

# Nutrition Education Using my Plate Media to Improve Self-efficacy and Parental Support towards Children in Full-day Primary School and Non-Full-day Primary School

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# Nutrition Education Using my Plate Media to Improve Self-efficacy and Parental Support towards Children in Full-day Primary School and Non-Full-day Primary School

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## ABSTRACT

Nutrition education approach is one of many ways that can be done to change people behavior, mainly regarding in health. There is still lack of nutrition education towards school children by the school because of human resource, facilities, and financial matters. Nutrition education using MyPlate media can help children to choose nutritious food. Nutrition education were given by attractive counseling using audio-visual and cooking demo based on MyPlate food guide. Balanced meal nutrition education using MyPlate are expected to be internalized inside children' mind. Participants of this study were 50 students from public and private primary school in Surabaya. Data for this study were gathered using pretest and posttest. Pretest was given before and posttest was given after nutrition education process in order to evaluate the result. To compute the data ANOVA statistical test was used. The use of ANOVA statistical test revealed that after nutrition education, students' knowledge towards MyPlate concept significantly increase in each food group: main food ( $p$ -value=0.004), vegetable ( $p$ -value=0.002), and water ( $p$ -value<0.001). Moreover, nutrition literacy score and literacy about MyPlate also significantly increase with each of it has  $p$ -value<0.001. This study showed that there was significant improvement in children literacy about MyPlate food concept before and after nutrition education process has given.

**Keywords:** Children-school age, MyPlate, nutrition education, balanced nutrition

## INTRODUCTION

Children around the world suffering malnutrition. More than 25% children in third world countries are stunted<sup>(1)</sup>. Stunted children cannot grow well. Stunted children have shorter height compare to normal children in their age. Moreover, stunted in children associated with sub-optimal brain development causes weakening in brain cognitive development, study and career achievement in the future<sup>(2)</sup>. The majority of developing country experienced nutrition phenomena known as

nutrition transition. Nutrition transition happened when the population adopting modern lifestyle while social-economy, urbanization, and acculturation aspect are emerging<sup>(3)</sup>. Popkin (2002) suggested that double burden of malnutrition in household correlated to urbanization. When urbanization occurred, household family income increased and affected their ability to buy more food, there is an increase in quantity but not in quality. Energy-dense food but low micronutrient and protein effect children's growth, especially in children height. Meanwhile in the side of mothers, if mothers eat high-dense food but do low physical activity then the risk of obesity and weight-gain will be higher. As the fourth most populated country, Indonesia undergo double burden of malnutrition. Prevalence of stunted children in Indonesia was 36,8%, 35,6%, and 37,2% consequently in 2007, 2010, and 2013<sup>(5)</sup>.

Mothers play important roles in supporting family nutritious intake. It is important, in a way that most

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of mothers are known to prepare and arrange food for their family. In the early stage of life, children are not able to choose their own food, therefore mothers play role in here, to help them choose the right and nutritious food. Savage *et al.* (2008) stated that parents powerfully shape children's early experiences with food and eating, providing both genes and environment for children. Children's eating patterns develop in the early social interactions surrounding feeding<sup>(6)</sup>. In Indonesia, balanced food recommendation previously socialized in 2009 by the Ministry of Health. Specifically, they promote MyPlate concept which regulated in PERMENKES. However, people especially mothers are still lack of understanding in implementing MyPlate concept. MyPlate is a reminder to find our healthy eating style and build it throughout our lifetime. MyPlate emphasizes five food groups: fruits, vegetables, grains, protein, and dairy products. Consuming balanced each of these food groups as recommended in MyPlate helps to build and maintain healthy bones<sup>(7)</sup>.

Nutrition education is one thing that can be done to changes one's behavior especially towards health. We see that it is important to introduce nutrition education to young people especially children school-age. Nutrition education in school age best given when collaborates with community who interact mostly with the kids, which is school. In line with Bezerra *et al.* (2017) statement that school can act as an enabling environment for the promotion of healthy eating behaviors and the practice of physical activity. Unfortunately, in Indonesia, there is still lack of nutrition education towards school children because of the lack of school resources such as human resource, facilities, and financial matters. The involvement of the school community represents a main role in social support to children and adolescents<sup>(8)</sup>.

Al-Muslim school is one of institution that served full-day school concept and had been declared as 'Healthy Promoting School' since 2008. They applied green education concept and nutritious food implementation to their student. Meanwhile, SDN Sidotopo Wetan I is a public school run by the government of Surabaya. This school is not full-day school thus they don't provide any lunch activity together. Therefore, MyPlate concept never been socialized in SDN Sidotopo Wetan I. Compare to Al-Muslim, the number of student in SDN Sidotopo Wetan I is larger. Hence, activity to improve student's literacy about MyPlate concept is needed importantly, looking at large number of students in SDN

Sidotopo Wetan I who unfamiliar with MyPlate concept.

<sup>20</sup> The objective of this study is to improve children self-efficacy, MyPlate and nutrition literacy also parents support towards nutritious food intake for their children using MyPlate concept. To improve and change ones' behavior, especially children, the programs must be fitted into the family, school, and community setting, in order to improve effectiveness<sup>(9,10)</sup>. To effectively promote healthy nutrition in children school age, we must better understand the determinants of their behaviors and change in these behaviors. One important theory of behavior change is Bandura's Social Cognitive Theory (SCT). Bandura's SCT is an interpersonal theory that emphasize mutual interactions of persons, behavior, and environment<sup>(11)</sup>. The SCT is relevant to health communication. SCT provides a framework for designing, implementing and evaluating programs. Evaluating behavioral change depends on the factors environment, people and behavior. The SCT includes all constructs that are both internal to individual (e.g., self-efficacy, goals) as well as external (e.g., social support, environmental influences)<sup>(12)</sup>. All of the three factors, environment, people, and behavior are constantly influencing each other. Behavior is not simply the result of the environment and the person, just as the environment is not simply the result of the person and behavior<sup>(13)</sup>. The theory deals with cognitive, emotional aspects and aspects of behavior for understanding behavioral change. The concepts of the SCT provide ways for new behavioral research in health education. Ideas for other theoretical areas such as psychology are welcome to provide new insights and understanding.

In this study, we try to improve children self-efficacy to change the behavior to consume nutritious food. Self-efficacy is fundamental to the process of behavior change in that confidence in ones' abilities can provide the motivation necessary to follow through with a change in behavior. Self-efficacy conceptualizes a belief in personal capabilities to organize and execute the courses of action required to attain a behavioral goal<sup>(14)</sup>. Additionally, self-efficacy is important because it influences several other SCT variables<sup>(13)</sup>. Consistent evidence indicates that self-efficacy is a mediator of behavior change Bandura suggested four specific antecedents of self-efficacy beliefs: enactive mastery experience, vicarious experiences verbal persuasion and physiological/affective states<sup>(15)</sup>. According to Bandura (1997) nutrition interventions will be more successful if they strengthen individuals' knowledge of the topic,

improve environmental factors, encourage self-efficacy, develop the use of self-regulatory, and the interventions are appropriately prepared for demographic groups. In this study, we highlighted three antecedents in Bandura's SCT to improve self-efficacy in AI-Muslim and SDN Sidotopo Wetan I, mastery experience, verbal motivation, and vicarious experience. These three strategies then elaborated into education activities given to students. We expected there will be positively correlation between nutrition educations about MyPlate and student's improvement in self-efficacy and also parental support.

**MATERIAL AND METHOD**

**Site and Subject of Study:** This study done in two different places, AI-Muslim Fullday Private School and Sidotopo Wetan Non-Fullday Public School. The participants of this study were 50 school-children in each school who divided into 5 groups consist of 10 students. In each group, there was one nutrition educator as a guide during education process. This nutrition educator played a role to help and ensure children to be aware and understand about MyPlate concept. Students and mothers who participated in this study in informed consent. This study has been approved by The Health Research Ethics Committee of Faculty of Public Health Airlangga University with registered number 159-KEPK and date of approval 26 April 2017.

**Pre and Post-Test:** The design of this study is using single-group pretest and posttest design. Assessment of pretest was done before intervention given. Assessment of posttest given after the children received nutrition education. To determine initial associations among the nutrition education, student's self-efficacy and parents support, Pearson product-moment correlations were estimated using SPSS (v.21.0). Afterward, to compute the data t-test and ANOVA statistical test were used.

**FINDINGS**

The result of ANOVA statistical test showed significantly improvement in students' food grouping competence and literacy after the nutrition education intervention was delivered. The p-value result of the variables showed positive correlations. Students' ability in classifying different food groups was improved. As can be seen in table 1, in main meal food grouping the p-value=0.004, vegetable p-value=0.002, and water

p-value<0.001. Moreover, nutrition literacy score and MyPlate literacy score was significantly increase with each p-value<0.001.

**Table 1: Chi Square Statistical Test Result**

Variable	Pre-test		Post-test		Chi Square p-value
	n	%	n	%	
<b>Grouping for Staple Food</b>					
Correct	49	50.5	68	70.1	<0.001
Incorrect	48	49.5	28	28.9	
<b>Grouping for Vegetables</b>					
Correct	81	83.5	93	95.9	0.018
Incorrect	16	16.5	3	3.1	
<b>Grouping for Fruit</b>					
Correct	69	71.1	69	71.9	<0.001
Incorrect	28	28.9	27	28.1	
<b>Grouping for Side-Dish</b>					
Correct	76	78.4	76	79.2	0.001
Incorrect	21	21.6	20	20.8	
<b>Grouping for Water</b>					
Correct	14	14.4	36	37.1	<0.001
Incorrect	83	85.6	60	61.9	
<b>Grouping for Sugar Salt and Fat</b>					
Correct	86	88.7	88	90.7	<0.001
Incorrect	11	11.3	8	8.2	

In table 2, increased MyPlate literacy score from 3.97 to 4.48, nutrition literacy score from 2.36 to 3.96, and self-efficacy score from 149.69 to 168.43. P-value of both total score in MyPlate and Nutrition Literacy is <0.001 which mean there was correlation between the nutrition education and total score in MyPlate and Nutrition literacy. But, in self-efficacy the p-value 0.385.

**Table 2: ANOVA Statistical Test Result**

Variable	Pre-test		Post-test		ANOVA p-value
	Mean	SD	Mean	SD	
Total Score for My Plate	3.97	1.05	4.48	1.17	<0.001*
Total Score for Knowledge	2.36	0.96	3.69	1.05	<0.001*
Total Score for Self-Efficacy	597.73	149.69	617.70	168.43	0.385

Al-Muslim had higher average score rather than Sidotopo Wetan I considering most of the Al-Muslim students were already aware about health information. Posttest assessment in Sidotopo Wetan I was increase significantly, more students acquired better score in MyPlate literacy. This result might be affected because of participants' characteristics. In Sidotopo Wetan I, most participants were 6<sup>th</sup> grade which could contribute to better comprehension. Meanwhile, Al-Muslim participants had more disparity from 3<sup>rd</sup> until 6<sup>th</sup> grade students.

For the posttest in nutrition literacy, the average score of nutrition literacy in Al-Muslim students were higher compare to Sidotopo Wetan I. The average score in Al-Muslim was in 3 meanwhile Sidotopo Wetan I was in 2. Therefore, we can conclude that there was significant improvement from pretest to posttest score about nutrition literacy.

Al-Muslim score was increase into 5, which was the maximum score and so did as Sidotopo Wetan I which improve into 4. There was significant improvement in Sidotopo Wetan I meanwhile Al-Muslim did not increase as significant as Sidotopo Wetan I. Nutrition literacy in both school were significantly improved after nutrition education was given.

Outcome of this study is to change students' behavior with parental support to be able to consume nutritious food based on MyPlate food guide. To start eating healthy from such early stage of life will reflects in adolescent health status. Healthy eating habit will help dealing with the complexity of the health problems in adolescents' life stage.

Both school improved in before and after intervention showed on pretest and posttest score. However, Sidotopo Wetan I public school showed more significant improvement in pretest and posttest score compare to Al-Muslim private school. It may be related because before intervention, Sidotopo Wetan I students were less aware about health, compare to students in Al-Muslim private school who were previously familiar about health. Al-Muslim private school had practicing eco-green education as a health promoting program since 2008. Therefore, Al-Muslim's students will likely have better comprehension about nutrition literacy rather than Sidotopo Wetan I public school. Thus, when education was given, Sidotopo Wetan I showed more significant improvement. However, in posttest result, Al-Muslim had higher score rather than Sidotopo Wetan I.

It is related to Al-Muslim healthy school practices since 2008, it encourages students to be more aware about health and it is reflected in posttest score compare to Sidotopo Wetan I.

Although there was score improvement with self-efficacy but there was no association between the intervention given and the improvement. It might be occurred because of the duration of intervention was not long enough to give the impact. In this study, nutrition education was given for one-month long. Meanwhile, some studies gave longer duration. Study conducted by Murimi *et al.* (2017) occurred for 5 months and succeed in improving self-efficacy in school children. Also, study by Jarpe-Ratner *et al.* (2016) found that ten-weeks nutrition education to student was effective in improving children's self-efficacy. Thus, in the future researchers can considered to give longer duration to increase and improve self-efficacy towards school children.

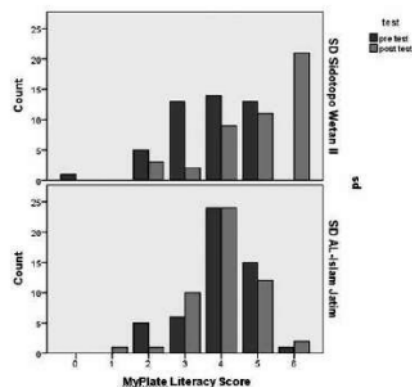


Figure 1: MyPlate Score Differentiation Before and After Intervention

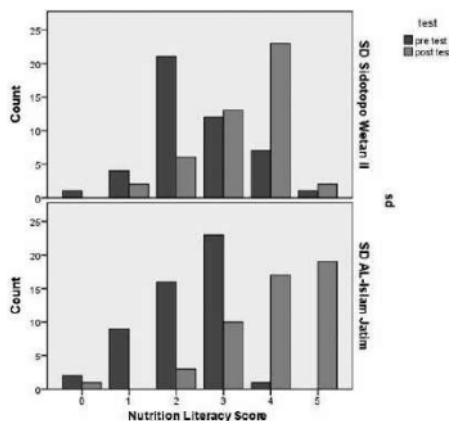


Figure 2: Nutrition Literacy Score Differentiation Before and After Intervention

## CONCLUSION

Nutrition education based on social cognitive theory is an effective model from which to explore influential construct of health behavior. Intervention using nutrition education with MyPlate media and attractive activities give significantly improvement in nutrition literacy and MyPlate literacy of students in private and public school. Longer duration of intervention might be needed to significantly improve children's self-efficacy,

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**Ethical Clearance:** This study is approved by The Health Research Ethics Committee at Faculty of Public Health Universitas Airlangga

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