DOI Number: 10.5958/0974-1283.2019.00250.0

Nutrition Management and Support Effect of Food Service at Home Childcare Center

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ABSTRACT

The goal of this study was to investigate current nutritional management status of meals served at home childcare center and the degree of improvement and the change of salt salinity after the support by the Center for Children's Foodservice Management (CCFM). The result showed that the mean compliance rate of all 14 items was 76.1% among which the items that were rated lower than the average was. Among the items that were rated lower than the average, 0.7% answered yes to "Does the center check the soup's salinity at cooking?", 28.0% for "Does the center cook by reading the standard recipe?", 32.7% for "Does the center provide alternative food to infants with food allergy?" 363.3% for Does the center natural seasoning during cooking', 73.3% replied yes to 'Does the center utilize special diet such as low-salt diet, low-end diet?', etc. The improvement in providing alternative foods to infants and children with allergies after one nutritional support did not show significant change. However, the mean scores of all four domains increased significantly ($p < 0.05$, $p < 0.001$), and the overall mean score increased significantly from 70.43 to 75.79 ($p < 0.001$).58 (50.4%) of 0.3 ~ 0.5% of the nursery schools were the most with the change in salinity after the nutritional support for lunch, while 59childcare center (49.5% reduced to 38(33.1%) which were more than 0.5%. The mean salinity of the nursing homes in the study was significantly reduced from 0.53% to 0.45% ($p < 0.01$) measured in the childcare center. The results of this study made sure that the nutritional management of the home childcare center was improved after the service of the child care center. However, there were some items that could not be improved only with one nutritional support, and there were many nurseries that did not improve with the salinity of the soup. Therefore, the Children's Food Service Support Center will continue to provide nutritional support for home childcare centers, and more home childcare centers will need to increase resources and opportunities to benefit from the *Center* for Children's Foodservice Management.

Keywords: *Home childcare center, Foodservice, Nutrition management, Salinity, CCFM.*

Introduction

Children under age five who spend some time in a childcare center would spend more than 33 hours per week at childcare center[1,2]. While eating at the childcare center, they take meals and snacks more than once and begin to form eating habit by interacting with the director of the center and teachers other than their peer groups. Such eating habits formed while young could influence the eating habits of adolescents and adulthood[3-5]. Therefore, other than providing the nutritional support necessary for the growth of children through the meals they provide, the childcare center has become an important institution that influences the eating habits that are formed throughout one's life and the resulting health[6]. However, analysis of the menu of the lunch provided by the real childcare center found that there were many problems such as the lack of vegetables, fruits, and whole grain, and excessive sugar and salt meals[7,8]. Experts say that to address these problems and ensure proper nutritional management of the childcare center, the meal should be done as planned on the right menu and share the nutritional policy of the childcare center

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with the parents[9]. In addition, the teacher should eat with the children, provide nutrition guidance with proper interaction and be a role model by themselves[8]. More than anything, more nutrition education and information to the director of the center are to be provided, and continuous improvement of nutritional management of nursery schools is necessary[7,8,10].

Australia is applying a Start Right - Eat Right system for nutrition management of full-time childcare centers. In the study of the efficacy of this system, 80% of the nurseries participating in the study fully complied with the standards and the overall compliance rate reached to 98% from 56%[11]. The program provided nine hours of nutrition training to the directors and cooking employees, and the children's meal intake has also been significantly improved after that. However, a study of nutrient management by Martyniuk *et al.*[6] found that home-based child-care facilities had a significantly lower nutritional value than center-based child; yet, both types of childcare centers indicated that improvements in nutritional management and nutrition education and training were needed for both kinds of childcare centers.

In Korea, the Center for Children's Foodservice Management (CCFM) has been established and operated by the Food and Drug Administration to systematically manage the hygiene and nutrition of childcare meals since 2011[12]. The Center for Children's Foodservice Support Center provides services such as nutrition education and education of cook and chief of care center, supervision of diary and cookery, check of foodservice management, and preparation of diets for childcare centers, kindergarten and children's welfare facilities without nutritionist. However, small-sized children's homes with younger-aged children are far less than those of large-scale childcare centers[13]. To this, the study is to evaluate the effect of center support for home childcare centers to benefit from more support centers. First, this study will investigate the nutritional management status of home childcare meals, and the degree of improvement after the support of the CCFM and the salinity change of soup provided for each lunch. The results of this study can be helpful in predicting the effectiveness of nutritional support in the CCFM

Method

Research Subjects and Duration: In this study, 150 childcare centers in Cheongju, Korea were visited by dieticians and examined the foodservice and food distribution of center. Two visits were made in total of which first visit was from February to July, and the second visit was from August to December.

Survey Method and Contents: In this study, the home childcare center was visited twice every 5 ~ 6 months. After the field visit at the first visit, the director and the center were provided with necessary nutrition education. The salinity of the soup served at lunch during the first and second visits was measured using the 'HM digital salinity meter (Model: SB-2000 PRO, Seoul, Korea)'. The nutritional management status of children's meals was measured using a checklist used by the support center[12].

The checklist used in the field visit was the one provided in the Guidelines for the CCFM[12], which divides the total 14 items into four domains. In the 'diet management' domain, there are three items. The second domain of 'food provision' provides 6 items. Third, there are four items in the 'cooking domain'. In the final 'distribution' domain, there is one item. After reviewing the nutritional management status of the meals, things that were not complied with well were mainly educated including the confirmation of diet and dietary changes, the description of special diets, allergies and substitutes, standard recipes, natural seasonings, appropriate salinity of the soup, the adequate amount of distribution.

Data Analysis: The statistical analysis of this study was SPSS ver. 18.0 for windows (Statistical Package for Social Science, SPSS Inc. Chicago, IL, USA). Frequency analysis was conducted to figure out the compliance rate of the generalities and the first check result. After the nutritional check-up and feedback on it, the study conducted a p-paired t-test on the first and second nutritional management scores and the salinity the soup served at lunch menu to grasp the efficacy of the check.

Results

Generalities of the Surveyed Childcare Center: Table 1 shows the generalities of 150 childcare centers surveyed. The number of preschool children was 16 ~ 20 persons in 45.4%, 67.8% in case of designated cook, and 31.3% in case of direct cooking by directors without designated cook.49.3% of the cooks or directors had less than 1 year of cooking experience, and 72.0% of them used water purifiers for drinking water and 24.0% of them used boiled tap water.87.3% of the childcare centers were certified by the Ministry of Health and Welfare in Korea and 97.3% were childcare centers using the diet provided by the CCFM.

Table 1: General characteristics of the childcare centers

Category		Frequency (N)	Percentage (%)
Number of child	1 - 5	6	4.0
	6 - 10	26	17.3
	11 - 15	50	33.3
	16 - 20	68	45.4
Number of foodservice employee	0*	47	31.3
	1	103	68.7
Working period of foodservice employee (or directors' cooking periods) (years)	< 1	74	49.3
	1 ≤ - < 3	30	20.0
	3 ≤ - < 5	25	16.7
	5 ≤ -< 7	18	12.0
	7 ≤ - < 10	3	2.0
Drinking water	Using purifier water	108	72.0
	Boiling tap water	36	24.0
	Others	6	4.0
National accredited facilities	Yes	131	87.3
	No	19	12.7
Use of center's menu	Yes	146	97.3
	No	4	2.7
Total		150	100

*Director cooks instead of foodservice employee.

Nutritional Management Status before the Foodservice Management Support of Home Childcare Centers: Table 2 shows the nutritional management status of home childcare centers before the support by the CCFM. The average compliance rate of all 14 items was 76.1%. The items with lower scores than the average were 'Does the center check the salinity of soup at cooking' 0.7%, 'Does the center cook with standard recipe', 28.0%, 'Does the center use alternative foods for the allergies' 32.7% 'Does the center use natural seasoning at cooking' 63.3%, 'Does the center use special diet such as low-salt diet and low-sugar diet' 73.3%. The domain with the lowest compliance rate was 'cooking management', with the average of 47.6%.

Table 2: Nutritional management status before the meals management support of home childcare centers (N = 150)

	Obeying no. (N)	Obeying rate (%)
<Diet management>		
Does the center use a dietitian's diet?	149	99.3
Does the center use a special diet such as a low salt diet and a low sugar diet?	110	73.3
Whether to place a monthly diet available and show them to their parents?	148	98.7
Subtotal mean		90.4
< Food provision management>		
Does the center provide substitute food for infants and children with food allergies?	49	32.7
Whether they are provided with meals and snacks in compliance with the menu?	140	93.3
Whether they provided fried food less than twice a week?	149	99.3
Is instant food is used less than twice a week?	150	100.0

Conted…

Do fresh vegetables or fruits are given more than three times a week?	141	94.0
Are snacks provided twice a week each in the morning and afternoon?	150	100.0
Subtotal mean		86.6
<Cooking management>		
Does the center use standard recipe?	42	28.0
Does the center not reuse frying oil as much as possible?	147	98.0
Does the center use natural seasoning at cooking?	95	63.3
Does the center check the salinity of soup during the cooking?	1	0.7
Subtotal mean		47.6
<Distribution management>		
Does the center distribute appropriate amount (nutritional intake standard) to infants?	127	84.7
Total mean		76.1

Comparisons of the nutritional management before and after the foodservice management support of home childcare centers: The nutritional management scores of primary and secondary inspections were compared to determine the difference in nutritional management before and after the foodservice management support to home childcare centers. Among 14 items, 6 items showed significant increase after receiving support from the CCFM (p<0.05, p<0.01, p<0.001). The mean scores of all four domains were significantly increased (p<0.05, p<0.001), and the overall mean score was significantly increased from 70.43 to 75.79 (p<0.001). (Table omitted.)

Comparison of the salinity measured result before and after the nutritional education of home childcare centers: During the first visit of the home childcare center, the salinity of the soup served at lunch was measured and nutritional education was conducted on the necessity of low salt diet. After 5 to 6 months, the salinity of the soup was measured again at the second visit and the results were compared (Table 3). 57 (49.5%) of the centers were more 0.5% in the first visit, which was the most, while 58(50.4%) of the centers that had the salinity of the soup as 0.3 ~ 0.5% were the most in the second visit. And the childcare centers having more 0.5% of salinity decreased from the first visit's 49.5%to 33.1%. The mean salinity of the centers in this study was significantly decreased from 0.53% in the first to 0.45% in the second (p<0.01).

Table 3: Comparison of the salinity measured result before and after the nutritional education of home childcare centers

		Before education	After education	χ^2/t-value
Salinity (%)	≤ 0.3	11(9.6)[1)]	19(16.5)	6.299
	0.3 < ~ ≤ 0.5	47(40.9)	58(50.4)	
	> 0.5	57(49.5)	38(33.1)	
Total[3)]		115(100.0)	115(100.0)	
Mean salinity (%)		0.53 ± 0.22[2)]	0.45 ± 0.15	3.242**

[1)]N(%), [2)]Mean ± S.D., **p<0.01, [3)]There were cases when salinity was not measured in before and after both.

Discussion

The purpose of this study was to investigate the current status of nutritional management of meals provided at home childcare center and figure out the changes of salinity of the soup provided at lunch and the extent of the improvement after support of the Center for Children's Foodservice Management. First, as a result of inspecting the status of nutritional management of children's meals before children's foodservice management support of home childcare center, the item that showed the lowest compliance rate was 'confirmation of saltiness of cooked

soup. Also, the actual salinity was measured to be 49.5% of the total number of childcare center over 0.5%, and the average salinity was 0.53 higher than 0.5, which is the recommended soup salinity of infant feeding school in Korea[14]. The intake of excess salt during childhood is highly correlated with later hypertension[15] and may negatively affect the function of the heart or kidney when grown up[16]. In addition, the eating habits at younger age would have a lasting effect even when they became adults[4,17]. The results of this study showed that there was a significant improvement in the salinity measurement practice after one nutritional support and the mean salinity of the country was also significantly decreased. Therefore, continuous education and management of low-salt food should be provided for children.

In this study, the second lowest level of nutritional compliance rate among childcare centers was cooked using standard recipes. In Lee's study[13], home nursery chiefs tend to refer only to the ingredients and recipes from the standard recipe and do not link them with the amount of material purchased, the amount of food they have been cooked, or the amount of food they eat. Therefore, the Center for Children's Foodservice Support Center should notify the importance and usefulness of the standard recipe for nursery homes and directors. Although the compliance rate for providing alternative food to infants with food allergies in the home childcare center of this study was low, this item was not significantly improved after nutritional support. Many children's foodservice workers know for sure that food allergy is a disease threatening heath, but are not aware that the consequences can be fatal[18]. Although the understanding and knowledge of food allergy have been improved after education about food allergy[19], as shown in the results of this study, it is difficult to improve practically with one education, so various methods of support and continuous education are needed.

Conclusion

The goal of this study was to investigate the current status of nutritional management of meals provided at childcare centers. The results indicated that some items and overall average scores were improved after nutritional management support for feeding of home childcare centers, and the salinity of the soup also showed favorable change. However, there were some items that were not improved only with one nutritional support, and the salinity of the soup was not improved sufficiently. Therefore, the Children's Food Service Support Center would need to continue its efforts to provide nutritional support for home childcare centers, and more home childcare centers will benefit from the Children's Food Service Support Center.

Acknowledgment

It can be revealed that the research materials come from some parts of the inspection results of 'the Food Service Management Support Center for small scale meal place in Cheongju city. I would like to express my gratitude to the managers, team members who has provided delicate care on the spot inspection and relevant management, and the directors of the home childcare centers.

Ethical Clearance: Not required

Source of Funding: Self

Conflict of Interest: Nil

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