

To eat or not to eat junk foods? Improvement in children's intention to reduce junk foods consumption following exposure to a media literacy intervention

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ABSTRACT

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Exposure to junk food information leads to high junk food consumption among children. This situation has raised concerns among agencies and organizations mandated to ensure children's health because high junk foods consumption results in several health problems. This study aimed to ascertain the effects of a media literacy intervention on elementary school children's knowledge, attitude towards junk foods, subjective norm, perceived behavioral control, and intention to eat junk foods and consume junk foods. Treatment groups included analysis+analysis, analysis+production, and no intervention. Children who underwent the analysis+production approach had significantly higher improvement in their attitude, subjective norm, perceived behavioral control, and intention during the post-test and the delayed post-test than those in the analysis+analysis approach and those not treated with any intervention. Results suggest that the analysis+production approach could improve children's knowledge of junk foods' health impacts and reduce their attitude towards eating junk foods, subjective norm, perceived behavioral control, and intention to eat junk foods. Overall findings indicate that initiatives aimed to encourage children to eat nutritious foods need repetition of the message. Aside from curriculum integration, engaging parents and application of game-based learning are also potential mechanisms for improving children's food habits.

Keywords: anti-junk food initiatives, healthy food promotion, behavioral change, children's food habits

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INTRODUCTION

Encouraging children to eat healthy foods remains a challenge for agencies, organizations, and groups tasked to promote children's good health. Part of the reasons for this difficulty is the natural appeal of junk foods to children brought about by food advertisements disseminated through television, in-school marketing, product placements, kid's clubs, the internet, toys, and products with brand logos, posters, radio, billboards, newspaper, magazine and youth-targeted promotions, such as cross-selling and tie-ins (Story and French 2004, Food and Water Watch 2012).

Among the health impacts of heavy junk food consumption is obesity. While arguing that obesity is a multifaceted problem, Boulos et al (2012) pointed out that intensive television viewing and television advertisements serve as heavy contributory factors to childhood obesity. Dietz and Gortmaker (1985) also showed a significant and positive correlation between television viewing hours and obesity among children. Barr-Anderson et al (2009) found that children (aged between 10-19) who watch television for more than 5 hours a day since childhood had lesser fruit, vegetables, whole grain, and calcium-rich food intake and had higher sugar-sweetened beverage consumption five years later than their peers who had lesser number of hours spent in viewing television a day. These developments pose a serious problem because obesity is a significant contributor to chronic diseases, including cardiovascular diseases, type 2 diabetes, and some cancers (Park et al 2012).

Given the ill effects of advertisements on children's health, there is a need to counteract media advertisements' effects. Among the potential methods is the use of media literacy intervention. Briefly, media literacy covers one's ability to analyze and develop messages of various forms critically. In general, media literacy programs aim to improve the audience's understanding of the media messages they encounter daily (Jeong, Cho and Hwang 2012). Media literacy interventions improve people's ability to comprehend, analyze, evaluate, and, consequently, make reasoned choices about these messages (Quesada, Miller and Armstrong 2000).

Several studies have proven the effectiveness of media literacy in changing young people's attitudes toward risky health behaviors. For example, the meta-analytic review by Vahedi et al (2018) showed that media literacy interventions have a positive effect on adolescents' attitudes and intention to initiate substance use, smoking, and risky sexual behavior. Kupersmidt et al (2010) also reported that after exposure to a media literacy intervention, elementary school-aged children have shown a significantly lesser interest, intention, and improved self-efficacy towards alcohol-branded merchandise and other substances. Lucidi et al (2017) also added that adolescents aged 13-19 showed a decrease in a positive attitude towards doping and a reduction in their use of legal performance and appearance-enhancing substances (PAES).

Currently, two media literacy intervention approaches are popularly applied -- analysis+analysis and analysis+production. The analysis approach enables participants to examine media messages critically (Banerjee and Greene 2007). Another strategy is to combine analysis and production. In this approach, participants experience analyzing and producing media messages. Information on message design and production develops participants' understanding of the design and production of media messages and how the components of the production

To eat or not to eat junk foods?

interact to produce effects in the audience (Banerjee and Greene 2007). In terms of cognitive processes, however, Banerjee and Kubey (2013) noted that the production approach is more effective in eliciting more attention than the analysis approach.

In the Philippines, less has been done to apply media literacy interventions to reduce children's junk food intake. Likewise, the effectiveness of the analysis and production approaches to media literacy intervention has not yet been explored. In this paper, we report a reduction in children's intention to eat junk food following their participation in a media literacy intervention.

METHODOLOGY

Research Setting and Respondents

This study aimed to determine the effects of media literacy intervention strategies on children's attitudes toward junk foods. It tested the hypothesis that the analysis+analysis, analysis+production, and control groups are significantly different in attitude, subjective norm, perceived behavioral control, and intention measures at the immediate post-test and delayed post-test.

The MLI was designed and implemented in three communities in Baybay City (10.6521°N, 124.8526°E). These communities have access to junk foods as they are sold in stores throughout the communities. These communities receive clear signals from national TV and cable TV channels. Children, therefore, could watch advertisements for junk foods. Likewise, posters featuring junk foods are posted in strategic places in these communities. These communities are also accessible to transportation.

The respondents were composed of 90 children aged 9 to 13. Wilcox et al (2004) pointed out that children at this age have already developed the ability to distinguish the motives and aims of an advertisement.

Before the implementation of the research activities, we obtained permission from the parents and sought the consent of the barangay captains to conduct the study.

Research Design and Data Gathering Procedure

Conducted within 4 weeks, this study applied the quasi-experimental research design. More specifically, it used the two-group pre-and post-test design. It included three treatment groups-- analysis+analysis, analysis+production, and a control group (Table 1).

Table 1. Treatment groups and schedule of activities

Group	Time 1 (Week 1)	Time 2 (Week 2)	Time 3 (Week 3)	Time 4 (Week 4)
T1 - Analysis + Analysis	Pre-test	Analysis I	Analysis II + Post-test	Delayed post- test
T2 - Analysis + Production	Pre-test	Analysis I & II	Production + Post-test	Delayed post- test II
No Intervention (Control)	Pre-test		Post-test	Delayed Post- test

¹In the Philippines, the barangay or village is the basic political unit. A barangay is headed by a captain.

Data Collection

Pre-test. The pre-test was administered before the intervention. Respondents were asked to answer a questionnaire to find out their socio-demographic variables, exposure to information on the ill effects of junk foods on their health, knowledge of the ill effects of junk foods, attitude towards junk foods, and intention to eat junk foods.

Intervention Phase. The intervention was implemented in a classroom setting. Following the procedures by Banerjee and Greene (2007), respondents were exposed to the media literacy intervention activities such as a discussion on different media persuasion strategies and awareness of junk food consumption and its effects on human health (Box 1).

Box 1. Media literacy intervention activities applied in this study (Adapted from Banerjee and Greene 2007)

Lesson 1 (Analysis 1). How persuasive strategies work. In this lesson, the different media persuasion strategies and concepts were explained. The participants were asked to look at a sample ad and were asked the following questions:

- For whom do you think is this advertisement intended? Why did you say so?
Does this encourage you to (do the action suggested by the ad)?
- In your opinion, how much did the company spend to produce this ad?
- On TV, what ads do you usually see?

Sample stimulus advertisements:



Lesson 1.2. The participants were introduced to the different persuasion strategies used in ads. Samples shown on endorsements were: glamour/sex appeal, having fun with family, being part of a group, and humor/unexpected. Each sample was expounded on for a better understanding of the concepts of persuasion strategies. In the discussion, the participants were asked:

To eat or not to eat junk foods?

- Who is the intended audience of this ad?
- What effect will this have on you?

Lesson 1.3. As a group, participants answered the following:

- What is the message of each ad? What persuasion strategy was used in each ad?
- Who is the intended audience of each ad?
- What do you think are the potential effects of the ad on its audience?

Lesson 2 (Analysis II). Analysis of advertisements. The class was divided into 5 groups with 6 members. Another set of sample ads was shown, and the participants were asked to:

- Identify the persuasion strategies
- The intended audience for each ad
- Potential effects of these ads on the audience (ie, they will eat more junk foods, etc.)

Lesson 2.2. The pro-junk food ads were shown and students were asked, "What is missing in the ad?" The following questions were asked:

- What is the persuasive strategy?
- Who is the intended audience?

Lesson 2.3. While the participants were looking at the ad, they were asked: "What is missing in the ad?" Then, some of the sample anti-junk foods ads were shown, and the missing points in the pro-junk foods ads were discussed. The following questions were asked of the groups:

1. What is the message of each ad? What persuasion strategy was used in each ad?
2. Who is the intended audience of each ad?
3. What do you think are the potential effects of the ad on its audience?
4. What do you think is missing from each ad?

Lesson 2.4. An interactive discussion of the adverse effects of junk foods was done. In this discussion, a nurse served as the resource person.

Lesson 3 (Production). Planning and producing the poster. As a group, the participants were asked to plan an anti-junk food poster. The participants were asked to fill in this activity sheet:

Main message:
Intended audience:
Illustrations to put in the poster:

Lesson 3.2. Once the plan is approved, the group can now proceed with the design and production of their posters.

Lesson 3.3. The group leaders presented their posters to the class. The participants were asked to vote for the best poster. More importantly, they were asked about what they have learned from the activities.

Post-test. Three weeks after the pre-test, the post-test questionnaire was administered. The items in the post-test were similar to that in the pre-test questions.

Delayed Post-test. The delayed post-test was administered four weeks after the pre-test. The purpose of this delayed post-test was to determine whether the effects of the MLI are lasting or fleeting. In addition, it examined the impact of an intervention on the participants' junk food consumption (Quirk et al 1998, Hewson et al 2001).

Measurement of Variables

The variables, attitudes towards eating junk foods, subjective norm, and perceived behavioral control were gathered using a 5-point Likert scale (5–strongly agree; 1–strongly disagree). In this study, the attitude was defined as the extent to which a respondent has a favorable or unfavorable evaluation of junk foods. An example of the item was, "I like eating junk foods because of their taste."

Subjective norm referred to the perceived social pressure to perform or not to perform a behavior; in this case, not to eat and to quit eating junk foods. Sample items were, "Most children, like me, eat junk foods. I should eat too" and "My favorite cartoon characters eat junk foods; I eat junk foods too."

Perceived behavioral control was defined as the respondents' perceptions of the factors that encourage and prevent them from eating junk food. Sample items were, "When offered, I accept and eat junk foods and "It is mostly up to me whether or not I will eat junk foods."

To measure changes in intention to reduce the consumption of junk food, the respondents' current attitudes under the section of the stage of change and intention were measured following the transtheoretical model by Prochaska and Velicer (1997). Based on their responses, respondents were classified as belonging to pre-contemplation, contemplation, preparation, action/maintenance, and improved attitude (Figure 1).

In the contemplation stage, people do not intend to take action in the future (defined as within the next 6 months). In this stage, people seem to disregard the pros of changing behavior and attend too much to the cons of changing behavior.

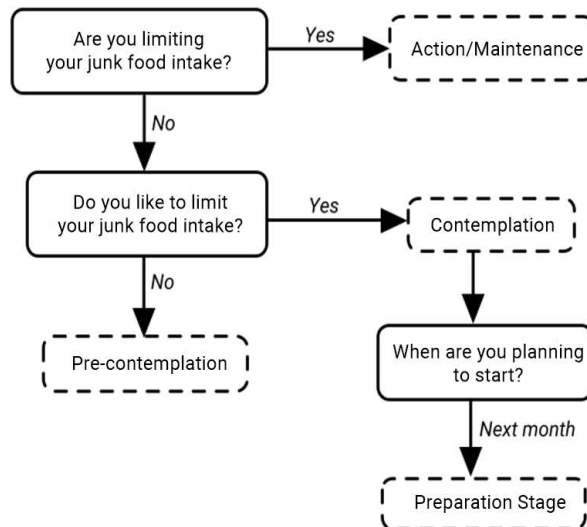


Figure 1. Method for classifying the stages of change following the transtheoretical model

To eat or not to eat junk foods?

At the contemplation stage, people intend to start healthy behavior in the future (defined as within the next 6 months). People are already aware that their behavior may be problematic, and more thoughtful and practical consideration of the pros and cons of changing the behavior occurs, with an equal emphasis placed on both. Even if they recognize it, people are still confused about whether to change their behavior or not.

During the preparation (determination) stage, people are ready to take action within 30 days. They are assumed to start to take small steps toward behavior change, and they believe changing their behavior can lead to a healthier life. At the action stage, people have already changed their behavior (defined as within the last 6 months) and intend to keep moving forward with that behavior change.

When people have sustained the behavior change for a while (defined as more than 6 months) and intend to maintain the behavior change going forward, they have reached the maintenance stage. People in this stage work to prevent reversion to earlier stages.

Data Analysis

Respondents' socio-demographic characteristics were analyzed using descriptive statistics. Changes in knowledge, attitude, subjective norm, perceived behavioral control, and the intention was analyzed using the univariate ANOVA. The paired t-test was applied to determine the improvement in respondents' knowledge of the ill effects of eating junk foods, changes in attitude towards eating junk foods, subjective norm, perceived behavioral control, and intention to eat junk foods.

RESULTS AND DISCUSSION

Socio-Demographic Profile of the Respondents

Almost half (44.33%) of the respondents belonged to the age bracket of 9-10 years old. More than a third (37.11%) were 11-13 years old while almost one-fifth (18.56%) were 7-8 years old. Most of the respondents (52.6%) were female. The respondents were composed of students from Grade 4 (28.9%), Grade 5 (22.7%), Grade 6 (33%), and Grade 7 (15.5%). Their average daily allowance was PHP20.00. A big number (77.32%) had an allowance ranging from PHP1-10.00.

Effects of the MLI on Intention to Reduce Junk Food Consumption

Effects of the media literacy intervention were measured in terms of knowledge of the ill effects of junk foods, attitude towards eating junk foods, subjective norm, perceived behavioral control, and intention to reduce junk foods. Results are presented in Figures 2 and 3.

In terms of knowledge, the univariate ANOVA showed a highly significant difference in the mean incremental scores among analysis+production, analysis+analysis, and control groups at Time 2 (T2), post-test, a week after the analysis+analysis, and analysis+production groups have undergone media analysis ($F_{2,87}=287.778, p<.01$). The post hoc analysis using LSD showed that analysis+production and analysis+analysis groups were significantly different from

each other (MD=4.33, $p<.01$). Moreover, the analysis+production group was significantly different from the control group (MD=6.00, $p<.01$). At T3, the ANOVA did not show any significant difference among the three groups.

The ANOVA also showed a significant difference in the respondents' subjective norm ($F_{2,87}=4.62, p<.05$). The post hoc analysis using LSD further showed a significant difference between the control group and analysis+production (MD=.687, $p<.05$) and between the control group and analysis+analysis group (MD=.68, $p<.05$). However, at T3, the ANOVA did not show any significant difference among the three groups.

A significant difference was also found in respondents' perceived behavioral control ($F_{2,87}=7.131, p<.05$). The post hoc analysis using LSD further revealed a highly significant difference between the control group and analysis+production (MD=.975, $p<.01$). At T3, the ANOVA results did not show significant differences among groups.

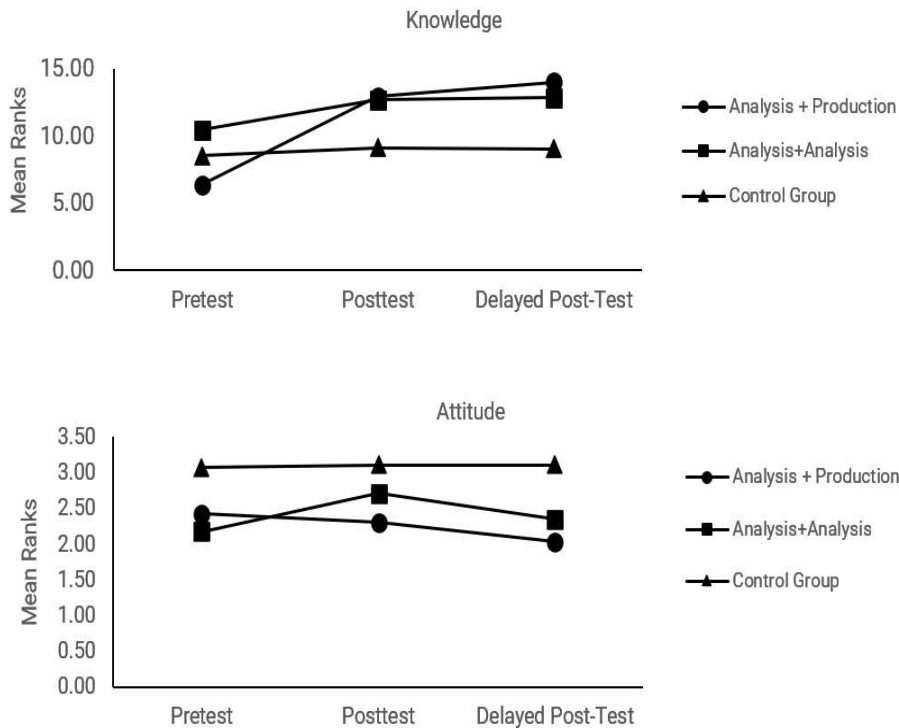


Figure 2. Changes in respondents' knowledge of the ill-effects of eating junk foods and attitude towards eating junk foods

In terms of intention to reduce eating junk foods, the ANOVA showed a significant difference between T2 and T3 ($F_{2,87}=3.233, p<.05$) and ($F_{2,87}=3.144, p<.05$, respectively). The post hoc analysis using LSD further showed a significant difference between the control and analysis+production groups (MD=-.633, $p<.05$). The post hoc analysis showed a highly significant difference between analysis+production and analysis+analysis groups at T3 (MD=-.6333, $p<.01$).

To eat or not to eat junk foods?

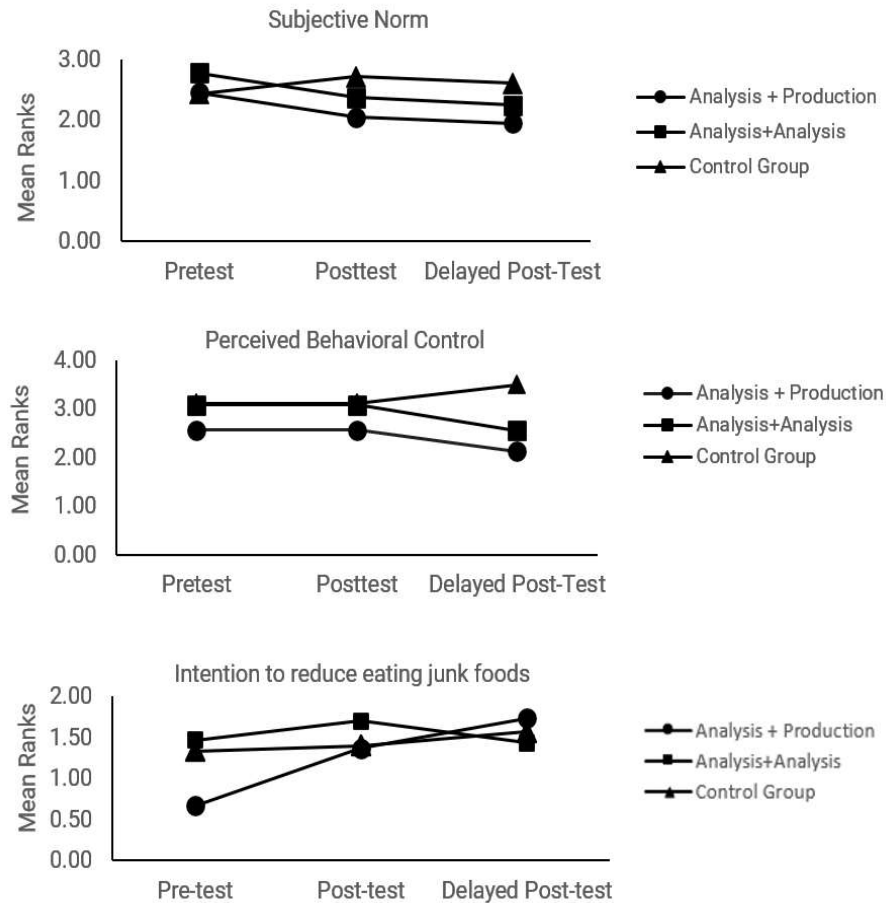


Figure 3. Changes in respondents' subjective norm, perceived behavioral control, and intention to reduce consumption of junk foods

Changes in Children's Intention to Reduce Eating Junk Foods

During the pre-test, the analysis+production group had the highest number of respondents who had "no intention" to reduce the intake of junk foods. However, in the post-test, the analysis+analysis group had the lowest number of respondents classified under pre-contemplation and had the highest score in the preparation stage. In the analysis+production group, a decrease in the number of respondents falling under the pre-contemplation stage was observed. The control group showed a fluctuating trend with slight changes in the stages of change (Figure 6).

During the delayed post-test, all three groups had an equal number of children falling under the pre-contemplation stage. The analysis+production group showed the lowest score under the contemplation stage and had the highest score in the preparation stage among the three groups. The analysis+analysis group, however, showed the highest score for contemplation but the lowest in the preparation stage. The control group had a slight change in terms of the contemplation stage (Figure 6).

The analysis+production group showed higher improvement on all dependent measures at the post-test and delayed post-test. The effectiveness of this approach could be due to the nature of interaction experienced by the children – that

is, they had the opportunity to experience analyzing messages and producing their own to counteract the dominant media messages. This result suggests that given the appropriate venue and methods, children could learn how to evaluate messages and exercise sound judgment on the information they encounter daily. There is, therefore, a scope for media literacy interventions if the goal is to develop children's skills to understand messages and make a sound judgment.

Similar findings have emerged in previous research. An example is a study by Liao et al (2016) that focused on food advertising literacy intervention on children's food purchasing behaviors. The study revealed an increase in the participants' nutritional knowledge and their food purchasing behavior at a 1-month follow-up.

Banerjee and Greene (2007) also found a significant reduction in smoking-related attitudes, norm, and behavioral intentions among adolescents following their participation in the analysis+production media literacy intervention. More specifically, their findings revealed that the planning group (where participants discussed, analyzed, and created their own anti-smoking ads) developed negative attitudes towards smoking and had lower intentions to smoke. The group which underwent analysis (where participants discussed and analyzed cigarette and anti-smoking ads) reported having less favorable smoking attitudes and intentions compared to the control group which did not undergo such intervention.

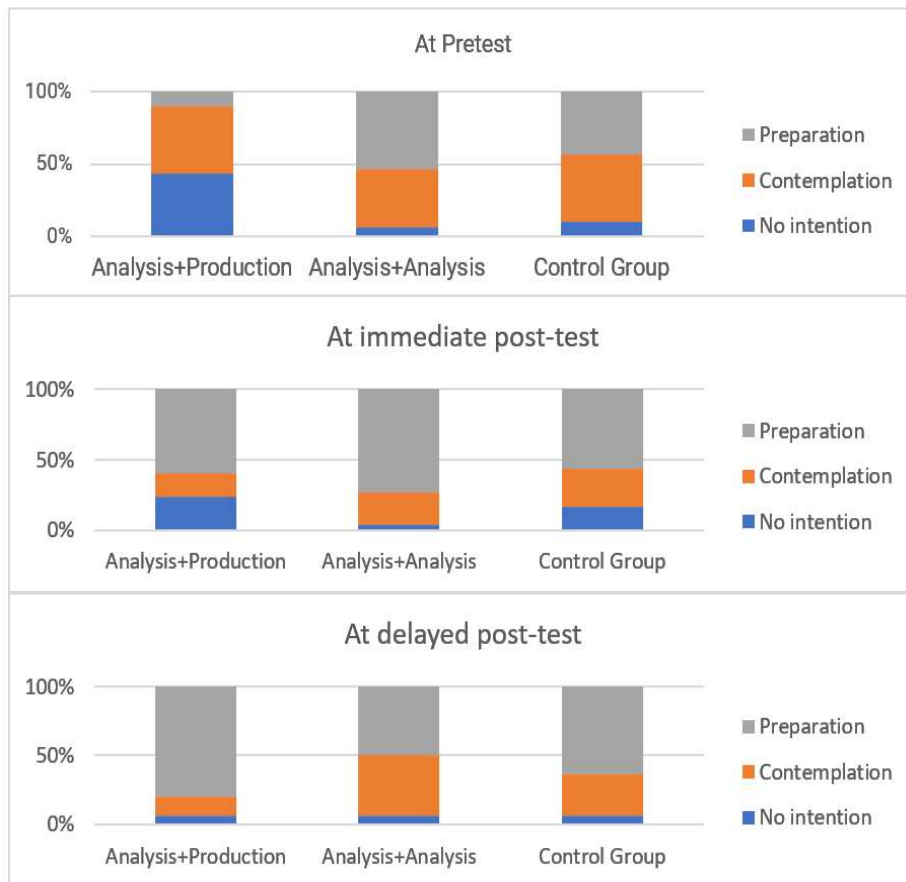


Figure 4. Children's pre-test, post-test and delayed post-test scores under the TTM scale

To eat or not to eat junk foods?

Anti-Junk Foods Messages Created by Children

Aside from changes in the psycho-social variables, this study also involved the creation of anti-junk food messages by children. These messages were conveyed through posters and were analyzed based on their themes and features.

Themes of the Posters. Participants created four posters. The thematic analysis revealed three themes from these posters. The first theme was "*Eat healthy foods like fruits and vegetables*". In this theme, participants suggested that fruits and vegetables are nutritious, and therefore, should be eaten by everyone.

The second theme was "Junk foods are unhealthy". The poster showed a muscular boy. The children said that the boy's muscular body is due to his consumption of nutritious foods such as fruits and vegetables.

The third theme was "*Do not eat junk foods*". Here, the poster compared two persons that rely on junk foods and the other, on nutritious foods. The drawings showed that the person who eats junk food is obese, and the other person who eats healthy food, is a healthy and fit person.

Features of the Posters. Among the most observable attributes of the posters were the persons on the poster. Half of the characters were male and half were female and the majority of the characters were children. Meanwhile, half of the posters depicted an image of friendship.

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Half of the group portrayed eating on top of the table, while half were conversing with the other person or directly with the audience. The majority of the posters compared children eating healthy food and children eating junk food. It is shown that children who eat healthy food are physically healthy, with flexed muscles, and lean. On the other hand, those children who eat junk food are portrayed as obese represented by protruding stomach. Other details are shown in Table 2.

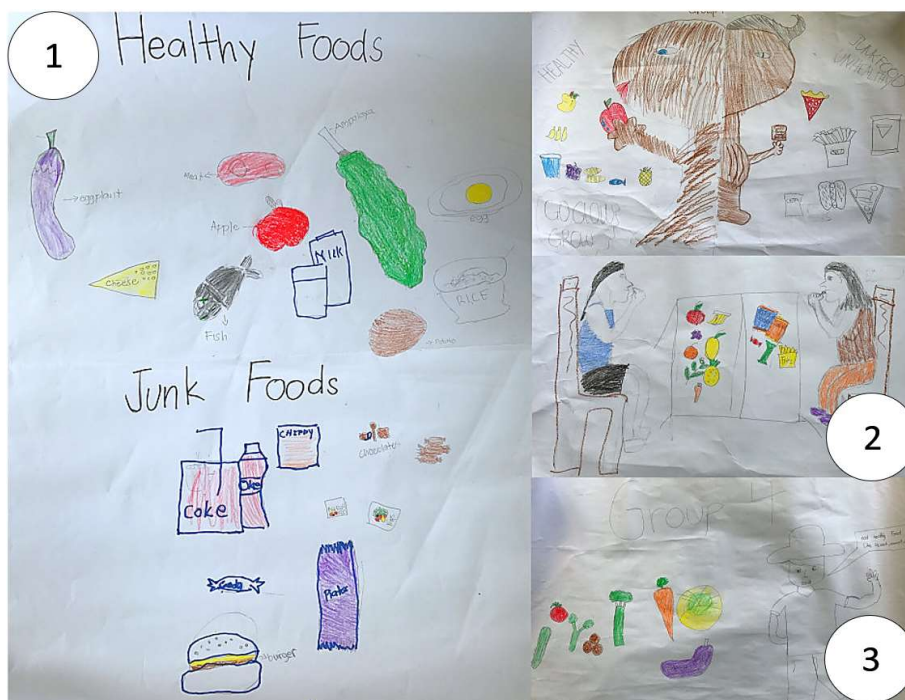


Figure 7. The poster with the theme, “Eat healthy foods like fruits and vegetables” (1), “Junk foods are unhealthy” (2) and “Do not eat junk foods” (3)

Table 2. Features of the posters created by the participants.

Variables	Frequency
Persons on the poster	
Male	6 (50%)
Female	6 (50%)
Children	9 (75%)
Friends	6 (50%)
Actions portrayed by the characters	
Eating on a table	6 (50%)
Conversing with the other characters	6 (50%)
Comparison between eating healthy foods and eating unhealthy foods	9 (75%)
Food Items Present on the Posters	
Vegetables	9 (75%)
Fruits	9 (75%)
Protein Foods	6 (50%)
Junk foods	9 (75%)
Healthy and unhealthy foods	9 (75%)
Aesthetic Value	
Use of Colors	12 (100%)
Dominant colors	
Red	3 (25%)
Green	6 (50%)
Yellow	3 (25%)

CONCLUSION AND RECOMMENDATIONS

This study demonstrated the effectiveness of the analysis and analysis+production approach to media literacy. Their effects were sustained until the delayed post-test, a week after the immediate post-test. This finding suggests that when messages that are potentially harmful to children's health are looming large, strategic interventions like the analysis+production workshop provide a scope for changing children's perceptions, attitudes, and behavior.

The posters containing anti-junk food messages portrayed children, friendship, and happy faces. From these results, it is safe to suggest that materials designers may consider focusing on happy children and friends when developing children's materials. For comprehensibility, the material may employ comparison techniques to convey the ill-effects of junk food and the benefits gained from maintaining a healthy lifestyle such as eating protein-rich foods, fruits, and vegetables. The materials may capitalize on such colors as green, which evokes health and being healthy. It may also include colors like red, yellow, and orange to add emphasis and easily attract their intended audience's attention.

The messages created by the group of children in this study may be used as anchors by health agencies and organizations in developing communication materials to discourage the intake of junk foods by children. Research highlights that messages created by those who have similar characteristics to the intended audience have a higher likelihood that these messages will be more effective.

The poster-making session can also serve as a springboard for a child-developed media campaign. The posters designed by children may be posted in strategic places in schools and in the communities. Evans et al (2006) argued that media literacy intervention through a child-developed media campaign could change children's home nutrition environment and a potent strategy in altering parental behavior.

The findings of this study emphasize that the positive effects of MLI could be strengthened if messages promoting the desired behavior is repeated. As suggested earlier, posters that counteract junk food advertisements may be posted on campus and in the community where the children live in.

Parents and other caregivers may also be tapped in promoting a healthy diet for children. Given the advent of digital media, designing a game and later on installed as an application in mobile phones is also a potential strategy. More importantly, communities, groups, and the scientific community may advocate for implementing policies restricting the printing and airing of food advertisements in the mass media.

More studies need to be conducted to generate more information that can improve our understanding of how media literacy interventions could facilitate the development of healthy behaviors among children. One potential research is a replication of the present study, covering more respondents and communities. It should be noted that the current study involved 90 children only from rural communities. Another weakness of the study is the lack of random sampling of the respondents.

Aside from replicating this study, there is also a need to design media literacy research to find out changes in adolescents' risky behaviors, including drug abuse, alcoholism and tobacco smoking, and taking medication for weight loss and maintaining physical stamina (Mallia et al 2020).

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To eat or not to eat junk foods?

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