

Research Article



Nutrition education programs necessary for social welfare facilities for persons with disabilities: a cross-sectional study

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ABSTRACT

Objectives: This study investigated the need for nutrition education aimed at improving the health of residents and users of social welfare facilities for persons with disability and aimed to provide basic information for developing a nutrition education program that meets the needs of the field.

Methods: Altogether, 249 employees working in social welfare facilities for people with disabilities were included in the study. Data on the health status of residents/users, meal management, nutritional education, nutritional education needs, and awareness of nutritional education were obtained through online surveys. A descriptive analysis was conducted to analyze the demographic characteristics, needs, and perceptions of the respondents, and independent t-tests and χ^2 tests were performed to analyze and compare the differences between residential and daycare facilities.

Results: The majority of residents/users of social welfare facilities for persons with disabilities have developmental disabilities. When educating residents with residents/users of social welfare facilities, 'personal hygiene' was the most necessary topic, followed by 'obesity management' education. Regarding the methods of providing education, face-to-face lectures demonstrated a high demand. They responded that when nutrition education experts provide nutrition education to people with disabilities, they must understand 'the physical characteristics of persons with disabilities' and have the ability to determine appropriate nutrition for such people. The most appropriate nutrition program training would be twice a year, lasting 30 min to 1 h per training session.

Conclusions: It will present a direction for operating a nutrition education program for persons with disabilities that meets their needs of social welfare facilities and ultimately contribute to the establishment and activation of nutrition education tailored to welfare facilities for such individuals in Korea.

Keywords: person with disability; nutrition education; social welfare facilities; needs

Data Availability

The authors confirm that the data supporting the findings of this study are available within the article and its supplementary materials.

INTRODUCTION

According to the Korean Health and Social Research Institute's Disability Survey [1], 79.3% of people with disabilities suffer from chronic diseases lasting > 3 months, and the types of chronic diseases among people with disabilities who reported having a chronic disease were 54.4% for hypertension, 25.6% for diabetes, and 18.8% for dyslipidemia. People with disabilities may develop chronic diseases at an earlier age owing to their relatively poor health status compared to people without disabilities [2]. International studies [3,4] have demonstrated that people with disabilities have a higher prevalence of chronic diseases than people without disabilities, and their complications and reduced life expectancy are also more severe than those without disabilities. In a previous study [5] comparing the prevalence of chronic diseases among people with and without disabilities, the odds ratio was 1.36 times higher for hypertension, 1.55 times higher for diabetes, and 1.46 times higher for heart disease, and the prevalence of chronic diseases among registered people with disabilities in Korea as of 2014 was 40.4% for obesity, 42.9% for hypertension, and 19.1% for diabetes, all of which were higher than the prevalence of obesity, 28.9% for hypertension, and 11.1% for diabetes among people without disabilities [6]. World Health Organization [7] has suggested that the occurrence of chronic diseases such as obesity, diabetes, and cardiovascular diseases, including cancer, is highly related to dietary habits, and in order to manage chronic diseases in Korea, a pilot project for chronic disease management is being conducted at public health centers, and education on non-drug therapies such as exercise diet is provided to patients diagnosed with hypertension or diabetes along with drug therapy [8]. The results of a previous study [9] revealed that dietary modification and nutrition education were effective in preventing complications by maintaining proper blood pressure and blood sugar levels.

According to a survey by the Ministry of Food and Drug Safety in 2021, meals are provided in 12,995 of 83,906 (15.5%) welfare facilities for the older people and persons with disabilities operating nationwide. Among the facilities that provide such meals, approximately 80% of 10,238 operate without a nutritionist. Of the 2,181 welfare facilities for people with disabilities, 1,097 (50.3%) operated canteens without a dietitian; by type of welfare facility, 59% of residential facilities for people with disabilities, 45% of vocational rehabilitation facilities for people with disabilities, and 42% of community rehabilitation facilities for people with disabilities had a dietitian managing the cafeteria [10]. Social welfare facilities without dietitians, who are in charge of providing comprehensive nutrition services, such as nutrition education and meal management, need professional support for nutrition, hygiene management, and education. Accordingly, the government has implemented the Act on the Safety Support of Meal Food in Social Welfare Facilities for older people and persons with disabilities, to expand customized meal services and nutrition management policies for social welfare facilities (July 28, 2022) and established a social welfare meal management support center to support meal facilities operated without nutritionists for such population [11]. The Support Center for Social Welfare Meal Management provides guidance on hygiene and nutrition visits to meal centers, customizes diets according to health conditions, and supports dietary education for each target [12]. To provide nutrition education tailored to social welfare facilities for people with disabilities, research is needed on the direction of education and program composition required in the field; however, current research on nutrition education for people with disabilities in Korea often focuses on dietary nutrition education for people with disabilities who live independently or at home rather than those who are residents or users of social welfare facilities for people with disabilities [13,14]. In addition, depending on the type of social welfare facility, the time of day differs, which leads to differences in the level

and frequency of meals and snacks provided; therefore, the nutrition education conducted in residents and users needs to be differentiated. Therefore, this study aimed to determine the demand for nutrition education programs intended to improve the health of users of social welfare facilities for the persons with disabilities and ultimately provide basic data to develop nutrition education programs that meet the needs of such social welfare facilities.

METHODS

Ethics statement

The informed written consent was obtained from each participant. The study protocol was approved by the Institutional Review Board of Chungnam National University (approval number: 202303-SB-048-01).

1. Participants

Residential workers in social welfare facilities for persons with disabilities nationwide were surveyed for over three weeks in April 2023. The questionnaire developed by the researcher was converted into an online survey, and the URL was distributed via mobile or email based on the contact information disclosed in the list of welfare facilities for persons with disabilities in 2022. Only participants who understood the purpose of the study and agreed to provide information were allowed to respond to the survey. Using the GPower 3.1 program, the number of samples required for the independent t-test was set at an effect size of 0.5, significance level of 0.05, and power of 0.80 according to Cohen's law; the minimum number of samples was calculated as 128. The questionnaire was distributed to 1 out of 1,535 workers in social welfare facilities for persons with disabilities nationwide, and 263 (17.13%) responses were collected. Of these, 249 (94.68%) responses were used for analysis, after excluding those who answered dishonestly or did not complete the questionnaires.

2. Research tools

The questionnaire used in this study was developed through discussions with an expert group comprising one nutrition education specialist, four clinical dietitians, and one team leader of a social welfare meal management support center based on relevant literature [15-17]. The questionnaire consisted of 21 questions, including 5 questions on respondents' general information, 9 questions on preliminary research, 2 questions on nutrition education program topic needs, and 5 questions on considerations for running a nutrition education program. All questions were organized by selecting the view closest to the respondent's opinion, and the need for educational topics and the direction of nutrition programs according to the participants were assessed on a 5-point Likert scale (1 point = not very; 5 = very much).

3. Data collection and ethical considerations

The survey for this study was conducted over three weeks in June 2023 by distributing URL via email to the facilities disclosed in the 2022 List of Disabled Welfare Facilities. The purpose of the study and the research method were explained to the participants through a pre-information page before the survey, and written consent was obtained before survey initiation. The written consent form included information on the purpose of the study, participants, data collection methods, confidentiality of participants' information, and exclusion of participants from the study at any time during the survey if they wanted to opt out.

4. Data analysis

Frequency analysis and descriptive statistics were used to investigate the respondents' general characteristics, current facility status, opinions, and needs. Chi-square test or independent t-test were performed to compare and analyze the responses of workers at residential facilities and daycare facilities. IBM SPSS Statistics 26 (IBM Corporation, Armonk, NY, USA) was used for the statistical analysis.

RESULTS

1. Demographic characteristics of respondents

The respondents' general characteristics are listed in **Table 1**. Of the total respondents, 27.31% (68) were male, and 72.69% (181) were female, with more female participants. The majority of respondents were in their 40s (110, 44.18%), followed by those in their 30s

Table 1. General characteristics of workers at welfare facilities for persons with disabilities

Item	Facility type		Total	χ^2
	Residential facility	Day care facility		
Sex				3.264
Female	87 (78.4)	94 (68.1)	181 (72.7)	
Male	24 (21.6)	44 (31.9)	68 (27.3)	
Age range				12.308*
20s	2 (1.8)	11 (8.0)	13 (5.2)	
30s	23 (20.7)	46 (33.3)	69 (27.7)	
40s	54 (48.6)	56 (40.6)	110 (44.2)	
50s	28 (25.2)	23 (16.7)	51 (20.5)	
60s	4 (3.6)	2 (1.4)	6 (2.4)	
Position within the facility				35.496***
Facility worker (social workers, nursing care workers, etc.)	41 (36.9)	97 (70.3)	138 (55.4)	
Nutritionist	45 (40.5)	16 (11.6)	61 (24.5)	
Facility manager	23 (20.7)	20 (14.5)	43 (17.3)	
Others	2 (1.8)	5 (3.6)	7 (2.8)	
Facility meal operation type				56.936***
Directly managed/home-type cafeteria	108 (97.3)	77 (55.8)	185 (74.3)	
Consignment cafeteria	3 (2.7)	15 (10.9)	18 (7.2)	
Meals cooked outside (lunchbox/delivery)	0 (0.0)	46 (33.3)	46 (18.5)	
Facility location				29.175*
Gyeonggi-do	21 (18.9)	36 (26.1)	57 (22.9)	
Seoul	16 (14.4)	21 (15.2)	37 (14.9)	
Daejeon	8 (7.2)	12 (8.7)	20 (8.0)	
Gyeongsangnam-do	12 (10.8)	5 (3.6)	17 (6.8)	
Busan	7 (6.3)	9 (6.5)	16 (6.4)	
Gyeongsangbuk-do	4 (3.6)	10 (7.2)	14 (5.6)	
Gwangju	8 (7.2)	4 (2.9)	12 (4.8)	
Jeollanam-do	4 (3.6)	8 (5.8)	12 (4.8)	
Jeollabuk-do	7 (6.3)	3 (2.2)	10 (4.0)	
Ulsan	3 (2.7)	6 (4.3)	9 (3.6)	
Gangwon	6 (5.4)	3 (2.2)	9 (3.6)	
Incheon	5 (4.5)	3 (2.2)	8 (3.2)	
Chungcheongnam-do	6 (5.4)	2 (1.4)	8 (3.2)	
Daegu	0 (0.0)	7 (5.1)	7 (2.8)	
Jeju	1 (0.9)	5 (3.6)	6 (2.4)	
Chungcheongbuk-do	2 (1.8)	3 (2.2)	5 (2.0)	
Sejong	1 (0.9)	0 (0.0)	1 (0.4)	
Others	0 (0.0)	1 (0.7)	1 (0.4)	
Total	111 (100.0)	138 (100.0)	249 (100.0)	

n (%).

* $P < 0.05$, *** $P < 0.001$.

(69, 27.71%), and 50s (51, 20.48%), with a significant difference between admission and utilization facilities ($P < 0.05$). Respondents' positions in the facilities were the highest among nutritionists (45, 40.54%), followed by facility workers (97, 70.29%), such as social workers and nursing care workers ($P < 0.001$). As for the type of meal operation, most of the facilities operated in the form of direct cooking (77, 55.80%) and the facilities used it (108, 97.30%), but in the case of facilities used, the proportion of external cooking, such as lunch boxes and delivery (46, 33.33%), was high ($P < 0.001$).

2. Health status of residents and users of social welfare facilities for persons with disabilities

The health statuses of residents and users are listed in **Table 2**. Among all responding social welfare facilities for persons with disabilities, the proportion of residents/users with only developmental disabilities was the highest at 78.71%, whereas residents/users with only physical disabilities accounted for a relatively low proportion of residents/users with developmental disabilities in terms of both the number of facilities (4.60%) and the number of facilities (9.62%). A significant difference in the proportion of residents and clients with physical disabilities was observed between facilities ($P < 0.05$). In the case of residents with complex developmental and physical disabilities, 20.40% of admission facilities and 8.67% of facilities were used, and the proportion of people with complex disabilities in the admission facilities was twice higher ($P < 0.01$). As a result of the question on the mobility status of admissions and users in proportion to the number of people, 84.13% of all admissions and users were confirmed to be in a state of mobility, although 80.30% of the users in the admission facility and 87.21% of the users in the use facility answered that they could move alone. Thus, a significant difference was observed between the facilities ($P < 0.05$). When

Table 2. Health status of users admitted to social welfare facilities for persons with disabilities

Category	Item	Facility type		Total	t
		Residential facility	Day care facility		
Type of disability ¹⁾	Developmental disability	75.00	81.70	78.71	-1.573
	Physical disability	4.60	9.62	7.39	-2.430*
	Complex disability	20.40	8.67	13.90	3.144**
	Total	100.00	100.00	100.00	
Physical dependency status ¹⁾	Capable of movement	80.30	87.21	84.13	-2.144*
	Need help moving around	15.28	10.67	12.73	1.776
	Bedridden patient (tube feeder)	4.42	2.12	3.14	1.443
	Total	100.00	100.00	100.00	
Frequent disease ²⁾	Obesity	80 (28.57)	124 (39.37)	204 (34.29)	-
	Hypertension	39 (13.93)	61 (19.37)	100 (16.81)	
	Diabetes	43 (15.36)	52 (16.51)	95 (15.97)	
	Masticatory disorder	45 (16.07)	36 (11.43)	81 (13.61)	
	Dyschezia	23 (8.21)	12 (3.81)	35 (5.88)	
	Underweight	16 (5.71)	6 (1.90)	22 (3.70)	
	Dysphagia	13 (4.64)	9 (2.86)	22 (3.70)	
	Dyslipidemia	8 (2.86)	7 (2.22)	15 (2.52)	
	Cardiovascular disease	2 (0.71)	3 (0.95)	5 (0.84)	
	Osteoporosis	3 (1.07)	1 (0.32)	4 (0.67)	
	Arthritis	1 (0.36)	0 (0.00)	1 (0.17)	
	Others	7 (2.50)	4 (1.27)	11 (1.85)	
	Total	280 (100.00)	315 (100.00)	595 (100.00)	

% or n (%).

P-value was determined by t-test.

* $P < 0.05$, ** $P < 0.01$.

¹⁾One response was made based on the ratio of classification to the number of people with disabilities residing in each facility. The total value is expressed as the average value of the ratio.

²⁾Multiple responses.

examining the prevalence of diseases among residents and users, the highest percentage of obesity (34.29%) was noted in all surveyed facilities, followed by high blood pressure (16.81%) and diabetes (15.97%).

3. Current status of meal management in social welfare facilities for persons with disabilities

The status of meal management in the facilities where respondents worked is presented in **Table 3**. In the case of admission facilities, nutritionists (54.95%), social workers (26.13%), and facility managers (10.81%) were in order, and facilities used were in the order of consignment companies (34.06%), nutritionists (26.09%), and social workers (18.84%), demonstrating significant differences according to the type of facility ($P < 0.001$). In terms of meals provided, residential facilities provided three meals a day and morning (3.30%, 14 participants) and afternoon snacks (17.22%, 73 participants), with a higher percentage of evening snacks. In the case of utilized facilities, only lunch was provided because of the nature of the facility, and utilized facilities were more likely to provide afternoon snacks (24.74%, 47) than morning snacks (2.63%, 5). In terms of meal type, the proportion of cafeteria meals (49.61%) and cafeteria + living (bedroom) meals (33.33%) was higher in residential facilities, whereas the proportion of cafeteria meals (78.87%) was the highest in utilized facilities.

Table 3. Status of meal management at social welfare facilities for persons with disabilities

Category	Item	Facility type		Total	χ^2
		Residential facility	Day care facility		
Facility's meal prepared by	Nutritionist	61 (54.95)	36 (26.09)	97 (38.96)	59.107***
	Social worker	29 (26.13)	26 (18.84)	55 (22.09)	
	Consignment company (catering company etc.)	2 (1.80)	47 (34.06)	49 (19.68)	
	Cook	6 (5.41)	15 (10.87)	21 (8.43)	
	Facility manager	12 (10.81)	5 (3.62)	17 (6.83)	
	Use the diet they have	0 (0.00)	4 (2.90)	4 (1.61)	
	Others	1 (0.90)	5 (3.62)	6 (2.41)	
Meals provided ¹⁾	Breakfast	110 (25.94)	0 (0.00)	110 (17.92)	-
	Morning snack	14 (3.30)	5 (2.63)	19 (3.09)	
	Lunch	99 (23.35)	138 (72.63)	237 (38.60)	
	Afternoon snack	73 (17.22)	47 (24.74)	120 (19.54)	
	Dinner	109 (25.71)	0 (0.00)	109 (17.52)	
	Evening snack	18 (4.25)	0 (0.00)	18 (2.93)	
	Others	1 (0.24)	0 (0.00)	2 (0.33)	
	Total	424 (100.00)	190 (100.00)	614 (100.00)	
Feeding type ¹⁾	Cafeteria meal	64 (49.61)	112 (78.87)	176 (64.94)	-
	Cafeteria+bedroom meal	43 (33.33)	5 (3.52)	48 (17.71)	
	Bedroom meal	18 (13.95)	8 (5.63)	26 (9.59)	
	Others	4 (3.10)	17 (11.97)	21 (7.75)	
	Total	129 (100.00)	142 (100.00)	271 (100.00)	
Presence of disease diet menu/guideline	Yes	59 (53.15)	8 (5.80)	67 (26.91)	45.76***
	No	52 (46.85)	130 (94.20)	182 (73.09)	
	Total	111 (100.00)	138 (100.00)	249 (100.00)	
Disease diet on offer ¹⁾	Easy to chew food	42 (27.45)	3 (30.00)	45 (27.61)	-
	Low-sodium diet	32 (20.92)	3 (30.00)	35 (21.47)	
	Thin liquid diet	25 (16.34)	1 (10.00)	26 (15.95)	
	Thick liquid diet	21 (13.73)	2 (20.00)	23 (14.11)	
	Diabetic diet	19 (12.42)	0 (0.00)	19 (11.66)	
	Tube feeding	9 (5.88)	0 (0.00)	9 (5.52)	
	Others	5 (3.27)	1 (10.00)	6 (3.68)	
	Total	153 (100.00)	10 (100.00)	163 (100.00)	

n (%).

P-value was determined by χ^2 test.

*** $P < 0.001$.

¹⁾Multiple responses.

Regarding whether they had special diets and manuals, 53.15% of the facilities had special diets, while only 5.8% of the facilities had special diets, confirming a significant difference by facility type ($P < 0.001$). In addition, in terms of the types of meals provided in consideration of the actual health conditions of residents and users, residential facilities provide a variety of meals, such as mastication aid, low-sodium meals, liquid meals, dysphagia meals, diabetic meals, and light meals, although only mastication aid, low-sodium meals, and dysphagia meals are provided. Therefore, the type of meal operation differs between residential and utilized facilities.

4. Nutrition education in social welfare facilities for persons with disabilities

According to the results of the survey on the current status of nutrition education in social welfare facilities for persons with disabilities (Table 4), 51.0% (127 facilities) reported that they provide nutrition education to residents and users; however, 72.07% of residents reported that they provide nutrition education, while only 34.06% of users reported that they provide nutrition education, indicating a significant difference between the facilities ($P < 0.001$).

When respondents from the 127 facilities who said they provide nutrition education were asked regarding their nutrition education programs, 33.86% (43 respondents) of all facilities provide education twice a year, and the most common method of delivery was face-to-face

Table 4. Current status of nutritional education of social welfare facilities for persons with disabilities

Category	Item	Facility type		Total	χ^2
		Residential facility	Day care facility		
Nutrition education provided	Yes	80 (72.07)	47 (34.06)	127 (51.00)	40.903***
	No	31 (27.93)	91 (65.94)	122 (49.00)	
	Total	111 (100.0)	138 (100.0)	249 (100.0)	
Nutrition education frequency	Twice a month	2 (2.50)	1 (2.13)	3 (2.36)	10.454
	Once a month	11 (13.75)	5 (10.64)	16 (12.60)	
	Once every 2-3 months	7 (8.75)	4 (8.51)	11 (8.66)	
	Twice a year	32 (40.00)	11 (23.40)	43 (33.86)	
	Once a year	23 (28.75)	17 (36.17)	40 (31.50)	
	Irregularly	5 (6.25)	9 (19.15)	14 (11.02)	
Nutrition education method	Face-to-face lecture	40 (50.00)	18 (38.30)	58 (45.67)	10.992
	Watch the video	20 (25.00)	9 (19.15)	29 (22.83)	
	Nutrition counseling	7 (8.75)	4 (8.51)	11 (8.66)	
	Provide printed materials	6 (7.50)	5 (10.64)	11 (8.66)	
	Cooking practice	2 (2.50)	8 (17.02)	10 (7.87)	
	Experience (gardening, field trips, etc.)	0 (0.00)	2 (4.26)	2 (1.57)	
	Others	5 (6.25)	1 (2.13)	6 (4.72)	
Nutrition education provider	Performed by the facility itself	70 (87.50)	38 (80.85)	108 (85.04)	5.705
	Local government (city hall, district office, etc.)	4 (5.00)	5 (10.64)	9 (7.09)	
	Public health center	1 (1.25)	3 (6.38)	4 (3.15)	
	Private institution	0 (0.00)	1 (2.13)	1 (0.79)	
	Others	5 (6.25)	0 (0.00)	5 (3.94)	
	Total	80 (100.00)	47 (100.00)	127 (100.00)	
Reasons for not providing nutrition education	Lack of educational materials and knowledge	3 (9.68)	28 (30.77)	31 (25.41)	8.748
	Education for persons with disabilities is not possible	6 (19.35)	23 (25.27)	29 (23.77)	
	Lack of support for education	7 (22.58)	17 (18.68)	24 (19.67)	
	Pressure on worker's duty	7 (22.58)	16 (17.58)	23 (18.85)	
	Negative to actual effect	7 (22.58)	4 (4.40)	11 (9.02)	
	Lack of facilities for education	1 (3.23)	2 (2.20)	3 (2.46)	
	Others	0 (0.00)	1 (1.10)	1 (0.82)	
	Total	31 (100.00)	91 (100.00)	122 (100.00)	

n (%).

P-value was determined by χ^2 test.

*** $P < 0.001$.

lectures (58 respondents, 45.67%). In addition, 85.04% (108 respondents) of the facilities provide in-house nutritional education.

When asked regarding the reasons for not providing nutrition education, 122 respondents from facilities that did not provide nutrition education cited a lack of educational materials and knowledge (31, 25.41%) and an inability to educate residents (29, 23.77%) as the biggest reasons.

5. Nutrition education needs in social welfare facilities for persons with disabilities

1) Who needs nutrition education

When respondents who needed nutrition education in their facilities were asked (**Table 5**), both residents (24.71%) and users (24.45%) demonstrated a need for education for residents and users. In addition, 22.65% of residents and 23.23% of users said that they needed nutritional education for facility workers, making facility workers the main target of nutritional education, along with residents and users.

2) Demand for nutrition education topics for residents and users

Table 6 presents the results of nutrition education topics required by residents and users. In all facilities, personal hygiene (4.44 ± 0.71), prevention of safety accidents during meals due to swallowing candy, rice cakes, etc. (4.41 ± 0.72), obesity management (4.34 ± 0.74), food poisoning prevention (4.23 ± 0.82), convenience food prevention (4.18 ± 0.90), sugar management (4.02 ± 0.89), and safe food (4.00 ± 0.87) were said to be highly necessary in such order.

3) Demand for nutrition education topics for facility workers

The nutrition education topics needed by workers in social welfare facilities for persons with disabilities, including facility directors, are presented in **Table 7**. The need for personal hygiene management (4.31 ± 0.77) was the highest among all facilities, followed by food poisoning prevention (4.27 ± 0.82), obesity meal management (4.24 ± 0.79), nutrients needed by persons with disabilities (4.14 ± 0.86), characteristics of meal guidance for persons with disabilities (4.10 ± 0.80), proper portion size (4.03 ± 0.86), and nutritional intake standards for residents (4.01 ± 0.87).

4) Preference for nutrition education methods

According to the results of the survey on the preferences of nutrition education methods for residents and users (**Table 8**), the overall preference for face-to-face lectures that include theory and activities (4.25 ± 0.88) was the highest, followed by experience-oriented face-to-face

Table 5. Participants requiring nutritional education.

Category	Facility type ¹⁾		Total
	Residential facility	Day care facility	
Resident/user	84 (24.71)	100 (24.45)	184 (24.57)
Facility worker (social workers, nursing care workers, etc.)	77 (22.65)	95 (23.23)	172 (22.96)
Facility manager	36 (10.59)	66 (16.14)	102 (13.62)
Cook	51 (15.00)	47 (11.49)	98 (13.08)
Nutritionist	45 (13.24)	39 (9.54)	84 (11.21)
Guardian	20 (5.88)	51 (12.47)	71 (9.48)
Nurse	25 (7.35)	8 (1.96)	33 (4.41)
Others	2 (0.59)	3 (0.73)	5 (0.67)
Total	340 (100.00)	409 (100.00)	749 (100.00)

n (%).

¹⁾Multiple responses.

Table 6. Need for educational topics for residents and users

Category	Facility type		Total	t
	Residential facility	Day care facility		
Personal hygiene management	4.38 ± 0.71	4.49 ± 0.70	4.44 ± 0.71	-1.193
Prevention of safety accidents (swallowing problem, etc.)	4.37 ± 0.71	4.43 ± 0.73	4.41 ± 0.72	-0.708
Obesity management	4.29 ± 0.78	4.38 ± 0.71	4.34 ± 0.74	-1.014
Prevention of food poisoning	4.22 ± 0.78	4.24 ± 0.86	4.23 ± 0.82	-0.218
Prevention of picky eating	4.10 ± 0.99	4.25 ± 0.82	4.18 ± 0.90	-1.347
Sugar intake management	3.96 ± 0.93	4.06 ± 0.86	4.02 ± 0.89	-0.825
Food safety	3.89 ± 0.91	4.09 ± 0.82	4.00 ± 0.87	-1.774
Appropriate snack	3.94 ± 0.97	3.90 ± 0.79	3.92 ± 0.87	0.344
Controlling processed food intake	3.83 ± 0.82	3.91 ± 0.87	3.87 ± 0.85	-0.712
Low-sodium diet	3.78 ± 0.99	3.93 ± 0.83	3.86 ± 0.90	-1.229
Health functional food	3.67 ± 1.03	3.70 ± 0.94	3.69 ± 0.98	-0.290
Water intake	3.74 ± 1.01	3.63 ± 0.99	3.68 ± 1.00	0.852
Digestive problems/dyspepsia	3.49 ± 0.98	3.39 ± 1.01	3.43 ± 1.00	0.747
Bowel movement disorder/dysphagia	3.62 ± 1.10	3.22 ± 1.00	3.40 ± 1.06	2.977**
Management of alcohol, cigarettes and flavored food	3.17 ± 1.38	3.30 ± 1.16	3.24 ± 1.26	-0.767
Swallowing disorder	3.37 ± 1.24	3.11 ± 1.21	3.22 ± 1.22	1.677
Low weight management	3.07 ± 1.26	2.91 ± 1.14	2.98 ± 1.20	1.041
Average	3.82 ± 0.61	3.82 ± 0.56	3.82 ± 0.58	-0.047

Mean ± SD.

The 5-point Likert scale (1: not at all, 5: very much).

P-value was determined by t-test.

**P < 0.01.

Table 7. Demand for nutritional education topics for facility managers and employees

Category	Facility type		Total	t
	Residential facility	Day care facility		
Personal hygiene management	4.34 ± 0.73	4.29 ± 0.80	4.31 ± 0.77	0.533
Prevention of food poisoning	4.31 ± 0.78	4.23 ± 0.86	4.27 ± 0.82	0.707
Obesity diet management	4.25 ± 0.76	4.24 ± 0.82	4.24 ± 0.79	0.130
Nutrients needed by people with disabilities	4.09 ± 0.94	4.17 ± 0.79	4.14 ± 0.86	-0.764
Characteristics of meal guidance for persons with disabilities	4.09 ± 0.89	4.11 ± 0.73	4.10 ± 0.80	-0.177
Appropriate amount of food	4.05 ± 0.87	4.02 ± 0.86	4.03 ± 0.86	0.212
Nutritional intake standards customized for persons with disabilities	4.04 ± 0.94	3.99 ± 0.80	4.01 ± 0.87	0.449
Diabetic diet management	3.99 ± 0.79	3.96 ± 0.92	3.98 ± 0.86	0.248
Prevention of safety accidents at cafeterias	3.95 ± 0.95	3.99 ± 0.94	3.97 ± 0.94	-0.253
Reduced sugar, sodium, and fat	3.95 ± 0.91	3.96 ± 0.83	3.96 ± 0.86	-0.014
Prevention of picky eating	3.78 ± 1.11	3.99 ± 0.92	3.90 ± 1.01	-1.592
Food Sanitation Act, etc.	3.82 ± 1.02	3.96 ± 0.92	3.90 ± 0.96	-1.172
Hypertension diet management	3.87 ± 0.78	3.88 ± 0.92	3.88 ± 0.86	-0.093
Basics of meal planning	3.70 ± 1.08	3.75 ± 1.00	3.73 ± 1.03	-0.331
Sanitary management of food waste	3.66 ± 1.03	3.75 ± 1.02	3.71 ± 1.02	-0.736
Equipment required for cafeteria	3.69 ± 1.11	3.70 ± 0.99	3.69 ± 1.04	-0.015
Food allergy	3.67 ± 1.01	3.64 ± 0.98	3.65 ± 0.99	0.171
Food ingredient purchase management	3.55 ± 1.07	3.64 ± 1.07	3.60 ± 1.07	-0.648
Difficulty chewing, dysphagia	3.73 ± 1.16	3.49 ± 1.10	3.59 ± 1.13	1.698
Underweight eating management	3.23 ± 1.22	3.17 ± 1.08	3.19 ± 1.14	0.402
Tube feeding management	3.01 ± 1.26	2.99 ± 1.10	3.00 ± 1.17	0.109
Average	3.85 ± 0.63	3.85 ± 0.62	3.85 ± 0.62	-0.087

Mean ± SD.

The 5-point Likert scale (1: not at all, 5: very much).

P-value was determined by t-test.

lectures (4.23 ± 0.93) and video (3.87 ± 0.97). The degree of preference for experience-oriented face-to-face lectures and videos differed according to facility type. The preference for experiential face-to-face lectures was significantly higher in utilized facilities ($P < 0.05$), and the preference for videos was significantly higher in residential facilities ($P < 0.01$) than in utilized facilities.

Table 8. Nutritional education method preference

Category	Item	Facility type		Total	t
		Residential facility	Day care facility		
For residents/ users	Face-to-face lecture (including theory and activities)	4.23 ± 0.96	4.26 ± 0.80	4.25 ± 0.88	-0.238
	Experience-oriented face-to-face classes	4.09 ± 1.08	4.35 ± 0.78	4.23 ± 0.93	-2.106*
	Video material provided	4.06 ± 0.96	3.71 ± 0.96	3.87 ± 0.97	2.888**
	1:1 nutritional consultation	3.67 ± 1.19	3.78 ± 1.05	3.73 ± 1.12	-0.814
	print media	3.61 ± 1.05	3.57 ± 1.08	3.59 ± 1.07	0.295
	Non-face-to-face (online) classes	2.95 ± 1.24	2.80 ± 1.13	2.87 ± 1.18	1.003
Average		3.77 ± 0.67	3.75 ± 0.60	3.76 ± 0.63	0.296
For facility workers	Video material provided	4.17 ± 0.81	3.89 ± 0.88	4.02 ± 0.86	2.592*
	print media	3.86 ± 0.95	3.84 ± 0.89	3.85 ± 0.91	0.208
	Face-to-face lecture (including theory and activities)	3.88 ± 0.97	3.72 ± 0.97	3.79 ± 0.97	1.335
	Non-face-to-face (online) classes	3.75 ± 1.00	3.76 ± 0.96	3.76 ± 0.98	-0.105
	Experience-oriented face-to-face classes	3.63 ± 1.11	3.70 ± 0.97	3.67 ± 1.03	-0.548
	1:1 nutritional consultation	3.61 ± 1.16	3.68 ± 1.03	3.65 ± 1.09	-0.494
Average		3.82 ± 0.66	3.77 ± 0.68	3.79 ± 0.67	0.616

Mean ± SD.

The 5-point Likert scale (1: not at all, 5: very much).

P-value was determined by t-test.

*P < 0.05, **P < 0.01.

When examining the preferences for nutrition education methods among facility staff, all facilities preferred video (4.02 ± 0.86), which was significantly higher among staff in residential facilities (4.17 ± 0.81) than among staff in utilization facilities (3.89 ± 0.88) (P < 0.05). Videos were followed by print media (3.85 ± 0.91), face-to-face lectures including theory and activities (3.79 ± 0.97), and non-face-to-face (online) theory lectures (3.76 ± 0.98).

6. Necessary competencies of nutrition education professionals for people with disabilities

According to the results of the survey on the competencies required for nutrition education professionals in social welfare facilities for people with disabilities (Table 9), respondents indicated a high need for all nine competency items, with a score of ≥ 4.0, and no significant difference was observed between respondents from welfare facilities and facilities for people with disabilities. Among all items, understanding physical characteristics according to disability (4.45 ± 0.67) was cited as the most important competency, followed by the ability of persons with disabilities to determine nutritional status (4.40 ± 0.66), knowledge of various disabilities (4.37 ± 0.72), understanding of psychological changes according to disabilities (4.36 ± 0.70), and knowledge of food and health functional foods (4.35 ± 0.68).

Table 9. Capabilities that nutritional education experts must have

Category	Facility type		Total	t
	Residential facility	Day care facility		
Understanding the physical characteristics of disability	4.46 ± 0.66	4.43 ± 0.68	4.45 ± 0.67	0.288
Nutrition assessment ability for persons with disabilities	4.40 ± 0.69	4.40 ± 0.65	4.40 ± 0.66	-0.025
Knowledge of various disabilities	4.38 ± 0.75	4.36 ± 0.70	4.37 ± 0.72	0.174
Understanding psychological changes caused by disability	4.38 ± 0.70	4.34 ± 0.71	4.36 ± 0.70	0.420
Knowledge on food and supplements	4.34 ± 0.72	4.36 ± 0.65	4.35 ± 0.68	-0.230
Ability to respond in case of crisis during training and counseling	4.29 ± 0.79	4.25 ± 0.76	4.27 ± 0.77	0.353
Ability to deliver information	4.31 ± 0.78	4.25 ± 0.68	4.27 ± 0.73	0.645
Understanding the cultural background and preference of persons with disabilities	4.26 ± 0.81	4.17 ± 0.79	4.21 ± 0.80	0.859
Ability to build a therapeutic relationship	4.20 ± 0.84	4.13 ± 0.78	4.16 ± 0.81	0.658
Average	4.33 ± 0.66	4.30 ± 0.59	4.32 ± 0.62	0.430

Mean ± SD.

The 5-point Likert scale (1: not at all, 5: very much).

P-value was determined by t-test.

Table 10. Expected effects of nutritional education

Category	Facility type ¹⁾		Total
	Residential facility	Day care facility	
Improving residents'/clients' food choice	97 (32.44)	127 (35.28)	224 (33.99)
Prevention of disease	76 (25.42)	94 (26.11)	170 (25.80)
Improving residents' (clients' at day facilities) satisfaction to facilities	65 (21.74)	63 (17.50)	128 (19.42)
Improving guardians' satisfaction to facilities	33 (11.04)	53 (14.72)	86 (13.05)
Reduction in number of visits to medical institutions	19 (6.35)	18 (5.00)	37 (5.61)
Reducing depression in people with disabilities	7 (2.34)	5 (1.39)	12 (1.82)
Others	2 (0.67)	0 (0.00)	2 (0.30)
Total	299 (100.0)	360 (100.0)	659 (100.0)

n (%).

¹⁾Multiple responses.

7. Expected effects of nutrition education programs

When asked regarding the expected effects of nutritional education programs in social welfare facilities for persons with disabilities (**Table 10**), 33.99% (224) respondents selected improving their eating habits. This was followed by disease prevention (170 respondents, 25.80%) and improvement in residents' satisfaction with the facility (128 respondents, 19.42%).

DISCUSSION

This study aimed to identify the nutrition education needs of facility workers to develop a nutrition education program to improve the health of residents and users of social welfare facilities for persons with disabilities. Thus, basic data on how to provide nutrition education that meets the needs and demands of social welfare facilities for persons with disabilities were derived, along with the following directions for developing nutrition education programs for social welfare facilities for persons with disabilities.

First, nutrition education programs differentiated according to the type of social welfare facility for persons with disabilities need to be developed. In this study, the results were analyzed by dividing social welfare facilities for people with disabilities into admission facilities and use facilities. Differences in the characteristics of admission and use facilities, diet management methods, disease diet management, and nutrition education management were observed.

In the case of residential facilities, the proportion of residents who need help with mobility or have to eat in their bedrooms is high, and social workers are in charge of meals (26.13%), followed by nutritionists (54.95%). Hence, social workers prepare and serve various types of special diets despite their lack of expertise. Therefore, residential facilities should strengthen education for facility workers, who are caregivers, and provide nutrition education on a wide range of topics related to nutrition, disease, and hygiene to help them manage and serve meals appropriately. A qualitative study on the health management of residents and users of social welfare facilities [18] has mentioned the need for training on dietary management for facility staff caring for people with brain lesions as important in residential facilities, but not in user facilities. However, the percentage of users with free mobility is high, and the time to stay in the facility is fixed in the form of back and forth; therefore, the time to receive nutrition management in the facility is relatively small. Additionally, the percentage of users who only provide lunch or entrust their meals to a catering company is high; therefore, they are not directly involved in meal preparation. Therefore, developing and providing nutrition

education courses for users at the developmental level are necessary to help them manage their nutrition.

Secondly, nutritional education programs need to be developed for individuals with developmental disabilities. In this study, 78.71% of the residents and users of social welfare facilities for persons with disabilities had developmental disabilities, and 13.90% had multiple disabilities, totaling 92.61% of the persons with disabilities living in the facilities. According to statistics on persons with disabilities (2023), the number of people with autism and intellectual disabilities, which are the main types of developmental disabilities, was 263,311 in 2022, which increased from 247,910 in 2020. Such increase in the number of people with developmental disabilities is expected to continue because of medical development and extended life expectancy [19]. Hence, developing nutrition programs that reflect the characteristics and needs of persons with developmental disabilities is important as the need for expanding social services to protect the lifelong needs of the growing population with developmental disabilities increases [20]. Developmental disability is a diagnosis that covers a "spectrum" of symptoms due to developmental delays or imbalances in intelligence, language, social, motor, sensory, and other areas; the symptoms and characteristics of each individual are unique [21]. However, Yoon and Choi [22] noted that children with developmental disabilities lag behind their peers in the development of food intake skills and face several dietary challenges. In addition, problems caused by interactions while taking medications owing to disabilities, excessive appetite, and severe eating disorders have been observed in children with developmental disabilities [23]. A qualitative study on the health management of residents and users of social welfare facilities [18] also mentioned the importance of obesity management education for people with developmental disabilities, and that educating facility workers on nutritional management for people with brain lesions is necessary. In this study, the need for characteristics (4.10 points) of nutrition education among facility workers was also confirmed, and the overall understanding of disability was emphasized as a competency expected of nutrition educators to conduct nutrition education in social welfare facilities for persons with disabilities. Lee and Park [24] identified knowledge of various learning styles and teaching methods for children with disabilities and the selection of strategies and materials according to the characteristics of children with disabilities as job performance skills required for educators in the field.

Third, hygiene and obesity-related nutrition education should be prioritized to improve the nutrition of residents and users of social welfare facilities for people with disabilities. In this study, hygiene management was the most important topic of nutrition education for residents and users. A previous study [25] has also reported that providing hygienic meals in facilities for people with disabilities is important because people with disabilities are at a higher risk of food poisoning owing to their lower immunity than people without disabilities. According to the five causes of food poisoning outbreaks reported by the U.S. Food and Drug Administration [26], food poisoning can be caused by poor personal hygiene in addition to the distribution of foods made from contaminated raw materials, improper cooking, improper storage temperatures, and hygiene of meals such as contaminated equipment. A previous study on junior high school students [27] has also indicated that preventing foodborne illness depends not only on the clean cooking process of meals but also on the personal hygiene of students receiving meals; therefore, hygiene education of meal recipients should be emphasized. In addition, in this study, the obesity rate of residents and users was high (34.29%), and accordingly, the demand for nutrition education on obesity diet management was also high (≥ 4.25 points). In a study [28] that analyzed domestic research

trends on obesity in people with disabilities, 18 out of 25 previous studies focused on obesity in people with intellectual disabilities because obesity among people with intellectual disabilities is increasing for various reasons. Han *et al.* [29] have reported that the obesity rate of people with intellectual disabilities is increasing because they have a higher tendency to consume high-calorie foods owing to a lack of physical and social activities, irregular meals, overeating, and convenience eating compared to other people with disabilities. In this study, the need for prevention of convenience eating was confirmed by demonstrating a high need with a score of 4.18. Choi and Lee [30] have emphasized that convenience eating should be corrected in nutrition education for children with obesity because such children who eat convenience food consume more animal protein and fat than healthy children, which can cause major problems in nutritional balance. Therefore, obesity management and improvement in the convenience of eating should be addressed as essential topics in nutrition education for users, residents, and workers of social welfare facilities with disabilities.

Although this study was conducted to improve the health of residents and users of social welfare facilities for persons with disabilities, a limitation exists in analyzing the needs of residents and users of facilities other than those with disabilities. If more direct needs are derived through follow-up studies, it can contribute to the development of effective educational programs. In addition, as understanding caregivers is necessary to improve the effectiveness of nutrition education for users of social welfare facilities, nutrition education courses that link facilities and homes can be developed by expanding the study population to families. Nevertheless, this study is important because it provides basic data for establishing nutrition education programs in the field, where data on nutrition education for people with disabilities in social welfare facilities are scarce. This study may also suggest the direction of nutrition education for improving the health of residents and users.

CONCLUSIONS

This study aimed to provide basic data for the development of nutrition education programs that meet the needs of social welfare facilities for persons with disabilities, by identifying the needs of nutrition education programs aimed at improving the health of residents and users of social welfare facilities. Depending on how persons with disabilities live in social welfare facilities, the analysis was conducted by dividing them into admission facilities and facilities used. Significant differences in the characteristics of admission and users, diet operation method, disease operation status, and nutrition education operation status were observed according to the type of facility. Additionally, significant differences in nutrition education topics and media needs were also noted according to the type of operation of social welfare facilities for people with disabilities. Therefore, customized nutrition education programs need to be developed according to the needs of the site and type of operation to improve the nutritional status and health of people with disabilities in facilities.

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