Evaluation Report
Good Health Starts Here
2015-2018

A food consumption behavior modification model for junior high school students in 2015[1]

(Thai FDA in collaboration with the Faculty of Education of Kasetsart University Bangkhen Campus and the Faculty of Education of the Institute of Physical Education Bangkok Campus)

Introduction

Children and youths are regarded as a vital human resource to the development of the country in all dimensions. Being healthy has a direct positive impact on child and youth development in becoming a valuable human resource for the nation. At present, rapidly changing circumstances have brought about changes in health behavior among children and youths. Lifestyle patterns, behavior, values, foreign culture as well as consumer trends all greatly affect the behavior of children and youths due to several factors, especially rapid advances in technology and with it the rise of many media forms. Such media have developed their advertising format to further their commercial targets. With highly competitive markets, manufacturers and distributors use advertising and marketing strategies so as to convince consumers to buy their products and services, especially food products that can generate a massive income for business operators. This creates risk regarding health problems among children and youths since they consume unhealthy food such as unhealthy snacks, soft drinks, and drinks containing much more sugar than the body needs. It damages health both currently and in their future lives. Simply put, children have nutrition deficiency and hypernutrition, growth retardation, frequent illness, inadequate learning ability, low learning achievement, as well as low competency in doing activities and sports (Thai Health Promotion Foundation, 2014). In the future, there may be knock on results as regards non-communicable diseases (NCDs) such as diabetes, heart disease, high blood pressure, and kidney disease since such food contains high proportions of carbohydrate, sugar and sodium.

---

[1] A food consumption behavior modification model for junior high school students in 2015 https://db.oryor.com/databank/uploads/fda/0980889001543479772_file.pdf?fbclid=IwAR0OxSDACePOknY7L9z8h38cRZUAQM0dewJxS1I1vpEI2ctgJriSnAdFzS4

Several research works reveal that children and youths consume unhealthy snacks, soft drinks and sugary drinks in high proportions. The study conducted by Veerachai et al. (2015) shows that the majority of junior high school students (62.2%) consumed unhealthy snacks, soft drinks and sugary drinks, while Narongsak (2007) revealed that 45.8% of students consumed unhealthy snacks every day. These results are also in line with the survey result found by the Department of Health Service Support – that children of every age group are overweight, and tall and corpulent rather than thin. Consequently, more problems concerning NCDs have been discovered both among children and adults, ruining the health of the country's human resource. Developing and taking care of consumption behavior in children is to promote the better quality of life among children and youths, as well as improve human resources to be ready physically and mentally, and with competence, leading to the development of the country in the future (Department of Health Service Support, 2014.

Thai FDA, the Ministry of Public Health by the Consumers Potential Development Network has created the operational plan to adjust consumer behavior (as concerns the issues related to the roles and responsibilities, and missions of Thai FDA) of junior high school students to reduce the consumption of unhealthy food products. In searching for an appropriate model to achieve the goal, the focus is on the reading behavior of the food nutrition labels, a guideline for daily amount labels (GDA), the usage of information on labels, avoidance/reduction of unsafe food consumption, and the rights protection behavior. The research on behavioral change patterns in the food consumption of junior high school students has therefore been conducted with the objective of creating, experimenting, evaluating and improving the model so as to acquire an effective format in changing the health behavior of junior high school students that can be further applied to other secondary schools.

The Purpose of Research

1. To create a model for changing the food consumption behavior of junior high school students.
2. To study an experimental result of a model for changing the food consumption behavior of junior high school students.

The Scope of Research

The research scope is designated as follows:

1. Content Scope

A model for changing the food consumption behavior of junior high school students places emphasis on the behavioral transformation of junior high school students as regards five issues: 1) reading labels on food products, 2) reading GDA labels, 3) the use of information on GDA labels in cutting down the consumption of sweet, oily and salty food, 4) reducing unsafe food consumption (focusing only on unhealthy snacks, soft drinks, sugary drinks, food with colour additive, and refried food), and 5) protecting consumers' rights.

Activities to transform the behavior are designed according to the theory of behavioral science, and adapted in line with the health belief model in order to reinforce factors in the following areas: 1) knowledge about safe food consumption, 2) awareness of possible risk regarding diseases caused by the behavior of consuming unsafe food, 3) awareness of severity as a result of unsafe food consumption behavior, 4) awareness of the benefits from safe food consumption behavior, 5) decrease in awareness of obstacles to safe food consumption behavior, 6) availability of incentive for safe food consumption, and 7) awareness of one's own ability to consume safe food.

2. Population Scope

The scope of area in which the trial of the model for changing the food consumption behavior of junior high school students took place comprised four experimental schools from four regions that are part of the operational network of Thai FDA:

1) Sanpatong Wittayakom School, Chiang Mai
2) Phu Kiew School, Chaiyaphum
3) Ammartpanichkul School, Krabi
4) Klaeng Wittayasathaworn School, Rayong

3. Time Scope

The period of operation lasted from 1 June until 31 August 2015.

3.1 Experimental period from 1 June to 31 July 2015.

3.2 Model adjustment from 1-31 August 2015

4. Scope of Population and Sample Group

The details regarding population and sample group used in the experiment of the model for changing food consumption behavior of junior high school students are as follows:

4.1 The population was Mathayom 1-3 students of the academic year 2015 from the secondary schools under the Office of the Basic Education Commission.

4.2 The sample group was 240 Mathayom 1 students of the academic year 2015 from the secondary school under the Office of the Basic Education Commission. The sample group was randomly selected following multi-stage sampling.

Concept Framework of Research Design

In creating the model for changing the food consumption behavior of junior high school students, the research was conducted as follows:

Independent Variable

Model for changing the food consumption behavior of junior high school students

Content comprises reading food nutrition labels, reading a guideline for daily amount labels (GDA), the use of information on GDA labels in reducing the consumption of sweet, oily and salty food, cutting down on unsafe food consumption, and consumer rights protection.

Activities were designed by applying the health belief model to reinforce the factors as follows: 1) knowledge about safe food consumption, 2) awareness of possible risk regarding diseases caused by behavior of consuming unsafe food, 3) awareness of severity as a result of unsafe food consumption behavior, 4) awareness of benefits from safe food consumption behavior, 5) decrease in awareness of obstacles to safe food consumption behavior, 6) availability of incentive for safe food consumption, and 7) awareness of one's own ability to consume safe food.

Figure 1

Concept Framework of Research Design

Dependent Variables

Factors relevant to safe food consumption

- Knowledge about safe food consumption
- Awareness of possible risk caused by behavior of consuming unsafe food
- Awareness of severity as a result of unsafe food consumption behavior
- Awareness of benefits from safe food consumption behavior
- decrease in awareness of obstacles to safe food consumption behavior
- availability of incentive for safe food consumption
- awareness of one's own ability to consume safe food

Food Consumption Behavior

- Reading food nutrition labels
- Reading a guideline for daily amount label (GDA)
- The use of information on GDA labels
- Reducing unhealthy food consumption

Personal Factors

- Age
- Gender
- Weight
- Height
- Average score

Variables explained:

Benefits gained from the research

The research on the model for changing the food consumption behavior of junior high school students provides the following benefits:

1. Acquiring a quality model in transforming the food consumption behavior of junior high school students.
2. Providing a guideline for relevant schools, personnel, or agencies to further adapt the model.

Summary of Operational Results

The four phases of the development of the model in changing the food consumption behavior of junior high school students were:

Phase 1

A survey on the food consumption behavior of junior high school students from schools employing the model activities.

Phase 2

The creation and development of medias/activities used as the model, and the improvement of a model in adjusting the safe food consumption behavior of junior high school students.

Phase 3

The trial of the model.

Phase 4

Improvement of the model.

The operational results are summarized as follows:

1. **A survey on the food consumption behavior of junior high school students**

The sample group is 600 junior high school students from Matthayom 1-3 of each of the four model schools: Sanpatong Wittayakom School, Chiang Mai, Phu Kiew School, Chaiyaphum, Ammartpanichkul School, Krabi, and Klaeng Wittayasathaworn School, Rayong, totaling 2,400 students.

The research shows that:

1.1 Most of the junior high school students consumed unhealthy snacks, soft drinks, and other drinks, accounting for 62.2%. The research shows that the majority consumed unhealthy snacks like potato chips at 69.6%, soft drinks like coca cola at 70.1%, and other drinks like instant tea at 38.2%.

1.2 The study of logical factors having an impact on safe food consumption behavior using seven variables to predict safety food consumption behavior at approximately 34.2%. The independent variables that are able to explain dependent variables with statistical significance are awareness of the possible risks caused by the behavior of consuming unsafe food, incentives for safe food consumption behavior, and confidence in one's own ability to consume safe food.

2. Assessment of the result from the model experiment on changing the food consumption behavior of junior high school students

The sample group was Mathayom 1 students from two classes of each of the four schools divided into one experimental group and one control group. The research shows that:

2.1 Regarding students' consumption behavior of unhealthy snacks and drinks, before the experiment, the experimental group consumed unhealthy snacks, soft drinks and other drinks at 97.8%. However, after the experiment, the consumption decreased to 89.6%. The control group, before the experiment, consumed unhealthy snacks, soft drinks and other drinks at 94.9%. After the experiment, however, they still consumed similar amounts at 92.0%.

2.2 The overview of the study on a causal factor having an impact on safe food consumption behavior reveals that after the experiment there was change in the experimental group regarding the factors promoting safe food consumption and safe food consumption behavior.

2.2.1 Factor regarding knowledge about safe food consumption behavior

Before the experiment, the experimental group had knowledge about safe food consumption behavior at a moderate level (60.1%). However, after the experiment, they had a very good level of knowledge about safe food consumption behavior (81.1%). For the control group, before and after the

experiment, they had knowledge about safe food consumption behavior at a moderate level (60.1% and 64.7% respectively). The statistical result of the experiment through the comparison of the average score of the students for each factor including food consumption behavior shows that the experimental group had more knowledge about safe consumption behavior than before the experiment. The control group, before and after the experiment, had similar knowledge about safe food consumption behavior. After the experiment, the experimental group had more knowledge about safe food consumption behavior than the students from the control group as shown in Table 1-3.

Table 1 Average percentage of knowledge about safe food consumption behavior of students from the experimental group and control group before and after the experiment.

Group	before the experiment		after the experiment	
	average percentage of knowledge	assessment result	average ercentage of p knowledge	assessment result
Experimental group	60.1	moderate	81.1	very good
Control group	61.3	moderate	64.7	moderate

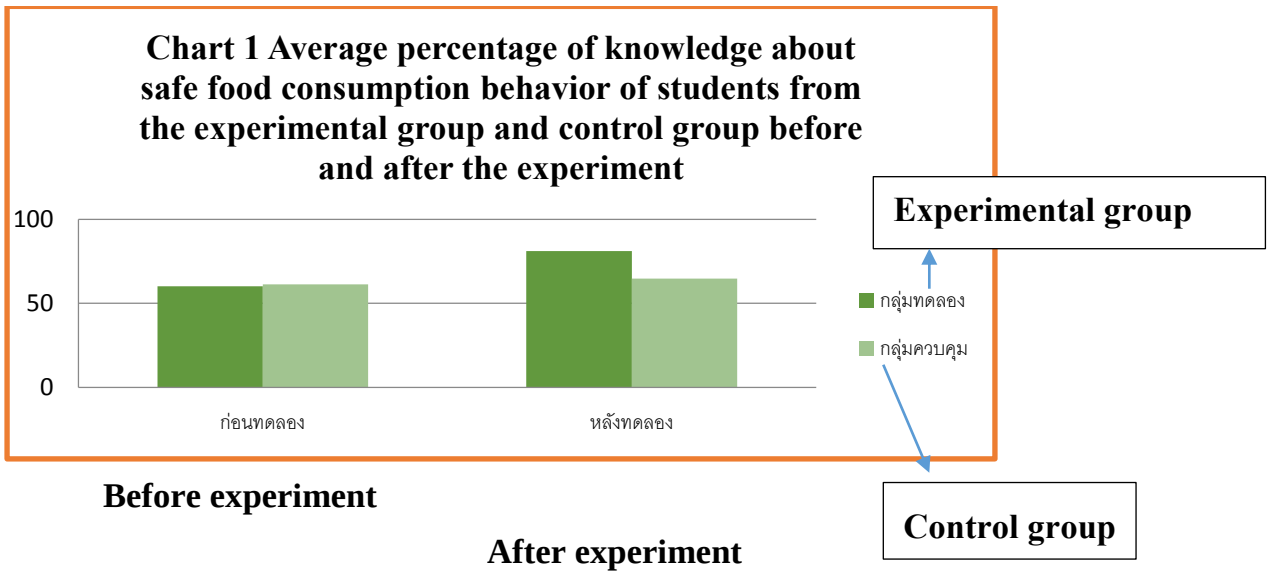


Table 2 Comparison of knowledge about safe food consumption behavior before and after the experiment of students from the experimental group and control group

Students	Experiment	Number(N)	($\bar{X}$)	SD.	t
Experimental group	before experiment	182	4.80	1.52	11.8-30*
	after experiment	182	6.40	1.12	
Control group	forebe experiment	175	4.90	1.65	-1.859
	after experiment	175	5.17	1.50	

*Statistically significant at .05

Table 3 Comparison of knowledge about safe food consumption behavior between students from the experimental group and control group

Experiment	Students	Number(N)	($\bar{X}$)	SD.	t
Before experiment	Experiemental group	182	4.80	1.52	-0.565
	Control group	175	4.90	1.65	
	Total	357			
After experiment	Experimental group	182	6.40	1.12	8.777*
	Control group	175	5.17	1.50	
	Total	357			

*Statistically significant at .05

2.2.2 Factor regarding the awareness of possible risks caused by unsafe food consumption behavior

Before the experiment, the experimental group had the awareness of possible risks caused by unsafe food consumption behavior at a high level (71.6%) and after the experiment the awareness was at the highest level (93.2%). As for the control group, the awareness was at a high level (82.2% and 85.2% respectively). The statistical result of the experiment reveals that the experimental group and the control group had greater awareness of the possible risks than before the experiment. After the experiment, the experimental group had greater awareness of the possible risks caused by unsafe food consumption behavior than the control group as shown in Table 4-5.

Table 4 Comparison of awareness of the possible risks caused by unsafe food consumption behavior before and after the experiment of the experimental and control groups

Students	Experiment	Number(N)	($\bar{X}$)	SD.	t
Experiment group	before experiment	182	3.58	0.58	-27.208*
	after experiment	182	4.66	0.32	
Control group	before experiment	175	4.12	0.40	-3.255*
	after experiment	175	4.26	0.46	

*Statistically significant at .05

Table 5 Comparison of awareness of the possible risks caused by unsafe food consumption behavior between the experimental group and control group

Experiment	Students	Number(N)	($\bar{X}$)	SD.	t
Before experiment	Experimental group	182	3.58	0.57	*10.158-
	Control group	175	4.11	0.46	
	Total	357			
After mentexperi	Experimental group	182	1.08	0.53	20.725*
	Control group	175	-0.14	0.58	
	Total	357			

*Statistically significant at .05

Note: Since the students from the experimental group and control group were different before participating in the experiment, the difference in the average score of the development of the awareness was compared.

2.2.3 Factor regarding the awareness of the degree of severity caused by unsafe food consumption behavior

Before and after the experiment, the experimental group had a high level of awareness of the degree of severity caused by unsafe food consumption behavior. Before and after the experiment, the awareness was at a high level (80.0% and 89.4% respectively). As for the control group, before and after the experiment the awareness was at a high level (82.0% and 83.8% respectively). This result reveals that the experimental group had greater awareness of the degree of severity caused by unsafe food consumption behavior than before the experiment. Moreover, awareness of the control group before and after the

experiment was similar. After the experiment, the experimental group had greater awareness than the control group as explained in Table 6-7.

Table 6 Comparison of the awareness of degree of severity caused by unsafe food consumption behavior before and after the experiment of the experimental group and control group

Students	Experiment	Number(N)	($\bar{X}$)	SD.	t
Experimental group	Before experiment	182	4.00	0.67	*9.597-
	After experiment	182	4.47	0.40	
Control group	Before rimentexpe	175	4.10	0.47	1.718-
	After experiment	175	4.19	0.49	

*Statistically significant at .05

Table 7 Comparison of the awareness of the degree of severity caused by unsafe food consumption behavior between the experimental group and control group

rimentExpe	Students	Number(N)	($\bar{X}$)	SD.	t
Before experiment	Experimental group	182	4.00	0.66	1.642-
	Control group	175	4.10	0.47	
	Total	357			
After experiment	Experimental group	182	4.47	0.39	*5.907
	Control group	175	4.19	0.49	
	Total	357			

*Statistically significant at .05

2.2.4 Factor regarding the awareness of the benefits of safe food consumption behavior

Before the experiment, the experimental group had a high level of the awareness of the benefits of safe food consumption behavior (84.0%). After the experiment, the awareness was at the highest level (93.6%). Before and after the experiment, the control group had a high level of awareness (86.0% and 86.8% respectively). The statistical result shows that the experimental group had greater awareness than before the experiment. As for the control group, they had similar awareness before and after the experiment. After the experiment, the experimental group had greater awareness of the benefits from

safe food consumption behavior than the control group as presented in Tables 8-9.

Table 8 Comparison of the awareness of the benefits from safe food consumption behavior before and after the experiment between the experimental and control groups

Students	Experiment	Number(N)	($\bar{X}$)	SD.	t
ental Experim group	Experimental group	182	4.20	0.64	-11.288*
	Control group	182	4.68	0.35	
Control group	Experimental group	175	4.30	0.48	-0.831
	Control group	175	4.34	0.51	

*Statistically significant at .05

Table 9 Comparison of the awareness of the benefits from safe food consumption behavior between the experimental and control groups

Experiment	Students	Number(N)	($\bar{X}$)	SD.	t
Before experiment	Experimental group	182	4.20	0.63	-1.756
	Control group	175	4.30	0.48	
	Total	357			
After experiment	mental Experi group	182	4.68	0.34	7.291*
	Control group	175	4.34	0.50	
	Total	357			

*Statistically significant at .05

2.2.5 Factor regarding the awareness of obstacles to safe food consumption behavior

Before the experiment, the experimental group had a moderate level of awareness of the obstacles to safe food consumption behavior (55.4%), and after the experiment the awareness was at a low level (40.6%). For the control group, they had a moderate level of awareness both before and after the experiment (57.4% and 55.4% respectively). The statistical result shows that the experiment group had less awareness than before the experiment, and the control group had similar awareness before and after the experiment. After the experiment, the experimental group had less awareness of the obstacles to safe food consumption behavior than before the experiment as presented in Tables 10-11.

Table 10 Comparison of the awareness of obstacles to safe food consumption behavior before and after the experiment of the experimental and control groups

Students	Experiment	Number(N)	($\bar{X}$)	SD.	t
Experimental group	Before experiment	182	2.77	0.85	*11.167
	After experiment	182	2.03	0.67	
Cotrol group	Before experiment	175	2.87	0.83	1.227
	After experiment	175	2.77	0.94	

*Statistically significant at .05

Table 11 Comparison of the awareness of the obstacles to safe food consumption behavior between the experimental group and control groups

Experiment	Students	Number(N)	($\bar{X}$)	SD.	t
Before experiment	Experimental group	182	2.77	0.85	-1.129
	Control group	175	2.87	0.83	
	Total	357			
After experiment	Experimental group	182	2.03	0.67	-8.536*
	Control group	175	2.77	0.94	
	Total	357			

*Statistically significant at .05

2.2.6 Factor regarding incentives for safe food consumption behavior

Before the experiment, the experimental group had a high level of incentive for safe food consumption behavior (81.0%). After the experiment, the incentive was at the highest level (90.8%). As for the control group, the incentive was at a high level both before and after the experiment (82.0% and 83.8% respectively). The statistical result shows that the experimental group had greater incentive for safe food consumption behavior than before the experiment. The control group, both before and after the experiment, had a similar level of incentive. After the experiment, the experimental group had higher incentive than the control group as shown in Tables 12-13.

Table 12 Comparison of incentive for safe food consumption behavior before and after the experiment of the experimental and control groups

Students	Experiment	Number(N)	($\bar{X}$)	SD.	t
Experimental group	Before experiment	182	4.05	0.67	-9.717*
	After experiment	182	4.54	0.38	
Control group	Before experiment	175	4.10	0.50	-1.779
	After experiment	175	4.19	0.51	

*Statistically significant at .05

Table 13 Comparison of incentive for safe food consumption behavior between the experimental and control groups.

Experiment	Students	Number(N)	($\bar{X}$)	SD.	t
Before experiment	Experimental group	182	4.05	0.66	0.732-
	Control group	175	4.10	0.50	
	Total	357			
After experiment	Experimental group	182	4.54	0.38	*7.328
	Control group	175	4.19	0.15	
	Total	357			

*Statistically significant at .05

2.2.7 Factor regarding confidence in their ability to engage in safe food consumption behavior

Before and after the experiment, the experimental group had confidence in their ability to engage in safe food consumption behavior at a high level (78.2%). After the experiment, the confidence was at a high level (86.4%). For the control group, the confidence both before and after the experiment was at a high level (78.8% and 79.8% respectively). The statistical result shows that the experimental group had more confidence than before the experiment. The control group, both before and after the experiment, had similar levels of confidence. After the experiment, the experimental group had greater confidence than the control group as prescribed in Tables 14-15.

Table 14 Comparison of the confidence in their ability to engage in safe food consumption behavior before and after the experiment of the experimental and control groups

Students	Experiment	Number(N)	($\bar{X}$)	SD.	t
Experimental group	Before experiment	182	3.91	0.69	-8.835*
	After experiment	182	4.32	0.45	
Control group	Before experiment	175	3.94	0.49	-0.905
	After experiment	175	3.99	0.58	

*Statistically significant at .05

Table 15 Comparison of the confidence in their ability to engage in safe food consumption behavior between the experimental and control groups

Experiment	Students	Number(N)	($\bar{X}$)	SD.	t
Before experiment	Experimental group	182	3.91	0.68	-0.544
	Control group	175	3.94	0.49	
	Total	357			
After experiment	Experimental group	182	4.32	0.45	5.999*
	Control group	175	3.99	0.58	
	Total	357			

*Statistically significant at .05

2.2.8 Safe food consumption behavior

Before the experiment, the experimental group had a moderate level of safe food consumption behavior (68.5%). After the experiment the safe food consumption behavior was at a high level (75.5%). As for the control group, it was found that before and after the experiment they had a moderate level of safe food consumption behavior (69.2% and 70.7% respectively). The statistical result shows that the experimental group engaged in safer food consumption behavior than before the experiment. The control group, before and after the experiment, had similar levels of safe food consumption behavior. After the experiment, the experimental group engaged in safer food consumption behavior than the control group as seen in Table 16-17.

Table 16 Comparison of safe food consumption behavior before and after the experiment of the experimental and control groups

Students	Experiment	Number(N)	($\bar{X}$)	SD.	t
Experimental group	Before experiment	182	2.74	0.56	-7.054*
	After experiment	182	3.02	0.43	
Control group	Before experiment	175	2.77	0.43	-1.289
	After experiment	175	2.83	0.49	

*Statistically significant at .05

Table 17 Comparison of safe food consumption behavior between the experimental and control groups

Experiment	Students	Number(N)	($\bar{X}$)	SD.	t
Before experiment	Experimental group	182	2.74	0.56	-0.558
	Control group	175	2.77	0.43	
	Total	357			
After experiment	Experimental group	182	3.02	0.43	3.708*
	Control group	175	2.83	0.49	
	Total	357			

*Statistically significant at .05

In summary, for the experimental group after the experiment, there was a better change in the causal factor influencing safe food consumption behavior. They also engaged in safer food consumption behavior than before the experiment.

Furthermore, in order to confirm the consistency of the results of qualitative research by having a group conversation and in-depth interview with the classroom teachers, a teacher coordinating the project, students' parents, and observation on students' consumption behavior, and the results of quantitative research, it was found that after six weeks of operating the research project, students engaged in safer food consumption behavior, especially in terms of reading food nutrition labels and GDA labels before buying food, and reducing unhealthy food consumption such as soft drinks and unhealthy snacks.

Development of a food consumption behavior modification model for junior high school students[2]

A fiscal year 2016 study by Thai FDA in collaboration with the Faculty of Education of Kasetsart University Bangkhen Campus and the Faculty of Education of the Institute of Physical Education Bangkok Campus

Introduction

The Public Consumer Affairs Division, under Thai FDA, has developed a food consumption behavior modification model that can be used to enhance the factors contributing to food consumption behavior. To ensure its effectiveness, the development of the model draws on an extensive literature review and surveys carried out to identify students' food consumption behavior and contributing factors based on the Health Belief Model (HBM). The surveys were administered in 2015 to 2,400 students in junior high schools under the Office of the Basic Education Commission (OBEC) sampled from the North, South, East, and Northeast of Thailand. The findings showed that healthy food consumption knowledge, awareness of risks from unhealthy food consumption, awareness of the severity of risks from unhealthy food consumption, awareness of the benefits of healthy food consumption, awareness of obstacles to healthy food consumption, the existence of triggers for healthy food consumption, and self-confidence in healthy food consumption significantly correlated with food consumption behavior ($p<0.05$). Additionally, awareness of risks from unhealthy food consumption, the existence of triggers for healthy food consumption, and self-confidence in healthy food consumption were interrelated predictor variables with the combined predictive power of 34.2% ($p<0.05$). In addition to its development being guided by the survey results, the

2 https://db.oryor.com/databank/uploads/fda/0120034001543479969_file.pdf?fbclid=IwAR3gE4L-ju32dTxydueOUp-WXijUZEK-0Ssb56LR-vHkOHe72pI1SUTcWM0

model was trialed on students in junior high schools also sampled from the four regions of Thailand. It was found that the application of the model significantly enhanced contributing factors and modified food consumption behavior ($p<0.05$).

In the fiscal year 2016, Thai FDA conducted an evaluation of the model by following up on the subjects having participated in the fiscal year 2015 study and by extending the application of the model to other groups of junior high school students. The ultimate objectives of the study are to identify whether the model can achieve sustainable outcomes and how effectively the model can suit a new context. Positive outcomes will demonstrate the potential of the model in enhancing the food consumption behavior of junior high school students across the country.

Research objectives

1) To follow up on the outcomes of the application of the model in enhancing the food consumption behavior of the junior high school students having participated in the fiscal year 2015 study.

2) To identify the effectiveness of the model in enhancing the food consumption behavior of other groups of junior high school students in the fiscal year 2016.

3) To modify the model so that its application can be extended to other groups of junior high school students nationwide.

Scope of the study

The research scope is designated as follows:

1) Scope of content

The focus was on the modification of the food consumption behavior of junior high school students comprising five aspects: 1) food product label reading, 2) guideline daily amount (GDA) label reading, 3) use of GDA labels and ‘Healthier Choice’ logos in cutting down on the consumption of sweet, oily, and salty food, 4) reducing the consumption of unhealthy food

(particularly snacks, soft drinks, sugary drinks, food containing color additives, and refried food), and 5) consumer rights protection.

The design of the activities used to modify the food consumption behavior of the subjects followed behavioral science theories, mainly adapting the HBM.

2) Operations scope

2.1) The follow-up on the outcomes of the application of the model assessed the retention of the modified food consumption behavior of the subjects having participated in the fiscal year 2015 study. The contributing factors and the food consumption behavior of the subjects were evaluated three times. The first and second were carried out in November 2015 and March 2016, whereas the last was conducted in July 2016 after a booster activity was run in the schools in the experimental group (see details in the Findings section).

2.2) To identify the potential for extending the model onto other groups of junior high school students, six learning management plans and three learner development activity plans were devised. An evaluation of the contributing factors and the food consumption behavior of the subjects was conducted twice, before and after the research period.

3) Scope of the population and the sample

3.1) Follow-up on the outcomes of the application of the model among the participants in the fiscal year 2015 study

The population was Mathayom 2 students from the academic year 2016 in secondary schools under the OBEC.

The sample comprised 182 junior high school students in the four pilot schools having participated in the fiscal year 2015 study. The four schools were divided into the control group and the experimental group using a simple random sampling method. The two schools in the former underwent regular learning and learner development activities, whereas the other two in the latter received an extra booster activity.

3.2) Experiment on the potential for extending the model to other groups of junior high school students

The population was Mathayom 1 students from the academic year 2016 in secondary schools under the OBEC.

The sample comprised 301 junior high school students in secondary schools under the OBEC randomly selected using a multi-stage sampling method.

4) The food consumption behavior modification model for junior high school students

Following the application of the food consumption behavior model for junior high school students under the Food Safety project in the fiscal year 2015, brainstorming sessions were conducted with teachers as well as health behavior development and food experts to assess the model in terms of suitability and practicability. Suggestions were made as follows.

4.1) Purposes of the food consumption behavior modification model for junior high school students

The main purposes of the model are to:

4.1.1) Modify nutrition label reading behavior among junior high school students,

4.1.2) Modify GDA label reading behavior among junior high school students,

4.1.3) Modify GDA label use behavior among junior high school students in reducing the consumption of sweet, oily, and salty food,

4.1.4) Modify junior high school students' consumption of unhealthy food, such as snacks and soft drinks, and

4.1.5) Modify high school students' behavior relating to consumer rights protection to ensure healthy food consumption.

4.2) Essence of the food consumption behavior modification model for junior high school students

The food consumption behavior modification model for junior high school students mainly embraces the HBM. The focus is on reinforcing factors contributing to good health, namely healthy food consumption knowledge, awareness of risks from unhealthy food consumption, awareness of the severity of risks from unhealthy food consumption, awareness of the benefits of healthy food consumption, awareness of obstacles to healthy food consumption, the existence of triggers for healthy food consumption, self-confidence in healthy food consumption, avoidance of unhealthy food consumption behavior, and behavior relating to consumer rights protection. The learning contents comprise the definition and importance of good health, factors contributing to good health; drawbacks and negative consequences of unhealthy food consumption behavior; knowledge and use of food product labels, nutrition labels, and GDA labels; negative effects of snacks and food containing color additives; methods and complaint channels for consumer rights protection; and the creation of learning media to reinforce the desired behavior.

4.3) Learning activities in the food consumption behavior modification model for junior high school students

The learning activities follow six learning management plans and three learner development activity plans, as detailed below.

4.3.1) The six learning management plans are as follows.

Learning Management Plan 1: Visualization of the future

Learning Management Plan 2: Food without labels: Silent dangers

Learning Management Plan 3: Communication with your loved ones

Learning Management Plan 4: Protecting your rights when encountering unsafe food

Learning Management Plan 5: Reading, avoiding, reducing, taking action

Learning Management Plan 6: Passing on good health

4.3.2) The three learner development activity plans are as follows.

Learner Development Activity Plan 1: Safe theaters

Learner Development Activity Plan 2: Smart people make wise food purchase choices

Learner Development Activity Plan 3: Shopping wisely

In addition, the learning activities are carried out in a variety of formats, such as educational games, media-supported lectures, simulation, role-play, communication through social media networks, hands-on practice, exhibitions, and idea sharing and brainstorming sessions.

4.5) Evaluation of the effectiveness of the food consumption behavior modification model for junior high school students

The effectiveness of the model is evaluated in two aspects.

4.5.1) Formative assessment. This refers to the periodic assessment of the application of the model during the implementation stage using such means as the evaluation of students' worksheets and appraisal of their performance.

4.5.2) Summative assessment. This refers to the quantitative and qualitative assessment of the final outcomes in terms of the factors contributing to food consumption behavior and changes toward healthy food consumption behavior through the administration of survey questionnaires, in-depth interviews, focused group discussions with teachers and parents, and observation of students' food consumption behavior.

Conceptual framework of the study

Similar to that of the fiscal year 2015 study.

Benefits of the study

1) The study will identify the contributing factors and the food consumption behavior of junior high school students.

2) The study will yield a food consumption behavior modification model that effectively addresses the factors contributing to the food consumption behavior of junior high school students.

3) The model can be adapted by other schools and/or related parties to modify the food consumption behavior of teenagers in their contexts.

Research methods

The research is a quasi-experimental study applying a pretest-posttest control group design.

1) Follow-up on the outcomes of the application of the model among the participants in the fiscal year 2015 study

The subjects were 182 junior high school students in the four pilot schools having participated in the fiscal year 2015 study. The four schools were divided into two groups using a simple random sampling method. The schools in the control group underwent regular learning and learner development activities, whereas those in the experimental group were administered an extra booster activity.

The research instruments comprised a learning management plan for enhancing the retention of the modified food consumption behavior, a food consumption behavior survey questionnaire, an evaluation form for assessing satisfaction with participation in the project, a food consumption behavior observation checklist, guideline questions for focused group discussions, and guideline questions for in-depth interviews. The instruments were validated in terms of content validity and reliability by experts in behavioral science, learning management, and/or nutrition.

In order to identify the retention of the modified food consumption behavior, comparisons were made between the results relating to the food consumption behavior of the subjects before the administration of the booster activity and those evaluated during the follow-ups in June, July, and August 2016.

The effectiveness of the model was evaluated from the quantitative data comprising the food consumption behavior of the subjects and their satisfaction with the application of the model using mean scores, standard deviation, and one-way repeated measure ANOVA as well as from the qualitative data comprising focused group discussion and in-depth interview results using a content analysis approach.

2) Experiment on the potential for extending the model to other groups of junior high school students

The food consumption behavior modification model was trialed on Mathayom 1 students from the academic year 2016 in secondary schools under the OBEC in four regions of Thailand. For each of the regions, two schools were randomly selected using a multi-stage sampling method, or a total of eight participating schools. Each of the schools was represented by one class of students assigned to take part in the study, or a total of eight classes. These were equally divided into the experimental group and the control group with at least 30 students in each using a simple random sampling technique.

A pretest-posttest control group design was applied. The experimental group participated in the activities under the learning management plans and the learner development activity plans, whereas the control group took part in those under the learning management plans only.

The research instruments comprised the activities under the learning management plans and the learner development activity plans running 50 minutes a week for six weeks, a food consumption behavior survey questionnaire, an evaluation form for assessing satisfaction with participation in the project, a food consumption behavior observation checklist, guideline questions for focused group discussions, and guideline questions for in-depth interviews. All the instruments were validated in terms of content validity and reliability by experts in behavioral science, learning management, and/or nutrition.

To identify the effectiveness of the model, the quantitative data comprising the food consumption behavior of the subjects and their satisfaction with the application of the model were analyzed using mean scores, standard deviation, and t-test scores, whereas the qualitative data comprising focused group discussion and in-depth interview results were analyzed using a content analysis approach.

3) Improvement on the food consumption behavior modification model

After the follow-up and the experiment were implemented, focused group discussions were held in which experts and stakeholders made suggestions on how to improve the food consumption behavior modification model.

Findings

1) Follow-up on the outcomes of the application of the model among the participants in the fiscal year 2015 study

The first and second follow-ups on the retention of the modified food consumption behavior of the students having participated in the fiscal year 2015 study were carried out in November 2015 and March 2016, respectively. The findings demonstrated that despite being retained to some degree, healthy food consumption behavior changed in a negative direction. To solve this issue, a booster activity was added for the two schools in the experimental group in July 2016. One week after the administration of the activity, the data were collected and analyzed. The main results were as follows.

1.1) As regards the factors contributing to healthy food consumption behavior, it was found that before the addition of the booster activity, the subjects in the experimental group and the control group did not differ significantly. Following the booster activity, the former exhibited positive changes in terms of awareness of obstacles to unhealthy food consumption. In contrast, the latter demonstrated negative changes in terms of the awareness of risks from unhealthy food consumption and awareness of the severity of risks from unhealthy food consumption.

1.2) As for healthy food consumption behavior, there were no significant differences between the subjects in the experimental group and the control group before the addition of the booster activity. After the addition, it was found that those in the experimental group exhibited healthier food consumption behavior than did their counterparts in the control group ($p<0.05$), as shown in Table 1.

Table 1. Comparison of healthy food consumption behavior between the experimental group and the control group

Experiment	**Students**	**Number (N)**	XX	**SD**	**t**	**p**
Before experiment	Experiemental group	95	3.00	0.52	1.881	0.072
	Control group	87	2.85	0.53		
	Total	182				
After experiment	Experimental group	95	3.09	0.45	2.575*	0.011
	Control group	87	2.89	0.49		
	Total	182				

*p<0.05, **p<0.01

2) Experiment on the potential for extending the model to other groups of junior high school students

An experiment was carried out in which the subjects were randomly divided into the experimental group, participating in the activities under six learning management plans and three learner development activity plans, and the control group, taking part only in those under the former. The main results were as follows.

2.1) As regards the consumption of snacks, soft drinks, and other types of unhealthy beverages, the subjects in the experimental group and the control group did not differ significantly before the experiment with 97.4% of the former and 98.5% of the latter consuming such food products, respectively. After the experiment, the rate of unhealthy food consumption among the subjects in the experimental group saw a drop of 10.3% to 87.1%, whereas that for the subjects in the control group declined by 14.8% to 83.7%.

2.2) As for the factors contributing to food consumption behavior, there were no significant differences between the experimental group and the control group before the experiment. Following the experiment, the subjects in both groups similarly exhibited positive changes for almost all the factors. However, those in the experimental group fared better in terms of the existence of triggers for healthy food consumption and self-confidence in healthy food consumption.

2.3) Regarding healthy food consumption behavior, the subjects in the experimental group did not differ significantly from those in the control group before the experiment. After the experiment, the former showed healthier food consumption behavior than their control group counterparts (<0.05), as shown in Table 2.

Table 2. Comparison of healthy food consumption behavior between the experimental group and the control group

Experiment	**Students**	**Number (N)**	XX	**SD**	**t**	**P**
Before experiment	Experiemental group	154	2.78	0.52	1.631	0.104
	Control group	147	2.69	0.44		
	Total	301				
After experiment	Experimental group	140	3.05	0.46	2.125*	0.035
	Control group	141	2.93	0.47		
	Total	281				

*p<0.05, **p<0.01

Discussion and recommendations

1) The follow-up on the outcomes of the application of the model among the participants in the fiscal year 2015 study indicated no statistically significant differences between the experimental group and the control group prior to the administration of the booster activity. After the activity was administered, the former showed healthier food consumption behavior than the latter ($p<0.05$). This is perhaps because the activity incorporates a wide variety of elements, such as infographics, edutainment, hands-on experience, collaboration, critical analysis, and a wrap-up of the key ideas that can effectively influence the subjects in the experimental group to realize the importance of healthy food consumption behavior.

2) The experiment on the potential for extending the model onto other groups of junior high school students showed that before the activities under the learning management plans and the learner development activity plans were administered, the subjects in the experimental group did not differ significantly from those in the control group. After the experiment, the former fared better than the latter in terms of health food consumption behavior ($p<0.05$). One possible explanation for such improvement is that the experimental group participated in the activities under both the learning management plans and the learner development activity plans, whereas the control group took part in those under the learning management plans only. As the activities under the learner development activity plans provide more opportunities for the subjects in the experimental group to review nutrition label reading information, practice making use of nutrition labels, learn how to calculate daily calorie intake, and assess the nutrition value of different kinds of food, to name a few, their healthier food consumption behavior is not unexpected. Also, such activities are likely to serve as triggers for and raise self-confidence in healthy food consumption, suggesting that these are two important interrelated predictive variables for healthy food consumption behavior.

3) The quantitative data demonstrate positive changes, such as a reduction in the body mass index (BMI), among the subjects in the experimental group after their participation in the activities under the food

consumption behavior modification model. This finding is supported by the qualitative data collected through in-depth interviews, during which many reported having lost weight as a result of leading a healthier lifestyle applying what they had learned from the activities. It is recommended that due to their physical changes in a more positive direction, these subjects should be invited to serve as role models for other students.

4) The food consumption behavior modification model incorporates a broad array of learning media, namely short awareness-building documentaries, infographics, an augmented reality (AR) application, educational games, exhibition materials, and health guide books. All these are aimed at providing knowledge and creating awareness of various health issues, such as nutrition reading/use, consumer rights protection, the importance of good health, and dangers from unhealthy food consumption behavior. As a result of being evaluated by experts and students as well as trialed in authentic contexts, the learning media will be suitable for secondary schools wishing to run projects to enhance the food consumption behavior of their students.

5) Overall, the findings suggest that the food consumption behavior modification model should be effective in modifying the contributing factors and the food consumption behavior of junior high school students. Thus, the application of the model should be extended to other groups of junior high school students nationwide.

Research Report on the Development of Food Consumption Behavior of Students from Oryor Noi Schools to Reduce Risk Factors of Non-Communicable Diseases (NCDs) in 2017.[3]

Introduction

The Oryor Noi Project focused on the development of appropriate food consumption behavior for Oryor Noi students so as to reduce the risk factors of non-communicable diseases (NCDs) caused by the consumption of overly sweet, oily and salty food. This research adopted the model for changing the food consumption behavior of junior high school students developed by Thai FDA in 2015-2016. Activities to transform the behavior are designed according to the theory of behavioral science, and adapted in line with the health belief model. The results of the model experiment show that the conduct following the components of the model can transform the causal factors and food consumption behavior of students at a statistically significant level of .05 (Veerachai et all, 2015). The focus is on the improvement of food consumption behavior in order to reduce the risk factors of non-communicable diseases (NCDs). The training for teachers of Oryor Noi schools was also organized for them to adopt into their teaching the knowledge and appropriate food consumption behavior for the students, leading to the further creation of good health. The result will be applied to improving and developing the model for sustainable effectiveness, in line with the school's context and student's behavior. Secondary schools across the country can adopt the model for changing the food consumption behavior of junior high school students for them to have appropriate food consumption behavior in the future.

Research Objectives

1. For students from Oryor Noi Schools to change the causal factors of their food consumption behavior in order to mitigate the risk factors of NCDs.

---

3 https://db.oryor.com/databank/uploads/fda/083708200154354927 0_file.pdf?fbclid=IwAR1rXw3GR846vRRRFaOzLlAB58Pz6vEuOviTeGgsCWYjn9bulpQtzBoG39c

2. For students from Oryor Noi Schools to engage in food consumption behavior that reduces the risk factors of NCDs.
3. To study the effectiveness of the model for changing food consumption behavior to mitigate the risk factors of NCDs of students from Oryor Noi Schools.

Benefits of the Research

1. Acquire a model for improving the food consumption behavior of Oryor Noi students in order to mitigate the risk factors of NCDs.
2. Provide a guideline for schools, staff or relevant agencies in adopting the model improving the food consumption behavior of Oryor Noi students to mitigate the risk factors of NCDs.

Scope of Operation

The research on the development of food consumption behavior of Oryor Noi students in order to reduce the risk factors of NCDs is a quasi-experimental research employing a pretest-posttest control group design. The researcher carried out one training session for teachers and one follow up on the progress on organizing a learning activity and learner development activity. In addition, the change in the causal factors related to the food consumption behavior and the food consumption behavior of Oryor Noi students that were the research's sample group before the project started in 2017 and after the project ended were compared.

Population and Sample Group

The population was junior high school students of the academic year 2017 from Oryor Noi Schools under the Municipality and the Office of the Basic Education Commission across every region of Thailand. These schools are members of the Oryor Noi School network under Thai FDA.

The sample group was 5,221 students of the academic year 2017 selected as the sample group of the research following multi-stage sampling. They were students from Oryor Noi Schools under the Municipality and the Office of the Basic Education Commission across every region of Thailand. These schools are members of Orgor Noi School network under Thai FDA.

Research Tools

1. The tools used in the experiment comprise four organizing plans (fifty minutes for each plan) for a learning activity for improving the food consumption behavior of Oryor Noi students to mitigate the risk factors of NCDs, and two organizing plans (fifty minutes each) for a learner development activity.

2. Data collecting tools

2.1 Two sets of tool for collecting quantitative data:

1) Questionnaire on the causal factor related to the food consumption behavior of Oryor Noi students in order to mitigate the risk factors of NCDs; 2) a satisfaction survey for activity participation.

2.2 Two sets of tool for collecting qualitative data: 1) Minor-group meeting guideline regarding the following-up of the minor meeting result of the model operation; 2) a record form of the following-up of the minor meeting result of the model operation.

Ascertaining Tool Validity

1. **Content validity**: In order to ascertain the content validity of the research tool, three experts in health education, behavioral science, and food and drugs selected the research tool for usage from the list containing an IOC (index of item-objective congruence) of over 0.50.

2. **Discrimination power**: In order to find the discrimination power, the researcher gave the questionnaire on the food consumption behavior of Oryor Noi students to reduce the risk factors of NCDs to the sample group for item analysis, t-test, and r-item total (correlation item—total correlation). Then the question containing the discrimination power with significant difference at .05, and item-total correlation equaling or over 0.20 were selected to include in the actual questionnaire.

3. **Reliability**: In search of the reliability of the questionnaire on the food consumption behavior of Oryor Noi students to reduce the risk factors of NCDs, the data was analyzed by finding the internal consistency of section 2-9 of the questionnaire (section 1 of the questionnaire containing general

information) and considering the α- coefficient. Consequently, the reliability of the questionnaire was 0.801-0.911.

Data Analysis

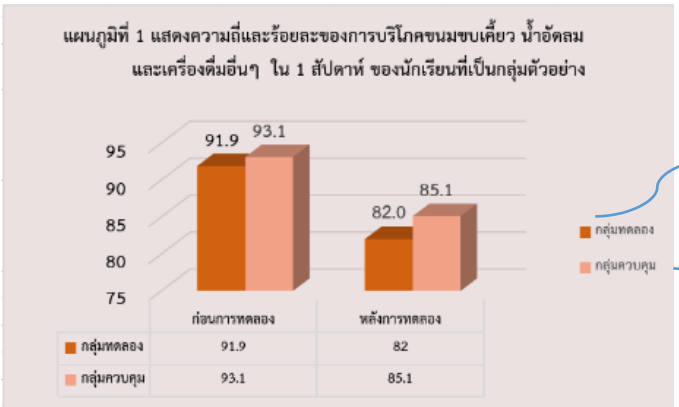
The effectiveness of the model was ascertained by comparing the scores of the causal factor related to the food consumption behavior and the food consumption behavior of students from the experimental and control groups before and after the experiment, and carrying out a t-test. The qualitative data acquired from the minor meeting and interview was analyzed using content analysis.

Research Summary

1. **Students' consumption behavior of unhealthy snacks and drinks**

The research shows that before the model experiment, most students from the experimental and control groups consumed unhealthy snacks, soft drinks and other drinks accounting for 91.9% and 93.1%. After the model experiment, the experimental group consumed unhealthy snacks, soft drinks and other drinks accounting for 82.0%, and the control group for 85.1% as shown in Chart 1.

Chart 1: Frequency and percentage of consumption of unhealthy snacks, soft drinks and other drinks in one week of the experimental group



Experimental group

Control group

Before experiment

After experiment

2. The causal factors of the food consumption behavior to mitigate the risk factors of NCDs

2.1 Factors regarding knowledge about food consumption behavior to mitigate the risk factors of NCDs

The statistical experimental result shows that after the experiment, both experimental and control groups had more knowledge about food consumption behavior to reduce the risk factors of NCDs than before the experiment. Moreover, after the experiment, the experimental group had more knowledge than the control group.

2.2 Factor regarding the awareness of possible risk caused by food consumption behavior leading to NCDs

The statistical result shows that after the model experiment, the experimental and control groups were more aware of the possible risk than before the experiment. In addition, after the experiment, the experimental group had greater awareness than the control group.

2.3 Factor regarding the awareness of the degree of severity caused by the food consumption behavior that may lead to NCDs

The statistical result indicates that after the experiment, the experimental and control group had such awareness, and the experimental group had greater awareness than the control group.

2.4 Factor regarding the awareness of benefits from the food consumption behavior for reducing the risk factors of NCDs

The statistical result reveals that after the model experiment, the experimental group had greater awareness of benefits than before the experiment, and after the experiment the experimental group had greater awareness than the control group.

2.5 Factor regarding the awareness of obstacles to the food consumption behavior to mitigate the risk factors of NCDs

The statistical result shows that after the model experiment, the experimental group had less awareness, and the experimental group had less awareness of obstacles than the control group.

2.6 Factor regarding the incentive for food consumption behavior reducing the risk factors of NCDs

The statistical result indicates that after the experiment, the experimental and control groups had more incentive than before the experiment, and after the experiment, the experimental group had more incentive than the control group as prescribed in Tables 11-12.

2.7 Factor regarding the confidence in their ability to engage in food consumption behavior reducing the risk factors of NCDs

The statistical result shows that after the model experiment, the experimental and control groups had more confidence than before the experiment, and after the experiment the experimental group had more confidence than the control group.

3. Food consumption behavior to mitigate the risk factors of NCDs

The statistical result reveals that after the experiment, the experimental and control groups engage more in consumption behavior to mitigate the risk than before the experiment. In addition, the experimental group engaged more in food consumption behavior reducing the NCD risk than the control group as presented in Tables 1-2.

Table 1 Comparison of food consumption behavior to reduce the risk factors of NCDs before and after the experiment of the experimental and control groups

Students	Experiment	Number(N)	$\bar{X}$	SD.	t	p
Experimental group	Before experiment	2638	2.71	.36	28.546**	.000
	After experiment	2638	2.99	.45		
Control group	Before experiment	2583	2.79	.44	5.949**	.000
	After experiment	2583	2.85	.43		

Table 2 **Comparison of food consumption behavior to reduce the risk factors of NCDs between the experimental and control groups**

Experiment	Students	Number(N)	$\bar{X}$	SD.	t	p
Before experiment	Experimental group	2638	2.71	.36	-6.656**	.000
	Control group	2583	2.79	.44		
	Total	5221				
ter Af experiment	Experimental group	2638	.28	.55	14.096**	.000
	Control group	2583	.06	.58		
	Total	5221				

*p< .05, **p<.01

Notes: Since before the experiment it was found that students from the experimental and control groups engaged differently in food consumption behavior to reduce the NCD risk, the analysis of the average value after the experiment was done by comparing the average value of the difference in the food consumption behavior before and after the experiment of each group.

4. Satisfaction from participating in the activity improving the food consumption behavior of Oryor Noi students in order to mitigate the risk factors of NCDs

The research result indicates that the overall satisfaction of the experimental group was at the highest level ($\bar{X}$ = 4.67, SD. = .28) and the satisfaction in every aspect was at the highest level. The first was the learning management plan, followed by the organization of learner development activity as shown in Table 3.

Table 3 The average value and standard deviation of the satisfaction of the experimental group participating in the activity developing the food consumption behavior to mitigate the risk factors of NCDs

No	Item	$\bar{X}$	SD.	Evaluation result
1	Learning management plan	4.74	.36	Extremely
2	tion of learner development Organiza activity	4.71	.46	Extremely
3.	Results gained from participating in the activity	4.64	.33	Extremely
	Total	4.67	.28	Extremely

5. Food consumption behavior development model for Oryor Noi students to mitigate the risk factors of NCDs

The summary of the model is:

5.1 The development model of the food consumption behavior of Oryor Noi students to reduce the risk factors of NCDs consists of four learning management plans, two organizing plans for a learner development activity, each of which contains 50 minutes. Four learning management plans are: 1) Learning Activity Organizing Plan 1—Future Health, 2) Learning Activity Organizing Plan 2—Read a Label, Reach Good Health, 3) Learning Activity Organizing Plan 3—Consume Wisely, Stay Healthy, and 4) Learning Activity Organizing Plan 4—Right Consumption, Strong Health. Two organizing plans for a learner development activity are Activity Base 1 "Trick Dice", and Activity Base 2 "Shop Wisely".

5.2 The objectives of the food consumption behavior development model for Oryor Noi students to mitigate the risk factors of NCDs are:

1. To develop the food consumption behavior of Oryor Noi students to mitigate the risk factors of NCDs.

2. To transform Oryor Noi students' behavior regarding the use of the GDA label to reduce the consumption of sweet, oily, and salty food so as to mitigate the risk factors of NCDs.

3. To transform the consumption behavior of unhealthy food products (products relevant to the Thai FDA such as unhealthy snacks and soft drinks) among Oryor Noi students in order to reduce the risk factors of NCDs.

5.3 The content of the model focuses on the modification of food consumption behavior in order to reduce the NCDs risk factors of Oryor Noi students in four aspects: 1) reading food nutrition labels, 2) reading GDA labels and Healthier Choice icon, 3) the use of information on GDA labels and Healthier Choice icon in reducing the consumption of sweet, oily, and salty food, and 4) reducing the unhealthy food consumption (only emphasizing unhealthy snacks, soft drinks, sugary drinks, color additive food and refried food).

5.4 Activities used in the development model of the food consumption behavior of Oryor Noi students to reduce the NCDs risk factors

are various such as educational games, lectures accompanying the media, the use of a model, mock situation, role play, hands-on practice, knowledge exchange, brain-storming, group work and skill practice.

5.5 There are two guidelines for evaluating the effectiveness of the development model for the food consumption behavior of Oryor Noi students to mitigate the NCDs risk factors: 1) process outcomes evaluation, and 2) final outcome evaluation.

Discussion

The results of the research indicate that after participating in the activities developing the food consumption behavior of Oryor Noi students to reduce the NCDs risk factors, the experimental group experienced the transformation of the causal factors resulting in the food consumption behavior in a positive direction and for every factor. Moreover, the experimental group was more engaged in the safe food consumption behavior than before the experiment, and more than the control group. This may be due to the development model of the food consumption behavior of Oryor Noi students to reduce the NCDs risk factors developed by the research team in the fiscal year of 2017. This systematically created and developed model was continually improved from the modification model of the safe food consumption behavior of junior high school students created and developed in the fiscal years of 2015 and 2016. The model activities focus on changing the causal factor of the food consumption behavior of students, and organizing a meeting for the relevant parties consisting of a health promotion expert, behavioral science expert, and food and drug expert. Also, the details about learning management activity and learner development activity were improved to be appropriate and become more practical.

Research Suggestion

1. The Food and Drug Administration (FDA) should extend the result of the model application to schools in the Oryor Noi network both in the central and regional parts by providing support on the result extension for the current schools in different classes and classrooms, as well as new schools showing their interest.

2. The Thai FDA should stimulate, promote, and support Oryor Noi schools adopting the development model for the food consumption behavior to reduce the NCDs risk factors to create innovation for developing such behavior among junior high school students complying with the context of schools and locality. In addition, the FDA should provide a platform to exchange and learn about innovation among the teacher committee responsible for Oryor Noi tasks.

3. A leading Oryor Noi teacher in each province should be a leader in searching for integrating the guidelines for the learning management plan and learner development activity in accordance with the development model of the food consumption behavior to reduce the NCD risk factors, and should be included in the secondary school curriculum. Professors from several relevant departments should join in considering the possibility and appropriateness of a plan in line with the learning content of each class level.

4. The Department of Pharmacy, Provincial Health Office, or agencies in charge of consumer protection for children and youth in schools should be a leader in coordinating to establish an academic support group as regards the food consumption behavior development to reduce the NCD risk factors among students.

5. The operating result of the research project of the food consumption behavior development to reduce the NCDs risk factors has brought about several types of prototype media. Such media should therefore be publicized.

Suggestions for Future Research

1. It is advisable to study and develop activities transforming the food consumption behavior of Oryor Noi students in order to mitigate the NCD risk factors in the form of co-curricular activities or learner development activities that are not learning activities carried out in a classroom.

2. It is advisable to carry out a long-term follow-up of the operation to transform the food consumption behavior to reduce the NCDs risk factors for junior high school students (longitudinal study) by studying the impact in terms of the health of students taking part in the activity.

3. The Thai FDA should promote the relevant personnel or network such as public health officers, schoolteachers, and Oryor Noi students to develop

innovation in order to promote safe food consumption, and to select the quality innovation, conduct an effectiveness test, and develop it into a prototype media for agencies and schools to further adopt in order to change the food consumption behavior of children and youth.

Healthy Diet for Monks project

Fiscal year 2017[4]

Suan Dusit University

The Public Consumer Affairs Division, under the Thai FDA , implemented the Healthy Diet for Monks project for Mahachulalongkornrajavidyalaya University, Mahathat Yuwaratrangsarit Temple, and Chonprathan Rangsarit Temple. The target groups were monks in these temples and residents in nearby areas. A survey study was later conducted on 390 subjects before a follow-up study was carried out on 361 subjects comprising 125 monks and 136 laypeople.

The survey results showed that 92.00% of the monks and laypeople having taken part in the project further disseminated information relating to the dangers of consuming sweet, oily, and salty food to their disciples and family members; 84.00% applied the knowledge acquired from the project in modifying their food consumption behavior; and 75.00% had healthier food consumption behavior. As for the follow-up conducted 15 days after project participation, it was found that the majority were knowledgeable about healthy food consumption and the benefits of nutrition label reading. They chose to consume beverages, such as milk, herbal drinks, and fruit juice, with a lower sugar content, and they avoided beverages containing sugar and/or caffeine as well as oily fried food. In addition to such positive changes in their food consumption behavior, the subjects were also found to be more cautious about their diets.

A closer look at the follow-up on the 125 monks indicated that 89.00% paid attention to nutrition label reading; 79.00% chose to consume milk, herbal drinks, and fruit juice with a low sugar content; 76.00% reduced their consumption of sugary drinks; 73.67% exhibited healthy food consumption

4 https://db.oryor.com/databank/uploads/fda/0033624001543485591_file.pdf?fbclid=IwAR00j0V2hdMD5CihDeAPtDgEYisdN7CVM47zqb895Gf7UkGwdljHPwmdBaU

behavior; and 73.30% further advised their disciples to read nutrition labels, guideline daily amount (GDA) labels, and ‘Healthier Choice’ logos.

Effects of the implementation of a nutrition label use promotion program on the nutrition label knowledge, attitudes, and use of communities
Fiscal year 2017[5]

This quasi-experimental study applies a pretest-posttest control group design in order to examine the effects of the implementation of a food label use promotion program on the food label knowledge, attitudes, and use of communities. The subjects were 69 residents in two communities in the Muang district of Chiang Rai province. Based on a purposive sampling scheme, the subjects from the first community were assigned into the experimental group (n=37) and those from the second community into the control group (n=32). Only the former participated in the food label use promotion program. The program comprised three activities with each lasting three hours. The first and second were run on two consecutive days, while the last was conducted a week later. The data were collected through survey questionnaires administered before, immediately after, and four weeks after the implementation of the program (i.e. follow-up). The data analysis incorporated both descriptive statistics (percentage, mean, and standard deviation) and inferential statistics (paired sample t-test and independent sample t-test). The statistical significance level was set at <0.05.

In terms of demographic characteristics, most of the subjects in the experimental group were female (81.10%) aged on average 67.14 years (SD=51.10). One-third were bachelor's degree holders. The majority were retired government officials with 45.90% having a monthly income of lower than 10,000 baht. 67.60% had non-communicable diseases (NCDs) as underlying diseases, and 62.20% had a family history of NCDs. As regards the subjects in the control group, most were female (71.90%) aged 57.47 years

5 https://db.oryor.com/databank/uploads/fda/0167511001543483477_file.pdf?fbclid=IwAR3WutaqegTvYGfORFvUsbTz2gzqfPAn73rk6yem7jxe6veEP4Qb8FvktEg

(SD=10.29). Almost half had received a primary education. 40.60% ran small businesses with a monthly income of lower than 10,000 baht. 59.40% did not suffer from any underlying diseases, but 50.00% had a family history of NCDs.

Concerning exposure to full nutrition labels, abridged nutrition labels, and guideline daily amount (GDA) labels prior to program implementation, 89.20% of the subjects in the experimental group reported having seen such labels. Immediately after and one month after program implementation, the figure rose to 94.60% and 97.30%, respectively. Similarly, prior to program implementation 45.50% read nutrition labels before making food purchase choices. Immediately after and one month after program implementation, the number increased to 77.10% and 80.60%, respectively. As for the subjects in the control group, the percentage of those having seen full nutrition labels, abridged nutrition labels, and GDA labels remained at 93.80% throughout the three periods. However, the percentage of those reading nutrition labels rose from 53.30% before program implementation to 66.70% immediately after and 73.30% one month after program implementation.

Regarding knowledge about nutrition labels and Healthier Choice logos, the subjects in the experimental group were found to perform better than their counterparts in the control group at a statistically significant level, probably because the program incorporated a wide variety of interesting activities and media that were effective in raising awareness of the importance of health, diet, and nutrition label reading.

In terms of attitudes toward nutrition labels, the experimental group and the control group were positive with no statistically significant differences both before and after program implementation. As for Healthier Choice logos, a different trend was identified. Although both groups had neutral attitudes prior to program implementation, only the former exhibited more positive attitudes after program implementation at a statistically significant level.

Concerning nutrition label use, after program implementation the experimental group made more use of nutrition labels than the control group at a statistically significant level. For instance, approximately half of the subjects in the experimental group would read nutrition labels carefully every time

before making food purchase choices. They would also choose to purchase food products with Healthier Choice logos over those without in order to reduce the intake of sugar, oil, and sodium due to their confidence in Healthier Choice food products. All this demonstrates that they realize the benefits of nutrition label use in keeping the intake of sugar, oil, and sodium content below the recommended daily amounts. In terms of awareness of the risks associated with negligence of the information on nutrition labels, the subjects in the experimental group also fared better than those in the control group at a statistically significant level.

Follow-up and evaluation of the 2018 Health for All project[6]

The Health for All project aims to create public awareness of the importance of understanding and modifying consumption behavior through activities that target communities and household-temple-school-hospital (HTSH) networks collaboratively plan and implement given their needs and lifestyles. Supported by Thai FDA through provincial health offices and HTSH networks, the project is expected to enable target communities to be self-reliant in maintaining healthy food consumption behavior. In 2018, the project was carried out in four pilot communities selected by four respective provincial health offices, namely Ban Thum community, Moo 1, Mueang district, Khon Kaen province; Na Kuam Nuea community, Mueang district, Lampang province; Prem Prachakhom community, Moo 2, Phra Phutthabat district, Saraburi province; and Pho Wai community, Mueang district, Surat Thani province.

Research procedures

The follow-up and evaluation of the project employed a mixed-methods approach, requiring the collection of both quantitative and qualitative data. The quantitative data were collected using survey questionnaires from at least 400 subjects in the four communities participating in the project. The qualitative data were collected using semi-structured interviews and project participation logs from two target groups: (1) four HTSH network leaders from each of the four communities, or a total of 16 HTSH network leaders, and (2) 10 project participants from each of the four communities, or a total of 40 project participants.

6 https://db.oryor.com/databank/uploads/fda/0236940001543480257_file.pdf?fbclid=IwAR2LBxyUEcpWnMlTDJMKlb2J9GKuieSm9VIrQYB6qyvMdHJ6in4RdZczJJc

Area-based collaborative research for development (ABC) and project implementation model

The project applies the area-based collaborative research for development (ABC) principle, which stipulates that in order to achieve optimal results, project planning and implementation need to suit specific socio-cultural contexts rather than proceeding indiscriminately. It is vital for all communities alike to be aware of the adverse effects of unhealthy food consumption behavior, especially the consumption of sweet, oily, and salty food as well as negligence of nutrition labels, on the genesis and development of non-communicable diseases (NCDs). However, the manner in which such awareness can be raised in different communities should be given careful consideration in terms of a community's potential, strengths and constraints, and workable mode of communication, for instance. In addition to this recognition, a linkage needs to be created between three mechanisms, namely (1) information relating to communities' incidence of NCDs and ways of life; (2) collaboration between provincial health offices, HTSH networks, other networks, such as sub-district and municipality administration organizations, and all the parties involved; and (3) learning management processes.

Based on the ABC principle, a project implementation model has been developed in which all the operations are centered on the target communities and their community members. HTSH and other network leaders serve as the intermediaries between Thai FDA and the target communities, running activities that help the target communities to solve food consumption issues, become healthier communities, and ultimately acquire health literacy. This is carried out following a data-driven approach using such information as health status (e.g. incidence of NCDs, food consumption behavior, and the number of ill community members), community capital (e.g. local wisdom, ally network size, natural resources, and cultural and community identity), and community development goals and strategic plans as expressed through social contracts and community plans.

Project implementation in line with the ABC principle will ensure concrete and measurable outcomes. One of the most immediate outcomes is

that it will strengthen the target communities and enable them to be self-reliant in analyzing their food- and health-related problems as well as devising appropriate solutions for modifying food consumption and health care behavior. It can also be expected that the target communities can serve as models for and share their success stories with other communities. If widespread, The Health for All project will play a significant role in helping Thai society move toward being health literate.

Areas of focus for the follow-up and evaluation

To ensure HTSH network leaders' clear understanding of the project implementation, and consistency between the project implementation and the follow-up and evaluation, the areas of focus were as follows:

- Utilization of community capital for the project implementation
- Changes in the food consumption attitudes, knowledge, and behavior of residents in the target communities
- Impacts on the food consumption attitudes and behavior of residents in non-target communities
- Roles and engagement of HTSH networks and other allies
- Learning processes and the resultant body of knowledge of the target communities

Measurement and evaluation of project implementation

The measurement and evaluation of project implementation encompassed changes in the food consumption attitudes, knowledge, and behavior of residents in the participating communities. These variables were measured and evaluated prior to project implementation and two weeks following project implementation. The survey questionnaires were administered to at least 100 conveniently sampled residents in each of the four target communities. The residents who were literate and not visually impaired would complete the questionnaires by themselves, whereas the illiterate and/or visually impaired residents would receive assistance from the data collection staff.

Prior to project implementation, 518 residents completed the questionnaires. After project implementation, the figure was 440. Their demographic characteristics before and after project implementation bore no statistically significant differences ($p<0.05$). The majority of the participants were female (over 75%) aged over 60 (45%) with underlying diseases (55%). The most common underlying diseases were hypertension (over 60%), followed by diabetes and dyslipidemia.

Main findings

Nutrition label knowledge and reading/use behavior

The measurement and evaluation of knowledge and behavior relating to food consumption and nutrition label[7] reading involves five aspects, namely food consumption knowledge, food consumption behavior, nutrition label reading knowledge, nutrition label reading/use behavior, and food product label reading/use behavior.

To enable comparison across different aspects, the raw scores for each were added up prior to being converted into percentage values. The percentage values were then evaluated against the following criteria.

0-60	means	low/unhealthy/inappropriate
61-80	means	moderate/acceptable
81-100	means	high/healthy/appropriate

The results are as follows.

(1) Nutrition label knowledge. After project implementation, 48% of the participants had a high level of nutrition label knowledge, a drastic increase of 38% from only 10% before project implementation, as shown in Tables 1 and 2.

(2) Nutrition label reading/use behavior. After project implementation, 23% of the participants demonstrated appropriate nutrition label reading/use behavior, 28% had acceptable nutrition label reading/use behavior, and 49%

[7] In this study, nutrition labels refer to full nutrition labels, abridged nutrition labels, guideline daily amount (GDA) labels, or 'Healthier Choice' logos.

reported inappropriate nutrition label reading/use behavior, compared to dramatically lower percentages of 12%, 15%, and 73% before the project implementation, respectively, as shown in Tables 1 and 2.

Table 1. Percentage values of nutrition label knowledge and reading/use behavior before and after project implementation

Aspects	Before			After		
	Low	Moderate	High	Low	Moderate	High
Nutrition label knowledge	59.8	29.7	10.4	28.1	24.3	47.5
Nutrition label reading/use behavior	73.6	14.7	11.8	49.3	27.7	23.0

Table 2. Descriptive statistics of nutrition label knowledge and reading/use behavior before and after project implementation

Items	Before				After			
	Min/Max	Median	Mean	SD	Min/Max	Median	Mean	SD
Nutrition label knowledge	0.0/91.6	58.3	64.3	20.0	0.0/100	75.0	72.5	20.6
Nutrition label reading/use behavior	0.0/100	53.2	47.9	27.4	21.4/100	64.3	66.4	17.2

(3) Nutrition label knowledge evaluated in terms of individual knowledge points. After project implementation, the participants exhibited an increased level of knowledge for most of the questions. For example, 90.3% were able to analyze GDA labels in order to choose the right food for weight control. In addition, 86.1% were able to identify the properties of food labeled with 'Healthier Choice' logos. The findings are displayed in Table 3.

Table 3. Percentage values of nutrition label knowledge by individual knowledge points before and after project implementation

Items	**Before**	**After**
I'm able to:		
1. Choose the right food for weight control using information on GDA labels.	77.4	90.3
2. Identify the properties of food labeled with 'Healthier Choice' logos.	69.7	86.1
3. Analyze nutrition labels to choose the right food given my health conditions.	74.3	84.4
4. Identify the sugar, oil, and sodium content using information on GDA labels.	67.2	82.5
5. Evaluate nutrition value using information on nutrition labels.	61.0	80.1
6. Choose food product brands least likely to cause illnesses using information on GDA labels.	67.6	80.6
7. Reduce sodium intake by avoiding canned, frozen, or processed food with a high sodium content.	65.3	79.4
8. Choose low sodium instant noodles, e.g. by looking out for those with 'Healthier Choice' logos.	55.8	73.3

Items	Before	After
9. Identify recommended daily amounts from nutrition labels.	44.6	72.1
10. Identify the sugar content of 200 ml beverages labeled with 'Healthier Choice' logos (i.e. three teaspoons).	17.0	65.2
11. Conclude that food with 'Healthier Choice' logos is good for health.	38.2	36.2
12. Understand food energy facts on nutrition labels	18.1	35.7

(4) As for nutrition label reading/use behavior, it was found that prior to project implementation, 20-39% of the participants had never read or made use of nutrition labels either before purchasing food or before consuming food. In contrast, all the participants read or made use of nutrition labels both before purchasing food and before consuming food. The findings are presented in Table 4.

(5) The post-implementation scores for nutrition label knowledge and reading/use behavior were significantly higher than the pre-implementation ones ($p<0.001$). The aspects in which the participants scored the highest were nutrition label reading/use behavior, followed by nutrition label knowledge and food product label reading/use behavior. The findings are shown in Table 5.

Table 4. Percentage values of nutrition label reading/use behavior before and after project implementation

Items	Before			After		
	Never	**Sometimes**	**Always**	**Never**	**Sometimes**	**Always**
I:						
1. Read nutrition labels before purchasing food.	19.5	29.7	50.8	0.0	38.1	61.9
2. Consume food in small servings based on the recommended daily amount for such food.	31.7	20.3	48.0	0.0	30.7	69.3
3. Analyze GDA labels before purchasing food.	28.6	26.6	44.8	0.0	42.8	57.2
4. Compare nutrition value before purchasing food by reading nutrition labels.	32.7	24.1	43.2	0.0	34.9	65.1
5. Choose food with ‘Healthier Choice’ logos.	31.5	27.9	40.6	0.0	38.4	61.6
6. Explain the figures on GDA labels to others.	39.1	17.5	43.4	0.0	34.9	65.1
7. Recommend food granted ‘Healthier Choice’ logos to other.	36.7	21.4	41.9	0.0	39.5	60.5

Table 5. Comparison of nutrition label knowledge and reading/use behavior before and after project implementation

Items	Before			After			Mean diff.	p-value
	N	Mean	SD	N	Mean	SD		
Nutrition label knowledge	518	54.8	20.1	440	72.5	20.6	17.7	<0.001
Nutrition label reading/use behavior	518	47.9	27.4	440	72.0	16.7	18.5	<0.001

Supplementary findings

(1) Nutrition label knowledge. Two weeks after project implementation, 90.3% of the participants were able to choose the right food for weight control using information on GDA labels (Table 1). In addition, the average score and median for nutrition label knowledge for all the participants equaled 72.5 and 75.0, respectively.

(2) Food purchase choices based on 'Healthier Choice' logos. Prior to project implementation, 31.5% of the participants had never made use of 'Healthier Choice' logos in reducing their intake of sweet, oily, and/or salty food. Following project implementation, all the participants reported having considered 'Healthier Choice' logos in making food purchase choices. Among these, as high as 61.6% often chose to buy food with 'Healthier Choice' logos.

(3) Nutrition label reading/use behavior. Before project implementation, 19.5-39.1% of the participants had never read or made use of nutrition labels. After project implementation, all the participants reported having read or made use of nutrition labels. For instance, the percentage of participants who always consumed food in small servings based on the recommended daily amount for such food rose from 48.0% to 69.3%. Additionally, there was a growth in the percentage of participants who always compared nutrition value before purchasing food from 43.2% to 65.1%.

(4) Most importantly, the findings indicated better changes in the participants' nutrition label knowledge and reading/use behavior across all of the aspects under investigation.

Lessons learned

Based on the data collected during project implementation through the administration of the survey questionnaires, observations, and interviews with the HTSH network leaders, project participants, and convenience and grocery stores, it can be concluded that all four communities vary in terms of geography, culture, main occupations, and values and beliefs. Such differences will play a crucial role in guiding Thai FDA's implementation of the Health for All project. For instance, the implementation of the project, the findings reveal, should comprise five stages: (1) establishing networks with allies in the target communities, (2) strategy formulation and implementation planning, (3) propelling the operations to achieve the project goals, (4) identification of the outcomes achieved, and (5) determining guidelines for extending the project onto other communities.

(1) **Establishing networks with allies in the target communities.** The sectors with which Thai FDA formed networks comprise:

- The civil sector, further comprising community leaders, public health volunteers, and local wisdom villagers,
- The religious sector, further comprising Buddhist monks, chaplains, imams, and other types of religious leaders,
- The education sector, further comprising teachers and students in schools or non-formal and informal education centers as well as junior FDA Thailand representatives,
- The public health sector, further comprising provincial health offices, district health offices, hospitals, district health centers, and sub-district health centers, and
- The administration sector, further comprising provincial governors, district chief officers, and municipality chief officers.

(2) **Strategy formulation and implementation planning.** Different strategies should be adopted depending on changing demographic characteristics. Thus far, three effective strategies have been identified.

- Getting up-close. This strategy is suitable for small communities where the degree of internal demographic differences is low and the residents often have little participation in community activities, such as the Prem Prachakhom community in Saraburi province. The project operations should focus on quick, short-term outcomes. Possible activities to promote healthy food consumption and nutrition label reading behavior include one-on-one guidance sessions, education programs, and dissemination of such information during community assemblies.

- Focusing on targets. This strategy is suitable for medium-sized communities with a low degree of internal demographic differences, such as the Ban Thum community in Khon Kaen province and the Na Kuam Nuea community in Lampang province. The focus should be on short- and medium-term outcomes. Communities need to be involved in the project since the preliminary stages, such as identification of the target groups and SWOT analysis of the communities and the networks involved. Project activities are to be specifically designed for the communities and surrounding areas. Public relations programs aimed at promoting awareness of and participation in the project should be carried out.

- Carrying it on. This strategy is suitable for large communities with vast internal demographic differences, such as the Pho Wai community in Surat Thani province. Since the size of such communities makes it difficult to effect changes in food consumption and nutrition label reading behavior in a speedy manner, the focus should not be on short-term outcomes but on medium- and long-term ones. These can be achieved, for example, through the formulation of clear goals and directions in line with the demographic profiles of the communities. In the process, the main driving force will be public health volunteers and HTSH network members, who serve to raise public awareness of the importance of healthy food consumption behavior and nutrition label

reading/use as well as to disseminate the necessary information in their respective neighborhoods.

(3) **Propelling the operations to achieve the project goals.** Whilst being operated according to the predetermined goals, the project should utilize and/or account for the mechanisms for fostering predisposing factors, reinforcing factors, and enabling factors.

- Mechanisms for fostering predisposing factors include one-on-one food consumption and nutrition label reading guidance sessions, food consumption and nutrition label reading education programs, and household visits.
- Mechanisms for fostering reinforcing factors include family member reminders; support from and participation by various levels of leaders, such as provincial governors, district chief officers, municipality chief officers, and local wisdom villagers; Buddhist monks' sermons; and presentations of awards and tokens of participation.
- Mechanisms for fostering enabling factors include educating food vendors and convenience/grocery store owners; promoting the sales of instant and convenience food, beverages, and seasoning ingredients granted 'Healthier Choice' logos, as well as other healthy food; and putting up health information notices and making health information radio broadcast in the communities and surrounding areas.

(4) **Outcomes achieved.** The most substantial project outcomes are as follows:

- The participants were more aware of the importance of and knowledgeable about the content on nutrition labels, including GDA labels.
- The participants exhibited healthier food consumption behavior and more informed food product selection, for example purchasing food with 'Healthier Choice' logos to a greater extent. Some also influenced their family members in leading a healthier lifestyle.
- The convenience/grocery stores in the communities assisted in promoting food with 'Healthier Choice' logos to consumers, reflecting collaboration between the public sector and the private sector.

(5) Determining guidelines for extending the project onto other communities. Based on the present findings, these include identifying the lessons learned and sharing the information in the pilot communities, extending the project onto other communities, and expanding ally networks. It is advised that in this process, Thai FDA should:

- Collaborate with convenience and grocery stores in the target communities to enhance coverage of the project,
- Run public relations programs to promote 'Healthier Choice' logos on mainstream media,
- Establish collaboration with and/or expand ally networks in the private sector, such as food producers and retailers,
- Implement the project on a continual basis, particularly through district health centers and community leaders, and
- Identify the outcomes achieved and the lessons learned for the new target communities.

Such guidelines are recommended on the grounds that only through extensive quality networks and continual dissemination of health information. The Health for All project can have sustainable impacts on the food consumption and nutrition label reading/use behavior of consumers. Once sustained in a community, the project will not only have lasting effects on the consumption behavior of the members of the community but also serve as a model for other communities with similar demographic profiles.

Mechanisms for modifying food consumption behavior in a sustainable manner

Mechanisms for ensuring overall project sustainability

(1) Thai FDA requires sufficient and continual financial support from such governmental agencies as the National Health Security Office (NHSO) and municipality organizations.

(2) The project should be incorporated into the long-term and annual plans of Thai FDA.

(3) Subject matters and content relating to healthy food consumption behavior and nutrition label reading/use should be integrated into the basic curriculum, health education courses, and textbooks.

(4) Content relating to healthy food consumption behavior and nutrition label reading/use should be presented in a consumer-friendly format, such as infographics, and disseminated to consumers through impactful social media platforms, such as Facebook, Line, Twitter, and YouTube.

Mechanisms for ensuring project sustainability in the target communities

(1) Public health volunteers are one of the intermediaries between Thai FDA and the target communities, disseminating information relating to healthy food consumption behavior and nutrition label reading/use from the former to the latter. The other intermediaries to perform similar duties are community leaders/ influencers, such as Buddhist monks, chaplains, and imams.

(2) Provincial and district health offices should serve as mentors providing academic and information support to public health volunteers and community leaders/influencers as well as organizers running education programs for community members and convenience/grocery stores.

(3) Municipality organizations and provincial and district health offices should join forces in creating an environment that nurtures healthy food consumption behavior and lifestyle.

(4) Schools as well as non-formal and informal education centers should ensure that the food vendors carry out their business responsibly by selling healthy food or at least providing healthy choices on the menus. They should also support their students who are junior FDA Thailand representatives in reaching out to the communities.

(5) Convenience and grocery stores as well as food vendors should cooperate by selling food products and/or using seasoning ingredients with ‘Healthier Choice’ logos. They should also be encouraged to give advice to consumers on making food purchase choices.

(6) Those who actively and continually contribute to the project success should be recognized and awarded.

Key success factors

(1) Thai FDA needs to establish a strong civil state network with a wide array of allies, such as community leaders/influencers, municipality officers, public health volunteers, and junior FDA Thailand representatives, as well as orchestrate the operations of such parties. Additionally, networks have to be formed with local organizations, such as district, sub-district, and municipality administration organizations, in order to ensure enforcement of the relevant measures and mutual agreement on important matters.

(2) The target communities have to determine their own future, visualizing the direction in which they want to move, such as becoming communities with lower rates of NCDs.

(3) The project implementation needs to adopt a role model strategy. That is, not only should community leaders/influencers, municipality officers, public health volunteers, and junior FDA Thailand representatives disseminate information relating to healthy food consumption behavior to their family members and in their neighborhoods, but they should also serve as role models by leading a healthy lifestyle themselves.

(4) Regulations mutually agreed by all the parties involved should be enforced, and disciplinary actions should be taken in the event that the community agreements are violated.