Research Article

A Cosmetic Content–Based Nutrition Education Program Improves Fruit and Vegetable Consumption Among Grade 11 Thai Students

Pattraporn Somsri, MSc[1,†]; Warapone Satheannoppakao, PhD[2]; Mathuros Tipayamongkholgul, PhD[3]; Paranee Vatanasomboon, PhD[4]; Rachada Kasemsup, MS, MD[5]

ABSTRACT

Objective: To examine and compare the effectiveness of a cosmetic content–based nutrition education (CCBNEd) program and a health content–based nutrition education (HCBNEd) program on the promotion of fruit and vegetable (F&V) consumption.

Design: Quasi-experimental.

Setting: Three secondary schools in Nonthaburi, Thailand.

Participants/Interventions: Three classes of students were randomly assigned to 3 study groups: experimental group 1 (n = 41) participated in the CCBNEd program, experimental group 2 (n = 35) experienced the HCBNEd program, and a comparison group (n = 37) did not participate in a program. All groups received F&V information. Data were collected between July and September, 2013.

Main Outcome Measures: Knowledge about F&V, attitude toward F&V consumption, and the amount and variety of F&V consumed were measured at baseline, posttest, and follow-up.

Analysis: Nonparametric statistics were used to compare the programs' effectiveness.

Results: After the test, experimental group 1 had significantly increased knowledge scores, attitude scores, and the amount and variety of F&V consumed compared with those at baseline ($P < .001$). These positive changes were maintained until follow-up. In experimental group 2, knowledge and attitude scores increased ($P < .001$) at posttest and then decreased at follow-up whereas the comparison group positively changed only in knowledge.

Conclusions and Implications: The CCBNEd program was most effective at increasing F&V consumption.

Key Words: nutrition education program, cosmetics, health, fruit, vegetables (*J Nutr Educ Behav*. 2016;48:190-198.)

Accepted November 8, 2015. Published online December 31, 2015.

INTRODUCTION

Fruits and vegetables (F&V) provide various health benefits, such as improving functions of the whole body, disease prevention, and delayed disease progression. Examples include improvement in microvascular reactivity,[1] better cognitive performance,[2] decreased risk of colorectal cancer,[3] and reduced risk of kidney disease.[4] Yet, suboptimal intake of F&V (< 5 servings or < 400 g daily)[5] has been a global public health problem in all age groups for more than 2 decades.[6-10] The challenge of increasing F&V consumption is a major concern for health professionals.

Adolescents are ideal targets for interventions to promote F&V consumption. Two main rationales are

[1]Department of Medical Services, Ministry of Public Health, Nonthaburi, Thailand
[2]Department of Nutrition, Faculty of Public Health, Mahidol University, Bangkok, Thailand
[3]Department of Epidemiology, Faculty of Public Health, Mahidol University, Bangkok, Thailand
[4]Department of Health Education and Behavioral Sciences, Faculty of Public Health, Mahidol University, Bangkok, Thailand
[5]Queen Sirikit National Institute of Child Health, Bangkok, Thailand

Conflict of Interest Disclosure: The authors' conflict of interest disclosures can be found online with this article on www.jneb.org.

[†]Ms Somsri was affiliated with the Department of Nutrition, Faculty of Public Health, Mahidol University, Bangkok, Thailand at the time this study was completed.

Address for correspondence: Warapone Satheannoppakao, PhD, Department of Nutrition, Faculty of Public Health, Mahidol University, 420/1 Rajvithi Rd, Rachathewi District, Bangkok 10400, Thailand; Phone: +(66) 2354-8543-9 Ext 1303; Fax: +(66) 2640-9839; E-mail: warapone.sat@mahidol.ac.th

http://dx.doi.org/10.1016/j.jneb.2015.11.002

as follows. First, adolescents experience physical, cognitive, social, and emotional developments that may lead them to adopt new behaviors.[11] Providing any nutrition education or intervention fittingly with their development may enhance new positive behaviors. Second, because of accelerated growth, they require more energy and nutrients, including vitamins and minerals mainly found in F&V. Unfortunately, the most recently published national food consumption survey shows that Thai adolescents consume 44.0–88.9 g vegetables/d and hardly eat fruit.[12] Accordingly, nutrition education aimed at this population would be useful.

Adolescence is a period during which attention is focused on body image and appearance.[13-15] Neumark-Sztainer et al[16] found that body shape and image were factors affecting adolescents' food choices. According to a review of factors determining F&V consumption, adolescents had positive outcome expectations with regard to the effect of F&V consumption on health, growth, nutrition values, feeling full, and body shape and image.[17]

For these reasons, adolescents, especially those in the middle phase, are interested in and pay attention to attractiveness and health. Outcome expectations and expectancies in the form of 2 of 11 Social Cognitive Theory (SCT) elements, were employed to help understand the health behavior of youth and encourage healthy dietary intake. An emphasis on outcome expectations and expectancies along with adolescents' attention points when designing nutrition promotion programs may drive adolescents to increase F&V consumption. Several previous studies have conducted nutrition education programs focusing on health effects[18] or chronic disease prevention[19-21] to improve healthy food consumption among college students or young adults. Positive changes in eating habits have been found in some food groups. As for a cosmetic-based nutrition education program, to the authors' knowledge, a few studies have concentrated on this. Therefore, the authors applied 2 aspects of SCT when planning nutrition education programs to promote F&V consumption among middle adolescents. Cosmetic and health benefits of F&V, as positive outcome expectations and expectancies, were emphasized to build motivation for F&V consumption. The objectives were to examine and compare the effectiveness of a cosmetic Content–based nutrition education (CCBNEd) program and a health content–based nutrition education (HCBNEd) program on F&V consumption. Primary outcomes measured involved F&V-related knowledge, attitude toward F&V consumption, and the amount and variety of F&V consumed.

METHODS

Study Design

The authors conducted a quasi-experimental study. Secondary schools located in Nonthaburi Province, Thailand, that met the criteria were invited to join this study. These criteria consisted of (1) schools that were under the control of the Office of Basic Education, Nonthaburi (to ensure that the socioeconomic background of the schools included in this study were comparable), (2) school principals who voluntarily agreed to allow the school to participate in the study, and (3) similar foods available in each school. Among 6 schools, 3 met all inclusion criteria. The 3 schools were randomly assigned to the study groups: experimental group 1 (CCBNEd program), experimental group 2 (HCBNEd program), and a comparison group (no program). All 3 groups received the same documents containing F&V information (eg, the importance of F&V for adolescents, recommended amount and variety of F&V for adolescents, and cosmetic and health benefits of F&V). The first 2 groups used them to recall content learned in class whereas the comparison group could read them as self-study material.

One class of grade 11 students in a mathematics and English program was randomly selected from each school. Sample size was calculated using a formula to determine sample size for a research design with repeated measures.[22] The calculated sample size was 36/group, but 20% was added to account for participant loss during implementation. Therefore, the final number of participants was 43/group. The intervention period was from July to September, 2013 during term time. For groups with missing data, the data were excluded from analysis (Figure). This study was approved by the Institutional Review Board for Human Research, Faculty of Public Health, Mahidol University. Written informed consent was obtained from all participants and their parent or guardian.

Outcome Measurements and Instruments

The authors developed the research questionnaire, which consisted of 4 parts: general information, knowledge of F&V, attitude toward F&V consumption, and a 3-day F&V diary to determine F&V intake. This questionnaire was tested for content validity by experts in nutrition, health education, and behavioral sciences. In addition, the questionnaire was given to students with the same characteristics as the study participants to test its reliability. The details are as follows.

Self-reported general information included demographic characteristics (eg, sex, weight, height, birth order, the daily amount of money he or she received from parents or guardians, parental marital status), F&V consumption frequency, and interest priorities in the benefits of F&V.

Knowledge regarding F&V was measured using the F&V-related knowledge test (Cronbach $\alpha = .62$). Questions covered the importance of F&V for adolescents (3 questions), the amount and variety of F&V that adolescents should consume (3 questions), cosmetic benefits of F&V (7 questions), and, health benefits of F&V (7 questions). Sample questions were "How many servings of F&V should you consume?" "Regarding the beneficial effects that F&V consumption can have on maintaining a good body shape, which of the answers shown below is incorrect?" and "Which minerals or vitamins are necessary for bone formation and growth?" Multiple choice questions with 4 options were used. A score of 1 was given for correct answers and 0 for incorrect ones, with a total possible score of 20.

Attitude toward F&V consumption was assessed using a questionnaire (Cronbach $\alpha = .71$). This questionnaire