33.10	4.09	3.163	0.002
Comparison	50	30.50	3.74		

Table 5. Comparison of difference in behavior about physical activity between two groups after intervention

Physical activity behavior	Intervention		Comparison		p-value
	Number	%	Number	%	
Regularly	32	78.0	41	82.0	0.638
Scarcely	9	22.0	9	18.0	

consumption and physical activity, and attitude scores about obesity, as shown in Table 3.

Behavior about food consumption of IG was better as shown in Table 4.

Behavior about physical activity of both groups was similar as shown in Table 5.

Discussion

The behavioral change program effectively control weight of OWOB students. The results showed that comparative average BMI = 25.58 and 26.11 kg/m² (before and after intervention 2013) with average BMI = 25.14 kg/m² of IG at 2016. The significant effects found on the students were interest to control weight, and behavioral factor about food consumption. Parental factors were better knowledge on food consumption and better attitude.

There was a Cochrane Systemic Review⁽⁵⁾ showing that the combined behavioral lifestyle intervention produced significant weight reduction in overweight children and adolescents. The same result was found in historical review of the present study. The present study found higher interest level in weight control and behavior on food consumption of intervention group showed significantly better results. The studies of Kastorini et al⁽¹⁰⁾, Amini et al⁽¹¹⁾, and Li et al⁽¹²⁾ reported school-based nutritional program and physical activity could be considered as an effective policy measure towards weight control in children. Historical review on the behavioral change program was also performed as school-based intervention program.

The study of Lee and Choi⁽¹³⁾ about mentored obesity management program for elementary school learners reported effective weight management and self-esteem improvement that agreed with the present

study program which health care personnel were trained and mentored intervention group were formed. The research of Li et al⁽¹⁴⁾ showed that school environment/policies related to nutritional and physical activity, the program we study were assisted by teachers, food retailers, and approval from the school administrators. The studies of Schalwijk et al⁽¹⁵⁾, and Robinson et al⁽¹⁶⁾ reported that participants in life style behavior intervention program benefit from parental support and help from their families, peers, and friends. Likewise, the present study acquired the assistance from parents and teachers and peers. The present study showed that parental factors as higher education level and higher knowledge about food consumption were associated with or at least presumed to support their children towards weight control. The research of Braden and Nigg⁽¹⁷⁾ showed that education plays an important role in obesity. Yu and Zhu⁽¹⁸⁾ identified that parental attitudes could influence school children's behavior as this study had the program to educate the parties involved. It showed significant effects on weight control from more knowledge about food consumption and physical activity, and better attitude among parents of intervention group. A review of Ewart-Pierce et al⁽¹⁹⁾ showed significant improvement of health outcome from context of multicomponent and multilevel integration, like the behavioral change program that was assisted by many different partners in early 2013. The research of Guess et al⁽²⁰⁾ demonstrated the usefulness of stage-matched approach in modifying dietary behavior and that stage of change is a valid measure of dietary behavior over time. The research of Sobol-Gold et al⁽²¹⁾ found more than one year effects of school-based obesity prevention programs. The study of Ho et al⁽²²⁾ showed that outcomes of lifestyle interventions and behavioral therapy last at least one year up, which were similar to the present study that found changes in behavior had sustained for three years in addition with identification of influencing factors.

In conclusion, the present study showed the behavior changes and associated factors of intervention group, with statistical significance on the interest to control weight and behavior about food consumption of the affected students. Such factors also included their parents were older, had chronic illness, higher education, better knowledge about food consumption and physical activity, and better attitude. Future study with randomized control trial is recommended to improve the intervention program via continuous model development aiming at potential extensive use.

What is already known on this topic?

Despite Ministry of Public Health has policy and measures to handle OWOB, the Thai Population Health Report in 2014 revealed that obesity in Thailand was ranked second from 10 Asian countries. Children obesity was scaling up and found at least one in ten during the past two decades⁽²⁾. Many effective weight control programs need more implementing.

What this study adds?

This behavioral change program can cause effectively 42% weight control. However, further interventions should be held for sustaining better outcomes, and preparing for the new sets of affected students. Individual's behaviors and social determinants are also proposed to be of concerned, when implementing the program.

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Potential conflicts of interest

None.

References

1. The World Health Organization warns of the rising threat of heart disease and stroke as overweight and obesity rapidly increase [Internet]. 2005 [cited 2016 Feb 23]. Available from: <http://www.who.int/mediacentre/news/releases/2005/pr44/en/>
2. Kanchanachitra C. Revealed Thai population health report 2014: Dangerous signals from obesity [Internet]. 2014 [cited 2016 Feb 23]. Available from: <http://www.hfocus.org/content/2014/06/7449>
3. Tulchinsky TH, Varavikova EA. Non communicable diseases and conditions. In: Tulchinsky TH, Varavikova EA, editors. *The new public health*. 3rd ed. Sandiego: Elsevier Academic press; 2014: 237-310.
4. Sirikulchayanonta C, Pavadhgul P, Chongsawat R, Klaewkla J. Participatory action project in reducing childhood obesity in Thai primary schools. *Asia Pac J Public Health* 2011; 23: 917-27.
5. Oude LH, Baur L, Jansen H, Shrewsbury VA, O'Malley C, Stolk RP, et al. Interventions for treating obesity in children. *Cochrane Database Syst Rev* 2009; (1): CD001872.
6. Society of Pediatric Nutrition of Thailand and The Royal College of Pediatricians of Thailand. Clinical practice guidelines for prevention and treatment children obesity [Internet]. 2014 [cited 2016 Jul 13]. Available from: http://www.thaipediatrics.org/cpg_file/CPGobesity_27_1_2015-.pdf
7. Stevenson M. Health behavior change theories and models: Understanding the process of behavior change. In: Snelling A, editor. *Introduction to health promotion*. San Francisco: Jossey-Bass; 2014: 25-50.
8. World Health Organization. Obesity and overweight fact sheets [Internet]. 2016 [cited 2016 Jul 19]. Available from: <http://www.who.int/mediacentre/factsheets/fs311/en/>
9. Pro-change Behavior Systems, Inc. The transtheoretical model [Internet]. 2016 [cited 2016 Jul 20]. Available from: <http://www.prochange.com/the-transtheoretical-model>
10. Kastorini CM, Lykou A, Yannakoulia M, Petralias A, Riza E, Linos A. The influence of a school-based intervention programme regarding adherence to a healthy diet in children and adolescents from disadvantaged areas in Greece: the DIATROFI study. *J Epidemiol Community Health* 2016; 70: 671-7.
11. Amini M, Djazayeri A, Majdzadeh R, Taghdisi MH, Sadrzadeh-Yeganeh H, Abdollahi Z, et al. A school-based intervention to reduce excess weight in overweight and obese primary school students. *Biol Res Nurs* 2016 Jun 29. pii: 1099800416654261.
12. Li XH, Lin S, Guo H, Huang Y, Wu L, Zhang Z, et al. Effectiveness of a school-based physical activity intervention on obesity in school children: a nonrandomized controlled trial. *BMC Public Health* 2014; 14: 1282.
13. Lee GY, Choi YJ. Effects of an obesity management mentoring program for Korean children. *Appl Nurs Res* 2016; 31: 160-4.
14. Li M, Xue H, Wen M, Wang W, Wang Y. Nutrition and physical activity related school environment/policy factors and child obesity in China: a nationally representative study of 8573 students

- in 110 middle schools. *Pediatr Obes* 2016.
15. 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. *Int J Behav Nutr Phys Act* 2015; 12: 102.
 16. Robinson TN, Matheson D, Desai M, Wilson DM, Weintraub DL, Haskell WL, et al. Family, community and clinic collaboration to treat overweight and obese children: Stanford GOALS-A randomized controlled trial of a three-year, multi-component, multi-level, multi-setting intervention. *Contemp Clin Trials* 2013; 36: 421-35.
 17. Braden KW, Nigg CR. Modifiable determinants of obesity in native Hawaiian and Pacific Islander youth. *Hawaii J Med Public Health* 2016; 75: 162-71.
 18. Yu CY, Zhu X. From attitude to action: What shapes attitude toward walking to/from school and how does it influence actual behaviors? *Prev Med* 2016; 90: 72-8.
 19. Ewart-Pierce E, Mejia Ruiz MJ, Gittelsohn J. "Whole-of-Community" obesity prevention: a review of challenges and opportunities in multilevel, multicomponent interventions. *Curr Obes Rep* 2016; 5: 361-74.
 20. Guess N, Vasantharajah L, Gulliford M, Viberti G, Gnudi L, Karalliedde J, et al. Improvements in stage of change correlate to changes in dietary intake and clinical outcomes in a 5-year lifestyle intervention in young high-risk Sri Lankans. *Prev Med* 2016; 90: 193-200.
 21. Sobol-Goldberg S, Rabinowitz J, Gross R. School-based obesity prevention programs: a meta-analysis of randomized controlled trials. *Obesity (Silver Spring)* 2013; 21: 2422-8.
 22. Ho M, Garnett SP, Baur L, Burrows T, Stewart L, Neve M, et al. Effectiveness of lifestyle interventions in child obesity: systematic review with meta-analysis. *Pediatrics* 2012; 130: e1647-71.

การศึกษาติดตามระยะเวลา 3 ปี ถึงผลของโครงการควบคุมน้ำหนักที่มีต่อความรู้ทัศนคติการปฏิบัติตนและพฤติกรรมในเด็กนักเรียนภาวะน้ำหนักเกินและโรคอ้วนในจังหวัดนนทบุรี

สมพงษ์ ชัยโอภาณนท์

วัตถุประสงค์: เพื่อศึกษาผลของโครงการปรับเปลี่ยนพฤติกรรมควบคุมน้ำหนักนักเรียนน้ำหนักเกินและโรคอ้วนในโรงเรียนเล็กโกเมศอนุสรณ์ ใน พ.ศ. 2556 และการศึกษาที่ศึกษาว่ามีพฤติกรรมที่ปรับเปลี่ยนใดคงอยู่ และศึกษาปัจจัยสำคัญเกี่ยวข้องกับการเปลี่ยนแปลงพฤติกรรม ภายหลังจากดำเนินการแล้ว 3 ปีก่อน

วัตถุประสงค์และวิธีการ: การศึกษาเชิงวิเคราะห์แบบตัดขวาง (*cross-sectional analytic study*) ศึกษาเด็กนักเรียนภาวะน้ำหนักเกินและโรคอ้วนในโรงเรียนเล็กโกเมศฯ ระหว่างเดือนมีนาคม พ.ศ. 2556 ถึง กรกฎาคม พ.ศ. 2559 ใน พ.ศ. 2556 กลุ่มนักเรียนผู้ปกครอง ครูอนามัย และผู้ขายอาหารในโรงเรียนเล็กโกเมศฯ เข้ารับการอบรมโครงการดำเนินการปรับเปลี่ยน 3 เดือน น้ำหนักและส่วนสูงของกลุ่มนักเรียนที่ร่วมโครงการได้รับการบันทึกก่อนและหลังเข้าโครงการ การศึกษานี้ได้รวบรวมข้อมูลด้านพฤติกรรมและปัจจัยเกี่ยวข้องจากนักเรียนและผู้ปกครองที่โรงเรียนเล็กโกเมศฯ และโรงเรียนอุดมศึกษา ในเดือนกรกฎาคม พ.ศ. 2559 เพื่อศึกษาเชิงเปรียบเทียบ โดยใช้สถิติเชิงพรรณนา, *independent t-test* และ *Chi-square test* ในการวิเคราะห์ข้อมูล

ผลการศึกษา: การทบทวนพบว่านักเรียน 50 คน เข้าโครงการปรับเปลี่ยนพฤติกรรมที่โรงเรียนเล็กโกเมศฯ ควบคุมน้ำหนักได้ร้อยละ 42 (น้ำหนักลดลงร้อยละ 18 คงที่ร้อยละ 24) การศึกษานี้มีนักเรียน 45 คน ที่เคยเข้าโครงการใน พ.ศ. 2556 เป็นกลุ่มทดลอง กลุ่มควบคุมประกอบด้วยนักเรียนโรงเรียนอุดมศึกษา 50 คน ที่ไม่เคยเข้าโครงการ ผลการศึกษาปัจจุบันหลังโครงการ 3 ปี พบว่าปัจจัยสำคัญและพฤติกรรมควบคุมน้ำหนักที่พบอย่างมีนัยสำคัญในกลุ่มที่เข้าโครงการ ได้แก่ ปัจจัยส่วนบุคคลในด้านความสนใจควบคุมน้ำหนักและพฤติกรรมการบริโภคอาหารของนักเรียนที่เข้าโครงการ ปัจจัยด้านผู้ปกครองของนักเรียนกลุ่มเข้าโครงการจัดอยู่ในกลุ่มอายุมากกว่า ระดับการศึกษาสูงกว่าปริญญาตรีขึ้นไปมากกว่า พบโรคประจำตัวมากกว่า คะแนนเฉลี่ยความรู้ในการบริโภคอาหารและกิจกรรมทางกายดีกว่า และคะแนนทัศนคติดีกว่า

สรุป: โครงการปรับเปลี่ยนพฤติกรรมเด็กนักเรียนภาวะน้ำหนักเกินและอ้วนควบคุมน้ำหนักได้ร้อยละ 42 การศึกษานี้พบว่าความเปลี่ยนแปลงด้านพฤติกรรมที่คงอยู่และปัจจัยสำคัญได้แก่ นักเรียนกลุ่มที่เข้าโครงการมีความสนใจในการควบคุมน้ำหนักและพฤติกรรมในการบริโภคอาหารมากกว่า ผู้ปกครองของนักเรียนกลุ่มที่เข้าโครงการจัดอยู่ในกลุ่มอายุสูงกว่า พบโรคประจำตัวมากกว่า การศึกษาสูงกว่า มีความรู้เกี่ยวกับการบริโภคอาหารและกิจกรรมทางกายร่วมกับทัศนคติที่ดีกว่า
