

The Public School Lunch Program and its Contribution to the Alleviation of Problem Behaviors

Mann Hyung Hur, PhD
College of Public Service
Chung-Ang University
Heukseok-dong 221, Dongjak-gu
Seoul, Korea 156-756

Abstract

This study examines the relationship between food hardship caused by the lack of school lunches and problem behaviors. The data for this study were collected from a survey questionnaire of fifth and sixth graders in elementary school in addition to middle school students in the seventh, eighth and ninth grades. A set of t-tests was employed to compare the level of problem behaviors under the condition of food hardship. Unlike preexisting studies, food hardship was a problem not only for low-income children but also for children of other socioeconomic status. This study showed that children experiencing food hardship are likely to also experience problem behaviors. More important, the data demonstrate that problem behaviors could be caused by even a temporary food hardship, such as skipping a meal.

Key words: school lunch program, food hardship, problem behavior, externalizing problem behavior, internalizing problem behavior

Introduction

Poverty among children is a problem not only in underdeveloped countries but also in developed countries. The child poverty rates in Scandinavian countries, such as Finland, Norway, and Sweden, are less than five percent, but the rates in some OECD (Organisation for Economic Co-Operation and Development) member countries, such as the United States and Mexico, are more than 20 percent. Approximately one out of every ten children in the OECD countries, including South Korea, is currently experiencing poverty (OECD, 2008). Food hardship often accompanies child poverty, which refers to the lack of food or money to buy food that a family needs. As a result, the school lunch program was established as a policy instrument to alleviate food hardship among children. The program, which was launched in the United States in 1946 and in Korea in 1992, provides free or low-priced school lunch meals to qualified students through government subsidies to schools.

The performance of the school lunch program has been evaluated by a variety of authors in terms of nutrition (Allen & Newton, 1986; Grainger, Senauer, & Runge, 2007; Gleason & Sutor, 2003; Wagner, Senauer, & Runge, 2007), health (Hofferth & Curtin, 2005), and the participation of children in the program (Maples & Spillman, 1996; Wojcicki & Heyman, 2006). Some studies (Ashiabi & O'Neal, 2007; Slack & Yoo, 2005) have focused on the relationship between food hardship and the problem behaviors of children, but these studies solely focused on low-income children. School lunch programs need to reach children from all income levels, not just those from poor families. This study examines the relationship between food hardship caused by the lack of school lunches and problem behaviors. It also investigates further how receiving lunch from a school lunch program potentially relates to the exhibition of problem behaviors.

Literature Review

Problem behavior management during childhood has been recently recognized as a major social welfare challenge because of findings that problem behaviors are empirically linked to poor school performance and later violence, criminality, substance abuse and dependence, and mental and physical health problems (Olsson, 2010; Thompson, et al., 1990).

The limited research suggests that food hardship is positively associated with problem behaviors (Dunifon, & Kowalski-Jones, 2003; Reid, 2002; Slack & Yoo, 2005). By using the USDA Food Security Module, Reid (2002) finds that greater severity and longer periods of food insecurity for children are associated with higher levels of behavior problems. Using the same data, Dunifon and Kowalski (2003) discover that food hardship relates to less positive behavior among children. Using data from two waves of a panel study of families that currently receive or recently received cash welfare benefits, Slack and Yoo (2005) reached similar conclusions as both of these previous studies.

However, these studies did not focus on the relationship between school lunch programs and problem behaviors, but rather on the association between the degree of food hardship and problem behaviors in low-income children. Children experiencing food hardship are not exclusively from low-income families; middle- and high-income families can also experience food insecurity or food hardship (FRAC, 2010). Therefore, it is erroneous to equate only children from low-income families with problem behaviors. Rather, children experiencing food hardship can exhibit behavior problems regardless of socioeconomic status. The focus of this research, then, is on the relationship between the experience of food hardship and behavior problems of children from all socioeconomic backgrounds. Reid (2002) and Slack and Yoo (2005) find that food hardship positively correlates with both internalizing and externalizing problem behaviors. Externalizing problem behaviors consist of delinquent and aggressive behavior, while internalizing problem behaviors are reflective of internal states such as anxiety, depression, and withdrawal (Stacks and Goff, 2006). Reid (2002) finds a stronger association between food insecurity and externalizing behaviors than between food insecurity and internalizing behaviors. According to Slack and Yoo (2005), food hardship positively associates with internalizing behavior problems for children between the ages of 6 and 12, as well as with internalizing and externalizing behavior problems for children between the ages of 3 and 5.

These studies were all conducted within the United States. The school lunch program was implemented in Korea in 1992 and covers more than 99% of elementary and middle schools. However, few studies have focused on the relationship between participation in a school lunch program and problem behavior. While Lee & Choi (2010) focus on the relationship between children's psychosocial adaptability with skipping meals, most studies that examine school lunch programs have been conducted in terms of nutrition value (Lee, 2005a), dietary behaviors (Kim & Lee, 2003), and customer satisfaction (Yi, Yang, & Park, 2009). To generalize the theory related to the association between food hardship and behavior problems, further research is required to determine whether the findings of prior studies are similar outside the United States.

Research Methods

The data used for this study were collected from a survey questionnaire of fifth and sixth graders in elementary school in addition to middle school students in the seventh, eighth and ninth grades. The questionnaire was given to all of the children who attended the selected schools, including low-income students receiving free or reduced-price meals and students purchasing full-price meals.

In this study, the survey of food hardship was conducted in two ways. First, food hardship was measured in terms of food sufficiency and security at home to examine its locus and level. The U.S. Census Bureau has previously utilized this type of survey as an index for its Survey of Income and Program Participation (SIPP). Each individual respondent was asked whether he or she had enough to eat and the types of food they desired; whether they had enough to eat, but not always the types of food they wanted; whether they sometimes did not have enough to eat; whether they often did not have enough to eat; and whether they always did not have enough to eat (Ribar & Hamrick, 2003). Second, food hardship was described as a situation in which children did not receive lunch and experienced hunger. This approach was employed to examine the relationship between food hardship and problem behaviors. Each individual respondent was asked to mark his or her own level of problem behaviors twice. The first was the perceived level of problem behavior during instances of not having lunch at school and feeling hungry, and the second was the level of behavior during instances of having lunch and not feeling hungry. The two levels were then compared to explore the relationship between food hardship and problem behavior.

Measurement of Problem Behaviors and Food Hardship. Four sections were included in the questionnaire. The first and second sections included nine items designed to measure the level of problem behaviors. Problem behaviors can be measured by applying the Social Skills Rating System (Gresham & Elliott, 1990).

An index of problem behavior must assess behavior as two subscale types: externalizing behavior problems and internalizing behavior problems. Five questions included items that measured externalizing behavior problems, such as arguing, fighting, getting angry, acting impulsively, and disturbing ongoing activities, while the remaining four questions included items that measured internalizing behavior problems, such as anxiety, loneliness, sadness, and decreasing self-esteem.

The nine items measuring both externalizing and internalizing problem behaviors were previously employed in a study on the influence of the National School Lunch Program on children in the United States conducted by Dunifon and Lowaleski-Jones (2004). Each individual question was structured using a 5-point Likert scale that ranged from never, seldom, sometimes, often, and always. In the first section, respondents checked the level of their symptoms in terms of the nine problem behavior items that occurred when they did not have lunch at school and experienced hunger. In the second section, respondents checked the level of their symptoms when they had lunch at school and did not feel hunger.

The third section included four questions, including the level of food hardship at home and the level of participation in the school lunch program. The level of food hardship at home was measured using a revised version of the index used in SIPP. The fourth section asked questions related to the socioeconomic backgrounds of the students.

The Sample. The questionnaire was distributed to 24 schools, 12 elementary and 12 middle schools located in Seoul, Korea. The socioeconomic background of residents in Seoul varies due to location, north and south of the Han River, and housing type, such as a single-family home or high-rise condominium. Those residents who live in high-rise condominiums south of the Han River are relatively richer than those who live in single-family homes north of the Han River. Single-family homes and high-rise condominiums from these areas were targeted for the study. Three elementary schools and three middle schools were chosen from the four locations.

Teams of two trained doctoral students were assigned to conduct the survey in three elementary and three middle schools in each of the four locations. Each team visited six schools and distributed the questionnaires to students during class. Students completed the questionnaire at home and handed them back to their teachers, after which the survey team returned to collect them. A set of 40 copies was delivered to 24 individual schools. Out of 960 surveys, 738 copies were collected from 242 elementary school students and 496 middle school students. Out of 738 respondents, 70 students received free lunches regularly before the study.

Analysis. The levels of food hardship and participation in the school lunch program were examined before exploring the relationship between food hardship and problem behaviors. Paired-sample t-tests were employed to compare the level of problem behaviors under the condition of food hardship with the level of problem behaviors under the condition of having food security. As mentioned previously, in the first section of the questionnaire, respondents were asked to check their perceived level of problem behaviors that occurred when they did not have lunch at school and experienced hunger, while in the second section, they reported the level of problem behaviors that occurred when they had lunch at school and did not feel hunger.

In Table 1, A through D represent the children's self-perceived levels of problem behaviors under the condition of food hardship, while W through Z indicate their self-perceived levels under the condition of food security. To examine the association between food hardship and problem behaviors, A and W, B and X, Y and C, and D and Z were compared using paired-sample t-tests. Previous studies have indicated that differences do exist between A and W and B and X, illustrating that children from low-income families exhibit problem behaviors when experiencing food hardship. Few studies, however, have examined whether differences exist between C and Y and D and Z. It can be assumed, then, that children from any income may exhibit problem behaviors when experiencing food hardship.

Previous studies assume that serious problem behaviors occur from those children already exposed to food hardship. The focus of these studies was limited to children from low-income families. However, another hypothesis can be made regarding the level of problem behaviors: for low-income children, the level of problem behaviors would likely be more serious than for other children, under both the conditions of food hardship and food security. If this assumption can be proven true, then it can be said that the problem behaviors of low-income children are more severe than those of other children.

To examine this hypothesis further, the children in the study were divided into two groups, those receiving free or reduced-price lunches and those purchasing full-price lunches. The levels of problem behaviors for the two groups were compared under the conditions of both food security and food hardship, respectively. The differences between A and C and B and D under the condition of food hardship and the differences between W and Y, and X and Z under the condition of food security were examined to test the assumption that the problem behaviors of low-income children are more severe than the behaviors for other children, even under the condition of equal food security.

Table 1. Analytic Methods of the Relationship Between Food Hardship, Household Income Level, and Problem Behaviors

Groups	Behavior Problems		Conditions	
	Categories	Items	Students with no school lunch experiencing hunger	Students with school lunch and not experiencing hunger
Students Receiving Free or Reduced-Price Lunches	Externalizing Problem Behavior	Arguing, fighting, getting angry, acting impulsively, and disturbing activities	A	W
	Internalizing Problem Behavior	Exhibiting anxiety, loneliness, sadness, and decreasing self-esteem	B	X
Students Purchasing Full-Price Lunches	Externalizing Problem Behavior	Arguing, fighting, getting angry, acting impulsively, and disturbing activities	C	Y
	Internalizing Problem Behavior	Exhibiting anxiety, loneliness, sadness, and decreasing self-esteem	D	Z

Two sets of paired-sample t-tests were conducted to compare the level of problem behaviors that occurred when students had lunch and did not experience hunger with that of students who did not eat lunch and did experience hunger. The first set of the t-test included those students who were provided free or reduced-price lunches, and the second set included those provided full-price lunches. The two sets of paired-sample t-tests were explored in terms of both externalizing and internalizing behavior problems. The students who received free lunches were low-income children, while those who purchased lunch were composed of children with a higher socioeconomic status. This study predicted that low-income children experiencing food hardship would demonstrate problem behaviors if the differences revealed in the first set of paired-sample t-tests proved to be statistically significant. Children other than those with a low socioeconomic status would also show behavior problems under the same conditions if the differences revealed in the second set of paired-sample t-tests were statistically significant. The last set of t-tests conducted was to explore whether low-income children showed more serious behavior problems than those of a higher socioeconomic status who also experienced food hardship.

Results

Food Hardship and Participation in the School Lunch Program. Using a 5-point Likert scale, the level of food security of students purchasing full-price school lunches was measured at 4.11, which corresponds with the category of students who had enough to eat, but not always the type of food they wanted. The level of students who received free or reduced-price lunches was weighted at 3.93, representing a slightly more serious level than those purchasing full-price lunches; however, that difference was not statistically significant at the 0.05 level. Level of participation in the school lunch program also was measured using a 5-point Likert scale. The level of participation for those students purchasing full-price lunches, at 4.48, was slightly higher than the level of those provided free or reduced-price lunches at 4.36. The difference between the two was also not statistically significant. However, the problem of food hardship did not exclusively affect the children receiving free or reduced school lunches. The results also show that children from other families, such as middle- and high-income families could also experience food insecurity or food hardship. Out of the 69 children receiving free or reduced-priced school lunches, 4.2 percent suffered from food hardship, while 2.4 percent of 666 children purchasing full-price school lunches experienced food hardship.

Table 2. The Level of Food Security and Participation in the School Lunch Program

Item	Type	N	Level***	Std. dev.	T	Sig.
Food Security	Full price*	666	4.11	1.053	1.359	.175
	Free or reduced-price**	69	3.93	1.145		
Participation in School Lunch Program	Full price*	667	4.48	.884	1.177	.284
	Free or reduced-price**	70	4.36	1.060		

* Students purchasing full-price lunches

** Students receiving free or reduced-price lunches

*** The level of food security was measured on a 5-point Likert scale: 5, when students had enough to eat and the types of food they wanted; 4, when they had enough to eat, but not always the types of food they wanted; 3, when they sometimes did not have enough to eat; 2, when they often did not have enough to eat; and 1, when they had always did not have enough to eat. The level of participation in the school lunch program was also measured on a 5-point Likert scale: 5 for **always** participating, 4 for **often**, 3 for **sometimes**, 2 for **seldom**, and 1 when students **never** participated in the school lunch program.

Relationship Between Food Hardship and Problem Behaviors. As seen in Table 3, the level of problem behaviors for low-income children with food hardships ranged from 1.26, which is just over the indicator for **never**, to 2.10, which is slightly over the indicator for **seldom**. The level of food security for the same group of children varied from 1.21 to 1.54. An externalizing problem behavior, such as arguing, reached the highest level under both food hardship and security, while internalizing problem behavior, such as sadness, reached the lowest level under both conditions.

Similar to the findings of previous studies (Dunifon & Lowaleski-Jones, 2004; Reid, 2002; Slack & Yoo, 2005), the problem behaviors of children occurred under the condition of food hardship such as not eating lunch and experiencing hunger, yet these problem behaviors were present for all nine items included in this study. Interestingly, the problem behaviors of low-income children experiencing food hardship were lower than those of other children or those purchasing full-price lunches. The first group showed a higher level of problem behaviors only for four items, including arguing, fighting, getting angry, and exhibiting anxiety, while the latter group showed a higher level for all items except sadness.

Low-income children, most often those receiving free or reduced-price lunches, who experienced food hardship had higher externalizing behavior problems for three items, including arguing, fighting, and getting angry when they had not eaten lunch and felt hungry. No significant differences appeared in the other two items of externalizing behavior problems, such as impulsive action and ongoing activity disturbance. Out of the four items of internalizing behavior problems, only anxiety showed a significant difference for children experiencing food hardship. These children indicated that the level of anxiety appeared to increase when they did not have lunch and felt hungry. No significant differences, even under the situation of food hardship, were shown for the other three items of internalizing behavior problems, including loneliness, sadness, and self-esteem.

Compared with the case of low-income children, the levels of externalizing and internalizing behavior problems for other children, in most cases, were higher when they experienced food hardship such as not having lunch and feeling hungry. Except for one item representing an internalizing behavior problem, their answers indicated that the level of problem behaviors in all eight items increased when the low-income children did not have lunch and experienced hunger. These behavior problems occurred for all five items of externalizing behavior problems, including arguing, fighting, anger, impulsive action, and ongoing activity disturbance, and for three items of internalizing behavior problems, including exhibiting anxiety, loneliness, and lower self-esteem.

There were some differences between externalizing and internalizing behavior problems in terms of the relationship between food hardship and behavior. Externalizing behavior problems were more extensively associated with food hardship than were internalizing behavior problems.

Out of the five items that represented externalizing behavior problems, three items occurred for children who received free or reduced-priced lunches, while all five items appeared for those children purchasing full-price lunches, thus showing their relationship to food hardship. However, out of the four items representing internalizing behavior problems, only one appeared for children receiving free or reduced-priced lunches and three for children purchasing full-price lunches.

It was also found that problem behaviors, either externalizing or internalizing, seemed to appear not only for low-income children (those receiving free or reduced-price lunches) but also for children with a higher socioeconomic status (those purchasing full-price lunches). The problem behaviors of children with a higher socioeconomic status were greater when experiencing food hardship than for the low-income children. This result suggests that the tolerance of low-income children to food hardship is greater than that of children with a higher socioeconomic status.

Table 3. Levels of Behavior Problems for Children Who Do Not Have School Lunch and Feel Hungry and for Children Who Have School Lunch and Do Not Feel Hungry

Groups	Behavior Problems		Level of the Behavior Problem***		Statistics	
			No school lunch & feeling hungry	School lunch & feeling no hunger	T	Sig.
	Types	Items				
Students Provided Free or Reduced-Price Lunches	Externalizing Problem Behavior	Arguing	2.10	1.54	4.349	.000**
		Fighting	1.74	1.49	2.416	.018*
		Getting angry	1.44	1.29	2.628	.011*
		Acting impulsively	1.57	1.42	1.559	.124
		Disturbing activities	1.41	1.43	.178	.859
	Internalizing Problem Behavior	Exhibiting anxiety	1.79	1.34	3.596	.001**
		Exhibiting loneliness	1.48	1.33	1.689	.096
		Exhibiting sadness	1.26	1.21	.725	.471
		Decreased self-esteem	1.41	1.33	.864	.390
Students Purchasing Full-Price Lunches	Externalizing Problem Behavior	Arguing	2.03	1.51	12.119	.000**
		Fighting	1.70	1.45	7.492	.000**
		Getting angry	1.44	1.34	3.740	.000**
		Acting impulsively	1.72	1.44	7.932	.000**
		Disturbing activities	1.53	1.40	4.150	.000**
	Internalizing Problem Behavior	Exhibiting anxiety	1.66	1.47	5.379	.000**
		Exhibiting loneliness	1.36	1.27	3.3333	.001**
		Exhibiting sadness	1.27	1.25	.544	.587
		Decreased self-esteem	1.44	1.27	5.189	.000**

* p≤ 0.05

**p≤0.01

*** **Never** refers to 1, **seldom** to 2, **sometimes** to 3, **often** to 4, and **always** to 5 on a 5-point-Likert scale.

The Association Between Income Level and Child Problem Behaviors. Under the condition of food hardship, there was little difference between the level of problem behaviors and low-income children and other children. As seen in Table 4, the level of behavior problems for low-income children was both higher and lower than that for the children of a higher socioeconomic status. Although the differences were not statistically significant, the low-income children showed a higher level of problem behaviors for four items, including arguing, fighting, exhibiting anxiety, and loneliness, while the other children expressed higher levels for five behavioral items, including getting angry, acting impulsively, disturbing ongoing activities, exhibiting sadness, and decreasing self-esteem. In the instance of food security, the two groups also did not demonstrate significant differences in their problem behaviors. Low-income children showed higher levels of problem behaviors for four items, including arguing, fighting, disturbing activities, and exhibiting loneliness, while other children expressed higher levels for five items, including getting angry, acting impulsively, exhibiting anxiety and sadness, and decreasing self-esteem.

However, the differences in behavior findings between these two groups were again not statistically significant. These results demonstrate that under any condition related to food hardship and food security, no significant differences exist for problem behaviors between the two groups. Indeed, the problem behaviors of low-income children were not any more severe than those of the children of a higher socioeconomic status.

Carefully reviewing the findings above, an interesting consistency emerged. Under the conditions of both food hardship and food security, low-income children showed a higher level of problem behaviors for three items, including arguing, fighting, and loneliness, while the other children expressed a higher level for four items, including getting angry, acting impulsively, experiencing sadness, and decreased self-esteem. The differences between these seven items were not statistically significant, but the meaning of the was consistent. Low-income children, regardless of food hardship or food security, tend to show more severe externalizing problem behaviors, such as arguing and fighting, and internalizing behavior problems, such as loneliness, while other children tend to express externalizing problem behaviors, such as getting angry and acting impulsively, and internalizing behavior problems, such as sadness and lower self-esteem. Arguing and fighting are included in externalizing problem behaviors that act against others, while getting angry and acting impulsively are externalized problem behaviors that do not necessarily require acting out against others. Therefore, on the basis of the consistency illustrated above, it can be said that low-income children have a greater possibility of showing externalizing problem behaviors toward others while children of a higher socioeconomic status have the tendency to express their externalizing problem behaviors only to themselves.

Table 4. Levels of Problem Behaviors in the Situation of Not Having Lunch and Feeling Hungry and Having Free or Reduced-Price Lunches and Full-Price Lunches

Condition	Type	Items	Level of Behavior Problems		Statistics	
			Children Receiving Free or Reduced-Price Lunches	Children Purchasing Full-Price Lunches	T	Sig.
Food Hardship (having no school lunch & feeling hungry)	Externalizing problem behavior	Arguing	2.10*	2.03	.532	.595
		Fighting	1.76*	1.70	.475	.635
		Getting angry	1.44	1.45**	.041	.967
		Acting impulsively	1.57	1.72**	1.214	.225
		Disturbing activities	1.41	1.53**	1.199	.231
	Internalizing problem behavior	Exhibiting anxiety	1.79*	1.66	1.005	.315
		Exhibiting loneliness	1.48*	1.36	1.325	.185
		Exhibiting sadness	1.26	1.27**	.123	.902
	Decreased self-esteem	1.41	1.44**	.257	.797	
Food Security (having school lunch & not feeling hunger)	Externalizing problem behavior	Arguing	1.54*	1.51	.292	.771
		Fighting	1.49*	1.45	.435	.664
		Getting angry	1.29	1.34**	.665	.506
		Acting impulsively	1.42	1.44**	.226	.821
		Disturbing activities	1.43*	1.40	.295	.768
	Internalizing problem behavior	Exhibiting anxiety	1.34	1.47**	1.288	.198
		Exhibiting loneliness	1.33*	1.27	.732	.464
		Exhibiting sadness	1.21	1.25**	.527	.598
	Decreased self-esteem	1.33	1.37**	.769	.442	

* Items where students are provided free or a reduced-price lunch and showed a higher level of behavior problems.

** Items where students purchased full-price lunches and showed higher level of behavior problems.

Discussion

Not all the findings in this study were in agreement with previous studies. As in preexisting work, this study showed that children experiencing food hardship are likely to also experience problem behaviors. More important, the data demonstrate that problem behaviors could be caused by even a temporary food hardship, such as skipping a meal.

Therefore, it can be said that having lunch meals at school can help alleviate the problem behaviors of children. The school lunch program is an effective instrument that raises the food security level of low-income children to that of children with a higher socioeconomic status. Unlike previously discussed studies (Ashiabi & O'Neal, 2007; Slack & Yoo, 2005), food hardship was a problem not only for low-income children but also for children of other socioeconomic status. Any child, regardless of household income, can experience food hardship. Because food hardship was not merely a concern for low-income children, these results suggest that food insecurity can occur for reasons other than low income. For example, a lack of care at home or at school can be a cause for food insecurity as well. Therefore, the focus of food insecurity studies should be extended from simply examining poverty or low-income circumstances to looking at other factors, such as a lack of care or concern for children.

Problem behaviors in this study did not exclusively occur in low-income children as is suggested by previous studies (Ashiabi & O'Neal, 2007; Slack & Yoo, 2005). These behaviors can happen to any child who experiences food insecurity regardless of family income or social status. So far, both academia and social practitioners have assumed a straightforward correlation between low income and food hardship, and food hardship and behavior problems. This study demonstrates that this assumption is not accurate. Such an assumption can mislead researchers and thus can result in a prejudiced point of view that presumes that low-income children will have more behavior problems. Such a straightforward relationship between food hardships, children from low-income families, and behavior problems should not be assumed or taken for granted. Problem behaviors occurring during a time of food hardship were less prominent for children from low-income families than for other children. Under the condition of food hardship, low-income children reported problem behaviors in four out of nine items, while other children revealed the same behaviors in eight of nine instances. Low-income children were more tolerant of food hardship circumstances and thus less likely to exhibit problem behavior than their peers from higher-income families. This phenomenon can be described as a zone of tolerance. In this study, the tolerance zone for low-income children to food hardship was greater than that for other children.

In terms of the types of problem behaviors, this study supports the findings of Reid (2002). Externalizing problem behaviors were more likely to occur than were internalizing problem behaviors when children were experiencing food insecurity. This phenomenon was especially evident in low-income children. Under the condition of food hardship, children's externalizing problem behaviors occurred for three items, namely, arguing, fighting, and getting angry, while children's internalizing problem behaviors appeared for only one item, anxiety. The low-income pattern of problem behaviors diverged from the behavior pattern of children from higher incomes. The low-income group tended to show their externalizing problem behaviors toward other children, while the children with higher income were inclined to express externalizing problem behaviors to themselves. The behavior patterns of these two groups did not change even when the current condition changed from experiencing food hardship to having food security.

Conclusion

In conclusion, three points need to be mentioned. First, the effects of the school lunch program have been positive in terms of the alleviation of food hardship. No significant differences between low-income children and other children were shown in the participation level for school lunch program, and even the level of food security for low-income children was closer to that of most other children. The school lunch program needs to be expanded to more children with increased quality so they can participate conveniently. In this context, school breakfast should be considered for both low-income children and children receiving little attention at home.

Second, as in the United States, food hardship causes problem behaviors in Korean schools. However, no straightforward relationship exists between low income and problem behaviors. A low socioeconomic status can cause food hardship, and food hardship can cause problem behaviors, but low income does not directly cause problem behaviors. Food hardship is associated with problem behaviors, but low income alone is not always associated with problem behaviors. A comparative study to explore whether this same phenomenon occurs in the United States or other countries would offer valuable contributions to the research on the school lunch program.

Third, food hardship was not always a matter of low income, but rather sometimes a matter of carelessness at home or at school, a factor that has been less researched. Care at home and school to ensure children's food security should be a potential focus, as researchers further examine the association between food hardship and problem behaviors in all school children.

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