

A Comparison of Two Teaching Strategies on Nutrition Knowledge, Attitudes and Food Behavior of University Students*

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ABSTRACT

The purpose of this study was to investigate the effect of two teaching strategies, benefit appeal and threat appeal, on the nutrition knowledge, attitude toward nutrition and food behavior of 165 university students. We presented university students with either a threat appeal, which emphasized the risks of not following the recommendations, or a benefit appeal, which emphasized what was to be gained if respondents followed recommendations. We assigned a random sample of 165 students either to a control group or to one of two experimental groups : a threat- or benefit- appeal group. Only respondents in the experimental groups received brochures, but all respondents completed pre- and post- test questionnaires. Students in the benefit appeal group demonstrated significant increases in both nutrition knowledge and more positive attitudes about nutrition education after participation. The control group, however, had no significant increase in knowledge at post-testing. Significant positive correlations resulted at post-testing between nutrition knowledge and attitude, as well as attitude and food behavior for the experimental group. Results from this study suggest that a change in nutrition knowledge precedes a change in attitude. The benefit appeal group appeared to be most effective in changing nutrition knowledge, attitude toward nutrition, and food behavior. (*J Community Nutrition* 2(2) : 159~163, 2000)

KEY WORDS : nutrition knowledge · attitude · behavior · threat- or benefit-appeal.

Introduction

Health promotion through nutrition education must be based on sound information. Thus nutrition educators have traditionally designed programs to increase the nutrition knowledge of participants, assuming that such information would result in adoption of nutritious food practices. However, nutritionists report that their educational programs result in cognitive gains (Brush 1986 ; Ross 1984), but changes in attitudes and behaviors are seldom forthcoming (Bredbenner et al. 1988).

There is need to identify strategies that will positively influence nutrition-related attitudes and behaviors, as well as knowledge. Several public health campaigns have used the threat appeal to foster changes

in attitudes and behavior related to a number of health issues. Threat appeals persuade by emphasizing the negative consequences that will result if the recommendation are not followed. The threat-appeal approach has been effective in changing attitudes and behavior (Looker 1984). An alternate strategy, benefit appeal, stresses the positive rewards of following recommended health practices. Recently, nutrition research with adults and preschool children has compared the efficacy of the threat appeal approach with the benefit appeal (Lawatsch 1990 ; Looker 1984 ; Shannon 1987). In the research that has been done regarding the effectiveness of benefit and threat appeals on various health and nutrition behaviors, some researchers have found a positive approach to be more beneficial than a fear appeal (Kirsch et al. 1975), while in other comparisons that outcomes were similar with either a benefit or threat emphasis (Boren et al. 1983).

The purpose of this study was to investigate the effect of benefit appeal and threat appeal on nutrition knowledge, attitudes and food behavior of university students. The specific objectives of this investigation was to determine that benefit appeal on nutrition edu-

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cation strategy was more effective than threat appeal on university students.

Subjects and Methods

1. Research design

The pre-test/post-test design employed in this study included a control group that did not receive nutrition brochures and two experimental groups that did. One experimental group received nutrition brochures that employed a threat appeal, and the other received nutrition brochures that employed a benefit appeal. The factual nutrition information in these two brochures was the same.

2. Subjects

The population for this study included university students majoring in Home Economics Education and Food & Nutrition attending Kyungpook National University in Taegu. The Students' age was ranging from 20 to 23 years. 4.5% of the students were male. The mean age of the subjects was 21 years. 4.6% of the students of the experimental group were male and 4.4% of the students of the control group were male.

3. Implementation of the study

The actual study consisted of three phases ; the pre-test, the treatment(receipt of the nutrition brochures), and the post-test. Approximately one month elapsed between each phase. Experimental respondents participated in all three phases, but control respondents participated only in the first and last phase. The topics of the four brochures in each set were body weight, weight control, iron nutrition and calcium intake and osteoporosis. The threat-appeal brochures employed a moderate level of fear to emphasize the risks associated with obesity, fad weight-loss diets, iron deficient diet, and osteoporosis. On the other hand, the benefit-appeal brochures did not mention negative consequences in any way ; instead, they emphasized the benefit of ideal weight, sensible weight-loss diet, adequate dietary iron, and adequate calcium intake.

4. Instruments

Data were collected for the study by means of three structural questionnaires. The instruments included a

nutrition knowledge test, nutrition attitude, and food behavior investigation. The pretest questionnaire contained an information sheet, which requested demographic data, plus the knowledge test, attitude scales and food behavior investigation, while the post-test contained the same knowledge test, attitude scales and food behavior investigation.

5. Nutrition knowledge test(NKT)

The NKT was developed as a test for general knowledge of potential nutrition educators. The framework for the text was the "Basic Concepts of Nutrition". The original 40-question instrument was developed with established concurrent validity and a Kuder-Richardson 20 reliability coefficient of 0.90. The instrument was refined through item analysis resulting in 30 distinct questions in the NKT for this study. The Cronbach alpha coefficient was used to estimate the internal reliability of test items. The alpha reliability coefficient of the NKT was 0.76.

6. Attitude toward nutrition(ATN) and Food Behavior(FB)

We used statements to assess the flexibility of attitude toward personal nutrition. Flexibility of attitude toward nutrition was measured by Boren and coworkers' scale(Boren et al. 1983).

The 18-item scale was constructed to measure attitudes independent of knowledge and the degree of flexibility-rigidity in changing nutritional practices. The Cronbach alpha reliability coefficient was 0.84.

Responses to statements were measured by a Likert-type scale. The scale varied from "strongly agree", "agree", "neither agree nor disagree", "disagree", to "strongly disagree". Each value was assigned a number for scoring. For analysis, all statements were scored as positive ones. For this study the total possible score was five, where high scores reflected greater flexibility or a more open attitude toward nutrition. We used the food frequency questionnaire to assess the subjects' food behavior score.

7. Analysis of data

Data were analyzed using SPSS program. Pearson correlation coefficients were computed to determine the strength of the relationship between attitude about

nutrition, food behavior, and nutrition knowledge scores. Differences in nutrition knowledge scores, attitude, and food behavior in the experimental and control groups prior to treatment were assessed by computing 2-sample independent t-tests. This test was also utilized to assess differences in nutrition knowledge, attitude toward nutrition, and food behavior scores between experimental and control groups following treatment. Paired t-tests were computed to assess the significance of scores within the experimental and control groups prior to and following treatment.

Results and Discussion

Table 1 shows the comparison of responses from the experimental group and control group to the Nutrition Knowledge Test(NKT) prior to and following the nutrition education module. Mean scores were reported as percent correct of the total number of 30 questions. No significant difference was found between the mean pre-test scores in nutrition knowledge for the control and experimental groups. Upon post-testing, the experimental group showed significantly higher($p < 0.01$) mean knowledge scores than did the control group.

Table 1. Comparison of response from experimental and control group to the nutrition knowledge test(NKT) prior to and following the nutrition education

Group	Percent correct Mean ± SD on NKT Pre-Test	Percent correct Mean ± SD on NKT Post-Test
Experimental		
Benefit appeal	64.1 ± 13.2	73.2 ± 14.2 ^{b, **}
Threat appeal	63.2 ± 11.4	70.3 ± 12.7 ^{b, **}
Control	63.0 ± 12.4	64.1 ± 10.5 ^a

Values within a column with different letter superscripts are significantly different at $p < 0.05$

** : Significantly different between Pre-Test and Post-Test at $p < 0.01$

And there was a significant positive response of the benefit appeal group for nutrition knowledge score than the other two groups. When the change in knowledge scores from pre-test to post-test was analyzed for the experimental and control groups, post-experimental group showed significantly higher($p < 0.01$) mean knowledge scores than pre-experimental group.

Responses of experimental(N=110) and control(N=55) groups to the Attitude Toward Nutrition(ATN) and Food Behavior(FB) prior to and following the nutrition education module were compared(Table 2). In the attitude toward nutrition scale, negative statements were reversed for scoring so that high scores reflected flexibility or a more open attitude toward nutrition, and low scores reflected rigidity or a more closed attitude toward nutrition. There were no significant differences found between the pre-test mean scores of the control and experimental groups. Upon post-testing, there was significant differences in ATN found between pre and post-test group only in benefit appeal group($p < 0.05$). When a comparison was made of experimental and control group on post-testing, flexibility of attitude scores of benefit appeal group was significantly higher($p < 0.05$) than the other two groups. Comparison of food behavior of the experimental(N=110) and control(N=55) groups prior to and following the nutrition education were made. Upon post-testing, the benefit appeal group showed significant higher mean scores than the other two groups($p < 0.05$). According to Hochbaum, nutrition education that emphasizes the immediate pleasures of delicious, healthful foods will probably be more persuasive than that which focuses on future, vague hazards associated with the less nutritious foods eaten(Houchbaum 1981). Thus, nutrition educators can promote well-liked sources of nu-

Table 2. Comparison of response from experimental and control group to the nutrition attitude and food behavior prior to and following the nutrition education

Group	ATN ¹⁾		FB ²⁾	
	on Pre-Test	on Post-Test	on Pre-Test	on Post-Test
Benefit appeal group	68.2 ± 10.5	75.3 ± 10.8 ^{b, *}	4.50 ± 0.25	5.10 ± 0.38 ^{b, *}
Threat appeal group	67.3 ± 11.2	70.2 ± 11.5 ^a	4.45 ± 0.35	4.51 ± 0.33 ^a
Control	67.7 ± 10.8	68.8 ± 12.0 ^a	4.51 ± 0.22	4.53 ± 0.28 ^a

1) ATN=Attitude Toward Nutrition

2) FB=Food Behavior

* : Significantly different between Pre-Test and Post-Test at the $p < 0.05$

Values within a column with different letter superscripts are significantly different at $p < 0.05$

Table 3. Relationships among total mean scores for the NKT, ATN and FB for the experimental and control group prior to and following the two nutritional educational modules

	Pearson correlation coefficient		
	Experimental group		Control group
	Benefit appeal	Threat appeal	
Pre-Test			
NKT ¹⁾			
ATN ²⁾	0.43*	0.43*	0.31
NKT			
FB	0.30	0.31	0.25
ATN			
FB	0.30	0.33	0.31
Post-Test			
NKT			
ATN	0.58**	0.59**	0.30
NKT			
FB	0.50**	0.54**	0.28
ATN			
FB	0.54**	0.57**	0.58**

1) NKT= Nutrition Knowledge Test

2) ATN= Attitude Toward Nutrition

3) FB= Food Behavior

* : Significant at the $p < 0.05$ ** : Significant at the $p < 0.01$

trients low in people's diet and more nutritious alternatives that provide the same gratification (Table 3).

Correlation were calculated among the pre- and post-test scores for the NKT, ATN, and FB for both the experimental and control groups. As Table 3 demonstrates, a significant positive relationship was found between post-test nutrition knowledge score (NKT) and attitude toward nutrition (ATN), between NKT and food behavior (FB), and between ATN and FB in the experimental group. At post-testing, the control group showed a significant positive correlation between ATN and FB. Post-test analysis showed that, for the control group, the ATN score was the only significant predictor of food behavior. Knowledge score was neither a significant predictor of both the attitude score nor of food behavior score. In the experimental group, post-test analysis showed knowledge score was a significant predictor of both the attitude and flexibility.

The results of this study indicate that the nutrition education module was effective in significant increasing the nutrition knowledge and positive attitudes about nutrition in the experimental group. Flexibility of attitude toward nutrition of benefit appeal group was sig-

nificantly higher than other two groups. The significant gain in knowledge of the experimental group reflects an emphasis on cognitive concepts throughout the module. Similar results have been found in the nutrition education intervention reports (Barbara & Looker 1984).

University students who participated in the nutrition education module and learned about nutrition knowledge significantly increased their positive attitudes about nutrition education. Students in the control group who did not participate in the module had significantly less positive attitude toward nutrition and food behavior. These results seem to confirm one of the principles of adult learning as defined by Knowles (Knowles 1984), which states that adult learners need to know why they need to learn something before they have an interest in learning it.

The significant positive correlations found for the experimental group after participating in the nutrition module indicate that as nutrition knowledge increased so did more positive attitude about nutrition. Further significant positive correlations in the experimental group at post-testing revealed that as nutrition knowledge increased, flexibility of attitude toward nutrition also increased. Flexibility of attitudes toward nutrition education was also positively correlated with food behavior.

The control group also showed a significantly positive relationship between attitude and food behavior at post-testing. However, the very low positive correlation between knowledge and attitude and between knowledge and food behavior at post-testing for the control group, show the effect of the nutrition education module.

Conclusions

The results of this study are consistent with previous research that found a positive approach more successful than a negative approach (Evans et al. 1970; Kirsch et al. 1975). Nevertheless, further research is need to clarify why some messages are more motivating than others and why certain messages are more motivating for males or females.

Critical to the determination of the efficacy of benefit versus threat appeal with university students would

be a larger, more demographically diverse population sample. Although this study used over 165 university students, they were homogeneous group. The success of the benefit appeal group may not be realized for all economic levels, geographic location. A greater sample size could have been realized if these materials have been adapted for use. Additionally, future research should explore the comparative effectiveness of these two types of appeals in nutrition messages directed to different population groups.

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