

Meal skipping children in low-income families and community practice implications

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Abstract

We examined dietary habits, food intakes, health status, and school and community life of meal skipping children, and investigated factors predicting meal skipping of children. A sample was composed of 944 children in low-income families who were provided with public meal service. The sample was obtained from the Survey of Meal Service for Poor Children conducted by the Korea Institute for Health and Social Affairs in 2007. Meal skipping was significantly associated with a lower nutrition and health status, and poor school performance of children, as hypothesized. The school age of child, family structure, region, job of caretaker, concern about diet, and the child's visit to welfare center significantly predicted frequency of meal skipping. We suggested a few implications for community practice to reduce meal skipping of children.

Key Words: Meal skipping, low-income children, nutrition and health status, risk factors, community practice

Introduction

In 1996, Korea joined the Organization for Economic Cooperation and Development (OECD) and has taken its place among the economically developed countries in the world. Korea, however, has experienced drastic socioeconomic changes and disclosed social problems such as poverty and polarization with economic recession since the late 1990s. Consequently, there are an increasing number of children who suffer from these social problems without adequate welfare provisions, particularly those in low-income families.

Of the Convention on the Rights of the Children that the U.N. adopted in 1999, and Korea signed in 1990 and ratified in 1991, Article 6 regulates the child's right to life and maximum survival and development. Further Article 27 regulates the child's right to an adequate standard of living particularly with regard to nutrition. Children will fail to make any significant progress in their physical as well as mental, emotional, and social development, and even put to death, if they are malnourished, so nutrition will always be at the top of any list of priorities for child well-being.

Food containing five key nutrients is prerequisite for full nutrition of children, which can be obtained by taking regular meals without skipping. Despite the abundant food availability and high food wastage in Korea, a great number of children experience food insufficiency by skipping their meals. The Ministry of Health & Welfare and Family (MW) data report that

the numbers of meal service for children increased almost 15 times from 16,000 in 2000 to 250,000 in 2006.

Children occasionally skip meals without a proper meal provider for them at home. Employment of a meal provider not at home during the daytime is one of the causes for meal skipping of children. Family dissolution due to parental divorce or householder death is another cause for meal skipping of children. Consequently, meal skipping children is more likely to be identified in single mother households or female-headed families (Casey *et al.*, 2001; McIntyre *et al.*, 2002; Wehler *et al.*, 2004).

Nevertheless, the most primary factor for meal skipping of children is poverty. Children and their families in poverty have insufficient financial resources affordable for adequate food and nutrition. Poverty is a direct cause of food insufficiency of children, which is originated from unemployment, household debt, and disease and disability of the householder (Brooks-Gunn & Duncan, 1997). A majority of the children (70.8%) attending a meal program in 2006 live in the economically destitute households under the official poverty line (MW, 2006). An independent study illustrates a strong relationship between poverty and meal skipping of children: 34.8% of school-aged children in poverty had only two meals a day compared to 17.9% of those in non-poverty, while 4.3% of school-aged children in poverty had only one meal a day compared to 1.2% of those in non-poverty. Further, 37.6% of middle-school adolescents in poverty had only two meals a day compared to 24.3% of those in non-poverty, whereas 3.1% of middle-school adolescents had

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only one meal a day compared to 1.5% of those in non-poverty (Choe & Kim, 2004). This signifies that poverty is significantly associated with meal skipping of children.

Meal skipping, and its following food insufficiency and malnutrition are critical for children who are in the stage of physical, mental, and emotional development. Studies confirm that salient adverse effects of insufficient food intake are health problems such as headache and stomachache, overweight or obesity, underweight, chronic asthma, and iron deficiency (Alaimo *et al.*, 2001b; Casey *et al.*, 2001, 2005). Further, children of food insufficiency reveal academic performance, psychosocial well-being, and health-related quality of life greatly lower than those of food sufficiency (Alaimo *et al.*, 2001a, 2001b; Casey *et al.*, 2005; Eisenberg *et al.*, 2004; Murphy *et al.*, 1998).

Particularly, children in low-income families were more likely to suffer from food insufficiency than counterparts (Alaimo *et al.*, 2001a, 2001b; Brooks-Gunn & Duncan, 1997; Rose & Oliveira, 1997; Wehler *et al.*, 2004). Alaimo and colleagues (2001a, 2001b) identified that children in low-income families with insufficient food intake differed from those in high-income families in several nutrition and anthropometric measures. Brooks-Gunn and Duncan (1997) reported that children in poverty were more likely to experience food insufficiency 10 times greater than children not in poverty. Additionally, children in poverty were more likely to reveal physical and mental retardation, learning disorder, school drop-out, deviant behavior, and criminal act compared to those not in poverty. In this context, we should express deep concern about meal skipping children in low-income families, and address this problem in the research and practice of nutrition.

A few studies have examined socio-demographic characteristics of meal skipping children and current meal service program for children (Chang & Park, 2006; Cho, 2007; Kim *et al.*, 2007). However, rare studies investigated factors predisposing low-income children to meal skipping. Utilizing a survey data, we sought to examine dietary habit, food intake, health status, and school and community life of meal skipping children, and to investigate factors predicting meal skipping of children. We hypothesized that meal skipping is associated with a lower nutrition and health status of children in low-income families. Finally we suggested a few implications for community practice.

Subjects and Methods

Study sample

A study sample in the present study was obtained from the Survey of Meal Service for Poor Children, which was conducted by the Korea Institute for Health and Social Affairs during three weeks in September 2007 (Kim *et al.*, 2007). The Survey originally purposed to investigate dietary habits and nutritional conditions of children in low-income families receiving public

meal service. Children practically skipping meals or at risk of skipping meals due to poverty and family dissolution are eligible for public meal service (MW, 2006). A sub-sample of 600 children was collected from the total 29 Community Child Centers providing group meal service. An independent stratified, clustered sub-sample of 400 children was recruited from the selected 20 areas over the country, by allocating the 20 areas according to four types of meal programs (food stamp, coupon, delivery, cash) and sampling 20 children per each area for each meal program. Consequently, a group of 1,000 children constituted a whole sample for the study. Fifty-six children were excluded because of no response or missing data. The final sample consisted of 944 children, who provided meal skipping information. All the children in the sample were interviewed by trained interviewers based on survey questionnaire and were asked to answer questions about dietary habit, food intake, health status, school and community activities, and socio-demographic and economic characteristics of families.

Measures and variables

Children were classified as "meal skipping" if the children report that they skip one or more meals a day or do not get enough meals to eat. Meal skipping was based on the response to the question, described as "how many meals do you have a day?" on the survey questionnaire. Children were defined as "low-income" if the children live in the families whose total household income is under the official poverty line. Low-income children were based on the response to the question, described as "does your family receive Livelihood Protection Benefit from the government?" The children's responses to this question might be unreliable for their poor understanding about Livelihood Protection Benefit. Therefore, all the children in the sample were categorized as "low-income" because they were recruited from those who currently receive public meal service.

Questions about dietary habits included frequency of meals, time keeping of meal, meal preparing, presence of parent or caretaker after school, caretaker's concern about meal; questions about food intake included intake of six food groups; questions about health status included height, weight, disease or illness, general health level, physical activity, and attentiveness; questions about school and community life included number of friends, school performance, and attendance at welfare center; and socio-demographic and economic characteristics of children included school age of child, sex of child, family structure, family size, education and job of caretaker, total household income, and region. General health level, physical activity, attentiveness, and school performance were measured on 5-Likert scale such as "very good," "good," "average," "bad," and "very bad." Caretaker's concern about child's diet was measured on 5-Likert scale such as "very strong," "strong," "average," "weak," and "very weak." Attendance at a welfare center program was measured on 4-Likert scale such as "daily," "often," "sometimes," and "never."

Data analyses

Descriptive analyses were used to present overall socio-demographic and economic characteristics of children and families. Bivariate analyses were employed to examine food intake, health status, school and community activities of meal skipping children, and to investigate their associations with meal skipping of children. Chi-squares and Pearson correlation coefficients were calculated for the analyses at this step. Multivariate analyses using ordinal logistic regression (cumulative logit model) were employed to identify factors predicting meal skipping of children. Ordinal logistic regression (cumulative logit model) is most appropriate when dependent variable (frequency of meal skipping in the present study) has more than two categories and the categories are ordered (Allison, 1995).

Results

Sample description

Girls comprised 52.6% and boys comprised 47.4% in the sample. The age composition of children is as follows: lower elementary school-age (1st to 3rd grade of primary school) represented 31.0%, higher elementary school-age (4th to 6th grade of primary school), 43.6%, middle school age, 18.9%, and high school age, 6.4% respectively. Children with both parents, children with single parent including single mother and single father, children with grandparent(s), and children with other caretaker made up 41.3%, 40.6%, 11.1%, and 7.0% respectively.

Almost half of the caretakers (46.5%) in the sample had finished high school level. Caretakers who finished middle school or lower level consisted of 36.3%, and those who dropped out or graduated from college and university consisted of 17.2%. The largest proportion of caretakers was for homemakers (18.6%). Next, 15.7% of caretakers were manual laborers and 14.8% of caretakers work for sales and services. More than 10% of caretakers were not employed without a job.

Two of five children (40.5%) lived in the families whose monthly household income is between 500,000 and 1,000,000 won (approximately 500 to 1,000 US dollars). Next, 28.3% of children lived in the families whose monthly household income is between 1,000,000 and 2,000,000 won (approximately 1,000 to 2,000 US dollars) Children living in the families with monthly household income higher than 3,000,000 won (approximately 3,000 US dollars) did not exceed 5% in the sample. Children in the sample reside in large urban areas including metropolitan city, middle urban areas, and rural areas, 52.2%, 30.4%, and 17.3% respectively.

Dietary habit of meal skipping children

Twenty-six percent of children skip meals twice a day and 64.2% skip once a day, while only 1% of children skip meals

three times a day. More than 6% of the children responded that they do not skip meals at all. The largest proportion of children (43.3%) responded that they skip breakfast because of time rush. Next, 19.9% of children responded that they skip breakfast because of no appetite. Those who skip breakfast because of no food constituted 7.2% of the respondent children. Most children (93.3%) do not skip lunch for public meal service in the present study. More than 26% of children responded that they skip dinner because of no appetite. Those skipping dinner because of no food composed 16.8%.

A majority of children responded that they are able to prepare their own meals (78.3%). Almost all middle and high school students (91.7%) responded that they are able to prepare their own meals. There was a significant association between time keeping and meal skipping of children ($r = -.289$, $p < .01$). Children who take meals on time were less likely to skip their meals. Parent or caretaker's concerns about a child's diet is significantly associated with meal skipping of children ($r = -.183$, $p < .01$). Children whose parent or caretaker was concerned about child's diet were less likely to skip their meals.

Food intake of meal skipping children

Table 1 presents the results of bivariate analyses on meal skipping and food intake of children. As an absolute number and proportion of children skipping meals three times a day is too small among the total respondent children, it should be cautious to interpret outcomes, even though the associations are statistically significant.

Intake of rice reflects regularity and balance of meals. Children who take rice three times including public meal service a day, composed 62.3%. However, children who take rice twice and once rice, including public meal service, composed 29.8% and 3.6% each. It is clear that a majority of children who did not skip meals have taken rice three times a day in the present study.

Meat and egg are important protein sources for children in developmental stages. The largest proportion of the children (41.7%) have taken meat and egg 2 or 6 times a week. Meanwhile, a significant proportion of children (16.3%) have taken meat and egg less than once a week. There is not a specific linear association between meal skipping and protein intake of children. In the present study, children who did not skip meals have taken meat and egg one or more times a day. Fish is another source for protein as well as for unsaturated fat. The largest proportion of children (38.5%) have taken fish 2 or 6 times a week. However, one of fourth of children (25.2%) have taken fish less than 1 time a week. Similar to meat and egg intake, children who did not skip meals have taken fish one or more times a day.

Vegetables and fruits provide minerals and vitamins which are inevitable nutrients for child growth. A majority of children (59.8%) have taken vegetable one or more times a day, while only 31.6% of children have taken fruit one or more times a

Table 1. Association between food intake and meal skipping of children (Units: %, number)

Frequency of intake	Frequency of meal skipping a day				Total
	3	2	1	0	
Rice $\chi^2 = 357.89^{**}$					
3 times a day	55.6	17.2	78.3	89.5	62.3
2 times a day	11.1	74.2	14.2	7.0	29.8
1 time a day	33.3	4.9	3.0	0.0	3.6
Less than 1 time	0.0	3.7	4.5	3.5	4.2
Meat and egg $\chi^2 = 32.23^{**}$					
1 time or more a day	37.5	23.8	27.7	43.9	27.8
2-6 times a week	0.0	46.7	41.2	31.6	41.7
1 time a week	0.0	13.3	15.7	5.3	14.3
Less than 1 time a week	37.5	12.5	11.7	14.0	12.3
Almost none	25.0	3.8	3.7	5.3	4.0
Fish $\chi^2 = 58.70^{**}$					
1 time or more a day	37.5	9.5	18.9	33.3	17.5
2-6 times a week	0.0	34.9	42.1	22.8	38.5
1 time a week	12.5	24.1	17.2	12.3	18.7
Less than 1 time a week	0.0	17.0	14.0	21.1	15.1
Almost none	50.0	14.5	7.8	10.5	10.1
Vegetable $\chi^2 = 23.76^*$					
3 times or more a day	50.0	16.3	26.6	33.3	24.5
1-2 times a day	12.5	38.9	34.0	36.8	35.3
2-6 times a week	0.0	27.2	25.4	15.8	25.1
Less than 1 time a week	25.0	12.1	10.6	8.8	11.0
Almost none	12.5	5.4	3.4	5.3	4.1
Fruits $\chi^2 = 32.66^{**}$					
3 times or more a day	37.5	5.8	8.4	20.4	8.7
1-2 times a day	25.0	19.1	23.5	33.3	22.9
2-6 times a week	12.5	45.2	40.0	29.6	40.6
Less than 1 time a week	25.0	22.0	22.8	11.1	21.9
Almost none	0.0	7.9	5.4	5.6	6.0
Milk and dairy goods $\chi^2 = 25.97^*$					
3 times or more a day	42.9	10.4	13.0	26.8	13.4
1-2 times a day	42.9	46.1	52.5	42.9	50.1
2-6 times a week	14.3	26.6	20.1	17.9	21.7
Less than 1 time a week	0.0	9.1	9.8	10.7	9.6
Almost none	0.0	7.9	4.6	1.9	5.2
	100.0	100.0	100.0	100.0	100.0
	(9)	(245)	(595)	(57)	(906)

* $p < .05$ ** $p < .01$

day. There were significant linear associations between meal skipping and vegetable and fruit intake of children. Children who skip meals one or more times were less likely to take vegetables and fruits.

Milk and dairy goods provide calcium for children in the developmental stages. A majority of children (63.4%) take milk and dairy food one or more time a day. However, a significant proportion of children (14.8%) take milk and dairy goods less than 1 time a week. There was not a clear linear association between milk and dairy intake and meal skipping of children. Children who do not skip meals regularly take milk and dairy goods three times or more a day.

Table 2. Correlation coefficients between meal skipping and health status

	Meal skipping	Physical activity	Attentiveness	General health level	Disease/sickness
Meal skipping	1				
Physical activity	-.036	1			
Attentiveness	-.078*	.096**	1		
General health level	-.106**	.158**	.218**	1	
Sickness/disease	.026	.097**	-.076*	-.228**	1

* $p < .05$ ** $p < .01$

Health status of meal skipping children

The present study examined the association between meal skipping and a few indicators of health status. Among the respondents, 12.1% of children were underweight and 10.3% of children were overweight or in the obesity group. Children of middle school age were more likely to be underweight compared to primary school children or high school students, 16.6%, 11.8%, and 1.7% respectively. Children who skip meals one or more times were more likely to be underweight, but it did not gain a statistical significance.

Table 2 presents the correlation coefficients between frequency of meal skipping and degree of health status. Frequency of meal skipping was not significantly associated with degree of physical activity. Frequency of meal skipping was negatively associated with degrees of attentiveness and general health level of children, though the relationships were not so strong. Children skipping meals more frequently were less likely to be attentive and healthy.

Almost half of children (48.9%) responded that they do not have any symptom of sickness or disease such as cold, respiratory ailment, headache, giddiness, toothache, amblyopia, indigestion, intestinal inflammation, anemia, and other sickness. The present study simply counted the number of sickness/disease to examine association with meal skipping of children. Frequency of meal skipping was not significantly associated with number of sickness/disease.

School and community life of meal skipping children

There was a significant association between meal skipping and school and community life of children. Table 3 presents the correlation coefficients between frequency of meal skipping, number of friends, school performance, and visit to welfare center. Meal skipping was negatively associated with number of friends and school performance. Children skipping meals

Table 3. Correlation coefficients between meal skipping and school and community life

	Meal skipping	Number of friends	School performance	Visit to welfare center
Meal skipping	1			
Number of friends	-.119**	1		
School performance	-.111**	.228**	1	
Visit to welfare center	-.156**	.108**	.141**	1

* $p < .05$ ** $p < .01$

frequently were less likely to have many friends and to achieve better school performance. Meal skipping was negatively associated with visit to welfare center. However, this finding should be interpreted in an opposite direction. Children who frequently visit welfare center for services and programs were less likely to skip meals.

Factors predicting meal skipping of children

We examined to what extent socio-demographic and economic characteristics of child and family predict the frequency of meal

Table 4. Ordinal logistic regression predicting meal skipping of children

	β	p
Intercept 0	-3.464	.000
Intercept 1	.667	.335
Intercept 2	4.325	.000
Child and family factors		
Sex of child		
Boys	.080	.685
Girls (ref.)		
Age of child		
Lower primary school	.613	.032
Higher primary school	.087	.722
Middle and high school (ref.)		
Family structure		
Single parent	.566	.021
Grandparent(s)	.316	.372
Other type	-.248	.538
Both parent (ref.)		
Education of caretaker		
Primary school	.281	.404
Middle school	.594	.123
High school	.260	.363
College and university (ref.)		
Job of caretaker		
Professional	.490	.389
Clerical	-.677	.122
Manual labor	.150	.599
Small shops	.456	.251
Sales and services	-.135	.656
Agriculture and fishery	1.614	.002
Unemployed (ref.)		
Month household income (Won)		
Less than 500,000	.106	.796
500,000 ~ 1,000,000	-.031	.931
1,000,000 ~2,000,000	-.399	.283
More than 2,000,000 (ref.)		
Region		
Large urban areas	.651	.025
Middle urban areas	1.196	.000
Rural areas (ref.)		
Dietary factor		
Caretaker concern about meal	-.426	.000
Social factor		
Visit to welfare center	-.216	.010
Chi-Square	74.57 (.000)	
Cox and Snell Pseudo R-Square	0.136	

skipping. Additionally, two variables, caretaker's concern about diet and a child's visiting the welfare center after school that may be associated with meal skipping of children, were included in the model.

Table 4 presents the results of ordinal logistic regression analyses. Among the socio-demographic and economic factors, school age of child, family structure, job of caretaker, and region significantly predicted frequency of meal skipping of children. Children of lower primary school age were more likely to skip meals compared to the reference group, children of middle and high school age. Single parent children were more likely to skip meals compared to reference group, both parent children. Children with caretaker having agriculture and fishery job were more likely to skip meals compared to reference group, unemployed caretaker. Children living in urban areas were more likely skip meals compared to reference group, children living in rural areas.

After controlling for socio-demographic and economic factors, caretaker's concern about diet and a child's visiting the welfare center after school significantly predicted frequency of meal skipping. Children with caretaker having concern about child's diet were less likely and children frequently visiting welfare center were less likely to skip meals. Conclusively, younger children of single parent families living in urban areas whose caretaker is not concerned about a child's diet were most likely to skip meals compared to any other child group. Explanatory power of all independent variables predicting dependent variable, meal skipping, was 13.6% in the present study.

Discussion

In the present study, a majority of children (93.8%) responded that they skip a meal one or more times a day. The prevalence of meal skipping in the present study is much higher than the other report (Choe & Kim, 2004), as it is mainly because the sample was drawn from poor children provided with public meal service. A significant proportion of children skip breakfast and dinner due to no food supply, suggesting that these children might be insufficient in food and nutrition intake. Particularly, children of no food supply were less frequently taking fruits for breakfast ($r = 44.88$, $p < .05$) and for dinner ($r = 47.75$, $p < .05$).

A majority of children responded they are able to prepare their own meals. It might be due to without a proper caretaker. Thirty-seven percent of children of primary school age did not have parent or caretaker at home when they return from school. Children who were neglected at home without caretaker were more likely to skip meals and to get public meal service.

Meal skipping of children was negatively associated with lower intake of food and nutrition, as hypothesized. The findings were consistent with other study results (Alaimo *et al.*, 2001b; Casey *et al.*, 2001, 2005). A majority of children regularly take five food groups, suggesting that they are not insufficient in nutrition

and nourishment. However, a significant proportion of children less frequently take five food groups, indicating that they might be insufficient of protein, saturated fat, minerals, vitamins, and calcium. Compared to vegetables, children do not take fruit more frequently. It is partially attributable to the Korean vegetable diet and high price of fruit for low-income families.

Meal skipping of children was negatively associated with health status indicators such as general health level and attentiveness, as hypothesized. The findings are consistent with other study results (Alaimo *et al.*, 2001b; Casey *et al.*, 2005). Although previous studies reported that children of food insufficiency have higher underweight rates than those of food sufficiency (Alaimo *et al.*, 2001b; Casey *et al.*, 2005), the findings in the present study did not show that meal skipping is significantly associated with underweight. The 2006 National Adolescence Health Survey data report that rates of underweight for middle school students and for high school students were 9.5% and 3.2% each (Kim *et al.*, 2007). In the present study, rate of underweight for middle school student was 16.6% comparatively higher than 9.5% of the national data. Rate of underweight for high school students was 1.7% comparatively lower than 3.2% of the national data. As the sample of the present study is not representative of total child population, we could not confirm that there is a substantial difference between two findings.

Meal skipping was negatively associated with number of friends and school performance. The findings are consistent with other study results (Alaimo *et al.*, 2001a; Brooks-Gunn & Duncan, 1997; Casey *et al.*, 2005; Murphy *et al.*, 1998).

The present study found that socio-demographic and economic factors such as school age of child, family structure, region, job of caretaker, concern about diet, and child's visit to welfare center significantly predicted frequency of meal skipping. A lower age of children was significantly associated with meal skipping. It is partially because a sub-sample was collected from the Community Child Centers providing meal service mostly for primary school children. Nevertheless, this finding suggests that children of lower ages were more likely to be neglected from meals compared to older children.

Single parent children were more likely to skip meals compared to both parent children. The findings are similar to those of other studies (Casey *et al.*, 2001; McIntyre *et al.*, 2002; Wehler *et al.*, 2004). Children with grandparent(s) were also more likely to skip meals compared to both parent children, though it did not gain a statistical significance. These findings indicate that family dissolution is significantly associated with meal skipping of children. Children with caretaker of agricultural and fishery job were more likely to skip meals. This finding might be associated with family structure and regional distribution. Children with grandparent(s) were more likely to stay in rural areas than in any other areas (Chi-square = 28.73, $p < .001$). Contrarily, a majority of single parent children were found in large urban areas (61.1%, Chi-square = 28.73, $p < .001$). The present study confirms that children with grandparent(s) in rural

areas and children of single parent families in large urban areas were the most vulnerable child group to meal skipping.

Parent or caretaker's concern about a child's diet significantly reduced meal skipping of children, which is consistent with bivariate analyses. It is because parent or caretaker with deep concern about child's diet was more regularly preparing meals for child ($r = .290$, $p < .01$). Visit to welfare center for services and programs significantly reduced meal skipping of children. This finding suggests that social support and community practice is significantly helpful to protect children from meal skipping.

The present study found that meal skipping of children in low-income families was significantly associated with a lower nutrition and health status and a poorer school performance of children, as hypothesized. It is clear that meal skipping has negative impact on physical and academic aspects of children, and should be suppressed beforehand. We suggest a few implications for community practice based on the study findings.

First, it is necessary to construct a community networking including the public sector as well as the private (non-profit) sector for meal service for children, as previous studies have emphasized (Chang & Park, 2006; Cho, 2007; Kim *et al.*, 2007). Studies abroad indicated that meal skipping of children is a proxy of food insufficiency practically originated from lack of access to food (Casey *et al.*, 2001, 2005; McIntyre, 2002).

Second, in the present study, children of meal skipping were likely to have a lower school performance. Current public meal service only emphasizes recruiting meal skipping children and providing children with meals on time, without concrete investigation of satisfaction degree. In addition to meal service, educational programs such as after-school sessions should be provided to reduce negative impact on academic aspect of children, and further to break vicious cycle of poverty (Kim *et al.*, 2007).

Third, the present study confirmed that poverty and family dissolution are significant risk factors for meal skipping of children. Absence of parent or caretaker who regularly provides meals for a child is critical for food and nutrition intake of children. Various social support programs should be provided to meet needs of meal skipping children and their families at community level. Mentoring programs and family strengthening programs are examples for supplementary social support programs (Chang & Park, 2006; Cho, 2007). Particularly child care support should be provided for low-income parents who are underemployed.

Fourth, it is prerequisite to examine risk factors so as to reduce meal skipping of children. As the study sample was drawn from the children in low-income families provided with public meal service, we could not compare meal skipping of children in low-income families with those in high-income families. We could not identify whether there is a substantial difference of meal skipping between children in low-income families and children in high-income families. So, it is requested to include a representative sample including children of all income levels.

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