



The Motivational Contents of Awareness-area in Nutrition Education

—The Enhancement of Healthy Eating Behavior
by Self-efficacy in Senior High School Students—

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Summary: This investigation and analysis were carried out, on the purpose to study the motivation contents of awareness-area in nutrition education. Especially, the enhancement of healthy eating behavior by self-efficacy (hereafter refer to as 'SE') was discussed on senior high school students. (hereafter refer to as 'students').

The influence of the 3 SEs (intellectual SE, practical SE and psychological SE) on eating behavior was analyzed from the mutual relationship between each SE and student's behavior. It was suggested that the motivation for desirable healthy eating behavior was enhanced directly by practical SE and psychological SE. On the other hand, it was considered that influences of intellectual SE for behavior caused by way of practical SE, indirectly. From those analysis, it is required not only knowledges (of nutrition and foods), but enhancement of practical and psychological SE in nutrition education.

The relationship between 3 SEs and various life-related factors was discussed. There was hardly any relationship of 3 SEs with bed time. There was a significant relationship of 3 SEs with the meal with family and involvement in household chores.

Further, an acquisition channel of 3 SEs was discussed. Practical SE and psychological SE had an acquisition channel from the "family" in male and female. And psychological SE had a relationship to "friends", for female. From those results, it was thought that the effective method for application of practical and psychological SE was cooperative education relating with family and friends.

In addition, practical SE had a relationship to "school lunch education" and "home economics" by case of female.

Key words: Intellectual self-efficacy, Practical self-efficacy, Psychological self-efficacy, Enhancement of motivation, Healthy eating behavior, Nutrition education, Senior high school students

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Objectives

As educational contents which enhance “healthy eating behavior”, there is a need to study-focus on the enhancement of awareness that motivate the change to healthy eating behavior.

Bandura, A. stated that an important factor in the modification of awareness is the “belief that one can achieve something”: the expectation of being able to follow through and internal confidence, in other words having the feeling of efficacy expectation. He expressed this as self-efficacy (SE).¹⁻⁵⁾

SE promotes initiative towards the issue itself, making greater effort possible for longer periods of time when faced with difficulty, reducing avoidance behavior and defensive behavior, and leading to desirable changes in behavior.

There are several research reports of the eating behavior in senior high school students,^{6, 7)} but few involve observations of the relationship between investigation of awareness and the eating behavior. The purpose of this study is clarifying the effect of the SE toward the nutrition education of students.

This paper also carried out to discussion about enhancement of motivation by SE for healthy eating behavior in senior high school students. Further, it made observations from the viewpoint of introducing the results of this analysis into the teaching content in awareness-area of nutrition education.

Method

1. Focus of the Survey

The survey focused upon a total of 1,288 senior high school second year students (636 male and 652 female) from six public senior high schools located in Nishinomiya, Kobe, Akashi, Sendai and Fukushima city

2. Survey Content

The content of SE was divided into three with the following survey categories, <A: main question> and <B: related questions>.

(1) Intellectual SE (confidence towards one’s own knowledge about healthy foods and nutrition)

A: Main question “Do you think you have knowledge of nutrition?”

B 1: Related question; SE towards explaining the balance in meals

“Can you explain what a balanced meals is?”

B 2: Related question; SE towards knowledge about healthy foods

“Can you differentiate between foods that are good or bad for your health?”

(2) Practical SE (confidence towards putting a healthy eating behavior into practice)

A: Main question “Do you think you have healthy meals.”

B 1: Related question; SE towards the nutritional content of daily meals

“Do you think that you are being careful about nutrition in your daily meals?”

B 2: Related question; SE towards nutritional balance in daily meals

“Do you think that the content of your meals is balanced?”

(3) Psychological SE (confidence with regard to possessing a good mentality and sense of values concerning meals)

A: Main question “Do you think everyday meals are important?”

B 1: Related question; SE towards the enjoyment of meals

“Do you feel that having meals is enjoyable?”

B 2: Related question; SE towards satisfaction of meals

“Are you satisfied with your meals at the moment?”

B 3: Related question; SEs towards the significance of shared meals

“Do you think that it is better to eat meals with other people?”

Other survey content is given in the necessary sections of “Results and Discussion.”

3. Survey Method

A direct questionnaire approach was used at three schools using the question sheet method. At the three other schools, the sheets were distributed to class units and collected the following day, with a return rate of 82% and a valid response rate of 91%. The survey was carried out in 2008~2009.

4. Method of Aggregation and Analysis of Survey Results

The aggregation and analysis were carried out using the SPSS statistics system. The cross analysis of each survey category used a calibration of χ^2 .

Results and Discussion

1. Motivational Contents by SE in Nutrition Education

(1) The relationship of 3 SEs and their influences on healthy eating behavior (Fig. 1, Table 1)

a. The mutual relationship of intellectual SE, practical SE and psychological SE

The ultimate aim of providing nutrition education is to have them adopt healthy eating behavior. However, senior high school is a stage where students face a diversification and individualization of values towards health, while it is also a period of insecurity from an awareness perspective. With this, the various factors that bring about a modification of awareness leading to changes in eating behavior were viewed from the three aspects of SE regarding one's own dietary knowledge about healthy foods and nutrition (intellectual SE), SE regarding putting a healthy eating behavior into practice (practical SE), and SE regarding the possession of a good mentality concerning meals (psychological SE), giving ordered scales to each of the question options and carrying out cross analysis of each survey category used a calibration of χ^2 .

As can be seen from Figure 1, it was indicated that the relativity was indicated for the “intellectual SE and practical SE”, but not indicated “intellectual SE and psychological SE”, with χ^2 cross analysis. On the other hand, for “psychological SE and practical SE”, a high degree relativity was indicated with χ^2 cross analysis (Table 1).

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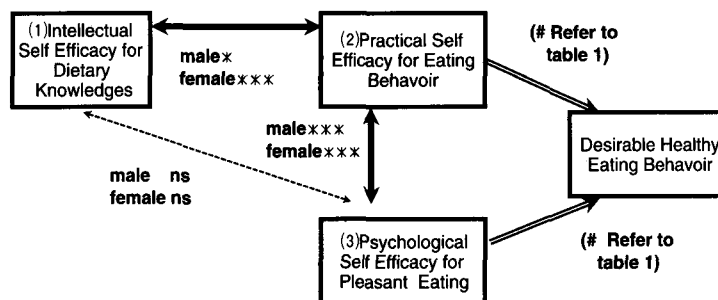


Fig. 1 Each Relationship of 3 SE and Influence for Desirable Healthy Eating Behavior

↔ Each Relationship of 3 SE ⇒ Influence on Desirable Healthy Eating Behavior
 ***P<0.001, **P<0.01, *P<0.05, ns = not significant

b. The relationship among 3 SEs, desirable healthy eating behavior and circumstances in meals (Table 1)

With regard to “desirable healthy eating behavior”, the indicator was “frequency of consumption of healthy foods (egg, soybean, vegetables, seaweed, milk and milk products)”. For circumstances in meals, we used “eating meals regularly” and “circumstances of eating with family,” apportioning scores using an ordered scale (see Table 1), and carrying out a cross analysis with the survey results

Table 1 The Relationship of the 3 SEs and Desirable Healthy Eating Behavior

	(1)Intellectual SE (confidence towards one's own knowledge about healthy foods and nutrition)	(2)Practical SE (confidence towards putting a healthy eating behavior into practice)	(3)Psychological SE (confidence with regard to possessing a good mentality and sense of values concerning meals)	Choices
	upper: male under: female	upper: male under: female	upper: male under: female	
1. Frequency of consumption of healthy foods.				
Egg	ns *	* **	*** **	1. Almost non-eating 2. Once per 1 week 3. Times per 23 times 4. Everyday
Soybean	ns ***	*** ***	ns **	
Vegetables	* ***	*** ***	*** ***	
Seaweed	ns ***	*** ***	*** **	
Milk & Milk products	ns ***	** ***	** ns	
2. Eating meals regularly.				
	** ns	*** ***	*** ***	1. Irregular 2. Sometimes irregular 3. Regular
3. Circumstances of eating with family.				
	ns ns	*** ***	*** ***	1. Almost alone 2. Sometimes alone 3. Always with family

***P<0.001, **P<0.01, *P<0.05, ns = not significant

of each SE category. Those results are indicated in Table 1. As regards intellectual SE, (for males) in particular there was hardly any relationship excepting vegetables, but (for female) it was recognized the relationship ($P < 0.05 \sim P < 0.001$) with eating behavior. It was recognized a relationship between practical SE and the consumption of all healthy foods ($P < 0.05 \sim P < 0.001$). While, for psychological SE, a relationship was not recognized for soybean (for male) and milk products (for female), but was recognized for other all foods ($P < 0.01 \sim P < 0.001$).

As those results, it was proven that practical SE and psychological SE had high degree relationship with modifications of healthy eating behavior. As set out in the two categories 2 and 3 at the bottom of Table 1, preferred regularity and circumstances in meals. It was suggested that a motivation of desirable healthy eating behavior was enhanced by practical SE and psychological SE.

It is thought that enhancement factors as practical SE and psychological SE are required, in order to carry out education that encourages specific modifications in eating behavior towards the frequency of consumption of the healthy foods indicated in Table 1, and towards preferred eating circumstances.

And, intellectual SE is effective on desirable eating behavior by way of practical SE.

(2) Education contents to enhance 3 SEs (Figure 2, Table 2)

By looking at relationship between (A) main question and (B) related question (Survey Content and Table 2~4”), we would now consider just what kind of education content which enhances SE, to be appropriate educational content by cross-analysis.

a. Education content to enhance intellectual SE (Figure 2, Table 2)

1) The aggregate results for males and females from the main question (A) “Do you think you have knowledges about nutrition?” for intellectual SE are given in Figure 2. For the answer “Yes” is 61.0% in males and 51.2% in females, indicating the suggestion that males have more knowledges about nutrition than females.

2) With regard to the content of the main question for intellectual SE of “Do you think that you have knowledges about nutrition?” in order to consider what content should be taught for intellectual SE.

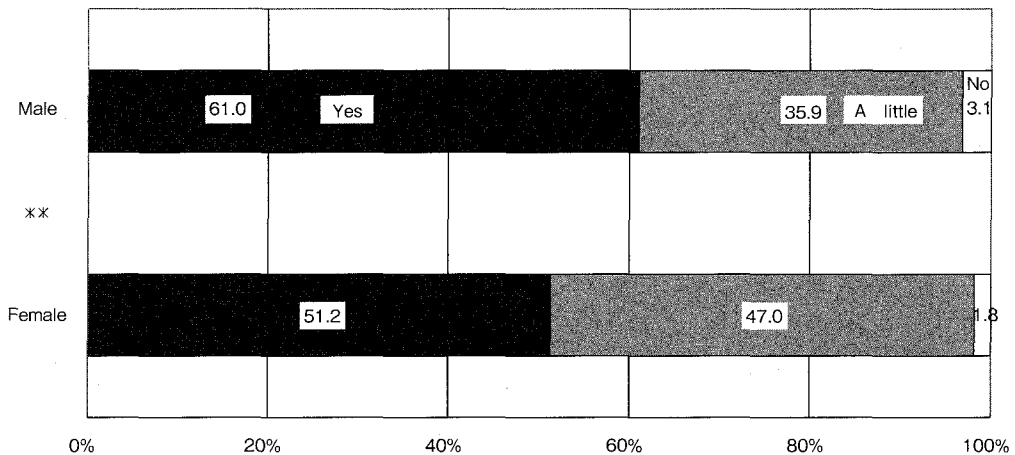


Fig. 2 Intellectual SE (confidence towards one’s own knowledges about healthy foods and nutrition) Main question: “Do you think you have knowledge of nutrition?” (** $P < 0.01$)

Table 2 Intellectual SE (confidence towards one’s own knowledges about healthy foods and nutrition)

	Question A: <i>Main question: Intellectual SE (confidence towards one’s own knowledges about healthy foods and nutrition)</i> “Do you think you have knowledges of nutrition?”
Question B: Related Questions	χ^2 Analysis (Ques. A \times Ques. B)
B 1: <i>SE towards explaining the balance in meals</i> “Can you explain what a balanced meals is?”	Male * Female **
B 2: <i>SE towards knowledge about healthy foods</i> “Can you differentiate between foods that are good or bad for your health?”	Male ** Female ***

Choices to A & B Questions: 1) Yes, 2) A little, 3) No
 ***P<0.001, **P<0.01, *P<0.05, ns = not significant

We and then carried out a cross-analysis of these related questions (B) to the main question (A) in order to confirm the educational content. As shown in Table 2, a significant relationship was recognized between the main question (A) and the related questions (B 1, 2) (P<0.05~P<0.001), it was suggested that the education content concerning to enhance intellectual SE is “B 1: SE to explain balanced meals, B 2: SE being able to distinguish between what food is healthy and what food is not.”

b. Education content to enhance practical SE (Figure 3, Table 3)

1) The aggregated results for males and females, from the main question (A) for practical SE are given in Figure 3. However, very few people responded to main question “Do you think you have healthy meals?”, the response, “Yes” attracted 18.2% of males and 10.3% of females, indicating the lack of confidence in their meals as shown in Figure 3.

2) With regard to the content of above main question for practical SE of “Do you think you have healthy meals?” we attached related questions B 1 and B 2 in order to consider specific educational content. As the results indicate in Table 3, there was a significant relationship recognized between the

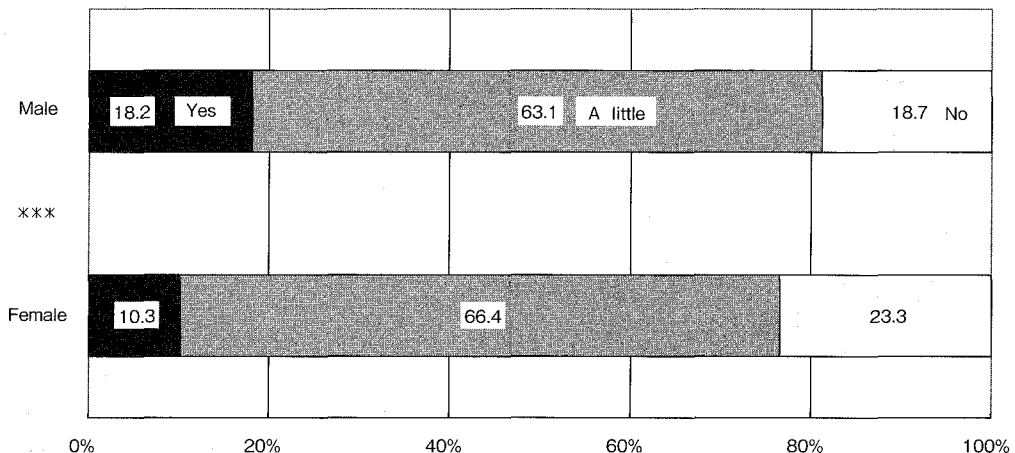


Fig. 3 Practical SE (confidence towards putting a healthy diet into practice) Main question: “Do you think you have healthy meals?” (*P<0.001)**

Table 3 Practical SE (confidence towards putting a healthy eating behavior into practice)

	Question A: <i>Main question: Practical SE</i> (confidence towards putting a healthy diet into practice) “Do you think you have healthy meals?”
Question B: Related Questions	χ^2 Analysis (Ques. A \times Ques. B)
B 1: <i>SE towards the nutritional content of daily meals</i> “Do you think that you are being careful about nutrition in your daily meals?”	Male ** Female ***
B 2: <i>SE towards nutritional balance in daily meals</i> “Do you think that the content of your meals is balanced?”	Male * Female ***

Choices to A & B Questions: 1) Yes, 2) A little, 3) No
 *** $P < 0.001$, ** $P < 0.01$, * $P < 0.05$, ns = not significant

main question and the related questions ($P < 0.05 \sim P < 0.001$). This suggesting that in order to enhance practical SE there is a relationship between main question A and B 1, B 2, so the educational contents is thought “B 1: SE for meals in which attention is given to nutrition, and B 2: SE for daily meals which are nutritional balanced.”

c. Education content to enhance psychological SE (Figure 4, Table 4)

1) In addition, the aggregated results of the main question on psychological SE for males and females are shown in Figure 4. For this main question A in psychological SE “Do you think that everyday meals are important?” Female was higher than males for psychological SE. The percentage of respondents who replied: “Yes” was 76.2% for males and 82.4% for females, far higher levels than for the other two SE categories, indicating that students have a high awareness of the importance of meals.

2) With regard to the content of the main question A for psychological SE of “Do you think everyday meals are important?”, we attached related questions (B 1~B 3) with main question (A) in order to consider specific educational content. As the results indicate in Table 4, there was a significant relationship recognized between the main question and the related questions ($P < 0.05 \sim P < 0.001$), sug-

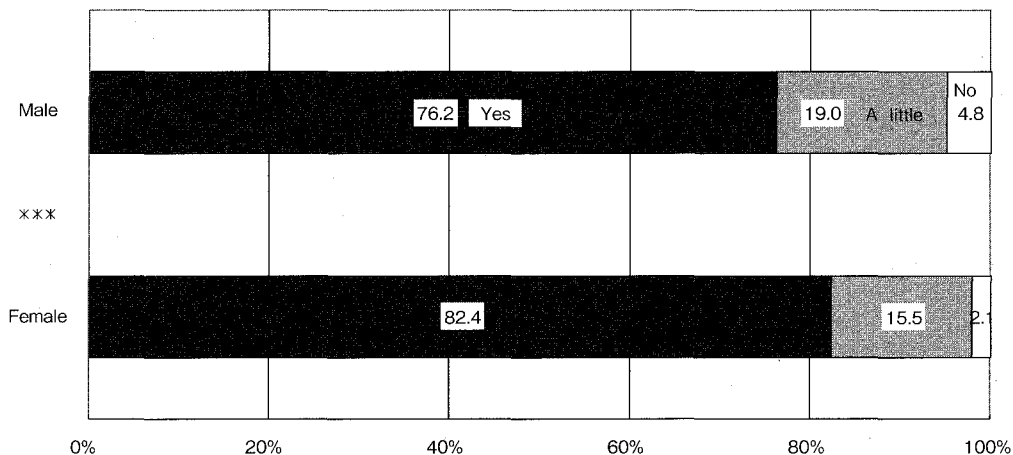


Fig. 4 Psychological SE (confidence with regard to possessing a good mentality and sense of values concerning meals: Main question: “Do you think everyday meals are important?” (*) $P < 0.001$)**

Table 4 Psychological SE (confidence with regard to possessing a good mentality and sense of values concerning meals)

	Question A: <i>Main question :Psychological SE confidence with regard to possessing a good mentality and sense of values concerning diet “Do you think everyday meals are important?”</i>
Question B: Related Questions	χ^2 Analysis (Ques. A \times Ques. B)
B 1: <i>SE towards the enjoyment of meals</i> “Do you feel that having meals is enjoyable?”	Male * Female ***
B 2: <i>SE towards satisfaction of meals</i> “Are you satisfied with your meals at the moment?”	Male ** Female **
B 3: <i>SE towards the significance of shared meals</i> “Do you think that it is better to eat meals with other people?”	Male ** Female ***

Choices to A & B Questions: 1) Yes, 2) A little, 3) No
 *** P<0.001, ** P<0.01, * P<0.05, ns = not significant

gesting that in order to enhance psychological SE there is a high relationship between the content of psychological circumstances in meals (B 1: meals being enjoyable, B 2: satisfaction involved in meals, and B 3: meals eating with other people (shared). On this occasion, the related questions assumed as the educational content of B 1, B 2 and B 3 SE categories.

2. The Relationship between the SE of their Eating Behavior and Various Life-related Factors of Senior High School Students (Table 5)

We considered what aspects of life-related factors have an influence in terms of enhancing each SE. In this survey, we set the questions regarding various life-related factors as bed time, the presence of rules in the family regarding meals, involvement in household chores, and sense of one’s current physical health, as set out in Table 5, carrying out a cross-analysis.

As those results (Table 5), there was hardly any relationship recognized between the 3 SEs and bed time. There was a significant relationship recognized with the meal with family and involvement in household chores (P<0.05~P<0.001). From this, it was suggested that the meal with family and

Table 5 The relationship between 3 SEs and life-related factors

		(1) Intellectual SE	(2) Practical SE	(3) Psychological SE	Coices
Bed time	Male Female	ns ns	ns ns	ns ns	1. Before PM 11 2. PM 11~AM 0 3. After AM 0
Meal with family	Male Female	*** ***	*** ***	*** ***	1. Always 2. Sometimes 3. Not at all
Involvement in household chores	Male Female	*** **	*** **	*** *	1. Always 2. Sometimes 3. Not at all
Sense of one’s current physical health	Male Female	ns ns	** ***	*** ***	1. Unhealthy 2. Healthy

*** P<0.001, ** P<0.01, * P<0.05, ns = not significant

Table 6 The relationship between channel of knowledge and 3 SEs

		Knowledge		Self Efficacy		
		Nutrition	Sickness	(1) Intellectual SE	(2) Practical SE	(3) Psychological SE
Family	Male	ns	**	ns	*	***
	Female	ns	ns	ns	***	**
School lunch education	Male	ns	*	ns	ns	ns
	Female	ns	ns	ns	*	ns
Home economics	Male	ns	ns	ns	ns	ns
	Female	ns	ns	ns	***	ns
Friends	Male	ns	ns	ns	ns	ns
	Female	ns	**	ns	ns	**
Television	Male	ns	**	ns	ns	ns
	Female	ns	ns	ns	ns	ns
Magazine	Male	ns	*	ns	ns	ns
	Female	ns	ns	ns	ns	ns
Book	Male	ns	**	*	ns	ns
	Female	ns	*	***	ns	ns

*** $P < 0.001$, ** $P < 0.01$, * $P < 0.05$, ns = not significant

involvement in household chores is effective in order to enhance students' SE regarding meals.

In particular, a relationship was recognized between psychological (or practical) SE and the sense of one's current physical health.

3. The Channel of Acquisition of Students' SEs (Table 6)

An acquisition channel of SE was analysed. As seen in Table 6, practical SE have a channel "family" for males ($P < 0.05$) and females ($P < 0.001$). And psychological SE has an acquisition channel from the "family" in males ($P < 0.001$) and females ($P < 0.01$), but the SE has a relationship to "friends", for females ($P < 0.01$). As those results, it was suggested that the effective application of those SEs are effective by cooperative education with family. For females, this SE has the relationships to "school lunch education" and "home economics"

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