■ORIGINAL ARTICLE

Influences of the Coronavirus Disease (COVID-19) Pandemic on Occupational Therapy: A Content Analysis of Long-Term Care Insurance Service Facilities in Hokkaido

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Abstract: Objective: This study aimed to clarify the influence of the coronavirus disease (COVID-19) pandemic on occupational therapy (OT), including changes in assessment and treatment, along with other restrictions and measures in long-term care insurance service facilities.
Methods: We conducted a questionnaire survey from representatives of OT departments in long-term care insurance service facilities in Hokkaido and obtained responses from 89 participants.
Results: More than half of the facilities remained unchanged in their assessments and treatments following the first emergency declaration, after which their responses gradually decreased. As for the content of assessment, there were increased needs, such as body temperature, health condition, and physical/cognitive changes due to disuse syndrome, while reduced opportunities were available to assess in areas, such as home environment, mobility outdoors, and instrumental activities of daily living outdoors. As for the content of treatment, while outings and group training had been discontinued, prevention of disuse syndrome had been added. The treatment also incorporated changes in methods, such as fixing the location and time. Restrictions related to OT were reported, including client participation, OT operations, and discontinuation of services. On the other hand, measures related to OT, such as thorough standard precautions, management of health conditions of the clients and housemates, and infection control measures by occupational therapists, were also mentioned.
Conclusions: Despite various restrictions, OT was provided by thoroughly implementing standard precautions, managing the physical conditions of the clients and housemates, providing new means of participant support and infection control for the influences of the COVID-19 pandemic.

Keywords: COVID-19, occupational therapy, combating infectious diseases, content analysis, long-term care insurance service

(*Asian J Occup Ther* **18**: 147−155, 2022)

1. Introduction

Coronavirus disease (COVID-19) is caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), and it was first reported by the World Health Organization (WHO) in December 2019 following a report of a cluster of "viral pneumonia" cases in Wuhan, China [1]. Thereafter, the number of infected persons and related deaths increased worldwide. The WHO stated that COVID-19 could be characterized as a pandemic because of being deeply concerned both by the alarming levels of spread/severity and inaction [2]. In Japan, the first case of COVID-19 was confirmed on January 16, 2020. By December 27, 2020, Polymerase Chain Reaction testing had confirmed positive viral serology for 217,312 people and 3,213 deaths had been reported [3]. In particular, Hokkaido, the largest and northernmost prefecture, has seen a widespread increase in COVID-19 incidence since the early stages of the disease due to transmissions among immigrating tourists, mass infections at events, and problems with the urban structure, such as people from various regions gathering in large cities and dispersing to different regions [4] [5]. Hokkaido's first local emergency declaration ended

Received: 31 May 2021, Accepted: 8 February 2022
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on March 19, 2020, and this was followed by a temporary decrease in the number of infected people [6][7]. However, on April 16, 2020, the Tokyo metropolitan, Osaka, and surrounding areas were found to be infection hotspots. There was a subsequent rapid increase in the number of infected people nationwide; therefore, the government declared a state of emergency, which continued until May 25, 2020 in Hokkaido [6][7]. The pandemic is still ongoing, and the situation remains unpredictable.

The COVID-19 pandemic has had a profound influence on rehabilitation, including occupational therapy (OT). The Japanese Association of Occupational Therapists has published an article titled "COVID-19 Infection Control/Occupational Therapy Work" [8]. According to this, practicing hand hygiene, use of protective equipment, and others are categorized as "Basics of infection control in OT," and places at risk of being closed, densely populated, and compact, such as staff rooms, OT visiting areas, and spaces for group activities (recreation, exercise, and calisthenics) are enlisted. It has provided with tailored preventive strategies provided under "Specific measures in COVID-19 infection control."

Previous studies have shown that older adults are at a higher risk of poor prognosis and fatality from COVID-19 [9][10]. Older adults living in long-term care facilities comprise 79% of the COVID-19 death toll in Canada [11]. Predictive factors of mortality among older adults with COVID-19 were premorbid activities of daily living (ADL) impairment, comorbidity, and increased C-reactive protein levels [12]. Therefore, clients being rehabilitated in long-term care insurance facilities are at risk of severe outcomes of COVID-19. Furthermore, therapists must pay close attention to the client's condition and ensure infection control.

There are no specific protocols for infection control in OT practice in long-term care insurance service facilities. In addition, few studies have comprehensively examined what restrictions and measures were taken in actual settings where OT was provided. It is necessary to accumulate information provided by various sites regarding OT and to consider the measures according to the changing situation of COVID-19. In Hokkaido, a state of emergency was declared twice, (February 28 to March 19, 2020; April 12 to May 25, 2020), and measures against infectious diseases were undertaken to combat the evolving situation from an early stage. The purpose of this study was to clarify the influences of COVID-19 on OT in long-term care insurance facilities in Hokkaido, focusing on changes in the contents of assessment and treatment, as well as other restrictions and measures.

2. Materials and Subjects

2.1. Research design

This was a cross-sectional study conducted using a postal questionnaire survey method.

2.2. Participants

The participants were representatives of OT departments from 725 facilities in Hokkaido belonging to members of the Japanese Association of Occupational Therapists in the fields of medical care, long-term care, and welfare for the disabled.

A list of facilities with occupational therapists was created using the list of facilities of the Japanese Association of Occupational Therapists, with permission for use.

2.3. Data collection

The questionnaire was mailed to the representatives of the OT department of the target facilities, and responses to the questionnaire were requested. All authors reviewed the items and responses in the questionnaire to ensure that the content was valid and aligned with the research questions and objectives. The questionnaires and consent forms were collected by mail using enclosed return envelopes. The survey period was from June 30 to August 14, 2020. The questionnaire survey items are shown below.

2.3.1. Characteristics of facility and OT

We asked about the target category (medical care, long-term care, welfare, and others), presence or absence of COVID-19-infected patients, the number of clients per occupational therapist, and the locations of OT before the first declaration of emergency in Hokkaido due to COVID-19 (before February 27, 2020; hereafter, "pre-declaration").

All applicable OT locations were selected from the following: 1) "facility room/residence": the client's room or home, 2) "in OT department": OT rooms under the jurisdiction of the OT department, 3) "in the facility": day room or hall in the target facilities, and 4) "outside the facility": outdoor or external facilities. In addition, we extracted information on the type of service (facility service, commuting service, home-visit service, and others) using the Japanese Association of Occupational Therapists' list of facilities and categorized the facilities accordingly.

2.3.2. Influences of COVID-19 on OT in each period

To evaluate the influences of COVID-19 on OT, participants were asked about the number of clients per

occupational therapist and location of OT across three time periods: during Hokkaido's first declaration of a state of emergency (February 28 to March 19, 2020; hereafter, Period I), during the period in which the declaration was temporarily lifted (March 20 to April 11, 2020; hereafter, Period II), and during the national declaration of a state of emergency (April 12 to May 25, 2020; hereafter, Period III). Then, they were requested to complete open-ended responses on changes in the content of assessment and treatment from pre-declaration and COVID-19–related restrictions and measures to OT across the three periods indicated above.

2.4. Data analysis

Of the returned questionnaires, those in the "long-term care insurance facilities" were selected for analysis in this study. First, the facility characteristics to which the subjects belonged were tabulated. Next, trends in the number of clients per occupational therapist and location of OT from pre-declaration to Period III were identified. Regarding the number of clients per occupational therapist, the proportion of clients from Period I to Period III was calculated, with that of the pre-declaration period being 100%. For the location of OT, the number and percentage of facilities at each location were determined, and the transition from pre-declaration to Period III was clarified.

Finally, changes in the content of OT assessments, treatments, restrictions on OT, and measures on OT were coded with the procedures of content analysis [13]. In content analysis, qualitative data can be described objectively, systematically, and quantitatively. The procedures for the analysis were as follows:

1) The responses in the questionnaire were divided into contextual sentences, and the sentences were divided into record units to ensure that the meaning of the content could be understood. In addition, data which were not adequately answered the question, were excluded.

2) Record units with similar semantic content were grouped as the same record unit; then, they were coded. At the same time, record units that did not correspond to the options in the questionnaire were excluded from the analysis.

3) Several codes were examined for commonalities and categorized abstractly as a category. In addition, the codes that had no commonality with other codes were classified into a category by a single code.

4) The number of occurrences of record units in the codes and categories were counted, and the percentage of the total was calculated. Restrictions and measures related to OT were analyzed as "Restrictions and measures other than the content of assessment and treatment" because it was assumed that some recording units overlapped in terms of changes in the content of assessment and treatment of OT. The analysis process was shared with the second and third authors, and the contents were repeatedly reviewed and revised. Categories and codes are represented by [ ] and < >, respectively.

2.5. Ethical considerations

This study was approved by the Sapporo Medical University Ethical Review Board (approval number 2−1−2). The participants provided written informed consent for all procedures.

3. Results

3.1. Facility characteristics

In total, 334 questionnaires were returned. Of those questionnaires, 89 (26.7%) were classified as long-term care insurance facilities, with valid responses. The long-term care services included facility service in 54 facilities (60.7%), commuting service in 60 (67.4%), home-visit service in 26 (29.2%), and other services in three (3.4%). One facility (1.1%) confirmed the presence of COVID-19 cases among the staff.

3.2. Number of clients in OT (Figure 1)

The mean values±standard deviations on the proportion of clients during the pre-declaration period and in Periods I, II, and III were 100%, 90.3±16.6%, 92.3±17.4%, and 90.5±19.8%, respectively. Comparing

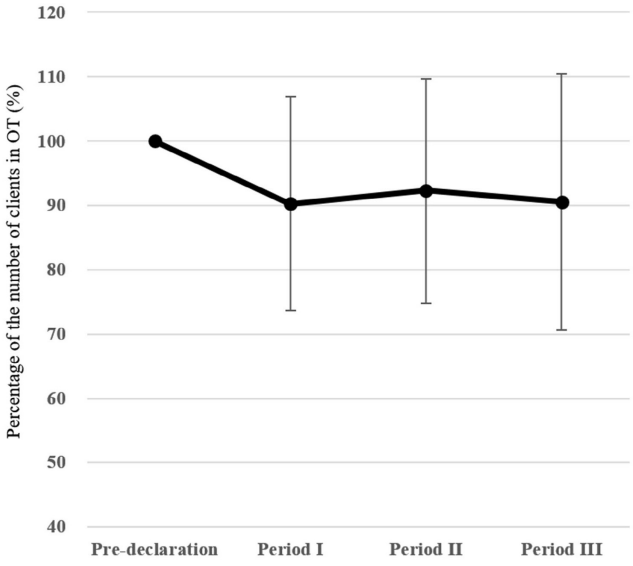

Fig. 1. Number of clients in OT

OT: Occupational Therapy
Note. The trends in the number of clients per occupational therapist from pre-declaration to Period III were shown.

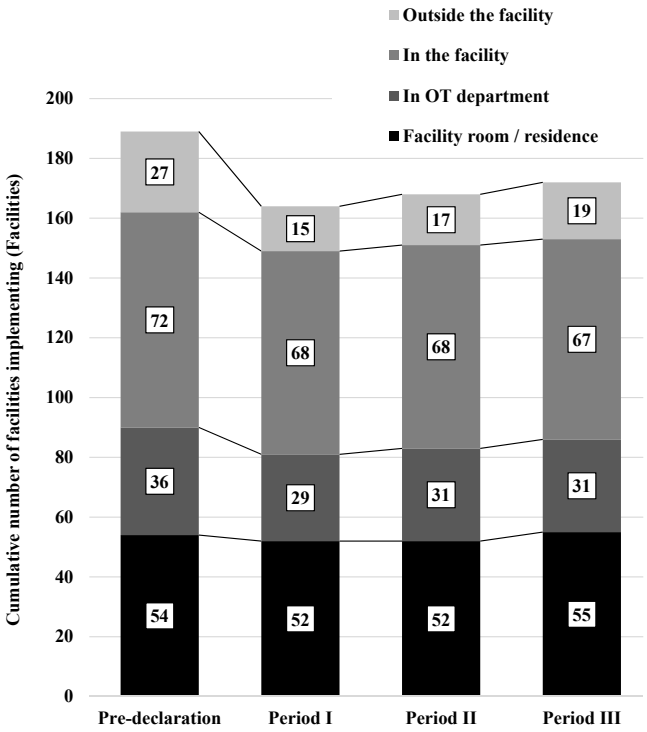

Fig. 2. The location of the implementation of OT in the long-term care insurance

OT: Occupational Therapy
Note. The number of facilities in each location of OT from pre-declaration to Period III were shown.

the number of clients during the pre-declaration period and in Period III, 39 facilities (43.8%) showed a reduction and six (6.7%) showed an increase, while the number remained the same in 44 (49.4%).

3.3. Location of the implementation of OT (Figure 2)

In the pre-declaration period, 54 facilities (60.7%) provided OT in the facility room/residence, 36 (40.4%) in OT department, 72 (80.9%) in the facility, and 27 (30.3%) outside the facility. The OT locations in Period I were 52 facilities (58.4%) in the facility room/home, 29 (32.6%) in the OT department, 68 (76.4%) in the facility, and 15 (16.9%) outside the facility. No change was reported in more than three facilities in any of the locations in Periods II and III compared with that in Period I.

3.4. Changes in the content of assessment in OT due to COVID-19 (Table 1)

Variables that had an [increased need for assessment] were <measurement of body temperature before OT>, <checking health condition before OT>, <changes in physical and cognitive functions due to disuse syndrome>, and <stress responses>. There was an increase in the number of record units as time went on. A small number of record units reported in <status of outdoor activities>, <opportunities for communication>, <awareness of infection control>, <checking the physical con-

Table 1 Changes in the content of assessment in OT from pre-declaration

Category	Code	Number of record units					
		Period I (n=78)		Period II (n=77)		Period III (n=78)	
Increased need for assessment	Measurement of body temperature before OT	8	(8.9%)	7	(7.5%)	7	(7.2%)
	Checking health condition before OT	7	(7.8%)	7	(7.5%)	7	(7.2%)
	Changes in physical and cognitive functions due to disuse syndrome	3	(3.3%)	7	(7.5%)	9	(9.3%)
	Stress responses	2	(2.2%)	8	(8.6%)	9	(9.3%)
	Status of outdoor activities	1	(1.1%)	1	(1.1%)	3	(3.1%)
	Opportunities for communication	1	(1.1%)	1	(1.1%)	1	(1.0%)
	Awareness of infection control	1	(1.1%)	0	(0.0%)	2	(2.1%)
	Checking the physical condition of housemate or roommate	0	(0.0%)	2	(2.2%)	2	(2.1%)
	Contact with visitors from infection hotspots	0	(0.0%)	0	(0.0%)	1	(1.0%)
	Subtotal	23	(25.6%)	33	(35.5%)	41	(42.3%)
Reduced opportunities for assessment	Home environment	4	(4.4%)	4	(4.3%)	5	(5.2%)
	Mobility outdoors	4	(4.4%)	3	(3.2%)	2	(2.1%)
	IADL outdoors	2	(2.2%)	2	(2.2%)	2	(2.1%)
	Living conditions at home	2	(2.2%)	2	(2.2%)	2	(2.1%)
	Subtotal	12	(13.3%)	11	(11.8%)	11	(11.3%)
The changed assessment methods	Changes in the location and time as appropriate	3	(3.3%)	4	(4.3%)	3	(3.1%)
	Using telephone for absent clients	1	(1.1%)	1	(1.1%)	1	(1.0%)
	Subtotal	4	(4.4%)	5	(5.4%)	4	(4.1%)
No change from the pre-declaration period		51	(56.7%)	44	(47.3%)	41	(42.3%)
	Total	90	(100.0%)	93	(100.0%)	97	(100.0%)

OT: Occupational Therapy, IADL: Instrumental Activities of Daily Living
Note. The Changes in the content of assessment in OT from pre-declaration were grouped into four categories. The number of record units for each category and code were shown.

dition of housemate or roommate>, and <contact with visitors from infection hotspots>. In contrast, factors with [reduced opportunities for assessment] included <home environment>, <mobility outdoors>, <instrumental activities of daily living (IADL) outdoors>, and <living conditions at home>. Many of these reports were attributed to restrictions on the provision of OT outside the facility. In addition, the content of [the changed assessment methods] included <changes in the location and time as appropriate> and <using telephone for absent clients>. While the above changes in the content of the assessment were mentioned, there were also responses of [no change from the pre-declaration period], accounting for 51 (56.7%), 44 (47.3%), and 41 (42.3%) of the responses in Periods I, II, and III, respectively.

3.5. Changes in the contents of treatment in OT owing to COVID-19 (Table 2)

The factors involved in the [discontinuation of treatment] due to the COVID-19 pandemic, such as <outdoor training and activities> and <group activities>, were reported. Although infrequently reported, <high-intensity exercise>, <cooking training>, and <swallowing and speech training> were also mentioned. Two respondents (2.3%) reported [total cancellation], that is they completely stopped OT in period III. In contrast, there was an increase in [additional support incorporating infection control] in light of the influences of COVID-19, including <interventions aimed at preventing disuse though self-restraint>, <outdoor training and activities>, <proposals and implementation for voluntary training>, and <interventions aimed at leisure and stress release>. In addition, [changes in treatment methods including infection control] were reported. These included <fixing the location for zoning>, <fixing the time of day for each stay and commute period>, <changing from day care to home visit>, <reducing the number of participants in group activities>, and <strategically placing people and clients to avoid crowding and proximity>. Some respondents indicated [no change from the pre-declaration period], accounting for 47 (61.0%), 42 (53.2%), and 33 (37.5%) of the responses in Periods I, II, and III, respectively. These rates decreased over time.

3.6. Restrictions and measures other than changes in the content of assessment and treatment owing to COVID-19 (Tables 3 and 4)

Regarding restrictions other than the changes in the content of assessment and treatment, [restrictions on client participation] were often mentioned. The most

Table 2 Changes in the content of treatment in OT from pre-declaration

Category	Code	Number of record units					
		Period I (n=80)		Period II (n=76)		Period III (n=78)	
Discontinuation of treatment	Outdoor training and activities	5	(6.5%)	7	(8.9%)	7	(8.0%)
	Group activities	5	(6.5%)	4	(5.1%)	5	(5.7%)
	High-intensity exercise	1	(1.3%)	2	(2.5%)	2	(2.3%)
	Cooking training	1	(1.3%)	1	(1.3%)	1	(1.1%)
	Swallowing and speech training	0	(0.0%)	1	(1.3%)	2	(2.3%)
	Subtotal	12	(15.6%)	15	(19.0%)	17	(19.3%)
Additional support incorporating infection control	Interventions aimed at preventing disuse through self-restraint	3	(3.9%)	5	(6.3%)	7	(8.0%)
	Outdoor training and activities	1	(1.3%)	1	(1.3%)	5	(5.7%)
	Proposals and implementation for voluntary training	1	(1.3%)	1	(1.3%)	3	(3.4%)
	Interventions aimed at leisure and stress release	0	(0.0%)	1	(1.3%)	2	(2.3%)
	Subtotal	5	(6.5%)	8	(10.1%)	17	(19.3%)
Changes in treatment methods including infection control	Fixing the location for zoning	7	(9.1%)	8	(10.1%)	10	(11.4%)
	Fixing the time of day for each stay and commute period	2	(2.6%)	1	(1.3%)	1	(1.1%)
	Changing from day care to home visit	2	(2.6%)	1	(1.3%)	1	(1.1%)
	Reducing the number of participants in group activities	1	(1.3%)	2	(2.5%)	4	(4.5%)
	Strategically placing people and clients to avoid crowding and proximity	1	(1.3%)	2	(2.5%)	3	(3.4%)
	Subtotal	13	(16.9%)	14	(17.7%)	19	(21.6%)
Total cancellation		0	(0.0%)	0	(0.0%)	2	(2.3%)
No change from the pre-declaration period		47	(61.0%)	42	(53.2%)	33	(37.5%)
	Total	77	(100.0%)	79	(100.0%)	88	(100.0%)

OT: Occupational Therapy
Note. The Changes in the content of assessment in OT from pre-declaration were grouped into four categories. The number of record units for each category and code were shown.

Table 3 Restrictions related to OT owing to COVID-19

Category	Code	Number of record units		
		Period I (n=81)	Period II (n=82)	Period III (n=82)
Restrictions on client participation	Available facilities	16 (15.2%)	16 (15.2%)	18 (16.2%)
	Interactions with people outside the facility	11 (10.5%)	11 (10.5%)	14 (12.6%)
	Visits outside of the facility and overnight stay	5 (4.8%)	3 (2.9%)	4 (3.6%)
	Participation by people in poor physical conditions	4 (3.8%)	4 (3.8%)	5 (4.5%)
	Interaction between residents	2 (1.9%)	2 (1.9%)	2 (1.8%)
	Participation of new clients	1 (1.0%)	2 (1.9%)	1 (0.9%)
	Contact with visitors from infection hotspots	0 (0.0%)	1 (1.0%)	3 (2.7%)
	Subtotal	39 (37.1%)	39 (37.1%)	47 (42.3%)
Restrictions on OT operations	Limitation of rehabilitation time and frequency	6 (5.7%)	6 (5.7%)	8 (7.2%)
	The use of equipment and supplies	5 (4.8%)	5 (4.8%)	6 (5.4%)
	Cancellation or shortening of meetings and trainings	4 (3.8%)	5 (4.8%)	4 (3.6%)
	Limiting the scope of staff work	5 (4.8%)	5 (4.8%)	6 (5.4%)
	Time constraints due to infection control	2 (1.9%)	3 (2.9%)	3 (2.7%)
	The use of infection control items	2 (1.9%)	2 (1.9%)	2 (1.8%)
	Lack of manpower due to limitation of staff attendance	2 (1.9%)	3 (2.9%)	3 (2.7%)
	Reduced opportunities for explanation and consent to the client and their family	2 (1.9%)	2 (1.9%)	1 (0.9%)
	Subtotal	28 (26.7%)	31 (29.5%)	33 (29.7%)
Discontinuation of long-term care services	Home-visit services	10 (9.5%)	10 (9.5%)	10 (9.0%)
	Day-care rehabilitation	5 (4.8%)	4 (3.8%)	3 (2.7%)
	Preventive services	2 (1.9%)	2 (1.9%)	2 (1.8%)
	Complete closure of the facility	4 (3.8%)	2 (1.9%)	2 (1.8%)
	Rehabilitation of residents	2 (1.9%)	2 (1.9%)	2 (1.8%)
	Stopping the use of other services	0 (0.0%)	0 (0.0%)	1 (0.9%)
	Subtotal	23 (21.9%)	20 (19.0%)	20 (18.0%)
No restrictions		15 (14.3%)	15 (14.3%)	11 (9.9%)
	Total	105 (100.0%)	105 (100.0%)	111 (100.0%)

OT: Occupational Therapy
Note. The restrictions related to OT owing to COVID-19 were grouped into four categories. The number of record units for each category and code were shown.

frequently reported codes were restrictions on <available facilities> and <interactions with people outside the facility>. Other factors included restrictions on <visits outside of the facility and overnight stay>, <participation by people in poor physical conditions>, <interaction between residents>, <participation of new clients>, and <contact with visitors from infection hotspots>. In addition, [restrictions on OT operations] included <limitation on rehabilitation time and frequency>, <the use of equipment and supplies>, <cancellation or shortening of meetings and trainings>, <limiting the scope of staff work>, and <time constraints due to infection control>. Furthermore, [discontinuation of long-term care services] were also reported, with <home-visit services> and <day-care rehabilitation> as the most commonly discontinued services. Compared with the above-listed restrictions, fewer reports were submitted regarding <preventive services>, <complete closure of the facility>, <rehabilitation of residents>, and <stopping the use of other services>.

Implementation of [thorough standard precautions] accounted for approximately 70% of the recorded units for measures other than assessment and treatment. The most frequently mentioned factors were <wearing masks>, <practice of hand hygiene>, and <disinfection of tools and common areas>, with more than 30 codes in any period. These were followed by <frequent ventilation>, <adjusting the environment to accommodate social distancing>, <gargling>, <minimal sharing of tools and equipment>, <sharing information about infection control measures>, and <use of humidifiers>. [Management of health conditions of the clients and housemates] by <checking body temperature before OT>, <checking the physical conditions>, <setting the criteria for discontinuation of participation>, and <checking the physical conditions of family members living together> was also reported. In addition to interventions for clients, [infection control measures by occupational therapists] were also reported, and these included <thorough management of physical condi-

Table 4 Measures related to OT due to COVID-19

Category	Code	Number of record units		
		Period I (n=86)	Period II (n=85)	Period III (n=85)
Thorough standard precautions	Wearing masks	36 (20.1%)	36 (20.0%)	38 (18.9%)
	Practice of hand hygiene	35 (19.6%)	33 (18.3%)	37 (18.4%)
	Disinfection of tools and common areas	30 (16.8%)	31 (17.2%)	33 (16.4%)
	Frequent ventilation	10 (5.6%)	11 (6.1%)	14 (7.0%)
	Adjusting the environment to accommodate social distancing	9 (5.0%)	9 (5.0%)	10 (5.0%)
	Gargling	2 (1.1%)	2 (1.1%)	2 (1.0%)
	Minimal sharing of tools and equipment	1 (0.6%)	2 (1.1%)	4 (2.0%)
	Sharing information about infection control measures	1 (0.6%)	1 (0.6%)	2 (1.0%)
	Use of humidifiers	1 (0.6%)	1 (0.6%)	1 (0.5%)
	Subtotal	125 (69.8%)	126 (70.0%)	141 (70.1%)
Management of health conditions of the clients and housemates	Checking body temperature before OT	10 (5.6%)	12 (6.7%)	12 (6.0%)
	Checking the physical conditions	4 (2.2%)	3 (1.7%)	3 (1.5%)
	Setting the criteria for discontinuation of participation	1 (0.6%)	1 (0.6%)	3 (1.5%)
	Checking the physical conditions of family members living together	0 (0.0%)	0 (0.0%)	1 (0.5%)
	Subtotal	15 (8.4%)	16 (8.9%)	19 (9.5%)
Infection control measures by occupational therapists	Thorough management of physical conditions	14 (7.8%)	12 (6.7%)	12 (6.0%)
	Use of personal protective equipment during OT	9 (5.0%)	10 (5.6%)	11 (5.5%)
	Fixing work content through reassignment	2 (1.1%)	4 (2.2%)	5 (2.5%)
	Thorough implementation of infection control measures in private life	4 (2.2%)	3 (1.7%)	6 (3.0%)
	Subtotal	29 (16.2%)	29 (16.1%)	34 (16.9%)
Changes in support methods in light of infection control	Changes concerning individual support	3 (1.7%)	2 (1.1%)	2 (1.0%)
	Sharing information and obtaining consent by mail or remotely	2 (1.1%)	2 (1.1%)	3 (1.5%)
	Strengthening inter-professional cooperation	2 (1.1%)	2 (1.1%)	2 (1.0%)
	Subtotal	7 (3.9%)	6 (3.3%)	7 (3.5%)
No measures		3 (1.7%)	3 (1.7%)	0 (0.0%)
	Total	179 (100.0%)	180 (100.0%)	201 (100.0%)

OT: Occupational Therapy
Note. The measures related to OT owing to COVID-19 were grouped into five categories. The number of record units for each category and code were shown.

tions>, <use of personal protective equipment during OT>, <fixing work content through reassignment>, and <thorough implementation of infection control measures in private life>. However, the participants reported [changes in support methods in light of infection control], such as <changes concerning individual support>, <sharing information and obtaining consent by mail or remotely>, and <strengthening inter-professional cooperation>. Finally, [no measures] was rarely reported.

4. Discussion

We investigated the influences of COVID-19 on OT in long-term care insurance facilities. Many facilities performed independent measures, modifying or adding content to assessments and treatments, while maintaining thorough infection control measures, even in the face of restrictions placed on participation and service provision.

Our results show that the number of OT clients in long-term care insurance facilities had decreased to approximately 90% due to COVID-19. Of these, nearly half of the studied facilities had no change in the number of clients, suggesting that they were still able to provide OT while taking infection control measures.

Regarding the location of OT in the long-term care insurance service facilities, there was a decrease in the number of sessions conducted outside the facilities during Period I. This is assumed to be due to the restrictions imposed by Hokkaido's local emergency declaration that refrained citizens from going outdoors [4]. However, there was a slight decrease in the implementation of the program in visiting rooms/homes, within the OT department, and in each facility after the emergency declaration. Factors involved in treatment, such as fixing the location using zoning and the time of day for each stay and commute period and changing from day care to home visit, were also reported. This suggested that the

location of each treatment was carefully considered and changed to minimize the risk of infection.

Regarding changes in the content of assessments due to COVID-19, the number of recording units with no change decreased from Period I to Period III, indicating that the influences of COVID-19 were gradually considered during assessments. From Period I, body temperature and physical condition were assessed. In addition, especially from Period II, the influences of COVID-19 on physical and cognitive functions due to disuse syndrome and stress response were assessed. When considering how to efficiently capture frailty status in pandemic management settings where time and resources are limited, feasibility and ease of use are paramount [14]. It is necessary to recognize frailty as early as possible in the assessment of OT in daily life. Concomitantly, assessment factors that prevent the spread of infection, such as awareness of infection control and assessment of housemates and visitors of clients, were also reported. Although it was inferred that the contents of the evaluation were important, it was also revealed that the restriction imposed on outside visits due to COVID-19 made it difficult to proceed with the assessment of outdoor activities and home environment. It can be inferred that the content of the assessment was greatly restricted by COVID-19 in most facilities. Therefore, OT should consider alternative means of assessment in the context of infection spread and control.

With regard to the changes in the content of treatment due to COVID-19, it was found that programs with high risk of infection, such as outdoor training and group activities, were discontinued from Period I in response to the local declaration of emergency in Hokkaido [4]. However, these were conducted after changing the treatment structure, such as changing the location to within the unit or own room, or zoning between staying and commuting, such that the risk of infection could be minimized; such changes were apparent from Period I onward. In addition, interventions to prevent disuse were conducted from an early stage. During Period III, outdoor training and activities with consideration for the influences of infectious diseases increased, and there were more reports of suggestions for voluntary training. We consider the possibility that these measures may be effective in ameliorating the decline in physical function and activity related to disuse syndrome and the accumulation of stress associated with changes in lifestyle due to self-restraint and other factors. Furthermore, there were also reports of "no change" in the content of treatment, and these influences tended to decrease gradually with time. This suggests that additional support incorporating infection control and changes in treatment methods are gradually being implemented in more facilities.

Restrictions other than those in OT assessment and treatment were categorized as restrictions on participation of the subject, on OT operations, and discontinuation of long-term care services. Although such restrictions occurred, the clients were guaranteed the opportunity to participate in OT with sufficient COVID-19 control measures through thorough implementation of standard precautions, such as the practice of hand hygiene, use of masks, management of the clients' physical conditions, and changes in support methods. Physical condition management for participation in OT was implemented for housemates as well as the clients, and careful infection control measures were undertaken. In addition, it was revealed that occupational therapists managed their physical conditions thoroughly and wore personal protective equipment such as face shields and gloves. They were taking measures against COVID-19 by introducing individual support, using remote methods, and strengthening multidisciplinary cooperation. These are similar to the results of a questionnaire survey conducted by the Japanese Society for Dementia Care on infection prevention measures in hospitals, residential facilities, and day care facilities [15]. However, changes concerning individual support, criteria for discontinuation of participation, and fixing of work content through reassignment were unique measures that were identified in this study and can be applied in other facilities according to the situation of the region, facility, or condition of the client.

The limitation of this study is that because the questions were asked in an open-ended form for each time period, some of the questions overlapped with other items or were omitted from later answers. In addition, the target population of this study was clients in long-term insurance facilities in Hokkaido. Each facility's characteristics, such as facility service, commuting service, and home-visit service, were not analyzed. The balance between urban and rural areas in Hokkaido is similar to the population structure of Japan as a whole [16], although the population density of Hokkaido is approximately one-fifth of the national average and distances between cities are two to three times longer than the national average [17]. COVID-19 in Hokkaido occurred mostly in the urban area centered on Sapporo [4][5], and it is assumed that there are regional differences as far as the influences of COVID-19. Therefore, further studies are needed to generalize the results of this study to other parts of Japan and worldwide and to examine methods for demonstrating the effectiveness of OT being influenced by COVID-19.

5. Summary and Conclusions

COVID-19 restricts the participation of clients in OT and in services provided to them in long-term insurance facilities. However, the influences of COVID-19 on the lives of the clients must be assessed in addition to general infection control measures and must be incorporated into the treatment contents accordingly. We recommend that the measures reported in this study be applied in each clinical setting, and they should be adopted after considering what methods are effective for taking such measures.

Conflicts of Interest

There are no conflicts of interest to declare.

Acknowledgments

This paper was supported by Sapporo Medical University. The authors wish to thank all participants who facilitated data collection.

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