Factors contributing to participation in food assistance programs in the elderly population

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BACKGROUND/OBJECTIVES: The study objectives were to examine the participation rate in food assistance programs and explore the factors that contribute to such participation among the Korean elderly population.
SUBJECTS/METHODS: The study sample comprised 3,932 respondents aged 65 years or older who were selected from a secondary data set, the fourth Korean Welfare Panel Study (KoWePS). The factors, related to participation in programs were examined based on the predisposing, enabling and need factors of the help-seeking behavior model. Multiple logistic regression analysis was used to select the best contributors among the factors related to program participation.
RESULTS: The predisposing rate in food assistance programs was 8.5% (7.1% for men and 10.4% for women). When all variables were included in the model, living without spouse, no formal education, low income, having social security benefits and food insecurity in elderly men, and age, low income, having social security benefits and feeling poor in elderly women were significantly related to a higher tendency to program participation.
CONCLUSIONS: The predisposing and need factors, such as living without spouse, low education level, food insecurity and feeling poor were important for program participation, as well as enabling factors, such as household income and social security benefits. A comprehensive approach considering these factors to identify the target population for food assistance programs is needed to increase the effectiveness and target population penetration of these programs.

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INTRODUCTION

The elderly population in Korea is growing rapidly, and will almost double from over 10% of the population in 2011 to 20% by 2026 [1]. With the increasing elderly population, policies and programs on aging are becoming more focused on identifying way to improve quality of life and health status rather than just extending life span. Specifically, for the elderly, adequate nutrition is important for their health because inadequate diets contribute to increased disability, decreased resistance to infection, exacerbation of disease and extended hospital stay [2]. Therefore, a few national food assistance programs provide nutritional support to the vulnerable elderly persons who require particular attention for optimal nutritional status [3]. However, a large number of elderly persons still lack access to the food needed [4]. The national estimate of food insufficiency in 2005 among the Korean elderly aged 65 years or older was 22.2%, which was the highest proportion among all age groups [5].

A variety of food assistance programs are intended to help elderly individuals meet their nutritional needs by improving limited food accessibility due to economic resource constraints. Conventionally, lower economic status measured by comparing household income with the Poverty Index Ratio has been used to define the elderly who are in need of food assistance programs. However, the Poverty Index Ratio may not fully reflect the complex needs for food assistance in the elderly, because the needs of the elderly are determined by multiple factors throughout their lives [6]. Several studies found that participation in food assistance programs was influenced by food insecurity, unemployment, disability, and socio-demographic factors [7-9].

Participation in food assistance programs is a kind of help-seeking behavior to meet one's need for food. According to the Andersen's help-seeking behavior model, help-seeking behavior is determined by predisposing, enabling, and need factors [10,11]. Given that the elderly are more likely to need food, their context renders them more vulnerable to delicate nutritional and health status, which in turn leads them to seek help as a compensatory strategy [12,13]. Therefore, understan-

ding their help-seeking behavior in terms of their participation or not in programs, and determining the factors that differentiate usage in various assistance programs would increase the benefit and effectiveness of food assistance programs. Therefore, the study objective was to examine the participation rate in food assistance programs and explore the factors that contribute to participation in the programs among the Korean elderly population.

SUBJECTS AND METHODS

Study population and data sets

Data were drawn from the Korean Welfare Panel Study (KoWePS), developed by the Korean Institute of Social and Health Affairs in conjunction with the Social Welfare Research Institute of Seoul National University. The study was designed to obtain nationally representative information on families and individuals in respect to their social service needs, utilization patterns, economic and demographic, income sources, emotional and behavioral health status. The sampling frame was based on the Survey of Least Living Expenditures, which included 30,000 households selected by a two-stage stratified cluster sampling from 2005 census data. The panel sample was selected from the Survey of Least Living Expenditures on the basis of income levels with the sampling design of a stratified systematic two-phase sampling. Among the sample of households, 3,500 households were low-income households under 60% of median income. The data for the present study were taken from the fourth wave of the KoWePS (2009). The panel sample in the 2009 KoWePS consisted of 12,661 individuals from a national probability sample of 6,207 households. The analytic sample for this analysis was set to 3,932 respondents aged 65 years or older. Since the KoWePS is a publicly released dataset that is available at the website of KoWePS (http://koweps.re.kr/) and no personal identifiers were used, the present study was exempt from human subjects review.

Variables

Participants in food assistance programs were defined as the respondent receiving free meal services or home-delivered meals during the last year before the survey. The free meal services provide meals and related nutrition services to older individuals at a variety of sites such as senior centers and community centers. The home-delivered meal service offers nutritious foods to seniors who are unable to leave their homes due to illness, disability, or frailty.

The factors related to participation in food assistance programs, which are a help-seeking behavior, were predisposing, enabling, and need factors based on the Andersen's behavior model [10,11]. The Andersen's behavior model describes the help-seeking behavior as a function of predisposing (demographics, social structure, and health beliefs), enabling (family and community resources), and need (functional and health problems based on perceived or evaluated need) characteristics of the individual. In this study, "predisposing" factors included marital status, education level and presence of a religion. Marital status was categorized into living with spouse and living without spouse (including divorced, separated, widowed and unmarried

adults). Education was categorized into three groups (no formal education, primary school, and middle school or higher) based on the highest level of individual education completed.

"Enabling" factors included household income, social security benefits, and residence area. Household income was divided by the square root of household size and categorized into three groups according to the poverty index ratio (household income/national poverty line × 100): ≤ 120% (poor households), > 120 and ≤ 250% (middle-income households) and > 250% (higher-income households). The social security benefits variable was whether a subject had received the national basic livelihood security, which includes cost of living, housing, medical, educational, childbirth, funeral and self-support benefits. Residence area was classified into three groups (metropolitan city, urban and rural). Metropolitan city included seven metropolitan cities including Seoul, and urban and rural area defined Si level and Gun level, respectively.

"Need" factors consisted of perceived and evaluated need. The perceived need factors included the presence of depression, the perceived level of economic status and disability. Depression was measured using the 11-item version of the Center for Epidemiological Studies Depression Scale (CES-D). The respondents were asked to indicate how frequently they experienced the symptoms within the past week on a scale ranging from one (rarely, less than once a week) to four (most of the time, more than six days a week). A CES-D score of 16 or higher was used for the likelihood of depression [14]. Perceived level of economic status and disability were grouped into two groups (poor or very poor and fair, rich or very rich for perceived level of economic status; disabled and non-disabled for disability).

Factors of evaluated need were current presence of chronic diseases (yes or no) and food insecurity. Current presence of chronic diseases was defined as having at least one chronic disease, such as cancers, arthritis, diabetes, cardiovascular disease, or heart failure. Food insecurity was measured by trained interviewers using the food security questionnaire modified from the six-item short form of the US Household Food Security Survey Module [15,16]. In order to assess household food insecurity status, each item was assigned a score of 1 if the answer was affirmative (often/sometimes, yes, or almost every month/some months, but not every month) and 0 for all other responses. Households were classified into a food security group (additive total score ≤ 1) and a food insecurity group (additive total score ≥ 2; food insecurity without hunger (low food security) for 2-4 and food insecurity with hunger (very low food security) for ≥ 5) according to the household's additive total score.

Statistical analysis

Because the KoWePS included post-stratification weight using 2005 census data, weight for primary sampling units and weight for an intentional over-sampling of low-income households, all results were estimated using the sample weight [17]. The proportion for the factors related to food assistance programs and the differences between participation and non-participation in food assistance programs were tested with the chi-square test. In order to examine the effects of factors on participation in food assistance programs, the odds ratios were

estimated using the multivariate logistic regression analysis, which was used to select the best contributors among predisposing, enabling and need factors in food assistance programs. All analyses were conducted using the SAS statistical software package version 9.2 (SAS Institute Inc., Cary, NC, USA).

RESULTS

Participation in food assistance programs and general characteristics

The participation rates in food assistance programs and related factors are presented in Table 1. The overall participation rate was 8.5% (7.1% for men and 10.4% for women). The rate was higher in the elderly aged 75 years or older than in those aged 65-74 years for both men and women. The mean age of subjects was 73 years old and the group aged 65-74 years comprised 65.5% of the total sample. About 84.9% of men and 42.4% of women were living with their spouse. The education and income level of the subjects were low, with 78.8% having no formal education and 47.3% having a poverty index ratio of 120% or less. In terms of the perceived need, the proportions with depressive symptom, disability and feeling poor or very poor were 27%, 15.3% and 45.4%, respectively. The proportion of subjects being food insecure was 4.7% and 4.1% had food insecurity without hunger.

Characteristics according to participation in food assistance programs

Table 2 shows the sample characteristics according to participation in food assistance programs by gender and age groups. The participants in programs were more likely to have no spouses and no formal education than non-participants were, but this difference was significant only in men (26.4% vs. 12.6% for living without spouses and 85.7% vs. 61.1% for no formal education). The proportions of low income (poverty index ratio of 120% or less) and social security benefits were higher in participants in programs than non-participants in both men and women regardless of the age group, and all these differences were significant ($P < 0.001$) except for men aged 75 years or older. Participants in programs were more likely to have depression or disability, to feel poor or very poor, and to be food insecure than non-participants. The difference in the proportions of these factors between participants and non-participants was especially significant in the age group of 65 to 74 years in both men and women. In terms of residence area, there was no difference between participants and non-participants in both men and women regardless of the age group.

Factors contributing to participation in food assistance programs

The factors related to participation in food assistance programs among factors of predisposing, enabling and need by the multiple logistic regression analysis are presented in Tables 3. For elderly men, living without spouse and no formal education among the predisposing factors and low household income and social security benefits among the enabling factors were positively related to participation in programs. The factors contributing to participation in programs differed by age group. For the elderly aged 65 to 74 years, those with social security benefits (Odds Ratio (OR) = 3.23, 95% Confidence Interval (95%

Table 1. General characteristics of study subjects[1]

	Total (n = 3,932)	Men (n = 1,559)	Women (n = 2,373)
Participation in food assistance programs			
No participation	91.5	92.9	89.6
Participation in only food delivery service	1.7	1.5	2.0
Participation in only free meal service	6.4	5.3	7.8
Participation in both	0.4	0.3	0.6
Factors related to participation in programs			
Predisposing factor			
Demographic factors			
Age (yrs)	73.1 ± 0.10	72.6 ± 0.15	73.4 ± 0.13
65-74	65.5	68.4	63.3
≥ 75	34.5	31.6	36.7
Marital status			
Living with spouses	62.3	84.9	42.4
Living without spouses	37.7	15.1	57.6
Social structure			
Education			
No formal education	78.8	62.5	92.1
Primary school	12.4	20.1	6.0
Middle school	8.8	17.4	1.8
Having a religion	58.1	49.7	64.1
Enabling factor			
Family resources			
Income (poverty index ratio)			
≤ 120 %	47.3	46.3	49.7
> 120 and ≤ 250 %	31.5	30.7	31.1
> 250 %	21.2	23.0	19.2
Social security benefits	10.2	7.5	12.6
Community resource			
Residence area			
Metropolitan city	38.9	40.5	36.8
Urban	42.3	41.3	43.3
Rural	18.8	18.2	19.9
Need factor			
Perceived need			
Depressive symptom (0-60) (≥ 16 points)	27.0	19.8	33.1
Disability	15.3	19.8	12.0
Feeling poor or very poor	45.4	41.5	49.0
Evaluated need			
Having chronic diseases currently	66.6	60.2	71.8
Food insecurity			
Food security	95.4	95.5	95.1
Food insecurity	4.7	4.5	4.9
without hunger	4.1	4.1	4.1
with hunger	0.6	0.4	0.8

[1] Values are all percentage except for age and age values are mean ± SE, estimated using the sample weight.

CI) = 1.01-10.3) and being food insecure (OR = 4.85, 95% CI = 1.28-18.4) were more likely to participate in programs, whereas among the elderly aged 75 years or older, living without spouse (OR = 2.97, 95% CI = 1.07-8.24) was significantly related to

Table 2. The proportion of characteristics according to participation in food assistance programs by sex and age groups

	Men (N = 1,559)									Women (N = 2,373)								
	Total (n = 1,559)			65-74 yrs (n = 982)			≥ 75 yrs (n = 577)			Total (n = 2,373)			65-74 yrs (n = 1,409)			≥ 75 yrs (n = 964)		
	NFAP[1]	PFAP[2]	P-value[4]	NFAP	PFAP	P-value	NFAP	PFAP	P-value	NFAP	PFAP	P-value	NFAP	PFAP	P-value	NFAP	PFAP	P-value
Predisposing factor																		
Demographic factors																		
Marital status																		
Living with spouses	87.4[3]	73.6	0.003	92.3	79.3	0.019	80.0	63.2	0.050	42.4	34.1	0.080	57.3	47.7	0.178	21.8	12.7	0.117
Living without spouses	12.6	26.4		7.7	20.7		20.0	36.8		57.6	65.9		42.7	52.4		78.2	87.4	
Social structure																		
Education																		
No formal education	61.1	85.7	0.001	56.1	83.5	0.009	68.5	92.6	0.033	91.7	95.2	0.151	89.4	95.4	0.171	94.9	96.1	0.619
Primary school	20.9	6.6		24.4	10.4		15.4	0.0		6.3	4.2		7.5	3.8		4.7	3.9	
Having a religion	50.6	40.0	0.149	50.9	42.9	0.422	50.6	36.3	0.170	64.1	63.0	0.847	65.6	62.3	0.62	62.2	62.7	0.935
Enabling factor																		
Family resources																		
Income (poverty index ratio)																		
≤ 120%	44.8	68.2		37.0	71.2		57.1	71.5		47.1	71.5		43.8	68.4		51.3	76.8	
> 120 and ≤ 250%	31.5	23.5	< 0.001	35.1	24.4	< 0.001	25.9	19.7	0.147	31.8	23.4	< 0.001	35.6	25.9	< 0.001	26.8	18.6	< 0.001
> 250%	23.7	8.3		28.0	4.5		17.0	8.7		21.1	5.1		20.6	5.8		21.9	4.6	
Social security benefits	6.3	23.8	< 0.001	4.7	29.8	< 0.001	9.2	18.6	0.134	10.4	31.4	< 0.001	10.0	30.3	< 0.001	11.1	32.6	< 0.001
Community resource																		
Residence area																		
Metropolitan city	41.3	30.0		44.2	31.7		37.3	25.5		36.7	37.4		40.8	35.7		30.5	37.0	
Urban	41.0	45.7	0.094	39.7	50.6	0.331	43.2	41.6	0.100	43.7	40.2	0.773	41.5	44.8	0.513	47.4	36.4	0.851
Rural	17.7	24.2		16.1	17.7		19.5	32.9		19.7	22.5		17.7	19.5		22.2	26.7	
Need factor																		
Perceived need																		
Depressive symptom	18.9	31.3	0.031	15.3	30.9	0.033	24.9	34.2	0.305	31.6	46.8	0.002	29.2	47.6	0.006	35.0	47.3	0.078
Disability	19.5	23.8	0.558	19.3	25.3	0.779	19.7	22.7	0.526	11.8	13.9	0.4141	11.8	16.8	0.286	11.7	11.4	0.910
Feeling poor or very poor	40.4	55.6	0.038	37.3	64.8	0.006	46.1	48.4	0.829	46.2	71.8	< 0.001	44.5	70.6	< 0.001	49.1	73.9	< 0.001
Evaluated need																		
Having chronic diseases	60.4	58.5	0.755	58.8	61.6	0.773	62.5	57.1	0.594	71.8	71.1	0.950	71.1	68.8	0.733	72.8	73.8	0.874
Food insecurity																		
Food security	96.3	84.9		97.0	77.5		95.0	92.4		95.8	88.9		96.2	87.6		95.3	89.7	
Food insecurity	3.7	15.1	< 0.001	3.0	22.6	< 0.001	5.0	7.6	0.365	4.2	11.1	0.002	3.8	12.4	0.004	4.7	10.3	0.082
without hunger	3.5	11.0		2.9	16.7		4.9	5.3		3.6	9.0		3.4	10.4		3.8	7.9	
with hunger	0.2	4.1		0.1	5.9		0.2	2.3		0.6	2.2		0.4	2.0		0.8	2.4	

[1] Non-participants in food assistance programs.
[2] Participants in food assistance programs.
[3] Values are percentage estimated using the sample weight.
[4] From chi-square test.

participation in programs after all variables were adjusted.

For elderly women, age group among the predisposing factors, low household income and social security benefits among the enabling factors, and subjectively feeling poor among the need factors were presented as significant factors related to participation in programs. After being divided into the age groups, the significance disappeared among those with 65-74 years, and low household income and social security benefits in the enabling factor still kept the significance among those aged 75 years or older (OR = 4.39, 95% CI = 1.12-17.3 and OR = 2.30, 95% CI = 1.10-4.82, respectively).

DISCUSSION

With the increasing importance of supports, such as food assistance programs to the vulnerable elderly population, this study examined the participation rate in food assistance programs and explored the factors that contribute to participation in such programs among the Korean elderly population. The participation rate in food assistance programs was 8.5%, and was higher in women (10.4%) than in men (7.1%) and in the elderly aged 75 years or older than in those aged 65-74 years. In terms of factors contributing to participation in food assistance programs, predisposing factors, such as marital status and education, need factors, such as food insecurity and feeling poor, and enabling factors, such as household income and

Table 3. Factors contributing to the participation in food assistance programs in the elderly[1]

	Men (N = 1,559)						Women (N = 2,373)					
	Total (n = 1,559)		65-74 yrs (n = 982)		≥ 75 yrs (n = 577)		Total (n = 2,373)		65-74 yrs (n = 1,409)		≥ 75 yrs (n = 964)	
	OR	(95% CI)	OR	(95% CI)	OR	(95% CI)	OR	(95% CI)	OR	(95% CI)	OR	(95% CI)
Predisposing factor												
Demographic factors												
Age												
65-74 yrs	1.00		-		-		1.00		-		-	
75 yrs or more	1.54	(0.83, 2.87)	-		-		1.82	(1.16, 2.84)	-		-	
Marital status												
Living with spouses	1.00		1.00		1.00		1.00		1.00		1.00	
Living without spouses	2.27	(1.08, 4.78)	1.31	(0.37, 4.73)	2.97	(1.07, 8.24)	1.34	(0.82, 2.18)	1.14	(0.61, 2.13)	1.82	(0.76, 4.37)
Social structure												
Education												
No formal education	3.29	(1.31, 8.24)	2.93	(0.90, 9.52)	4.04	(0.86, 19.03)	1.21	(0.44, 3.31)	1.56	(0.39, 6.24)	0.88	(0.19, 4.07)
Primary school or higher	1.00		1.00		1.00		1.00		1.00		1.00	
Having a religion												
No	1.00		1.00		1.00		1.00		1.00		1.00	
Yes	1.15	(0.61, 2.17)	0.94	(0.39, 2.31)	1.38	(0.55, 3.48)	0.98	(0.63, 1.53)	1.05	(0.57, 1.96)	0.91	(0.48, 1.71)
Enabling factor												
Family resources												
Income (PIR)												
≤ 120%	3.58	(1.07, 12.0)	5.40	(0.76, 38.3)	3.03	(0.58, 15.9)	3.78	(1.50, 9.53)	3.26	(0.93, 11.5)	4.39	(1.12, 17.3)
120-250%	1.91	(0.54, 6.78)	2.91	(0.39, 21.8)	1.55	(0.26, 9.06)	2.37	(0.91, 6.17)	1.99	(0.54, 7.28)	2.75	(0.66, 11.4)
> 250%	1.00		1.00		1.00		1.00		1.00		1.00	
Social security benefits												
No	1.00		1.00		1.00		1.00		1.00		1.00	
Yes	2.45	(1.05, 5.68)	3.23	(1.01, 10.3)	2.47	(0.66, 9.23)	2.06	(1.22, 3.47)	1.85	(0.86, 3.98)	2.30	(1.10, 4.82)
Community resource												
Residence area												
Metropolitan city	1.00		1.00		1.00		1.00		1.00		1.00	
Urban	1.27	(0.62, 2.62)	1.42	(0.52, 3.86)	1.30	(0.43, 3.91)	0.84	(0.52, 1.37)	1.18	(0.60, 2.31)	0.53	(0.26, 1.09)
Rural	1.37	(0.58, 3.23)	1.09	(0.30, 3.94)	1.86	(0.55, 6.32)	1.08	(0.61, 1.92)	1.11	(0.48, 2.59)	0.96	(0.43, 2.15)
Need factor												
Perceived need												
Depressive symptom												
No	1.00		1.00		1.00		1.00		1.00		1.00	
Yes	1.36	(0.69, 2.70)	1.14	(0.40, 3.24)	1.39	(0.54, 3.61)	1.21	(0.78, 1.88)	1.34	(0.71, 2.53)	1.09	(0.58, 2.02)
Disability												
No	1.00		1.00		1.00		1.00		1.00		1.00	
Yes	0.84	(0.38, 1.82)	0.90	(0.31, 2.60)	0.79	(0.24, 2.57)	1.19	(0.64, 2.24)	1.26	(0.55, 2.92)	1.09	(0.41, 2.90)
Feeling poor or very poor												
No	1.00		1.00		1.00		1.00		1.00		1.00	
Yes	0.86	(0.43, 1.73)	1.18	(0.43, 3.20)	0.66	(0.24, 1.79)	1.69	(1.03, 2.79)	1.81	(0.90, 3.64)	1.62	(0.78, 3.33)
Evaluated need												
Having chronic diseases currently												
No	1.00		1.00		1.00		1.00		1.00		1.00	
Yes	0.90	(0.48, 1.67)	1.04	(0.43, 2.53)	0.74	(0.30, 1.83)	0.84	(0.53, 1.34)	0.73	(0.38, 1.38)	0.96	(0.49, 1.90)
Food insecurity												
Food security	1.00		1.00		1.00		1.00		1.00		1.00	
Food insecurity	2.01	(0.72, 5.63)	4.85	(1.28, 18.4)	0.63	(0.10, 4.01)	1.40	(0.68, 2.91)	1.59	(0.58, 4.40)	1.27	(0.44, 3.72)
Goodness of fit [2]	7.047		7.153		6.278		7.823		7.517		10.5145	
P-value [2]	0.5315		0.5203		0.6161		0.4509		0.4821		0.2308	

[1] Values are odds ratio (95% confidence interval) estimated by multiple logistic regression analysis, using the sample weight.
[2] Hosmer and Lemeshow Goodness-of-Fit Test and P-value.

social security benefits were significantly related to participation in programs.

The low participation in food assistance programs among the elderly population was similar to the results of other studies [9,18-19]. The reasons of low participation have been explained by their low access to a lack of information, perceived lack of need, stigma, costs of participation and living alone [9,19]. In a previous study, participation in food assistance programs among the Korean elderly was lower than another vulnerable population despite all being food insecure (16.4% for elderly households and 56.9% for households with children) [18]. This study examined the contributors of participation in programs based on determinants of the help-seeking behavior model because the participation in the programs is a kind of help-seeking behavior for inadequate foods. The information could be helpful to better understand the participation mechanism among the Korean elderly.

The present study found that predisposing and need factors, such as living without spouse, low education level, food insecurity and feeling poor contributed to program participation independently of enabling factors. Food insecurity is defined as the non-availability of nutritionally adequate and safe foods or the inability to acquire acceptable foods in socially acceptable ways [20,21]. Several studies suggested that food insecurity was a good predictor reflecting the need for food assistance [6,7] so that it could help improve targeting of food assistance programs to the elderly most in need [24]. In addition, it has been suggested as an indicator to evaluate the impacts of food assistance programs [6,22,23].

Recently, a modified Korean version of the food security questionnaire based on the US household food security survey module was developed and used in the 2012 Korea National Health and Nutrition Examination Survey. Further study on the effect of program participation on food insecurity will be helpful to better understand the mechanism of such participation. In this study, marital status was important in program participation, especially among men. A similar result was also shown in the US elderly population [9]. Difficulties in preparing and cooking foods alone would be more serious in elderly men. Feeling poor is an indicator of subjectively perceived economic status and thus, it could also increase program participation as a proxy of household income.

Several previous studies showed that the participation rate in food assistance programs was different by gender and age [25-27]. Generally, women and the young old were more likely to participate in programs than men and the elderly aged 75 years or older, and this finding was consistent with this study. The different participation rate in food assistance programs according to gender and age group could be explained by different factors contributing to participation. In this study, for men, food insecurity in the elderly aged 65-74 years and living without spouse in the elderly aged 75 years or older were significantly related to greater program participation after adjusting for other factors. For women, feeling poor in total group, and low income and getting social security benefits in elders aged 75 years or more were related to higher participation. This finding would imply that for the elderly men, the economic variable conventionally used to define persons

who are in need of food assistance programs is insufficient of reflecting the complex conditions of need for food assistance. The information will be helpful to screen the target population for such programs, thus increasing their efficiency and effectiveness.

Several study limitations should be considered in interpreting the present study results. Because of the cross-sectional nature of the study, a causal association between the factors and participation in food assistance programs could not be determined. Although an attempt was made to examine possible factors contributing to program participation, the factors were relatively oriented to an individual level. Thus, other environmental factors such as policy, social supports, and neighborhood need to be included in future study for comprehensive understanding of the mechanism of program participation.

In conclusion, participation in food assistance programs among the Korean elderly was strongly related to predisposing and need factors, such as living without spouse, low education level, food insecurity and feeling poor, as well as enabling factors, such as household income and social security benefits. These findings will be helpful in identifying segments of the population to be targeted for food assistance programs and thus increasing the effectiveness and target population penetration of these food assistance programs.

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