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ORIGINAL ARTICLE

Effectiveness of the nutritional promoting program on the growth of pre-school children in a child development center, Pongyangkok Sub-district, Hang Chat District, Lampang Province

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Abstract

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The objective of this quasi-experimental research was to investigate the effectiveness of a nutritional promotion program on pre-school children's growth. This was conducted by applying behavioral learning theories. The sample of this study was 108 pre-school children aged between 3-5 years old with their parents and a purposive sample of 8 caregivers of pre-school children in the child development center in the Pongyangkok Sub-district Municipality, Hang Chat District, Lampang Province.

The intervention comprised 12 weekly curriculum sessions for pre-school children, four weekly activities for parents, and three weekly activities for caregivers. The measurement of growth was done by weighing and measuring the height of the children to be compared with the weight for age, height for age, and weight for height criteria. The data were analyzed using descriptive statistics. Mean comparison between before and after the program was performed by using paired t-test.

The results revealed that after the intervention, higher percentages of pre-school children passed the normal weight for age, height for age, and height for weight criteria than before. In the aspect of parents and caregivers, the score of the knowledge, attitude and practice of nutritional promotion on the growth of pre-school children after the intervention statistically significantly increased more than before. The results of this study suggest that the intervention working together with parents, caregivers and children themselves is a valuable tool and may play a role in improving the nutritional status of children.

Keywords: nutritional status, growth, pre-school children, nutritional promotion program

วารสารสาธารณสุขและการพัฒนา
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ประสิทธิผลของโปรแกรมส่งเสริมภาวะโภชนาการต่อการเจริญเติบโตของเด็กก่อนวัยเรียนในศูนย์พัฒนาเด็กเล็ก ตำบลปงยางคก อำเภอห้างฉัตร จังหวัดลำปาง

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บทคัดย่อ

จักรกฤษณ์ วังราษฎร์ ณัฐติพร อ้นด้วง ยุพา ชาญวิกรัย ชมนาด สิงห์หันต์ และ ศิริวรรณ ใบตระกูล ประสิทธิผลของโปรแกรมส่งเสริมภาวะโภชนาการต่อการเจริญเติบโตของเด็กก่อนวัยเรียนในศูนย์พัฒนาเด็กเล็ก ตำบลปงยางคก อำเภอห้างฉัตร จังหวัดลำปาง ว. สาธารณสุขและการพัฒนา 2561;16(2):1-13

การศึกษาครั้งนี้เป็นการวิจัยกึ่งทดลอง มีวัตถุประสงค์เพื่อศึกษาประสิทธิผลของโปรแกรมส่งเสริมภาวะโภชนาการต่อการเจริญเติบโตของเด็กก่อนวัยเรียน โดยประยุกต์ใช้ทฤษฎีการเรียนรู้กลุ่มพฤติกรรมนิยม กลุ่มตัวอย่างประกอบด้วยเด็กก่อนวัยเรียน อายุระหว่าง 3-5 ปี พร้อมผู้ปกครอง จำนวน 108 คู่ และครูผู้ดูแลเด็กที่คัดเลือกแบบเจาะจงทั้งหมดจำนวน 8 คน จากศูนย์พัฒนาเด็กเทศบาลตำบลปงยางคก อำเภอห้างฉัตร จังหวัดลำปาง โปรแกรมส่งเสริมภาวะโภชนาการประกอบด้วย บทเรียนสำหรับเด็กก่อนวัยเรียนรวม 12 สัปดาห์ กิจกรรมสำหรับผู้ปกครองรวม 4 สัปดาห์ และกิจกรรมสำหรับครูผู้ดูแลรวม 3 สัปดาห์ วัดการเจริญเติบโตด้วยการชั่งน้ำหนักและวัดส่วนสูงนำมาเทียบกับเกณฑ์น้ำหนักต่ออายุ ส่วนสูงต่ออายุและส่วนสูงต่อน้ำหนัก วิเคราะห์ข้อมูลด้วยสถิติพรรณนา และเปรียบเทียบค่าเฉลี่ยก่อนและหลังการใช้โปรแกรม โดยใช้สถิติ paired t-test

ผลการศึกษาพบว่าภายหลังการทดลอง ร้อยละของเด็กก่อนวัยเรียนที่ผ่านเกณฑ์มาตรฐานน้ำหนักต่ออายุ ส่วนสูงต่ออายุและส่วนสูงต่อน้ำหนัก เพิ่มมากขึ้นกว่าก่อนการทดลอง ในส่วนของผู้ปกครองและครูผู้ดูแลเด็ก ภายหลังการทดลองมีค่าคะแนนเฉลี่ยความรู้ ทัศนคติและการปฏิบัติด้านการส่งเสริมภาวะโภชนาการต่อการเจริญเติบโตของเด็กก่อนวัยเรียนเพิ่มขึ้นมากกว่าก่อนการทดลอง จากผลการศึกษาครั้งนี้ชี้ให้เห็นว่าโปรแกรมการส่งเสริมภาวะโภชนาการที่กระทำร่วมกันทั้งในผู้ปกครอง ครูผู้ดูแลเด็กและตัวเด็กเอง มีคุณค่าและมีบทบาทเป็นอย่างยิ่งต่อการส่งเสริมภาวะโภชนาการของเด็กก่อนวัยเรียน

คำสำคัญ: ภาวะโภชนาการ การเจริญเติบโต เด็กก่อนวัยเรียน โปรแกรมส่งเสริมภาวะโภชนาการ

Introduction

Pre-school children are children aged between 0-5 years. Pre-school children are at an early age to develop their physical, emotional, and intellectual abilities, and personality. Not having been properly cared for and receiving unsuitable food for a long time will cause pre-school children to have health and nutritional problems resulting in illness and mental and physical development disorders.[1] From a survey on health and nutritional status of children in Thailand conducted by the Office of the Basic Education Commission in the fiscal year 2009, which was based on the weight and height of children according to the age of Thai children by referring to the Ministry of Public Health standards, it was found that 6.3% of a total of 4,665,374 children aged 1-5 years surveyed were shorter than the standard, 2.4% of children under two years exhibited severe midget conditions, and 4.8% of children aged 1-5 years weighed less than the standard. Children who were shorter or weighed less were at risk of low intelligence, while 8.5% were overweight and obese[2]. This is an important cause of health problems as well as affecting their intelligence, thus, affecting the children's learning. From a report by the Department of Health, the Ministry of Public Health stated that since 1997-2009, it was found that Thai children aged 0-5 years showed an average level of intelligence, dropping from 91 to 88, which was lower than the average defined by the World Health Organization at 90 to 110, while the IQ of children in developing countries should be more than 104. It was also found that Thai children had a reduction in developmental age from 72% to only 67%. The report also stated that 45% of Thai children were receiving inappropriate food for their age. Moreover, eating crunchy candy and soft drinks increased by 1.8 and 1.5 times, respectively while 90% of the snacks were of low nutritional value and higher in sugar, fat and sodium than the standard. It was also found that Thai children were eating an average of 9,800 baht worth of sweets per person per year. In comparison, only 3,024 baht per person per year was spent on the cost of education. This consumption behavior results in Thai children experiencing both nutritional deficiencies and over nutrition. They may grow into unhealthy adults with a poor quality of life[3].

This results of the rural Thai children having problems with health and consumption behavior, and experiencing nutritional deficiencies were more than the children from the city at 25% and 14.3%, respectively. However, the severity of the problem varies. The rural people had low average household incomes. This affects the purchase and consumption of family food in both quality and quantity. It can be said that children from well-off families would have better nutritional status than those from middle and low-income families. At present, the socio-economic changes, including problems related to poverty, drought, and inability to do farming, which is the main occupation, make the role of parents change, struggling to survive. Migrants are finding jobs in urban areas and need to leave the family, especially the children and the elderly alone[4]. This phenomenon is likely to increase and the lack of parental care and feeding results in changes in lifestyle and dietary habits of their children. This has a direct impact on their health status, growth, nutrition and development in all aspects[5].

The objective of this research was to study the effectiveness of the nutritional promotion program

on the growth of pre-school children and evaluate the effects of a multifaceted intervention based on the attention at a child development center run by a sub-district administrative organization. The developed program was based on the concept of involvement between parents and caregivers to participate in the activities. These people, who are very close to the children and can convey knowledge, attitude, as well as be role models in various good behaviors were used to create the program by the researcher. However, these individuals needed to be educated and their nutritional attitudes and behaviors also needed to be appropriate. Additionally, this research also focused on promoting nutritional status directly through the pre-school children themselves with the use of educational media to create knowledge, good understanding, and attitude about nutrition. This will also lead to proper and right behavior.

Methods

Population and sample

This is a cross-sectional quasi-experimental research that was implemented in the form of a one-group pre-test and post-test design and the data was collected from March to December 2016. The population included 150 children aged between 3 and 5 years old in a child development center in Pongyangkok Sub-district Municipality, Hang Chat District, Lampang Province. Defined through the sample sizing methods of Krejcie and Morgan,[6] a sample size of 108 was obtained, and the sample group was selected through purposive selection. We also excluded children who presented congenital diseases or learning disabilities, a history of nutritional and metabolic diseases, and chronic diseases that could influence their growth, and also, those who did not agree to collect the data. All of the parents of the 108 children were asked to participate in the intervention and fill out a questionnaire. The parents who agreed to participate were requested to return the informed consent form along with their completed questionnaire. This resulted in the recruitment of a total of 108 pairs of children and their parents.

A purposive sample of all eight caregivers was employed by the child development center in Pongyangkok Sub-district Municipality, Hang Chat District, Lampang Province and the caregivers were recruited to participate in the intervention program. Eligibility in the study required all participants to be above 18 years of age at the time of data collection, and they would provide lunch and snacks to the pre-school children in the child development center.

Intervention

The developed nutritional promotion programs for pre-school children were based on the concept of behavioral learning theories[7] and lasted for 12 weeks. The programs passed the inspection on content consistency, objective congruence and the consideration of the language suitability by three experts in nutrition and who were from a pre-school children development program. The program composed of the following activities:

1. Pre-school nutritional promotion program for parents was implemented by educating the parents four times for a total of 24 hours. The first time was a six hour lecture to educate the parents on the content of the five major food groups and choosing the right foods for pre-school children. The second lecture was on practicing for six hours with the content being on basic nutritional assessments of foods, and preparing

and cooking food to maintain the nutrition. The third was a lecture and practice for six hours on nutritional assessment and basic nutritional disorders observation on pre-school children. The fourth was a focus group discussion activity with the parents sharing their learning with each other joined by a team of researchers and pre-school children food and nutrition experts to provide counseling and advice during the conversation, which took about six hours.

2. The pre-school nutritional promotion program for caregivers of children was implemented by educating the caregivers three times, totaling 18 hours. The first time was a six hour lecture to educate the caregivers on the content of the five major food groups, and choosing the appropriate foods for pre-school children and the right environment to promote the nutritional status. The second was a lecture and practice for six hours with the content being on basic nutritional assessments of foods, and preparing and cooking food to maintain the nutrition. The third was a focus group discussion activity with the parents sharing their learning with each other joined by a team of researchers and pre-school children food and nutrition experts to provide counseling and advice during the conversation, which took about six hours.

3. The nutritional promotion program for pre-school children was comprised of classroom activities with lectures, activities, storytelling, singing, drawing, coloring, and game playing. All stages were performed by the researcher with the caregivers as supporters. The 30-minute activities were arranged once a week every Monday for 12 weeks total. The content comprised of as follows:

During the 1^{st} - 5^{th} weeks, the content involved the benefits of the five major food groups and selection of meat, milk, eggs, beans, white rice, and brown rice, different kinds of flour, fatty oils, vegetables and fruit, and clean water.

During the 6^{th} - 8^{th} weeks, the content involved eating beneficial snacks and the benefits and downfalls of snacks, crispy snacks, desserts, candy, soft drinks, and junk food.

During the 9^{th} - 10^{th} weeks, the content involved good hygiene, washing hands before handling, eating, choosing, and keeping food clean and safe from germs.

During the 11^{th} -12^{th} weeks, the content involved oral hygiene: proper teeth brushing, exercising, and appropriately performing physical and recreational activities.

Research instruments and data collection

1. The questionnaires used in the research were, 1) Parent general data, 2) Pre-school children general data (Parents of the children answered the questionnaire) 3) Parents and caregivers nutrition knowledge questionnaire 4) Parents and pre-school caregivers attitude toward nutrition questionnaire, and 5) Parents and caregivers nutritional promotion practice questionnaire. The calculated content validity index was 0.82 and the reliability was tested by using the test on 30 people whose characteristics were similar to the sample. Cronbach's coefficient was used to determine the reliability at 0.84.

2. A growth record form was used to store age, weight, and height information of the pre-school children. The weight and height measurements were taken of all sample children. All of the research assistants and team members were well-trained to use

standardized methods carefully of an anthropometric measurement and outcome collecting procedure which is a rigorous standard of recording.

Data analysis

Personal information was analyzed using descriptive statistics. The parents' knowledge, attitudes and nutritional promotion practices scores were compared before and after using the program and were determined by using a paired t-test. As the limited number of subjects, caregivers' knowledge, attitudes and nutrition promotion practices comparing the scores before and after using the program were analyzed by using the Wilcoxon signed rank test. The growth of the pre-school children was analyzed by using weight, height and age to determine the weight for age, height for age, and weight for height ratios. It was then compared with the criteria based on the growth of 2-7 year old children established by Department of Health, Ministry of Public Health,[8] and the pre-test and post-test were then compared by using paired t-test. A statistical significance level was set at 0.05.

Results

General information of parents and caregivers

General information of the 108 pre-school children population indicated the following: 46 were males (42.6%), and 62 were females (57.4%). None exhibited a congenital disease nor a history of drug or food allergies.

Parents were 47 males (43.5%), and 61 females (56.5%), and the mean age was 35.6 years. The relationship with the children was 45 parents (41.7%) and 63 relatives (58.3%). The majority (47.2%) of the family's income was in the range of 10,001-20,000 baht. In the aspect of occupations, the most common occupation was an employed vender (57.4%). In the aspect of education, the most of them graduated from high school (43.5%).

There were a total of eight caregivers. All of them were female and the average age was 42.2 years with the average occupation period as caregivers of children were 7.5 years. Five of the caregivers held a bachelor's degree and three held a lower than bachelor's degree. There were two caregivers who had been trained on how to promote nutrition and growth in pre-school children at least two times in a period of five years.

Parents and caregivers of children knowledge, attitude and nutrition promotion practices

When the pre-test and post-test scores were compared, it was found that knowledge, attitude, and nutritional promotion practice of the pre-school children's parents after the program had an average score of 12.50, 13.0 and 9.0, respectively, which was statistically higher than before the program (Table 1).

Table 1 The mean score of knowledge, attitude, and nutritional promotion practice of pre-school children's parents before and after intervention

Variables	Before Mean (SD)	After Mean (SD)	t	p-value
Knowledge about nutritional promotion for pre-school children	7.5 (2.1)	12.5 (4.1)	3.99	0.025*
Attitude about nutritional promotion for pre-school children	7.0 (2.6)	13.0 (3.1)	3.51	0.023*
Practice in nutritional promotion for pre-school children	5.0 (3.8)	9.0 (4.7)	3.67	0.031*

*p-value < 0.05

As shown in Table 2, the Wilcoxon test results established the difference between mean ranks as statistically meaningful. The difference was in favor of the post-test. In other words, a significant increase was observed in caregivers' knowledge, attitude, and nutritional promotion practice. It can thus be stated that the intervention work specified in the caregivers was effective in improving their knowledge, attitude, and nutritional promotion practice.

Table 2 The mean score of knowledge, attitude, and nutritional promotion practice by caregivers of pre-school children before and after intervention

Variables	Before Mean (SD)	After Mean (SD)	z	p-value
Knowledge about nutritional promotion for pre-school children	10.7 (1.1)	13.3 (1.7)	4.25	0.003*
Attitude about nutritional promotion for pre-school children	9.8 (1.6)	13.5 (2.1)	2.82	0.002*
Practice in nutritional promotion for pre-school children	5.5 (1.7)	9.3 (1.7)	2.75	0.005*

*p-value < 0.05

The growth of the children

In the aspect of the growth of the children, the average weight before and after the nutritional promotion program of pre-school children was at 14.5 and 18.5 kg, respectively. There was a significant statistical difference at the 0.05 level. The average height before and after the program was 92.5 and 93.6 cm. There was no significant statistical difference. This may be due to the height measurement required over a long period of time. It can be observed to change.

When the growth criteria in the aspect of weight for age was considered, before using the program, 16.7% of children were under weight, 3.7% were overweight and 79.6% were considered normal. Whereas, after the program, 1.9% were underweight, 0.9% were overweight and 97.2% were according to the normal, respectively. It can be seen that the number of underweight and overweight children had decreased. In the aspect of height for age criteria, it was found that before the program, there were 15.7% that were slightly short, 0.9% that were slightly tall, and 83.3% that were according to the normal, respectively. Whereas, after the program, 14.8% were slightly short, 0. 9% were slightly tall and 84.3 % were according to the normal, respectively.

In the aspect of height for weight criteria, it was found that before the program, there were 9.3% that were slim, 7.4% that were slightly fat, and 83.3% that were according to the normal, respectively. It was also found that after the program, there were 9.3% that were slim, which was not different from the initial data, whereas 2.8% were slightly fat, and 95.4% were according to the normal, respectively. Which was better than before (Table 3).

Table 3 Comparison of child growth before and after intervention

Variables	Before	After
Weight		
Minimum (Kg)	9.3	11.8
Maximum (Kg)	21.4	24.2
Mean (SD)	14.5 (2.3)	18.0 (1.6)
Height		
Minimum (Kg)	79.5	79.7
Maximum (Kg)	107.0	107.6
Mean (SD)	92.5 (5.0)	93.6 (4.5)
Weight for age		
Too light	-	-
Light	-	-
Under weight	18 (16.7%)	2 (1.9%)
Normal	86 (79.6%)	105 (97.2%)
Over weight	4 (3.7%)	1 (0.9%)
Heavy	-	-
Height for age		
Too short	-	-
Short	-	-
Slightly short	17 (15.7%)	16 (14.8%)
Normal	90 (83.3%)	91 (84.3%)
Slightly tall	1 (0.9%)	1 (0.9%)
Tall	-	-
Weight for Height		
Too skinny	-	-
Skinny	-	-
Slim	10 (9.3%)	10 (9.3%)
Normal	90 (83.3%)	103 (95.4%)
Slightly fat	8 (7.4%)	3 (2.8%)
Fat	-	-
Obese	-	-

*p-value < 0.05

Discussion

After the pre-school children nutritional promotion program, parents and caregivers of children had more knowledge, attitude and nutritional promotion practice for pre-school children than before the program. When the pre-school children after the program were considered, the children had better growth based on the normal weight for age, height for age, and height for weight. This can be explained as follows:

The knowledge on nutrition promotion of parents and caregivers for pre-school children changed as a result of joining the pre-school children nutritional promotion program with activities. The activities comprised of lectures on nutritional education, practice in making the students gain theoretical knowledge, practice based on the principle of active learning that focuses on the students taking action, and thinking about what they were doing during the learning process. The student role will change from knowledge receiver to co-creators and students used a higher-order of thinking processes such as analysis, synthesis, and evaluation enabling them to maintain a more durable and longer learning experience than the normal learning process in which the learner is only the receiver[9-11]. The parents and caregivers who attended the program also received a nutritional guide and a pre-school children food menu that can be used in everyday life. This is consistent with a study conducted by Tanyalak and Utai[12] on the effectiveness of pre-school children consumption behaviors promotion programs at Ratchaburi Kindergarten. It is reported that after using the program, the consumer behavior was developed by applying the social support theory to parents and classmates by educating through lectures and learning through direct experience. As a result, parents and caregivers of the children in the experimental group had significantly higher mean scores after the experiment than in the comparison group with a statistical significance at the 0.01 level.

The exchange of knowledge, experience, and ideas between the parents, caregivers and researcher throughout the process of exchanging information with each other, consequently, opened new perspectives resulting in a raised awareness of the benefits of promoting nutritional status in pre-school children and initiated positive changes in the attitudes of both parents and caregivers of the children. This is consistent with a study conducted by Teerarat and Pannee[13] on the effectiveness of promoting a vegetable and fruit consumption behavior program among pre-school children by the parents at a child development center in Muang District, Surin Province that allowed parents and caregivers to meet, talk, exchange experiences and know each other which included questions from the researcher or scholars. After the experiment, caregivers and parents had a more positive attitude in promoting increased consumption of fruits and vegetables for pre-school children than before the experiment. This is consistent with the reports of Chapman EN[14] and Zimbardo PG[15] that stated that attitude is not a permanent feature of a person's personality. Attitudes tend to change when stimuli demand change such as raising awareness of new information, gaining new experience, and being emphasized to understand or appreciating new things by being persuaded in believing or doing something differently. Additionally, the attitude of a person can change as a result of a knowledge-driven activity along with the motivation to succeed in one[16] as did the parents and caregivers of the children in

this study, who participated in the activities in the program, which emphasized a change in attitude, designed by the researchers.

The scores of parents and caregivers behaviors and nutritional promotion practices for pre-school children after the program were higher than before the program. This was a result of participating in the nutrition program for pre-school children with training activities to enhance their skills in and knowledge about food and nutrition, particularly in selecting the raw materials and ingredients for cooking, developing cooking practices in a way to preserve and maintain nutrition calculating the energy of each meal, and adopting healthy food menus. These activities can be practiced by parents and caregivers. This is consistent with the study conducted by Reyes MH *et.al*[17] which reported that parents and caregivers of children were overweight in Mexico. In this study, parents and caregivers participated in a program that included training, focus group discussion and practices on food and nutrition every two months and an exhibition and short message transmission, which was the knowledge of relevant issues totaling 12 months. After the program, parents and caregivers of the children had more knowledge and practice about nutrition. Parents and caregivers had changed their food preparation behaviors for the children by buying less food that was not useful to be kept at home and promoting an increase in the consumption of vegetables at home and school. Parents and caregivers of the children became more aware of eating habits and decided to be good role models for the children regarding consumption behavior.

In terms of the pre-school children population, an experiment on nutritional support programs on their growth was also conducted on a different population in this study when the weight for age and height for weight criteria were considered. The values after the experiment were also higher than before except in the height for age. It was found before and after the program they were 83.3% and 84.3%, respectively. At the end of the experiment, population height per age, according to the benchmark only increased by one, because height is the growth of bone structure consisting of leg bone length, pelvis, spinal and skull size combined, so the changes are quite slow and due to the duration of this experiment negligible.

However, when the weight for age and height for weight criteria were considered, it can be seen that the number of children that met the criteria after the experiment were more than before the experiment. Much of this is due to the fact that the children participating in a nutritional promotion program which was researched and designed by applying behavioral learning theories. These theories state that all behaviors occur by learning and observing each type of behavior and is the sum of many independent reinforcements, and if the behavior is inappropriate or incorrect, it can be adjusted to fit correctly through reinforcement or a new teaching[18]. In addition, the researcher also used the principle of learning by nature by designing the learning process according to the needs and interests of the child and created interesting stimuli which engages the children to learn. These included activities such as lectures, storytelling, singing, playing games, drawing, painting, and imaging. When there is an interesting stimulus, the child perceives through their senses such as sight, hearing, smell, taste, and touch creating learning, memorizing, understanding, and responding in the form of practice or behavior.

This is consistent with a study conducted by Marut *et al.*[19] who studied the effects of storytelling. Cooking activities centering on knowledge and vegetable consumption were included in a story told to the children about vegetables and the benefits of eating vegetables and the drawbacks of not eating vegetables. In addition to cooking activities, children were involved in ingredient preparation and cooking three times per week. This was done by one story and one recipe preparation at a time for one hour and 30 minutes totaling four weeks. From the study, it was found that post-test scores of the experimental group were higher than the control group and the score of the experimental group was also higher than before, which suggests that pre-school children could learn through various activities. This will stimulate attention and lead to remembering and desired behavior.

Another important factor that influenced the pre-school children to improve knowledge and behavior and leads to better nutrition and growth, was the parent participation in the pre-school nutritional promotion program, so their knowledge, attitude, and practice also improved. This resulted in the ability to convey and apply knowledge gained. Additionally, the practice of proper food consumption was also a good example for the children. This is because pre-school children like to emulate and create their own behavior by imitating and following as shown in the study conducted by Chotika and Pattamasiri[20] on the role of parents in promoting the eating behaviors of pre-school children in Phetchaburi Kindergarten. This was evident in three aspects: the role models, environment, and support which found that parents played a role in promoting the eating habits of pre-school children on a massive scale. The highest role was support, particularly, meal preparation which allowed the children to be involved and reinforced. The second was composed of manners, setting aside time to eat, environment, and motivation, respectively. It was shown that parenting styles need to be emphasized as an important aspect of eating behavior in pre-school children[21].

Additionally, caregivers of children are another important factor playing a role in nutrition promotion in pre-school children. This is because of their proximity to the children and it is the task of the caregivers to plan and organize activities to promote learning activities for skill development and create an appropriate environment for pre-school children. Additionally, caregivers of children, also play a role in communicating to the parents their duties of conveying and passing their knowledge and advice on how to promote the children's steady growth and to find solutions to problems. Therefore, caregivers of children that have gone through the program can effectively present such roles and excellently contribute to the growth and development of the children[22-23].

Recommendations

The results of this study suggest that working together with parents and caregivers of children is a valuable method in improving the nutritional status of children. The inclusion of the parents and caregivers of children has been recommended, since young children are more susceptible to interventions focused on environmental and behavioral factors by members of their own family, childcare centers, and schools. It will be necessary to assess whether the maintenance of implemented activities in daycare centers over a longer period can demonstrate effectiveness that justifies scaling.

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