

*Communicating the Indonesian Dietary Recommendations:
Lessons Learned From Boarding School*

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Abstract

Monotonous meals are commonly provided at boarding schools in Indonesia with poor nutritional value and a lack of variety. As part of the Environmental Nutrition Program, this study was conducted to raise awareness of the importance of a balanced diet among female boarding high school students. We set out to improve Indonesian students' nutritional knowledge using mixed communication methods including a poster, booklet, and interactive session. A quasi-experimental study was conducted at two boarding high schools, one intervention school (IS) and one control school (CS). Nutritional education (NE) was delivered at the IS that covered the effects of food on health, nutrient sources, food groups, and dietary recommendations. NE was run over eight weeks, with two weeks for each topic. Data on nutritional knowledge were collected before and after NE using a validated questionnaire with binary response options (correct, incorrect). Student's T-test and the Mann-Whitney U-test were applied to analyze the data. A total of 57 IS and 56 CS female students were recruited. Baseline data showed no difference in students' knowledge between the schools. However, there was a significant increase in nutritional knowledge at the IS after NE compared to the CS ($M_{IS}=78$, $SD=9.3$; $M_{CS}=72$, $SD=7.2$; $P < 0.001$). Positive feedback was received on all communication methods, and the poster was found to have been the most effective, especially for communicating dietary recommendations. Our study suggested that a poster can increase school students' declarative nutritional knowledge, while two-way communication is effective at enhancing their procedural nutritional knowledge.

Keywords: Students, Boarding School, Nutritional Knowledge, Communication, Indonesia

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Introduction

Adolescence is a life stage where a good foundation of health can be constructed. Demanding autonomy, adolescents made effort to do activities as they wish including health-related ones. It is common, particularly among high school students, that peers become their priority and lead to unhealthy dietary practice (Roshita et al., 2021). Recent national health survey supported it as over one-third of highschool-aged adolescents in Indonesia consumed sugary drinks, savory and oily foods more than once every day (Ministry of Health, 2018). However, recent study argued that engaging with peer was also benefited adolescents to understand difficult information by explaining those with common term of their age (Sharif Ishak et al., 2020). Literacy on food and nutritional knowledge among adolescents was then suggested enabling adolescents to make healthier choice and yield better health outcome (Thomas et al., 2019).

Previous studies explained that student's nutritional knowledge associated with the consumption of nutrient-dense food and less consumption of unhealthy food (Oddo et al., 2022). Furthermore, female student was having higher nutritional knowledge and was applying healthier lifestyle than male as they concerned about health as well as appearance (Gaylis et al., 2020; Husain et al., 2021).

Heretofore, various activity and media use such as lecture, leaflet, poster exhibition, peer-led nutrition education as well as an internet-based was done and provided an increase on high school student's knowledge of food and nutrition in the intervention study (Oddo et al., 2022; Sharif Ishak et al., 2020). Unfortunately, in boarding schools where stricter of non-curricular activities regulation apply, the effect of an intervention aiming nutritional knowledge change remained unclear. Therefore, this study aims to explain nutrition education delivery methods with nutritional knowledge change among female students in boarding high school settings.

Methods

a) Study Design and Participant

This present study was a part of a quasi-experimental of the Environmental Nutrition Program (ENP) on female boarding high school students. ENP purposively selected two boarding highschools with 100% face-to-face learning, full-service kitchen, and willing to participate throughout the study period as intervention school and control school. Participant recruitment started at school level with inclusion criteria e.g. female student grade 10 to 11, willing to participate, and collected parent's consent by the time baseline measurement took place. Students who had dietary restriction and/or chronic disease, or failed to complete all the measurements were excluded from data analysis.

This study was approved by The Research Ethics Review Committee Chulalongkorn University (#245/2021) and Health Research Ethics Committee Fakultas Kesehatan Masyarakat Universitas Muhammadiyah Jakarta (#10.353.B/KEPK-FKMUMJ/XI/2021).

b) Intervention

ENP was a nutrition program at school wherein used an environmental approach to support balanced meal consumption of female high school students in a boarding school setting. ENP in general consisted of several activities, including (1) the use of uniform food serving tools,

(2) Nutrition Fact display, (3) food and nutrition information display, (4) body weighing awareness, and (5) photovoice activities. This paper however is aimed to explain particularly on food and nutrition information display.

Food and nutrition information (Nutrinfo) was developed based on Indonesian dietary guidelines (Ministry of Health, 2014) and covered topics related to dietary recommendation, nutrient and sources, food group, and food effect on health. Each topic of Nutrinfo was provided in the form of 1 squared meter (banner) and A4 size posters. Banners were posted on a wall in the dining hall where students were facing the wall while queuing for food, and on a wall right beside the tuck shop where students usually get their snacks. A4 posters were inserted in the acrylic stand and 6 of them were displayed on the dining table where participating students were seated during mealtime. Nutrinfo was timely posted with an interval period of 2-weeks for each topic to catch students' attention by presenting different topics with fresh design. In addition to banner and A4 poster display, an interactive session was held emphasizing on a simulation to read food label under dietary recommendation topic and timeline. Altogether, students were exposed to Nutrinfo for 8-weeks period from February to April 2022.

c) Measure

Nutritional knowledge was assessed using researcher-made general nutrition knowledge questionnaire (GNKQ) following Indonesian dietary guideline (Ministry of Health, 2014). GNKQ was validated applying inter-objective congruence (IOC) of 3 experts and pre-tested to 30 non-participant students. GNKQ featured dichotomous answer (correct/incorrect) and consisted of 45 questions with Kuder Richardson formula (KR-20) value of 0.7 by which acceptable. Nutritional knowledge score was collected as percentage of the total correct answers and total questions with 100 as the full score. Student characteristics e.g., date of birth (to calculate age in year) and major (science/social) were also obtained with a self-administered questionnaire.

d) Data Analysis

Data analysis was performed using SPSS version 28.0 (Chulalongkorn University license) and the significance was set at *p-value* <0.05 with 95%CI. Descriptive statistics were provided explaining participants' characteristics. Nutritional knowledge at baseline was tested using Mann Whitney-U test for comparability. At post intervention, intragroup differences were tested using student's paired t-test for normally distributed data and Wilcoxon test for skewed data and inter-group differences were tested using student's independent t-test for normally distributed data and Mann Whitney-U test for skewed data. Furthermore, effect of Nutrinfo was examined using linear regression model wherein coefficient value indicates nutritional knowledge change overtime in the intervention group.

Results

A total of 113 female students were enrolled in the study, 57 students in intervention school and 56 students in control school. Student's mean of age was 15.7 years old (SD=0.7) and 76.1% of them were majoring science subject. At baseline, students from both schools had the same level of nutritional knowledge (*p-value* = 0.48, Table 1). Students in the intervention school showed an increase in nutritional knowledge after intervention compared with baseline (mean difference = 6.45, *p-value* < 0.01) and had a higher nutritional knowledge than those in control school after intervention (mean = 78.1, *p-value* < 0.01).

	Baseline	After intervention	Mean difference	P-value
	Mean (SD)	Mean (SD)	(95% CI)	
Intervention	71.6 (7.6)	78.1 (9.3)	6.45 (3.7; 9.2)	< 0.01 ‡
Control	70.9 (7.5)	72.4 (7.2)	1.47 (0.7; 3.6)	< 0.01 ‡
P-value	0.48 ^a	< 0.01 ^a		

a: Mann-Whitney U test. ‡: paired Student's t-test. †: Wilcoxon test

Table 1: Student's nutritional knowledge before and after intervention

Lessons Learned

A study aiming to increase nutritional knowledge among female high school students is beneficial to help them having consideration on health and applying it in daily life. Female adolescent not only is prone to nutrient deficiencies but also has to prepare their nutritional status for conception. However, boarding schools with tight schedule were hardly making time for session outside school curriculum. Internet and gadget access was also restricted in most boarding school in Indonesia, including the school where the present study was conducted. These aforementioned situations demanded an effective nutrition education in which less burden on educators' and students' time.

This present study suggested that banner size and multiple posters could be the alternative on delivering a vast and hassle-free food and nutrition information to the students in a boarding school setting. A recent study at the same boarding school setting was supporting our finding (Rimbawan et al., 2023). Even so, as emphasizing on environmental approach, location and design became pinpoints for our study. The students were aware of something new within school premises. They were open to a new knowledge and showed enthusiasm only when it packaged with simple design and wording as they found it was near to their daily life.

As the matter of fact, current dietary guideline of Indonesian has been promoted quite some time with insufficient understanding (Octaria et al., 2020). In this present study, students possessed higher retained knowledge on dietary recommendation after presenting Isi Piringku (as MyPlate) with pictures of common food among adolescent including in school food, following food group and portion. Besides, recommendation to hydrate and limit on additive were also included in pictures. Students were then simply grasping the guideline as the whole picture as they kept seeing it every mealtime.

This present study, however, run in a rather short period. Future research is encouraged to expand the time or method addressing procedural knowledge. Its practical could be potential to bring descriptive knowledge on food and nutrition into dietary behavior (Morren et al., 2021). Nevertheless, this study attempted the procedural knowledge on how to read food label with interactive session. The session did attract students by involving on case studies. It was then contributed to the increased knowledge on dietary recommendation topic.

Another limitation of this study was regarding the generalizability. Media use and its content in this study was tailor-made for boarding high school setting and female students. Future research may consider those characteristics when applying Nutrinfo activities in general school.

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References

- Gaylis, J. B., Levy, S. S., & Hong, M. Y. (2020). Relationships between body weight perception, body mass index, physical activity, and food choices in Southern California male and female adolescents. *International Journal of Adolescence and Youth*, 25(1), 264-275. <https://doi.org/10.1080/02673843.2019.1614465>
- Husain, W., Ashkanani, F., & Al Dwairji, M. A. (2021). Nutrition Knowledge among College of Basic Education Students in Kuwait: A Cross-Sectional Study. *Journal of Nutrition and Metabolism*, 2021, 5560714. <https://doi.org/10.1155/2021/5560714>
- Ministry of Health. (2014). *Peraturan Menteri Kesehatan Republik Indonesia Nomor 41 Tahun 2014 Tentang Pedoman Gizi Seimbang*. Ministry of Health.
- Ministry of Health. (2018). *Laporan Nasional RISKESDAS 2018 [Report of National Health Survey 2018]*. Badan Penelitian dan Pengembangan Masyarakat, Kementerian Kesehatan RI.
- Morren, M., Mol, J. M., Blasch, J. E., & Malek, Ž. (2021). Changing diets - Testing the impact of knowledge and information nudges on sustainable dietary choices. *Journal of Environmental Psychology*, 75, 101610. <https://doi.org/https://doi.org/10.1016/j.jenvp.2021.101610>
- Octaria, Y., Apriningsih, A., Dwiriani, C. M., & Februhartanty, J. (2020). School readiness to adopt a school-based adolescent nutrition intervention in urban Indonesia. *Public Health Nutrition*, 1-12. <https://doi.org/10.1017/S1368980020001299>
- Oddo, V. M., Roshita, A., Khan, M. T., Ariawan, I., Wiradnyani, L. A. A., Chakrabarti, S., Izwardy, D., & Rah, J. H. (2022). Evidence-Based Nutrition Interventions Improved Adolescents' Knowledge and Behaviors in Indonesia. *Nutrients*, 14(9). <https://doi.org/10.3390/nu14091717>
- Rimbawan, R., Nurdiani, R., Rachman, P. H., Kawamata, Y., & Nozawa, Y. (2023). School Lunch Programs and Nutritional Education Improve Knowledge, Attitudes, and Practices and Reduce the Prevalence of Anemia: A Pre-Post Intervention Study in an Indonesian Islamic Boarding School. *Nutrients*, 15(4), 1055. <https://www.mdpi.com/2072-6643/15/4/1055>
- Roshita, A., Riddell-Carre, P., Sjahrial, R., Jupp, D., Torlesse, H., Izwardy, D., & Rah, J. H. (2021). A Qualitative Inquiry into the Eating Behavior and Physical Activity of Adolescent Girls and Boys in Indonesia. *Food and Nutrition Bulletin*, 42(1_suppl), S122-S131. <https://doi.org/10.1177/0379572121990948>
- Sharif Ishak, S. I. Z., Chin, Y. S., Mohd. Taib, M. N., Chan, Y. M., & Mohd. Shariff, Z. (2020). Effectiveness of a school-based intervention on knowledge, attitude and practice on healthy lifestyle and body composition in Malaysian adolescents. *BMC Pediatrics*, 20(1), 122. <https://doi.org/10.1186/s12887-020-02023-x>

Thomas, H., Azevedo Perry, E., Slack, J., Samra, H. R., Manowiec, E., Petermann, L., Manafò, E., & Kirkpatrick, S. I. (2019). Complexities in Conceptualizing and Measuring Food Literacy. *J Acad Nutr Diet*, *119*(4), 563-573.
<https://doi.org/10.1016/j.jand.2018.10.015>

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