Current status of long-term care facility workers' physical function improvement activities for the elderly

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Objective: This study was conducted to provide basic data on physical function improvement activities of elderly care facilities by identifying the degree of physical improvement activities of elderly caregivers.
Design: Descriptive correlational study.
Methods: The instrument of this study consisted of 12 questions on the general characteristics of the subject. For the assessment of improvement in physical function activities, the measuring tool used for the elderly consisted of a total of 20 questions. For data analysis, Pearson's correlation coefficient & Spearman's rho and multiple regression were used.
Results: The higher the age of the subjects, the lower their educational background ($r=-0.273$, $p<0.05$), and the higher the probability of having a religion ($r=-0.258$, $p<0.05$), the more stable the employment type ($r=-0.333$, $p<0.05$). The higher the level of education, the higher the monthly income ($r=0.187$, $p<0.01$), and the shorter the career ($r=-0.204$, $p<0.05$). The more stable employment, the more unstable duty ($r=-0.245$, $p<0.05$), and the more unstable work, the higher the monthly income ($r=-0.206$, $p<0.05$) and the longer the career, the higher the monthly income ($r=0.247$, $p<0.05$). The more stable the employment, the more activities to improve physical function were found ($r=0.341$, $p<0.05$), and the more unstable the duty, the more activities to improve physical function were found ($r=0.321$, $p<0.05$), and the higher monthly income, the less physical function improvement activities ($r=-0.196$, $p<0.05$).
Conclusions: It is necessary to provide regular services by a dedicated physical therapist for physical function improvement activities in order to improve the quality of life of the elderly in the future.

Key Words: Caregiver, Long-term care, Older adults, Physical performance

Introduction

In Korea, which is preparing for an ultra-aged society due to the increase in the older population and prolongation of life expectancy, the number of older people in need of long-term care is rapidly increasing. Moreover, in Korea, the increasing number of those aged 65 years has marked Korea's entry into an aging society as the older population accounts for 15.7% of its total population as of October 2020, showing the fastest aging rate worldwide [1]. With this aging society, the incidence rates of health problems in the elderly,

such as dementia, stroke, cardiovascular disease, and other senile diseases, have increased. Moreover, due to the increase in the number of nuclear families and dual-income families, the need for long-term care for older people has reached its limit. There is a trend that services of a guardian are in greater demand. Accordingly, a long-term care insurance system for the elderly was implemented to solve problems with short-term and long-term care and to improve the quality of life of the elderly population [2].

Since the long-term care insurance system for the elderly was implemented in July 2008, a total of 273,613 care work-

ers were recorded as of 2018 [3]. A nursing care provider specializes in assisting in the physical or household activities for an older person. He or she collects information about the patients from doctors, nurses, and family members, establishes a nursing care service plan, and performs tasks to support the subject's daily activities.

Under Article 34 of the Welfare of Senior Citizens Act enforced by long-term care institutions, long-term care service is offered in a welfare facility for older people that provides social support to help reduce the support from the family and provide long-term care for the elderly in welfare facilities (excluding elderly care hospitals). This long-term care provides education and training for elderly persons who require admission, support for physical activities, maintenance of mental and physical function, and improvement of their function. In foreign countries, even in countries that experienced societal aging before Korea, the experience of caring for the elderly is re-examined from a positive view [4].

As the degree of functional dependence of elderly persons increases, their level of care may be determined. Subjects with grades 1 and 2 find it very difficult to perform daily life activities independently without the full help of a nursing care provider. Older people living in facilities need help from care workers, but improving their ability to perform daily activities and improving their physical functions have significant influence on their quality of life. Regular exercise prevents muscle atrophy, functional decline, and disability, and has a positive effect on the cognitive function of healthy but weak older individuals. Decreased exercise capacity in elderly persons can lead to diminished physical and cognitive functions. Regular exercise is effective in preventing falls, as it improves physical functions such as endurance, lower extremity muscle, and balance in older people with dementia and lower balance ability and muscle function than the general population. Increasing the growth and function of the cranial nerve has a positive effect on cerebrovascular function and helps improve psychomotor ability [5-8].

Nevertheless, the long-term care insurance has a flat fee system. There is a standard fee for the placement of a full-time care provider, but there is insufficient consideration according to the target level of care. Moreover, the compensation for voluntary work that improves the quality of life is insufficient. In addition, the fact that most care workers are old and the compensation level is insufficient can also affect voluntary behavior. A previous study found that high work experience and better physical and personal environment of the nursing care provider had a positive effect on job satisfaction, but it was confirmed that a good compensation system did not increase job satisfaction [9].

This study aimed to contribute to enhancing the physical activity function of the elderly by determining the degree of performance of the elderly person's physical improvement activities by care workers and to provide basic data on the physical function improvement activities of elderly persons in nursing care to improve their residual ability. Specifically, the 1st aim was to identify the characteristics of the nursing care provider. The 2nd aim was to assess the degree of physical function improvement activities for the elderly persons performed by care workers in long-term care facilities. The 3rd aim was to identify the correlation between variables. Finally, the 4th aim to identify the factors that influence the performance of physical improvement activities of the elderly population.

Methods

This study is a descriptive correlation survey, which was carried out to identify the factors affecting the performance of elderly physical function activities by nursing care workers.

Participants

The number of subjects required for the study was calculated using the G*Power version 3.1.9.2 (Universität Kiel, Kiel, Germany). In the multiple regression analysis for the 8 variables to be analyzed, the minimum number of samples was set to a significance level of 0.05, a median effect size of 0.15, and a power of 0.80. We calculated a total of 160 people. In this study, a questionnaire was distributed to a total of 168 people in consideration of the dropout rate of 5%, and 159 questionnaires (recovery rate 94.6%) were used in the final analysis, excluding 9 insolvency and omission questionnaires including 2 subjects who dropped out from the survey.

Instruments

General characteristics
The study instrument consisted of 12 questions on the general characteristics of the subjects.

Physical function improvement activities
A 5-point scale tool developed by the researchers was used to measure the physical function improvement activity

of the elderly. The development process of this tool was as follows.

First, through a review of the literature of the research team and consultation with a professor of physical therapy, the physical function improvement activities for the elderly in the facility consisted of 'non-moving balance exercise', 'moving balance exercise', 'isometric exercise' and 'passive exercise'. Twenty questions were developed for the 1st preliminary tool.

Second, in order to assess the validity of experts in the 1st question, a total of 5 professors of the department of nursing, 1 doctor of nursing program, 1 professor of physical therapy and 1 PhD candidate were consulted. The questions were selected. In this process, 'Bend the upper body forward and put it in place' and 'walking quickly' were deleted as safety problems could occur, and the motion of 'helping breathing exercise' was ambiguous, so we decided to discuss it again later and deleted it (a total of 17 questions).

Third, 3 nursing care workers with more than 5 years of current experience were asked to review the questions; take deep breaths to help with breathing exercises', Third, 3 nursing care workers with more than 5 years of current experience were asked to review the questions; take deep breaths to help with breathing exercises, massage hands and feet in the current posture to improve rehabili tation and remaining ability. In order to avoid prolonged pressure on one area, tap the back to change position was added (total of 20 questions).

Fourth, as a result of a survey of 1 facility manager (social worker) with 20 years of experience working in nursing facilities, 1 nurse with more than 15 years of experience, and a nursing care worker with more than 5 years of experience, there was no disagreement on the existing and added items.

Finally, 20 items with a validity of content validity index of 0.8 or higher were selected as in step 1.

For each question, this tool measures 'very often performed' as 5 points, 'frequently performed' as 4 points, 'sometimes performed' as 3 points, 'almost never performed' as 2 points, and 'not at all performed' as 1 point. In this study, the Cronbach's α of this tool was 0.908.

Data collection

The data collection period started from October 21, 2020, to October 26, 2020. Due to the Coronavirus Disease-19 (COVID-19) pandemic situation, visits to nursing home were not allowed, so a request was made for cooperation in data collection through the facility manager, and a con-

venience sampling was done. After the researchers requested cooperation from one of the metropolitan cities, Seoul and Incheon, and 3 long-term care facilities in the rural area, Taebaek, the research assistant explained the purpose and method of the study to the subjects, who then provided written consent. The questionnaires were collected immediately after they were filled out.

Data analysis

In this study, the subject's characteristics were analyzed by frequency and percentage. The degree of physical function improvement activities were analyzed by mean and standard deviation values. The correlation between major variables and factors was analyzed by Pearson's correlation coefficient and Spearman's rho. Multiple regression was conducted to identify influencing factors on physical function improvement activities.

Ethical considerations

Data were collected after obtaining approval from the Institutional Bioethics Committee of Sahmyook University (2-1040781-A-N-012020103HR). An explanation of the study and consent form to participate in the study were attached to the 1st page of the questionnaire. In accordance with the Declaration of Helsinki, the purpose of the study and method of participation were explained to the identified subjects. The subjects can withdraw participation in the study at any time. When a subject wanted to participate of the study, a questionnaire was administered after he/she signed the consent form.

Results

Characteristics of the participants

The study subjects were distributed by residential area: Taebaek with 79 (49.7%) subjects, Seoul with 47 (29.6%) subjects, and Incheon with 33 (20.8%) subjects. For the age distribution, 53.8% (n=86) of the subjects were in their 50s, 31.6% were in their 60s, 12.0% were in their 40s, and 4% were in their 30s. In regards to educational level, 96 (60.8%) were high school graduates, 33 (20.8%) were college graduates or higher, 20 (12.7%) were middle school graduates, and 9 (5.7%) were elementary school graduates. As for the question on whether they have a religion, 86 (54.1%) answered "Yes" and 73 (45.9%) answered "No".

With regard to the types of nursing facilities where the study subjects work, 138 (86.8%) were working in "nursing

homes" and 21 (13.2%) were working in "day and night care facilities". As for the type of work, 110 (69.2%) subjects were working in facilities with "three shifts", 45 (28.3%) in facilities with "two shifts", and 4 (2.5%) facilities with "fixed daytime". There were 121 (76.6%) full-time workers, 32 (20.3%) contract workers (full-time), 4 (2.5%) contract workers (part-time), and 1 (0.6%) part-time temporary worker.

In regards to the average monthly income, 101 (63.5%) earned 1.5-2.0 million won, 52 (32.7%) earned 2.0-2.5 million won, 4 (2.6%) earned 2.5 million won or more, and 2 (1.3%) earned 1.0-1.5 million won. In regards to work experience, 95 (60.9%) subjects had 3 or more years of work experience, 24 (15.4%) had 1-2 years, 22 (14.1%) had 2-3 years, 10 (6.4%) had less than 1 year, and 5 (3.2%) were new with 1-3 months. The long-term care level of elderly persons

Table 1. Characteristics of the subjects (N=159)

Variables	Factors	Frequency	Rate
Residence area	Seoul	47	29.6%
	Incheon	33	20.7%
	Taebaek	79	49.7%
Age	30s	4	2.5%
	40s	19	12.0%
	50s	86	54.1%
	60s	50	31.4%
Education level	Elementary school	9	5.7%
	Middle school	20	12.7%
	High school	96	60.8%
	college	33	20.8%
Religion	Yes	86	54.1%
	No	73	45.9%
Type of nursing facility	Nursing home	138	86.8%
	day and night care facilities	21	13.2%
Working type	Fixed daytime	4	2.5%
	3 shifts	110	69.2%
	2 shifts	45	28.3%
	Fixed nighttime	0	0.0%
	Fixed weekend	0	0.0%
	Part time	0	0.0%
Employment type	Full time	121	76.6%
	Contract worker (full time)	32	20.3%
	Contract worker (part time)	4	2.5%
	Part-time temporary	1	0.6%
Average monthly income	1.0 million won ↓	0	0.0%
	1.0-1.5 million won	2	1.3%
	1.5-2.0 million won	101	63.5%
	2.0-2.5 million won	52	32.7%
	2.5 million won ↑	4	2.5%
Work experience	1-3 month	5	3.2%
	1 year ↓	10	6.4%
	1-2 years	24	15.4%
	2-3 years	22	14.1%
	3 year ↑	95	60.9%
Long-term care level of the elderly	Mainly level 1	2	1.4%
	Levels 1 and 2	49	30.9%
	Level 2	16	10.1%
	Levels 2 and 3	92	57.6%
Total		159	100.0%

in the facility where the subjects worked levels 2 and 3 in 92 (57.6%) subjects, levels 1 and 2 in 49 (30.9%) subjects, higher than level 1 in 16 (10.1%) subjects, and mainly level 1 in 2 (1.4%) subjects (Table 1).

Degree of physical function improvement activity for the elderly

The physical function improvement activities provided by the study subjects to the elderly persons are listed in order of frequency as follows: Elevate your upper or lower body to prevent edema (4.21±0.89), helps older people to get active in a wheelchair (4.19±0.82), pats back after changing their position to avoid prolonged pressure on one area (4.14± 0.98), to prevent foot drop, which is an abnormal lower leg sensation, puts an auxiliary cushion, etc. (4.03±0.93), frequently elevates the patient when lying and sitting (3.89± 0.83), turns head to left and right (3.78±0.95), encourages the elderly to walk using a walker whenever possible (3.72± 0.80), practices lower body muscle rehabilitation and close care to prevent edema (3.72±1.00), for rehabilitation and improvement of residual ability, hand and foot massage is given in a lying position (3.71±0.89), encourages deep breathing and helps with breathing exercises (3.62±0.93),

lifts the limbs from the seat (3.59±0.82), lifts the pelvis from the bed (3.56±0.99), helps arm and leg range of motion (ROM) exercise (3.52±0.98), helps with arm and leg joint ROM exercise (3.48±0.76), sits at the edge of the bed and then stand up (3.48±0.89), propping elbows with pillows when in the sitting position and giving support (3.35±0.88), walking in place (static balance) (3.32±0.73), helps isometric exercise (strengthening from a standstill) (3.31±0.74), standing in place and moving legs in place (dynamic balance) (3.16±0.75), standing and lifting one foot at a time (dynamic balance) (3.06±0.82) (Table 2).

Correlation analysis

In the correlation analysis, the higher the age of the subjects, the lower their educational background (r=−0.273, $p<0.05$), the higher the probability of having a religion (r=−0.258, $p<0.05$) and having an unstable employment type (r=−0.333, $p<0.05$), type of duty (r=0.276, $p<0.05$).

The higher the level of education, the higher the monthly income (r=0.187, $p<0.01$). The shorter the work experience (r=−0.204, $p<0.05$), the more stable is the employment, the more unstable the duty time (r=−0.245, $p<0.05$), and the more unstable the work is. Physical function improvement

Table 2. Care workers' physical function improvement activity

Rank	Physical function improvement activity	Mean (SD)
1	Elevate your upper or lower body to prevent edema	4.21 (0.89)
2	Help you to get active in a wheelchair	4.19 (0.82)
3	Pat back after changing your position to avoid prolonged pressure on one area	4.14 (0.98)
4	To prevent foot drop, which is an abnormal lower leg sensation, put an auxiliary cushion, etc.	4.03 (0.93)
5	Frequently elevates the patient when lying and sitting	3.89 (0.83)
6	Turn head to left and right	3.78 (0.95)
7	Practice lower body muscle rehabilitation and close care to prevent edema	3.72 (1.00)
8	Encourage older people to walk using a walker whenever possible	3.75 (0.80)
9	For rehabilitation and improvement of residual ability, hand and foot massage is given in a lying position	3.71 (0.89)
10	Help with deep breathing exercises to help perform breathing exercise	3.62 (0.93)
11	Lift the limbs from the seat	3.59 (0.82)
12	Lift the pelvis from the bed	3.56 (0.99)
13	Help with arm and leg ROM exercise	3.52 (0.98)
14	Help you sit on the edge of the bed and then stand up	3.48 (0.89)
15	Help with arm and leg joint ROM exercise	3.48 (0.76)
16	Propping your elbows with elbows when sitting and providing support (home position)	3.35 (0.88)
17	Walking in place (static balance)	3.32 (0.73)
18	Help with isometric exercise (strengthening from a standstill)	3.31 (0.74)
19	Standing in place and moving legs in place (dynamic balance)	3.16 (0.75)
20	Standing and lifting one foot at a time (dynamic balance)	3.06 (0.82)
	Overall	3.93 (0.73)

ROM: range of motion.

Table 3. Correlation between individual characteristics and variables of the subjects (N=109)

Variables	Age	Education	Religion	Type of duty	Unstable employment	Income	Work experience	No. of seniors in charge	PFIA
Age	1								
Education	−0.273*	1							
Religion	−0.258*	0.008	1						
Type of duty	0.276*	−0.044	−0.057	1					
Unstable employment	−0.333*	0.02	−0.02	−0.245*	1				
Income	−0.004	0.187**	−0.107	−0.206*	0.341*	1			
Work experience	0.082	−0.204*	−0.033	−0.111	0.22*	0.247*	1		
No. of seniors in charge	−0.149	0.08	0.006	0.008	−0.113	−0.155	0.091	1	
PFIA	−0.088	−0.1	−0.112	−0.225*	0.321*	−0.196*	0.12	0.083	1

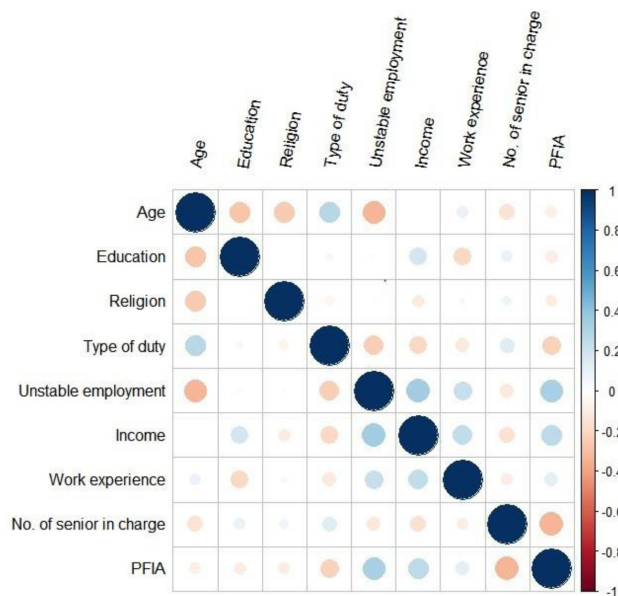PFIA: physical function improvement activities.
*$p<0.05$, **$p<0.01$.

Figure 1. Correlation plot. PFIA: physical function improvement activities.

activities were low (r=−0.196, $p<0.05$), which means that the higher monthly income, the less physical function improvement activities. The more stable the employment, the more activities to improve physical function were found (r=0.341, $p<0.05$) (Table 3, Figure 1).

Factors influencing the participants' physical function improvement activities

To understand the influence of the subjects characteristics on the improvement activities for the elderly person's physical function, age, monthly income, work experience, num-

Table 4. Factors influencing elderly person's physical function improvement activities (N=159)

Variables	β
Age	−0.007
Income	−0.198*
Work experience	−0.038
No. of seniors in charge	0.037
Constant	3.390**
F	2.696*
Adjusted-R^2	0.059

*$p<0.05$, **$p<0.01$.

ber of care recipients, and number of care recipients showed significant correlation. Monthly income ($\beta=-0.198$, $p<0.05$) was significant, and the explanatory power was 5.9%.

To verify the adequacy of this regression model, the normality of the physical function improvement activity, a dependent variable, was identified. As a result of the Kolmogorov-Smirnov verification, the data was confirmed for normal distribution. The variance inflation factor was 1.05-1.77, confirming that there was no problem of multicollinearity (Table 4).

Discussion

This study identified the factors affecting physical function improvement activities that can influence the quality of life of elderly persons performed by care workers working in long-term care facilities.

In this study, the number of physical function improve-

ment activities for the elderly performed by care workers in long-term care facilities was 3.93±0.98 points, which indicated that activities were performed relatively frequently. However, the improvement activities that showed the highest frequency were passive and specialized activities such as preventing accidents or bedsores, e.g., "raising the upper and lower body to prevent edema", "moving while on a wheelchair", and changing position and tapping to prevent long-term compression in one area. These actions did not require knowledge of movement. When providing services to the older subjects, the nursing care provider sets up a plan that benefits both the nurse and social worker, which is in accordance with the elderly subject's disease condition and physical characteristics, provides services according to the plan, and supports daily life [10,11].

Therefore, in the daily nursing care plan, it is necessary to provide systematic improvement activities by setting up a plan of performing appropriate physical function improvement activities according to the patient's condition. Physical function improvement activities, which are relatively infrequent, are considered to require more effort by a nursing care provider [12-14].

In the correlation analysis, the elderly person's physical function improvement activities performed by care workers showed a negative correlation with age. This means that the older they are, the less they performed physical function improvement activities. However, it can be interpreted that the more unstable the employment, the more active are the physical function improvement activities, and the more enthusiastic the older people are to improve their physical function. Moreover, nursing care workers with stable employment are less engaged in physical function improvement activities. To encourage physical function improvement activities, which are direct nursing activities that improve the quality of life of elderly persons, reorganization of the nursing care system, which is currently the same, is required. At the same time, nursing care workers should be encouraged to perform physical function improvement activities and provide systematic education to the patients [15,16].

In the regression analysis, monthly income was the only factor influencing the performance of physical function improvement activities. This was thought to occur because compensation for voluntary activities such as physical function improvement activities was not clear, and these activities consume a lot of energy in the daily work in the nursing home. As shown in the correlation analysis, care workers appear to be very sensitive to pay [17]. Therefore, it is neces-sary to establish a standard compensation for physical function improvement activities to improve the quality of life of elderly persons by partially improving the nursing care compensation, which is currently a comprehensive fee system. In addition, there is a need to improve the institutional environment so that services can be officially received by professional physical therapists.

In Korea, more than 75% of senior citizens admitted to long-term care facilities showed low levels of physical activity over the past 3 days, and 75% of the elderly persons admitted did not engage in outdoor activities at all [18]. In Korea, more than 75% of the older people admitted to long-term care facilities showed a low level of physical activity participation over the past 3 days, and it was confirmed that 75% of the older people admitted to long-term care facilities did not perform any outdoor activities and recognition of functional improvement activities was low. However, in this study, care workers reported that they performed relatively frequent physical activities with an average of 3.93±0.73 points, which is judged to show a considerable gap between the perception of care workers and the results of a previous study [18].

From the above results, although there are practical difficulties in pursuing quality care of care workers in the comprehensive fee system according to the current long-term care level, the care workers' direct or indirect nursing practices improve the quality of life of the older people. The administrator should be able to exercise discretion, such as encouraging them and adjusting their workload.

This study had the following limitations. First, the study subjects was a convenience sample for care workers working in senior medical welfare facilities in Seoul, Incheon, and Taebaek because it is difficult collect data with the ongoing COVID-19 pandemic. Second, the measuring tools used in this study were modified tools developed for other similar occupations, and it is difficult to say that the characteristics of care workers are sufficiently reflected. Nevertheless, at the forefront of a rapidly increasing number of long-term care facilities, factors influencing physical function improvement activities that have a significant effect on the quality of life of elderly persons were explored by care workers who are in charge of direct nursing. The results herein have implications on investigating the effects of and management on the care of older people and improvement of the quality of long-term care services.

This study was conducted to identify the current status of physical function improvement activities that influence the

quality of life of the elderly in long-term care facilities, targeting care workers who are working in long-term care facilities for elderly persons, whose demand is rapidly increasing. This study found lower the satisfaction of elderly persons on the care worker's performance of physical function improvement activities. This shows that care workers only thought that are working mainly for specified daily tasks. We thought that this stems from the unclear and inadequate compensation, and this is was closely related to the current comprehensive fee system for senior long-term care insurance, suggesting that it is necessary to provide regular services by a dedicated physical therapist for physical function improvement activities to see improvement in the quality of life of the elderly population in the future.

Acknowledgement

Conflicts of Interest

The authors declare no potential conflicts of interest with respect to the authorship and/or publication of this article.

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