Humanities and Social Sciences Letters
2024 Vol. 12, No. 3, pp. 575-593
ISSN(e): 2312-4318
ISSN(p): 2312-5659
DOI: 10.18488/73.v12i3.3811

The effect of healthy food promotion through lunch boxes on the knowledge, attitudes and habits of elementary school students

E. Erhamwilda[1+]
Nurul Afrianti[2]
Arif Hakim[3]
Drupadi Dillon[4]
J. Julia[5]

[1,2,3]*Early Childhood Teacher Education Program, Universitas Islam Bandung, Bandung, Indonesia.*
[1]*Email: erhamwilda@unisba.ac.id*
[2]*Email: nurulafrianti@unisba.ac.id*
[3]*Email: arifhakim@unisba.ac.id*
[4]*Southeast Asian Ministers of Education Organization Regional Center for Food and Nutrition, Jakarta, Indonesia.*
[4]*Email: ddillon@seameo-recfon.org*
[5]*Elementary Teacher Education Program, Universitas Pendidikan Indonesia, Bandung, Indonesia.*
[5]*Email: juli@upi.edu*

(+ Corresponding author)

Article History
Received: 8 August 2023
Revised: 28 May 2024
Accepted: 13 June 2024
Published: 22 July 2024

Keywords
Attitude
Elementary school student
Habituation
Healthy lunch box
Knowledge
Nutrition campaign.

ABSTRACT

This study aims at investigating the implementation of the stunting prevention programme called Delicious, Nutritious and Low-Cost School Lunch (DNLCSL) for elementary school students in Bandung City, West Java Province, Indonesia. This research employed a mixed-methods design combining quantitative and qualitative approaches. Quantitative data was collected through surveys and qualitative data was collected through in-depth interviews with leaders in the education and culture offices, health department, public health centre staff, elementary school principals, teachers, students, parents and canteen staff. The research findings revealed that the stunting prevention program DNLCSL was an innovative nutrition campaign. The DNLCSL Programme was implemented as an alternative to nutrition education to help elementary school students consume nutritious and well-balanced food. The planning and organizing phases have been completed but the implementation and monitoring processes should be improved. It was found that there were changes concerning lunch boxes and snacking habits in the elementary schools that consistently implemented the program. This research implies that more widespread implementation is needed as the DNLCSL programme can improve students' knowledge, attitudes and dietary habits which can indirectly prevent stunting. The involvement of the government, education and health agencies and community collaboration are also needed to keep the programme sustainable.

Contribution/Originality: This paper evaluates stunting prevention programs through the Delicious, Nutritious, and Low-Cost School Lunch (DNLCSL) Programme campaign. The results of the campaign showed positive changes indicating that the programme could change students' snacking habits and encourage them to bring healthy homemade lunch boxes.

1. INTRODUCTION

As a developing country, Indonesia has a high prevalence of stunting (Beal, Tumilowicz, Sutrisna, Izwardy, & Neufeld, 2018; De Silva & Sumarto, 2015; Semba et al., 2008). According to the Ministry of Health, Indonesia's stunting rate was 30.8% (Wulandari, Margawati, & Rahfiludin, 2021). Stunting is a chronic malnutrition issue that requires the attention of all countries. To address this issue, the World Health Organization (WHO) needs to call

for global action to reduce the stunting rate by 40% by 2025. One-third of children under five have been suffering from stunting which was the cause of death for 14% of children. Stunting mostly occurs in children's vulnerable age (the first 1,000 days due to 18 risk factors observed in 137 developing countries) (Danaei et al., 2016). In 2019, it was estimated that 21.3% (144 million) of children under five years old were affected by stunting (Vaivada et al., 2020). Stunting refers to the condition of a child who is too short compared to other children of the same age (Perkins et al., 2017; Rizal & van Doorslaer, 2019). According to the Medium-Term National Development Plan, the government is planning to reduce the rate to 19% in 2020-2024.

Each Indonesian region must create a stunting prevention programme to implement it. In this case, Bandung City West Java is one of the biggest cities in Indonesia and has a stunting case rate of 25.3% (De Silva & Sumarto, 2015). To address this issue, Bandung City Health Office has enacted the Delicious, Nutritious and Low-Cost School Lunch (DNLCSL) Program. The DNLCSL programme is a nutrition campaign held in elementary schools to encourage students to bring a healthy and affordable lunch or snack box to school. The programme aims at developing students' and parents' understanding and giving them knowledge about the importance of well-balanced, nutritious meals and the dangers of unhealthy food such as fast food and snacks in the school.

The issue of stunting is a global concern and various regions around the world have implemented a range of initiatives to address it. For instance, Italy has introduced a noteworthy programme known as the Maestra Natura Program. This innovative nutrition education initiative is designed to heighten awareness regarding the critical relationship between dietary habits leading to a healthy lifestyle and the practical application of nutritional guidance in daily life (Scazzocchio et al., 2021). Further research is related to the effectiveness of the health-promoting schools (HPS) approach. The research results prove that the HPS programme is able to increase participants' consumption of high-fibre foods, healthy snacks, water, milk and vegetables (Rana & Alvaro, 2010; Shi-Chang et al., 2004; Wang & Stewart, 2013). Another study found that healthy food subsidies significantly increased purchases and consumption of promoted products (An, 2013).

Various problems have occurred during the implementation of the program. These inhibiting factors included a lack of resources for the teacher to be able to master the nutrition education materials, a lack of support from the parents and the limited availability of nutritious food in schools and school canteens that provide unhealthy food. Several studies found that most primary school students received between 9 and 13 hours per year of nutrition education (Rizal & van Doorslaer, 2019; Teo, Chin, Lim, Masrom, & Shariff, 2019). Moreover, it was also discovered that teachers should provide nutrition education for at least 35 to 50 hours to change students' food consumption habits (Baute, Sampath-Kumar, Nelson, & Basil, 2018; Liu et al., 2018; Watts, Piñero, Alter, & Lancaster, 2012). Therefore, it is essential to have regulations to improve the effectiveness of the programme (Hood, Colabianchi, Terry-Mcelrath, O'Malley, & Johnston, 2013; McIsaac, Spencer, Chiasson, Kontak, & Kirk, 2019). Several studies believe that parents' knowledge, attitudes and habits related to nutritious food could affect their children's nutrition and become one of the factors causing malnutrition (McIsaac et al., 2019).

Since April 2019, DNLCSL has been implemented. However, after one year of implementation, the number of studies examining the programme implementation and effectiveness was limited. This research aimed at determining the effect of DNLCSL on the knowledge, attitudes and habits of elementary school students regarding balanced nutrition to prevent stunting in Bandung City, West Java Province, Indonesia in order to overcome these limitations.

2. THEORETICAL FRAMEWORK

2.1. Healthy Food Campaign at School

Each country has been developing methods to reduce the stunting rate through country-specific population growth to achieve the aforementioned global target (De Onis et al., 2013). Some studies showed that various intervention measures have been conducted and proven to be effective in changing students' food consumption

habits. Other research also found that a free lunch and breakfast programme was conducted by schools. Bhattacharya, Currie, & Haider, 2004; Evans et al., 2010; Kairiene & Sprindziunas, 2016; Walingo & Musamali, 2008) provided one-third of the daily nutritional needs of their students (Kupiainen, Hautamäki, & Karjalainen, 2009). Nutritional education also significantly encouraged students to consume fruits and vegetables (Ghattas, Choufani, Jamaluddine, Masterson, & Sahyoun, 2020; Hausner et al., 2008; Holley, Haycraft, & Farrow, 2015; Upton, Upton, & Taylor, 2013). In addition, it was also found that pre-service teachers trained also had self-efficacy in teaching healthy food (Hood et al., 2013). Efforts to increase healthy food literacy have been conducted through storybooks or novels encouraging children to consume healthy foods (Laureati, Bergamaschi, & Pagliarini, 2014; Sugiarto et al., 2019; Truman & Elliott, 2019). Another effort has also been made by reducing students' high energy density snack intake and increasing vegetable consumption in their homes through monitoring (Cravener et al., 2015; Wyse et al., 2010).

2.2. Behavior Modification

School-based nutrition education could affect children's nutritional health (Birch & Fisher, 1998; Halloran, Gorman, Fallon, & Tovar, 2018). Parent participation in nutrition education can be more successful by balancing the information learned at school with its application at home (Grutzmacher et al., 2018; Grutzmacher et al., 2019). School nutrition education should also involve stakeholders such as nutritionists, teachers and the media (Amahmid et al., 2020; Marlene, 2020). It is expected that nutrition education can improve nutritional knowledge and increase the amount and type of nutritious food consumed by students (Chaudhary, Sudzina, & Mikkelsen, 2020; Xu, Sawadogo-Lewis, King, Mitchell, & Roberton, 2021). Implementation of a coordinated HPS framework in the area of nutrition and diet is positively correlated with school teachers' nutritional knowledge and food intake. Behavior modification strategies were strategically integrated into community, school and family-based intervention programs with the objective of altering pivotal behaviours specifically, physical activity levels, television viewing habits and dietary choices associated with childhood obesity among third-grade students. The outcomes of these initiatives demonstrated their effectiveness in successfully reshaping children's eating patterns and enhancing their engagement in physical activities (Chen et al., 2010; Eisenmann et al., 2008).

2.3. Healthy and Nutritional Traditional Foods

Asia has a diverse array of traditional foods that stand out not only for their nutritional richness but also for their notable disease-preventive and health-promoting attributes. This exploratory documentation sheds light on the multifaceted benefits of these traditional culinary offerings (Evans et al., 2011). Certain traditional foods (rye bread) were treated as superior to certain other foods usually given to children (Karrebæk, 2012). Exploratory documentation reveals that traditional foods, prevalent across various cultures possess not only a wealth of essential nutrients but also offer substantial advantages in the realms of disease prevention and health enhancement (Harmayani et al., 2019). Numerous endeavours have been undertaken to promote the consumption of traditional, healthful foods through channels like newspapers and electronic media. However, the impact of these initiatives on real consumption patterns has been limited. It is imperative to devise educational outreach strategies that actively engage influential individuals within communities such as leaders and advocates as well as leverage the collective influence of healthy food community groups (Sumaedi & Sumardjo, 2021).

3. METHODS

3.1. Research Design

This research employed a mixed-methods approach, a combination of quantitative and qualitative approaches to obtain a comprehensive picture of the problems studied (Ivankova, Creswell, & Stick, 2006; Julia et al., 2020). The quantitative approach was used to obtain information about the effect of DNLCSL on the knowledge, attitudes and

habits of elementary school students collected through a questionnaire. Meanwhile, the qualitative approach was used to investigate the sources through face-to-face or direct interaction with research subjects. A qualitative approach was also employed to: a) describe the data concerning the effectiveness of the programme including planning, implementation and evaluation. b) Interpret the experiences of the stakeholders during the implementation of the program. c) Identify the obstacles to the program.

3.2. Setting and Participant

3.2.1. Quantitative

The study was conducted in Bandung City, West Java, Indonesia. The city was chosen because it was the first city to innovate in implementing a stunting prevention programme with the concept of local culture. The data were collected from elementary schools implementing DNLCSL in the North, South, West and East Bandung areas. The sampling technique used in this research is presented in Figure 1.

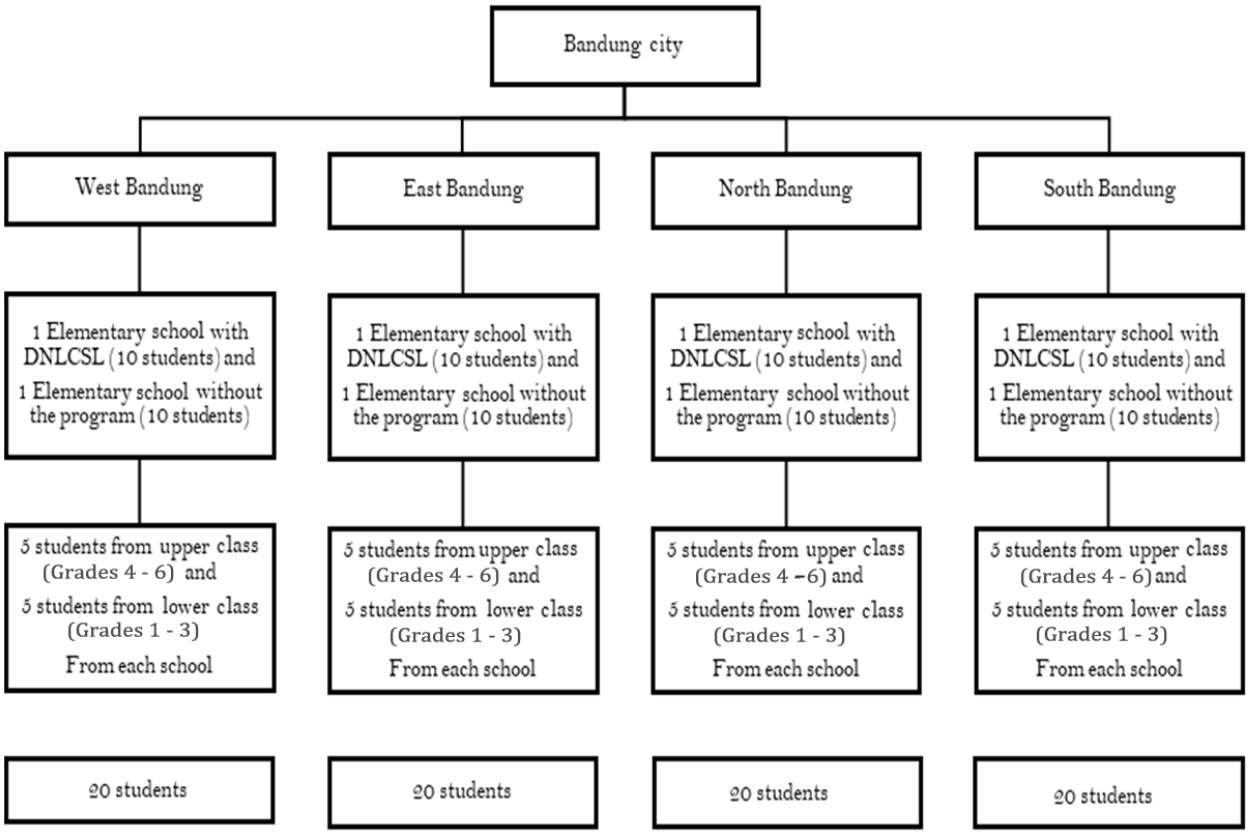


Figure 1. Respondent data and demographics are described as follows.

Table 1. Children's gender.

Respondent characteristics		DNLCSL program				Total	
		Participating		Not participating			
		f	%	F	%	f	%
Gender	Male	14	35.0%	18	45.0%	32	40.0%
	Female	26	65.0%	22	55.0%	48	60.0%
Total		40	100.0%	40	100.0%	80	100.0%

Table 1 shows that more respondents are female.

Table 2. Children's age.

Respondent's age		DNLCSL program				Total	
		Participating		Not participating			
		f	%	f	%	f	%
Age (Years)	6	0	0.0%	1	2.5%	1	1.3%
	7	4	10.0%	7	17.5%	11	13.8%
	8	11	27.5%	8	20.0%	19	23.8%
	9	7	17.5%	6	15.0%	13	16.3%
	10	5	12.5%	8	20.0%	13	16.3%
	11	12	30.0%	8	20.0%	20	25.0%
	12	1	2.5%	2	5.0%	3	3.8%
Total		40	100.0%	40	100.0%	80	100.0%

Table 2 shows that the proportion of children in elementary school who implemented the DNLCSL and those who did not implement the programme did not differ by age. The average respondents were in the age range of 7-11 years.

Table 3. Parents' educational background.

Level of education		DNLCSL program				Total	
		Participating		Not participating			
		f	%	F	%	F	%
Fathers' education	Elementary school	1	2.5%	2	5.0%	3	3.8%
	Junior high school	10	25.0%	5	12.5%	15	18.8%
	Senior high school or equivalent	20	50.0%	26	65.0%	46	57.5%
	Diploma-1	0	0.0%	1	2.5%	1	1.3%
	Bachelor	8	20.0%	5	12.5%	13	16.3%
	Master	1	2.5%	1	2.5%	2	2.5%
Total		40	100.0%	40	100.0%	80	100.0%
Mothers' education	Elementary school	7	17.5%	2	5.0%	9	11.3%
	Junior high school	10	25.0%	4	10.0%	14	17.5%
	Senior high school or equivalent	13	32.5%	27	67.5%	40	50.0%
	Diploma-1	0	0.0%	1	2.5%	1	1.3%
	Bachelor	10	25.0%	6	15.0%	16	20.0%
Total		40	100.0%	40	100.0%	80	100.0%

Table 3 shows that most fathers of students had a junior or senior high school education. Only a small proportion of respondents had primary and postgraduate education. Although the proportion of a mother's education was relatively the same as that of a father's, various mothers had primary education. The average level of education of parents of elementary school students who did not participate in the programme was higher than those who did not participate in the program.

Table 4. Parents occupation.

Occupation		DNLCSL program				Total	
		Participating		Not participating			
		F	%	F	%	f	%
Fathers' occupation	Private employees	6	15.0%	9	22.5%	15	18.8%
	Civil servant	2	5.0%	1	2.5%	3	3.8%
	Police	0	0.0%	1	2.5%	1	1.3%
	Other	9	22.5%	9	22.5%	18	22.5%
	Entrepreneur	23	57.5%	20	50.0%	43	53.8%
Total		40	100.0%	40	100.0%	80	100.0%
Mothers' occupation	Teacher	1	5.0%	0	0.0%	1	2.6%
	Housewife	34	85.0%	37	92.5%	71	88.8%
	Private employees	0	0.0%	2	5.0%	2	2.5%
	Civil servant	1	2.5%	0	0.0%	1	1.3%
	Entrepreneur	3	7.5%	1	2.5%	4	5.0%
Total		40	100.0%	40	100.0%	80	100.0%

Table 4 shows that half of the fathers were self-employed while the mothers were mostly housewives.

3.2.2. Qualitative

The participants (P) are the key people who are directly involved in the planning, implementation and evaluation of DNLCSL. The participant characteristics are described in Table 5.

Table 5. Participant characteristics.

No.	Participants	Code	Gender	Information
			M/F	
1.	Bandung city education and culture office (P1)	P1	M	Policymakers, supervisors of the implementation of education and culture program.
2.	Bandung city health office representative (P2)	P2	M	Programme planner for "DNLCSL".
3.	Community health centres (P3)	P3a	F	Promoting and monitoring the programme implementation in South Bandung.
4.		P3b	F	Promoting and monitoring the programme implementation in North Bandung.
5.		P3c	F	Promoting and monitoring the programme implementation in West Bandung.
6.		P3d	F	Promoting and monitoring the programme implementation in East Bandung.
7.	Elementary school (ES) principal (P4)	P4a	F	The person in charge of the programme implementation is an ES in South Bandung.
8.		P4b	F	The person in charge of the programme implementation is an ES in North Bandung.
9.		P4c	F	The person in charge of the programme implementation is an ES in West Bandung.
10.		P4d	F	The person in charge of the programme implementation is an ES in East Bandung.
11.	Elementary school teacher (P5)	P5a	F	The main implementer of the programme is an ES in South Bandung.
12.		P5b	F	The main implementer of the programme is an ES in North Bandung.
13.		P5c	F	The main implementer of the programme is an ES in West Bandung.
14.		P5d	F	The main implementer of the programme is an ES in East Bandung.
15.	Parents (P6)	P6a	F	Providing data related to students' lunch and snack box preparation before and after the implementation of DNLCSL in an ES in North Bandung.
16.		P6b	F	
17.				
18.		P6c	F	
19.		P6d	F	

3.3. Data Collection Method

3.3.1. Quantitative

Data on the knowledge, attitudes and habits of students who participated in the DNLCSL and those who did not participated in the DNLCSL were collected by means of a questionnaire adjusted to the child's grade level. For knowledge data, the questions given were related to knowledge about healthy balanced nutritious foods including: 1) types of foods containing carbohydrates, animal protein, vegetable protein, vitamins in various fruits and vegetables. 2) The urgency of food diversity, drinking mineral water, maintaining hand hygiene and physical activity. For the attitude aspect, the question items used a Likert scale with questions related to: 1) cognitive

aspects of breakfast and snack menus to be accepted and rejected based on the type, process of making, ingredients and dangers of unhealthy food. 2) Affective aspects of breakfast and snacks that tend to be liked and disliked based on their type, nutritional content, place and process of serving them and types of food substances that endanger health. 3) The conative aspect regarding breakfast and snacks that tend to be consumed in terms of the type of food and its content, cleanliness and efforts to choose healthy foods and beverages. For the habit aspect, the question items asked were related to food and drinks consumed repeatedly, the level of frequency or whether they were consumed automatically due to conditioning or their own desires based on the type and ingredients of various foods and beverages. All instruments were judged by nutritionists and education experts and tested to be valid and reliable.

3.3.2. Qualitative

The data were collected from July to September 2020 mainly through in-depth interviews and documentation studies. However, focus group discussion and field observations could not be conducted due to the COVID-19 situation which has forced the participants to work from home. The in-depth interviews were conducted by interviewing participants involved with the planning, implementation, monitoring and evaluation of the DNLCSL Program. In addition, in-depth interviews with parents, students, school principals, teachers, nutrition and community health centres staff were conducted at their house to create an open environment allowing the in-depth discussion to be conducted. Meanwhile, interviews with the Programme Planner (PP) of the Bandung City Health Office were conducted at the office.

The interviews were conducted using Sundanese (a regional language) to make participants more comfortable, allowing them to speak freely. During the process, the study was assisted by six interviewers from each area of the city. The interviewers were graduates of early childhood education studying nutrition and health with knowledge of psychology and the process of education and learning. The results of the interview were considered sufficient and the data triangulation was valid.

3.4. Data Analysis

3.4.1. Quantitative

Quantitative data from the results of the questionnaire was processed and analysed descriptively by first testing the validity and reliability of the questionnaire. Data with a normal distribution were presented as mean±standard deviation and analysed by a parametric test. Data with abnormal distribution were presented as the median (25%-75%) and analysed by a non-parametric test. The PLS test was conducted to obtain a structural model of the effect of the DNLCSL programme on changes in knowledge, attitudes and habits of students and parents. Furthermore, the interpretation of the model for drawing conclusions was carried out.

3.4.2. Qualitative

The analysis process was conducted continuously throughout the collection process. During the collection, the interviews were recorded and transcribed in the field. Categories and themes were designed by processing the data repeatedly until they succeeded in creating a complete set of themes to obtain valid data. In this case, the researcher collaborated with participants to reveal the emerging themes. The interview results with the same topic for different participants were observed for similarities and differences to interpret the data. If variations were discovered, more interviews were conducted to validate the data because of variations in implementation or perspectives while responding to inquiries. Then, the interview results were grouped according to the type of data. The data submitted by the health office was compared with the data from the community health centres, the school principals and the teachers. Next, the data suitability was checked to identify the similarities and differences

between the principals and the teachers of the school participants. The parent interview results were also categorized to be further analysed.

4. RESULT

4.1. Quantitative

4.1.1. The Effect of DNLCSL on Students Consumption Healthy Balanced Foods

Comparisons were made between upper and lower grade students from elementary schools implementing DNLCSL and upper and lower grade students from schools that did not implement DNLCSL from 4 areas in Bandung City to investigate the effect of DNLCSL on students' knowledge, attitudes and habits in consuming healthy balanced nutritious foods.

Table 6. Categories of knowledge, attitudes and habits of children.

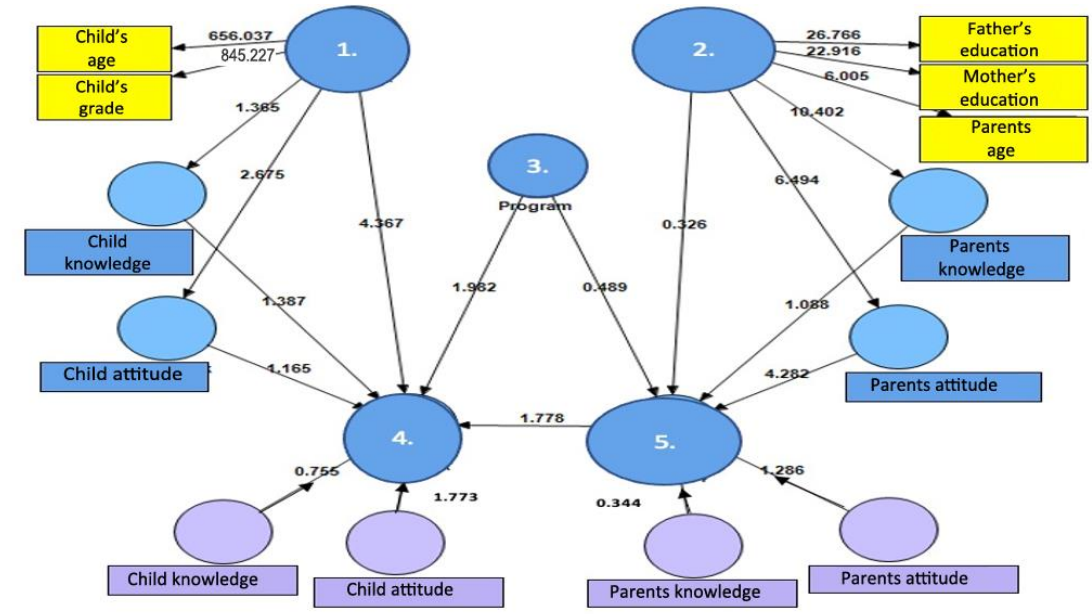
Categories		DNLCSL Program				Total	
		Participating		Not Participating			
		f	%	f	%	f	%
Categories of children's knowledge	Poor	13	32.5%	9	22.5%	22	27.5%
	Average	16	40.0%	13	32.5%	29	36.3%
	Good	11	27.5%	18	45.0%	29	36.3%
Total		40	40	100.0%	40	100.0%	80
Categories of children's attitude	Poor	0	0.0%	1	2.5%	1	1.3%
	Average	7	17.5%	3	7.5%	1	12.5%
						0	
	Good	33	82.5%	36	90.0%	69	86.3%
Total		40	100.0%	40	100.0%	80	100.0%
Categories of children's habits	7	17.5%	11	27.5%	18	22.5%	22.50%
	29	72.5%	27	67.5%	56	70.0%	70.00%
	4	10.0%	2	5.0%	6	7.5%	7.50%
Total		40	100.0%	40	100.0%	80	100.0%

Table 6 shows that the average knowledge of elementary school students about healthy balanced nutritious food and drinks is still in the sufficient category and about a quarter is still lacking. Students from elementary schools who were not participants in the DNLCSL program did not have better knowledge than students from elementary schools who were not participants in the DNLCSL program. Most of the students' attitudes towards healthy food and drink were in the good category. In terms of habits, it turned out that students from elementary schools who participated in the DNLCSL program had better habits of providing food and drinks to school than children from elementary schools who were not participants in the DNLCSL program.

4.1.2. PLS-MMGA to Observe the Effectiveness of the DNLCSL Programme

The grouping of these students into two groups was tested to investigate its effect on the structural relationship between knowledge levels and attitudes towards habits using Partial Least Square Multi group Analysis (PLS-MGA). Some researchers accommodated multigroup differences in this structural equation with moderator variables.

The comparison of the two groups of sample data showed the effect of the moderator variable on the casual relationship between the variables studied. In this research, the moderator variable was the distribution based on the application of the DNLCSL program as shown in Figure 2.



Description:
1. Child characteristics
2. Parents characteristics
3. Program
4. Child's habits
5. Parents habits

Figure 2. Effect of knowledge and attitudes on habits with programme moderation.

Table 7. Test results of the moderator variable.

Effect of the program	Original sample (O)	Standard error (STERR)	T statistics (|O/STERR|)	T table
Parent's knowledge * programme -> Parent's habits	0.037	0.108	0.344	1.665
Children's knowledge * programme -> Child habits	-0.073	0.097	0.755	1.665
Child attitude * programme -> Child habits	0.178*	0.100	1.773	1.665
Attitude of parents * programme -> Habits of parents	0.114	0.088	1.286	1.665

Note: *Significant at the 5% level.

Table 7 presents the results of the moderator variable test. The test results showed that the t statistics on the moderator variable of the programme on children's attitudes towards children's habits were greater than the t table (1.665) so it was concluded that the DNLCSL program had a significant effect on the effect of attitudes on children's habits related to balanced nutrition and healthy food provision. In terms of the comparison of the R2 values, the modelling results using the DNLCSL program moderator variable had a higher R2 (0.224) than without a moderator variable (0.175). These results can be seen in the attachment. This also indicated that the model using a moderator variable was better than that without a moderator variable.

Table 8. The effect of the DNLCSL program.

Effect of attitudes on children's habits	Path coefficient
The effect of attitudes on children's habits at schools that implement the program.	0.235*
The effect of attitudes on children's habits at schools that do not implement the program.	-0.056

Note: *Significant at the 5% level.

Table 8 shows that the results of the calculation of the path coefficient of the effect of attitudes on children's habits in schools implementing the DNLCSL program had a higher value than those in schools that did not

implement the DNLCSL program . This indicated that a change in attitude had a greater impact on habits in schools implementing the DNLCSL program than in schools that did not implement the DNLCSL program .

4.2. Qualitative

4.2.1. Local Culture-Based Stunting Prevention

According to the related documents, the campaign was conducted based on local culture. Bandung City Government officially launched the DNLCSL School Lunch Programme to improve children's nutritional quality. This programme aimed to reduce the stunting prevalence in the city by improving children's nutrition from an early age.

The DNLCSL program introduce nutritious food to children using "what's on my plate" features that consist of yellow spiced rice and various foods such as eggs, fried chicken, cakes made of potatoes, mashed potatoes, scrambled tempeh, vegetables and chilli sauce. The "what's on my plate" media (in the form of a circular plate) is divided into three parts, of which 1/3 have carbohydrates, animal or vegetable proteins and 1/3 are divided into two, 1/6 fruit and 1/6 vegetables. In this case, it contains basic foods that represent carbohydrates such as rice, bread, wheat and sweet potatoes in the bottom, vegetables and fruits in the middle and protein at the top. This programme also promotes a healthy lifestyle such as clean-living habits, physical activity and periodic monitoring of body weight. The health office also made an example of preparing a school lunch menu for one week (from Monday to Saturday). On the menu, all types of foods follow Sundanese culture in which ingredients are easy to obtain. For example, the lunch box on Monday should consist of fresh vegetables, bananas, brown rice, grilled pomfret fish and bitter ground shrimp.

The DNLCSL program is an innovative movement to prevent stunting developed by the Bandung City Health Office. This campaign aims at encouraging students to bring a homemade nutritious, well-balanced, tasty and low-cost lunch box. The principles of the lunch box are diverse, nutritious, well-balanced and safe. Diverse means combining different types of food that offer macro (carbohydrates, protein and fat) and micro (vitamins) nutrients. Well-balanced means the amount of food is according to the needs (age, gender, weight, activity and physiological condition). Safe means free from chemical, physical and biologically hazardous matters. Delicious refers to taste and composition preferred by children. Low-cost means affordable food using local knowledge and can be made by parents, canteens or catering that has received guidance.

Bandung City Education Office, Bandung City Health Office, nutrition staff of the community health centre, and school principals were asked, "Why does the elementary school need the DNLCSL programme?" The answers are presented as follows:

P1 "This programme was created by the health office to prevent stunting. The Education Office only acts as a supporter and facilitator to promote it from an elementary school to another " (June 2020)

P2 "This programme aims to promote well-balanced nutrition for elementary school students from an early age by changing their snacking and eating habits from consuming instant food to healthy local products " (June, 2020).

P3a "The DNLCSL programme is expected to provide balanced eating habits and understanding balanced portions " (July 2020).

P3b "Due to the high stunting cases in Bandung and to gradually change students' unhealthy snacking habits " (July 2020).

P3c " DNLCSL programme was launched to address the stunting issues " (July 2020).

P3d "By promoting DNLCSL programme, elementary school students are expected to bring their nutritious lunch box made by their parents and also to promote having a breakfast first " (August 2020).

P4a "DNLCSL programme is promoted because most street food vendors around elementary schools do not pay attention to the nutrition of the food they sell and also tell their parents to make their children consume healthy food for better growth " (July 2020).

P4b "Due to stunting cases among elementary school students in Bandung " (July 2020).

P4c "Because elementary school students are used to snacking and going without having a breakfast " (August 2020).

P4d "Because many students are snacking and to make them bring a home-made nutritious lunch box" (July 2020).

It can be inferred that the DNLCSL programme was developed to prevent and break the chain of high stunting cases caused by malnutrition. Thus, students will not experience any malnutrition-related issues when they become teenager. The DNLCSL programme promotes the habit of going to school with a healthy, nutritious and balanced lunch box made from local ingredients.

The programme was expected to change students' habits of consuming unhealthy food and encourage them to eat healthy, well-balanced and nutritious meals to habituate them to consume fruits and vegetables based on the study results of the DNLCSL programme initiator. This habit should not be difficult to nurture because Bandung is surrounded by areas producing vegetables and fruits, livestock and fish that are easy to obtain at low prices. Various Sundanese meals that are healthy and nutritionally balanced should be promoted to be consumed by children.

4.2.2. Developing Concerns to Prevent Stunting

DNLCSL programme promotion-related documents were collected to investigate the process of public awareness building on the importance of well-balanced and nutritious meals for students conducted by the Bandung City Government. Moreover, an in-depth interview was conducted with the head of the Bandung City Health Office in the field of nutrition and with the nutrition staff from the community health centre. The question was "what was the DNLCSL program planning process like?" Based on the answers from P2, P3a, P3b, P3c, and P3d (June, 2020), the findings revealed that the DNLCSL programme has been planned by the Mayor of Bandung since 2019 by involving various stakeholders. During the planning process, this programme was delegated to the Bandung City Health Office and was fully assisted by the elementary school institutions in four areas in the City of Bandung.

The success of this programme is an example of the synergy between institutions in handling stunting issues. Parents' and students' commitments and participations are the main reasons for the program's success.

In this research, their role in the programme was also investigated. They were asked, "What is your role in the DNLCSL program?" The participants gave the following answers:

P2 "Bandung City Health Office developed the program, prepared the materials and media for socializing and promoting DNLCSL programme and choosing which the elementary schools that would implement the program " (June 2020).

P3a "First, we made a list of which schools would implement the programme in North Bandung. Second, we collaborated with them and had a cross-programme with the community health centre. Third, we collaborated with sub-district offices to promote the program " (June 2020).

P3b "First, we choose which elementary schools have and have not implemented this program. Second, we promote the programme to all schools in the area" (June 2020).

P3c "We conducted a cross-sector promotion programme through workshops attended by sub-districts and schools' representatives in June 2019. Then, we promoted the programme to schools and parents" (June 2020).

P3d "Our main duty is to promote the programme to teachers, parents and students" (June 2020).

P4a "The person in charge and supervisor provide direction to the teacher " (July 2020).

P4b "To socialize the programme with teachers and students through certain activities" (July 2020).

P4c "Actively promoting the programme to teachers, parents and students" (July 2020).

P4d "Managing the activities of this programme to run properly" (July 2020).

According to the data, it can be concluded that the role of the Regional Technical Implementation Unit of Health of the community health centre was to brainstorm ideas related to the programme with the school, parents and students. On the other hand, the school principals acted as the person in charge in terms of implementation to monitor and evaluate the program.

In its implementation, the programme often found obstacles related to the competence of the classroom teachers in implementing the program. Therefore, the principal should motivate and direct them to achieve the program's goals.

To explore the next steps, the participants were asked, "How is the implementation of DNLCSL programme?" The participants gave the following answers:

P4a "DNLCSL programme is to be conducted almost every day for up to three months. The programme aims to make targets for each class " (July 2020).

P4b "This programme is conducted twice a week. Student should bring home-made lunch and eat it together in a room. It was scheduled to be twice a week" (July 2020).

P4c "The programme is conducted by class 1-3 that has to be done every day. For classes 4-6, it is conducted once a week together with physical education activities. The practice of eating together with classmates is managed by the class teacher " (June 2020).

P4d "The first step is collaborating with the school health clinic, teachers and PE teachers. Then, we promote it to the parents through teachers. Second, the homeroom teacher is asked to create an implementation plan " (June 2020).

P5a "First, during the first hour or lunch breaks, if students are about to go to their home, they are asked to make a programme about the menu in their home. Second, we monitor students every morning at the school gate, checking whether they bring their lunch or not. Third, every Saturday we are given directions on nutrition " (July 2020).

P5c "Teachers immediately implement the programme and they make a programme about students' lunch boxes or snacks" (July 2020).

P5b As a teacher, I promote the programme to the students and parents. Furthermore, plan a schedule and menu for the lunch box and check whether it meets the nutritional standards or not and discuss it with parents " (June, 2020).

It may be concluded from the data that different schools use different implementation strategies. It also showed that the process included balanced and nutritious food promotions for students by involving teachers and parents. The school principal was the decision-maker in the process of socializing and promoting the program. The school principal's policy by involving various internal and external school parties affected the process of dissemination and promotion of healthy and balanced nutrition for students.The DNLCSL programme can be more well-known and effective in managing stunting difficulties if more parties participate and play an active role. The stages of socialization and implementation of the DNLCSL programme as a nutrition campaign to promote healthy and balanced eating and snacks are described in Figure 3.

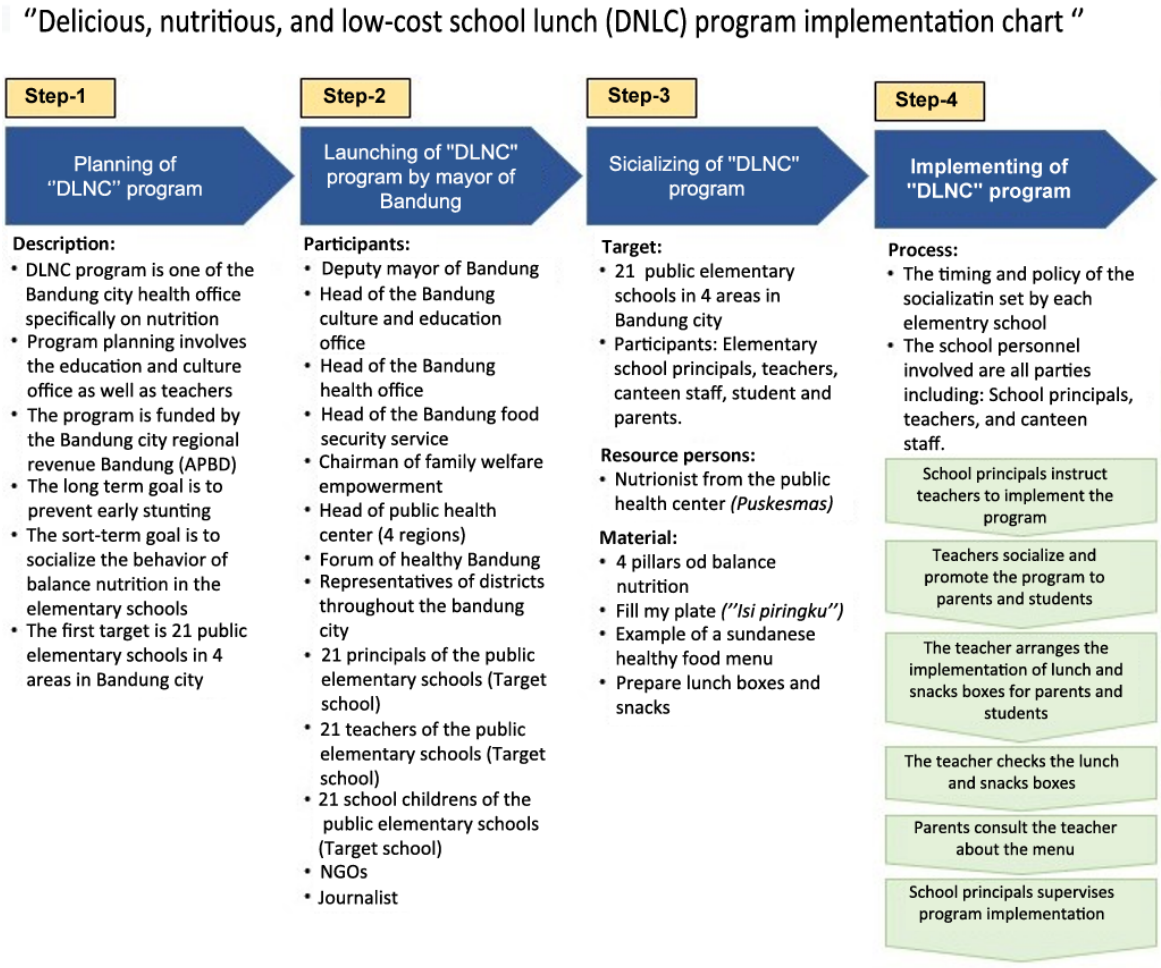


Figure 3. DNLCSL implementation process.

4.2.3. Changing Children' and Parents' Habits

Interview sessions were conducted with teachers and parents to determine the impact of the programme on changing students' eating habits. The participants were asked, "what is the impact of the DNLCSL implementation?" The participants gave the following answers:

P5a "Schools can successfully implement the programs with effective collaboration between teachers and parents. Teachers motivate students to bring nutritious and healthy lunch boxes and snacks to school. Parents are essential for the programme to be successful because of their responsibility and support. brought by the students is nutritionally balanced and healthy" (July 2020).

P5b "The programme is fully supported because parents understand the purpose of this program and understand nutritious food " (July, 2020).

P5c "The programme has yet to be successfully implemented with all students" (July 2020).

P5d "Busy parents prefer to give pocket money instead of making their lunch boxes "

P6a "I think a homemade meal is good, so students will not be snacking too much, thus saving their money. Students can only bring food from home but, I am busy with work, so this programme is a bit of a hassle for me because I have to cook " (July 2020).

P6b "The programme is very good if it continues to be implemented" (July 2020).

P6c "A good programme could save money but, I will be busy" (July 2020).

P6d "My child's snacking habit is reduced just a little" (July 2020).

The success of the programme in changing the students' and parents' eating and snacking habits was highly dependent on the cooperation of school personnel and the parents. The school that had successfully implemented the programme had been able to change the parents' habits. Although some parents were overwhelmed, they responded positively to the program. The confession of parents who were too busy to prepare a nutritious and healthy lunch box came from their inability to prepare a lunch box that followed the teacher's suggested menu. Meanwhile, parents who had prepared them admitted that they had received the benefits as they could change students' bad snacking habits and encourage them to eat nutritious, well-balanced and low-cost foods. According to a teacher (P5a), the habituating process of consuming a healthy and well-balanced nutritious lunch box corresponding with the local menu had an impact on "the students' diet at home that could affect parents preparation of healthy and nutritious meals for their families".

4.2.4. Supporting and Inhibiting Factors for Programme Implementation

4.2.4.1. Inhibiting Factor

Several things hindered the effectiveness of the DNLCSL programme. For example, the health office could not run the programme if it did not get permission and support from the school. On the other hand, schools could implement the programme consistently if the city education office supervised them. To find the other factors, the head of the Bandung City Health Office in the nutrition field, nutrition staff from the community health centre and the elementary school principals were asked "are there any inhibiting factors in the implementation of DNLCSL?" Several statements suggested that the inhibiting factor of the programme was caused by the school principals who refused to implement it since they did not fully comprehend its urgency. It could also be caused by parents who did not have the time to prepare lunch and snack boxes. In addition, they seemed to think that the programme was burdensome. It could also be caused by teachers who did not consistently implement the programme so they could not comprehend its impact on preventing and breaking the stunting issues' chain.

From the data, P4a had implemented the programme for nine months by involving several school personnel and collaborating with the parents. In addition, they also had conducted healthy and well-balanced nutritious meals promotion to the canteen staff. It was stated that there were no obstacles on implementing the program. P4a believed that DNLCSL program had succeeded in changing the students' and parents' habits in consuming food and snacks.

4.2.4.2. Supporting Factor

Several school principals and teachers were asked about the factors that determine the success of the program to identify the supporting factors. P4a stated that "schools can successfully organize the programs if there is synergetic cooperation between teachers and parents. The teacher supports this by having a special policy to ensure that students bring well-balanced and healthy lunch to school " (July 2020). On the other hand, P5a stated that "parents' awareness concerning their children well-balanced and healthy diet determines their awareness of their children's foods and snacks " (July 2020).

According to the findings, it can be concluded that the DNLCSL programme could successfully change the students' habits if it started with forming a caring attitude towards the stunting prevention programme among teachers, parents, canteen staff and students. Moreover, teachers were required to promote healthy and well-balanced meals for the students to the parents. On the other hand, school principals were required to make regulations to discipline the provision of meals and snacks followed by promotional activities in the school.

5. DISCUSSION

The DNLCSL programme was proven to be able to change elementary school students' habits in eating and drinking nutritious and healthy food and drink. This change is quite important to prevent children from experiencing stunting or to be one of the programs to break the chain so that stunting does not continue. A sustainable effort is required because the programme is intended to prepare excellent human resources for the future. The DNLCSL programme can be considered strategic because it is based on local culture. Thus, it makes the programme easier to disseminate to all levels of society in Bandung, most of which are Sundanese.

The programme is in line with studies that have been conducted in other countries. A children's nutrition intervention strategy can be implemented at the local level (Dorado et al., 2020). In addition, there are differences in the nutritional status of children due to geographic and socioeconomic factors. Furthermore, planning, implementation and evaluation of food and nutrition programs should be based on needs and outcomes at the district city level (Di Cesare et al., 2015).

The DNLCSL programme target is elementary school students which is an important stage in nurturing their habits and they will habituate them if they are repeated (Houtveen, Rietveld, Schoutrop, Spiering, & Brosschot, 2001). To achieve its long-term goals, changing its well-being-related habits is important. Studies showed that schools often ignore habituation activities and prefer cognition, metacognition and mental development (Fiorella, 2020). In nutrition education, teachers, parents and caregivers have an important role in forming their students' dietary habits and knowledge (Cotton, Dudley, Peralta, & Werkhoven, 2020). It is an accurate move to choose elementary school students as the target for preventing stunting cases because they have a higher risk of consuming unhealthy food. It was found that there are at least two million people per year affected by foodborne and waterborne diseases including children. Most of these unhealthy foods were being sold in the street and most of them were contaminated by harmful bacteria, viruses, parasites or chemical compounds that cause more than 200 diseases including diarrhoea and cancer (Kamala & Kumar, 2018). Primary school students are the most vulnerable group to food poisoning. During elementary school age, they spend much time away from their parents and their friends influence them about food consumption at school (Kigaru, Loechl, Moleah, Macharia-Mutie, & Ndungu, 2015). Most of the time, it stems from the daily school snacks that will give negative short and long-term effects (Beets, Tilley, Kim, & Webster, 2011). The data shows that 60% of school snack quality was unhealthy and unable to meet the quality standard to support children's growth and development. The food and drug administration survey found that 45% of elementary school snacks were potentially dangerous and could be confiscated.

The DNLCSL programme needs to address the stunting issues through school institutions that involve various parties including principals, teachers, canteen staff and parents. Schools have an important role to educate and promote a healthy diet among students (Dudley, Cotton, & Peralta, 2015). External assistance is urgently required

to provide them with healthy meals to improve the nutritional needs of students from low-income families (Walingo & Musamali, 2008). A successful school would be able to create a healthy school climate striving for their students to have a healthy diet (Lucarelli et al., 2014). The early years of childhood are a great opportunity to establish healthy dietary patterns (Bell, Edwards, & Grieger, 2015). However, knowledge of nutrition and a healthy diet is not enough to change children's habits. Thus, it is important to nurture a healthy consumption habit from early childhood (Kigaru et al., 2015). Education, knowledge and practice about nutrition are interrelated and inseparable efforts. Nutrition education provides parents and children with the required knowledge about a healthy diet (Bhattacharya et al., 2004). Therefore, it would be important to teach elementary school students about nutrition to increase the effort effectiveness. In addition, teachers are an important factor for the programme to be successful (Cotton et al., 2020; Laureati et al., 2014). The free breakfast programme prepared by the school is beneficial for students coming from low-income families in different locations of the country (Bernstein, 2004).

The habits of unhealthy eating and drinking, including snacking could have been developed since the early age of elementary school due to parenting style. However, these bad habits can be changed in a supportive environment. The habit of unhealthy eating is related to the gustatory or the perception of the flavour system which would be difficult to change without proper treatment (Verhoeven, Adriaanse, Evers, & De Ridder, 2012). This research proved that habits that was nurtured since early childhood can also be changed because they have to adapt to a new environment. In this case, three concepts of the habit development process are required that include environmental cues, routine and harmony because the environment can trigger a habit (Chen et al., 2010).

6. CONCLUSION

The DNLCSL programme which has been implemented for one year has been able to change some participating elementary school students' snacks and eating habits. In addition, the programme has been able to increase parents' nutritional awareness. In several elementary schools, the programme has not been implemented according to the plan due to various obstacles. To be successful, the programme has to be continuously implemented according to the plan with measurable monitoring and evaluation processes supported by all parties. It was found that the DNLCSL programme could improve knowledge, attitudes and habits concerning students' diet which could indirectly prevent stunting issues.

7. SUGGESTION

The DNLCSL Programme was recommended to other elementary schools through collaboration with the health office, education office, school principals, class teachers, parents and school cafeteria officers.

Funding: This research is supported by Southeast Asian Ministers of Education Organization Regional for Food and Nutrition (Grant number: 005c/RECFON-SK/II/2020).
Institutional Review Board Statement: The Ethical Committee of the Universitas Islam Bandung, Indonesia has granted approval for this study on 16 May 2020 (Ref. No. 117/KEPK-Unisba/V/2020).
Transparency: The authors state that the manuscript is honest, truthful, and transparent, that no key aspects of the investigation have been omitted, and that any differences from the study as planned have been clarified. This study followed all writing ethics.
Competing Interests: The authors declare that they have no competing interests.
Authors' Contributions: All authors contributed equally to the conception and design of the study. All authors have read and agreed to the published version of the manuscript.

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