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Influences of COVID-19 pandemic and the states of emergency on occupational therapy for physical disorders: A questionnaire survey in Hokkaido, Japan

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Abstract

Objective: This study aimed to explore the influence of coronavirus disease-2019 (COVID-19) on occupational therapy (OT) for physical disorders, including changes in the assessment, treatment, other restrictions, and measures of OT.

Methods: A questionnaire survey was conducted among occupational therapists working in Hokkaido, Japan, and 123 out of the 334 (36.8%) were from OT facilities that target physical disorders. The responses were classified the categories and codes by [ ] and < >, respectively.

Results: The number of patients decreased in 47.1% of the OT facilities after the pandemic declaration. Only one facility reported <decrease in intervention with palpation>. Therefore, [thoroughness of standard precautions] including <disinfection of materials and common use areas>, <hand hygiene>, and [changes in treatment structure] including <restriction on use of materials> were implemented. Additionally, there were not only [restrictions on participation of patients] and [restrictions on outpatient services], but also [restrictions on operations of OT], such as <cancellation or change of the methods of meetings and workshops> and so on. Furthermore, [changes in treatment structure] and [setting criteria for discontinuation of participation] were utilized in some facilities to prevent and to reduce the risk of infection.

Conclusions: By revisiting the assessment and treatment guidelines on infection control, it is possible to provide continuous OT services and to tackle the challenges posed by the pandemic.

Keywords

COVID-19, occupational therapy, physical disorder

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Introduction

The spread of coronavirus disease-2019 (COVID-19) has resulted in many deaths worldwide. As of 3 March 2022, there were 5,067,735 positive cases and 23,860 deaths (Ministry of Health, Labour and Welfare, Japan, 2020), and is increasing daily. On 16 April 2020, the first national state of emergency was declared in Japan, and measures were taken to prevent the spread of infection. Prior to the national state of emergency, a

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state of emergency was declared in Hokkaido (Suzuki, 2020), and requests were made to refrain from going out unnecessarily. Although there has been a temporary decrease in the number of positive cases, the COVID-19 pandemic continues.

Major changes in our daily lives have occurred and the impact of the COVID-19 pandemic on the medical field has become burdensome. Moreover, there has been a significant effect in the field of rehabilitation, including occupational therapy (OT), and necessary infection prevention measures have been implemented. The Japanese Association of Occupational Therapists published the "Infection prevention of COVID-19 and Occupational therapy services" (Japanese Association of Occupational Therapists, 2020); these guidelines alerted the members, suggested methods for the prevention of COVID-19, and provided specific examples of responses in sections titled "specific measures for COVID-19 infection control" and "preventive measures for areas at risk due to closed spaces, crowded places, and close-contact settings in facilities." However, there are many target disorders or areas in OT. Depending on the target disorders, occupational therapists may have different requirements for contact with patients and their families, and the treatment could differ in each target disorder. It is therefore necessary for therapists to consider separate COVID-19 prevention measures for each target disorder.

Patients with physical disorders, any disorder resulting from an abnormality in the structure or biochemistry of body tissues or organs, are unable to perform some activities of daily living (ADL) because of paralysis and/or sensory disturbance. In order to improve physical functions, they undergo rehabilitation including OT. Since this rehabilitation includes passive movement, assistance from a therapist is often necessary; physical contact is inevitable. Additionally, therapists for physical disorders have high risks of infection by droplet and drooling because of physical contact. Therefore, it is expected that OT will be challenging during the COVID-19 pandemic, and more stringent infection control measures will be necessary in OT practice for physical disorders. However, there are no protocols specifically designed for infection control in OT practice for physical disorders, and the actual conditions are unknown. Therefore, it is necessary to clarify the restrictions and measures in OT practice to facilitate the continued provision of OT during the pandemic. The state of emergency in Japan was firstly declared in Hokkaido, and was declared and lifted repeatedly. The declaration of the state of emergency may make it difficult to continue OT, and forming strategies to deal with the situation and to continue OT in each area are vital. An investigation of the restrictions and measures taken for the OT practice in Hokkaido will be generalized in Japan. We hypothesized that the restrictions and measures would change between declaring and lifting a state of emergency. Since, we could more sensitively assess the impact and changes within a state of emergency, we conducted our study by dividing the period into four parts. We conducted a questionnaire survey to identify the measures taken for and influences of COVID-19 on OT in physical disorders in Hokkaido, Japan.

Methods

Study participants

Occupational therapists from 725 facilities in Hokkaido, Japan, participated in this study, including department managers of OT responsible for the management in the department, and members of the Japanese Association of Occupational Therapists.

Data sampling

The questionnaire and consent forms were sent to each participant by mail to be completed and returned using enclosed envelopes. The items and responses were reviewed by the authors to confirm the validity and alignment with the research questions and objectives. Furthermore, the period covered by the survey was divided into four, based on the declaration of state of emergency in Hokkaido and Japan: "Pre-declaration period": before the declaration of the state of emergency (before 27 February 2020), "Period I": during the declaration of the state of emergency in Hokkaido (28 February to 19 March 2020), "Period II": between the declaration of the state of emergency in Hokkaido and Japan (20 March to 11 April 2020), and "Period III": during the declaration of the state of emergency in Japan (12 April to 25 May 2020). The survey collection was from 30 June 2020, to 14 August 2020. The questionnaire items were as follows:

Characteristics of facilities

The participants were asked about the target disorders (physical, mental, and pediatric), the stages of illness of the patients (acute, convalescent, and chronic), the number of patients per occupational therapist, and the locations of OT in each period ("Facility room"—the patients' room; "In the department of OT"—room managed by the department of OT; "Inside the facility"—somewhere in the facility, and "Outside the facility"—outdoors).

Influences of COVID-19 on OT

To assess the influences of COVID-19 in each period, participants were requested to answer a questionnaire that was divided into four major categories: "changes in the assessment," "changes in the treatments," "restrictions on OT," and "measures on OT".

Data analysis

From the returned questionnaires, the responses from facilities such as, public and private hospitals targeting physical disorders were selected for data analysis. The characteristics of these facilities were tabulated and changes in the number of patients per occupational therapist during the survey period were identified. The percentage of the number of patients per occupational therapist in periods I, II, and III was calculated in the pre-declaration period standardized as 100%. The total number and percentage of facilities were calculated for each location, and we confirmed whether there was an increase or decrease between the pre-declaration period and period III.

The responses that OT for physical disorders was changed by COVID-19 were coded individually, referring to the content analysis (Funashima, 2007). In the analysis, the responses in the questionnaire were divided into contextual units and then to recording units. Moreover, the recording units that did not correspond with the questionnaire were excluded from the analysis, while those with similar meanings were grouped into codes. Additionally, we compared several codes with common meanings and grouped them into categories. The recording units and codes without commonality with other units or codes were classified as separate categories. Finally, the number of recording units in each code and category was calculated, and its ratio to all recording units was determined. In the four major categories, duplication of recording units between "restrictions on OT and measures on OT," and "changes in the assessment and the treatment" were expected. Therefore, we proceeded with the analysis of "restrictions on OT except for evaluations and treatments," and "measures on OT except for evaluations and treatments." Extracted recording units, codes, and categories were described objectively, systematically, and quantitatively. Furthermore, in order to increase the reliability of the data analysis, the processes were shared, and the recording units, codes, and categories were thoroughly reviewed and revised by the authors. The categories and codes are represented by [ ] and < >, respectively.

Ethical considerations

The study was approved by the ethics committee of Sapporo Medical University (Approval number: 2-1-2). Written informed consent from each participant was enclosed with the questionnaire responses. Additionally, permission to use the list of addresses of facilities was obtained from the Japanese Association of Occupational Therapists before the study.

Results

Characteristics of the facilities

Three hundred and 34 out of 725 (46.1%) mailed facilities for OT returned the questionnaires, wherein 123 out of the 334 (36.8%) were from the occupational therapists and classified as OT facilities targeting physical disorders. We chose these for analysis. The stages of the patients in the facilities that returned the questionnaires were "acute stage": 59 facilities (48.0%), "convalescent stage": 26 facilities (21.1%), "chronic stage": 31 facilities (25.2%), "terminal stage": six facilities (4.9%), and "others": one facility (0.8%).

Number of patients

A total of 121 facilities, with a response rate of 36.2%, replied to this question and were analyzed. Furthermore, when the number of patients in OT in the pre-declaration period was set at 100%, the following percentages were obtained: 96.7 ± 10.1%, 92.7 ± 14.9%, and 89.7 ± 15.3% in periods I, II, and III, respectively, which gradually decreased over time as shown in Figure 1(a). The number of patients in the pre-declaration period and Period III, which decreased by 23.7 ± 11.5% in 57 facilities (47.1%), remained the same in 56 facilities (46.3%), and increased by 12.8 ± 3.8% in only eight facilities (6.6%).

Locations of OT

We received the answers from 122 facilities, except for one. The response rate for this question was 36.5%. Figure 1(b) shows that the location numbers in the pre-declaration period for the "Facility room" was 75 (61.5%), "in the department of OT": 99 (81.1%), "inside the facility": 105 (86.1%), and "outside the facility": 32 (26.2%). Compared with the number of facilities in the pre-declaration period, "facility room" decreased by two facilities, "in the department of OT": 7, "inside the facility": 2, and "outside the facility": 18 in Period I. Moreover, in period II, "facility room" decreased by six facilities, "in the department of OT": 7, "inside the facility": there was no change, and "outside the facility": 17 from the pre-declaration period. In period III, "facility room": nine facilities decreased, "in the department of OT": 9, "inside the facility": 2, and "outside the facility": 22 compared to that in pre-declaration period.

Changes in the assessment of OT due to COVID-19

The number of recording units obtained was 97, 90, and 91 in period I (88 facilities, 26.3%), II (81 facilities, 24.3%), and III (81 facilities, 24.3%), respectively (Table 1). In "changes in the assessment", <measurement of body temperature before OT>, <confirmation of physical condition before OT>, <mood

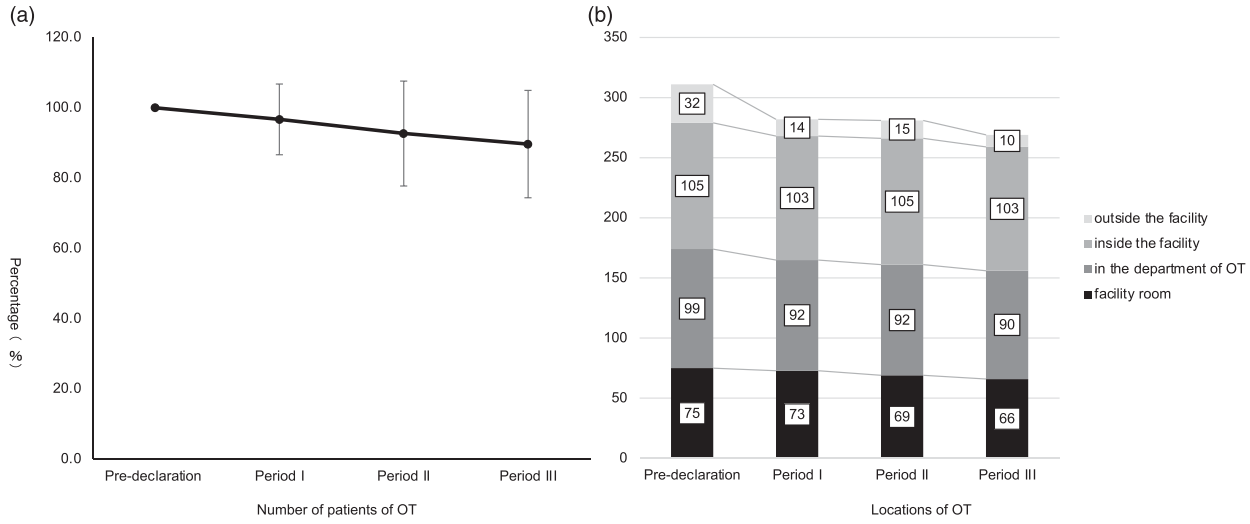

Figure 1. Number of patients and Locations of OT.

or emotion>, and <ADL> were reported as the category of [increased need for assessment]. Additionally, <ADL and IADL outside of facilities>, <driving a car>, <evaluation of high cognitive dysfunction>, <evaluation of environment at home by visiting>, and <collection of information from the patients and families> were corrected as the category of [limited need for assessment]. The recording units in the categories mentioned above, exceeded 20% of all responses throughout periods I to III. However, there were many responses of [no change from pre-declaration period], accounting for more than half of the responses in each period: 55 (56.7%), 52 (57.8%), and 48 (52.7%) in periods I, II, and III, respectively.

Changes in the OT treatments due to COVID-19

The number of recording units obtained was 108, 105, and 105 in Period I (89 facilities, 26.6%), II (88 facilities, 26.3%), and III (85 facilities, 25.4%), respectively Table 1. In "changes in the OT treatments", <discontinuation of outdoor/outing training>, <decrease or discontinuation of indoor ADL/IADL training>, <discontinuation of social function training>, <decrease in training due to environmental changes>, <discontinuation of group therapy>, and <decrease or discontinuation of family guidance> were reported as the category of [decrease or discontinuation of training and program]. The total number of recording units in that category accounted for more than 25% of all responses in periods I–III. There was <decrease in intervention with palpation>, but only one recording unit was found in period II. Additionally, the following recording units were noted as requiring [changes in treatment structure]: <change to intervention in a ward>, <change to intervention in the room or at the bedside>, <restriction on use of materials>, <limitation of training time>, <fixed time for avoiding contact>, and <modification of treatment to suit the location>. Furthermore, as part of the support for infection control measures, [provision of training information by alternative means] was mentioned. Although, there were many responses of [no change from pre-declaration period] in period I: 56 (51.9%), period II: 53 (50.5%), and 47 (44.8%) in period III, there were slight decreases over time.

Restrictions and measures on OT except for evaluations and treatments due to COVID-19

The number of recording units obtained for "restrictions on OT" was 88, 84, and 89 in period I (68 facilities, 20.4%), II (67 facilities, 20.1%), and III (71 facilities, 21.3%), respectively (Table 2). In "restrictions on OT," <restrictions on participation of patients who were not feeling well>, <restrictions on participation of patients with inadequate infection prevention measures>, <restrictions on interaction with other patients or family members>, <restrictions on outings and overnight staying from facility>, and <restrictions on new patients> were reported as the category of [restrictions on participation of patients]. The total number of recording units in this category accounted for more than 50% of all responses in periods I–III. Additionally, the percentages of [restrictions on outpatient services] were approximately 25% in periods I–III. <Cancellation or change of the methods of meetings and workshops>, and <lack of human resources for infection control> were also mentioned as [restrictions on operations of OT]. While cases of [total discontinuation] of OT were also reported, there was no significant increase in their number, which was 1 (1.2%) in period II, and 2 (2.2%) in period III. Furthermore, [no restrictions] was reported in 13 (14.8%), 13 (15.5%), and 7 (7.9%) cases in period I, II, and III, respectively.

Table 1. Changes in the assessment and treatment of OT due to COVID-19.

Category	Code	Number of recording units		
	Changes in the assessment of OT	Period I (88 facilities)	Period II (81 facilities)	Period III (81 facilities)
Increased need for assessment	Measurement of body temperature before OT	13 (13.4%)	12 (13.3%)	11 (12.1%)
	Confirmation of physical condition before OT	7 (7.2%)	7 (7.8%)	9 (9.9%)
	Mood or Emotion	1 (1.0%)	1 (1.1%)	1 (1.1%)
	ADL	1 (1.0%)	0 (0.0%)	1 (1.1%)
	Subtotal	**22 (22.7%)**	**20 (22.2%)**	**22 (24.2%)**
Limited need for assessment	ADL and IADL outside of facilities.	8 (8.2%)	7 (7.8%)	8 (8.8%)
	Driving a car	1 (1.0%)	1 (1.1%)	2 (2.2%)
	Evaluation of high cognitive dyfunction	1 (1.0%)	1 (1.1%)	1 (1.1%)
	Evaluation of environment at home by visiting	7 (7.2%)	6 (6.7%)	6 (6.6%)
	Collection of information from the patients and families	3 (3.1%)	3 (3.3%)	4 (4.4%)
	Subtotal	**20 (20.6%)**	**18 (20.0%)**	**21 (23.1%)**
No change from Pre-declaration period		**55 (56.7%)**	**52 (57.8%)**	**48 (52.7%)**
	Total	**97 (100.0%)**	**90 (100.0%)**	**91 (100.0%)**
	Changes in the OT treatments	(89 facilities)	(88 facilities)	(85 facilities)
Decrease or discontinuation of training and program	Discontinuation of outdoor/outing training	11(10.2%)	12(11.4%)	13(12.4%)
	Decrease or discontinuation of indoor ADL/ IADL training	5(4.6%)	5(4.8%)	5(4.8%)
	Discontinuation of social function training	2(1.9%)	2(1.9%)	2(1.9%)
	Decrease in training due to environmental changes	1(0.9%)	1(1.0%)	2(1.9%)
	Decrease in intervention with palpation	0(0.0%)	1(1.0%)	0(0.0%)
	Discontinuation of group therapy	4(3.7%)	4(3.8%)	4(3.8%)
	Decrease or discontinuation of family guidance	4(3.7%)	4(3.8%)	4(3.8%)
	Subtotal	**27(25.0%)**	**29(27.6%)**	**30(28.6%)**
Changes in treatment structure	Change to intervention in a ward	5(4.6%)	3(2.9%)	3(2.9%)
	Change to intervention in the room or at the bedside	6(5.6%)	5(4.8%)	6(5.7%)
	Restriction on use of materials 6(5.6%)	7(6.7%)	9(8.6%)	
	Limitation of training time 1(0.9%)	1(1.0%)	2(1.9%)	
	Fixed time for avoiding contact	2(1.9%)	2(1.9%)	2(1.9%)
	Modification of treatment to suit the location	3(2.8%)	3(2.9%)	4(3.8%)
	Subtotal	**23(21.3%)**	**21(20.0%)**	**26(24.8%)**
Provision of training information by alternative means		**2(1.9%)**	**2(1.9%)**	**2(1.9%)**
No change from Pre-declaration period		**56(51.9%)**	**53(50.5%)**	**47(44.8%)**
	Total	**108(100.0%)**	**105(100.0%)**	**105(100.0%)**

Table 2. Restrictions and measures on OT except for evaluations and treatments due to COVID-19.

Category	Code	Number of recording units		
	Restrictions on OT	Period I (68 facilities)	Period II (67 facilities)	Period III (71 facilities)
	Restrictions on participation of patients Restrictions on participation of patients who were not feeling wel	12(13.6%)	11(13.1%)	11(12.4%)
	Restrictions on participation of patients with inadequate infection prevention measures	2(2.3%)	2(2.4%)	2(2.2%)
	Restrictions on interaction with other patients or family members	23(26.1%)	20(23.8%)	23(25.8%)
	Restrictions on outings and overnight staying from facility	7(8.0%)	8(9.5%)	8(9.0%)
	Restrictions on new patients	2(2.3%)	3(3.6%)	3(3.4%)
	Subtotal	**46(52.3%)**	**44(52.4%)**	**47(52.8%)**
Restrictions on outpatient services		**24(27.3%)**	**20(23.8%)**	**25(28.1%)**
Restrictions on operations of OT	Cancellation or change of the methods of meetings and workshops	3(3.4%)	3(3.6%)	3(3.4%)
	Lack of human resources for infection control	2(2.3%)	3(3.6%)	5(5.6%)
	Subtotal	**5(5.7%)**	**6(7.1%)**	**8(9.0%)**
Total discontinuation		**0(0.0%)**	**1(1.2%)**	**2(2.2%)**
No restrictions		**13(14.8%)**	**13(15.5%)**	**7(7.9%)**
	Total	**88 (100.0%)**	**84 (100.0%)**	**89 (100.0%)**
	Measures on OT	(91 facilities)	(86 facilities)	(89 facilities)
Thoroughness of standard precautions	Disinfection of materials and common use areas	34(18.4%)	36(20.0%)	38(18.3%)
	Frequent changing of materials	1(0.5%)	1(0.6%)	2(1.0%)
	Hand hygiene	28(15.1%)	25(13.9%)	28(13.5%)
	Wearing masks	25(13.5%)	24(13.3%)	24(11.5%)
	Frequent ventilation	11(5.9%)	12(6.7%)	14(6.7%)
	Gargle	1(0.5%)	0(0.0%)	0(0.0%)
	Subtotal	**100(54.1%)**	**98(54.4%)**	**106(51.0%)**
Setting criteria for discontinuation of participation		**3(1.6%)**	**3(1.7%)**	**4(1.9%)**
Discontinuation of programs that have a hige risk of infection		**1(0.5%)**	**1(0.6%)**	**1(0.5%)**
Changes of the support methods	Uniformity of support by staff collaboration	2(1.1%)	2(1.1%)	5(2.4%)
	Providing support that can be implemented on an individual basis	2(1.1%)	2(1.1%)	3(1.4%)
	Use of online information sharing	6(3.2%)	7(3.9%)	8(3.8%)
	Providing opportunity for family members to observe	2(1.1%)	2(1.1%)	1(0.5%)
	Setting criteria for overnight staying from facility	1(0.5%)	1(0.6%)	1(0.5%)
	Subtotal	**13(7.0%)**	**14(7.8%)**	**18(8.7%)**

(continued)

Table 2. (continued)

Infection control of occupational therapists	Hand hygiene for occupational therapists	14(7.6%)	14(7.8%)	14(6.7%)
	Maintaining the physical condition of occupational therapists	10(5.4%)	8(4.4%)	9(4.3%)
	Use of personal protective equipment	23(12.4%)	25(13.9%)	32(15.4%)
	Adjustment of work content through reassignment	4(2.2%)	3(1.7%)	6(2.9%)
	Adjustment to reduce opportunities for contact between staff members	2(1.1%)	2(1.1%)	4(1.9%)
	Risk reduction of face-to-face opportunities during work	10(5.4%)	7(3.9%)	11(5.3%)
	Subtotal	**63(34.1%)**	**59(32.8%)**	**76(36.5%)**
No measures		**5(2.7%)**	**5(2.8%)**	**3(1.4%)**
	Total	**185 (100.0%)**	**180 (100.0%)**	**208 (100.0%)**

The number of recording units obtained for "measures on OT" was 185, 180, and 208 in period I (91 facilities, 27.2%), II (86 facilities, 25.7%), and III (89 facilities, 26.6%), respectively (Table 2). <Disinfection of materials and common use areas>, <frequent changing of materials>, <hand hygiene>, <wearing masks>, <frequent ventilation>, and <gargle> were reported as the category of [thoroughness of standard precautions]. The total number of recording units in this category was 50% of all responses in periods I–III. Various measures have been taken and reported, such as [setting criteria for discontinuation of participation] and [discontinuation of programs that have a high risk of infection].

Additionally, there was an attempt to continue the training by [changes of the support methods], such as <uniformity of support by staff collaboration>, <providing support that can be implemented on an individual basis>, <use of online information sharing>, <providing opportunity for family members to observe>, and <setting criteria for overnight staying from facility>. [Infection control of occupational therapists] was carried out in many facilities. In this category, <hand hygiene for occupational therapists>, <maintaining the physical condition of occupational therapists>, <use of personal protective equipment>, <adjustment of work content through reassignment>, <adjustment to reduce opportunities for contact between staff members>, and <risk reduction of face-to-face opportunities during work> were reported.

Discussion

We investigated the influence of COVID-19 on the OT for physical disorders and the restrictions needed and measures taken to continue OT. The number of patients in OT between the pre-declaration and period III decreased in 47.1% of the facilities. Except for evaluations and treatments, there were many recording units in the category of restrictions of OT, such as [restrictions on participation of patients] and [restrictions on outpatient services], which had a significant impact on the reduction in the number of patients. A similar decrease in the number of patients was seen in other countries because of the priority given to COVID-19 management (Baracchini et al., 2020; Bersano et al., 2020; Markus & Brainin, 2020; Prvu Bettger et al., 2020). As a result, although COVID-19 did not cause discontinuation of OT, the restrictions did affect it.

In terms of location changes, the number of "outside facilities" between the pre-declaration and period III decreased by 68.8% of the facilities. This was related to the reduction of the infection risks, such as <restrictions on outings and overnight staying from facility>. Additionally, in "changes in the assessment of OT due to COVID-19," <ADL and IADL outside of facilities> were reported as the category of [limited need for assessment]. Furthermore, there were fewer opportunities which were <evaluation of environment at home by visiting>, and <collection of information from the patients and families>. In "changes in the OT treatments due to COVID-19," there were some codes related to discontinuations or decreases, not only <discontinuation of outdoor/outing training> but <decrease or discontinuation of indoor ADL/IADL training> and <discontinuation of social function training>, because of the reduction of staff movements and physical contacts. In addition to the restrictions of assessment and treatment, some facilities reported <decrease or discontinuation of family guidance> in order to avoid contact with outsiders. Therefore, the assessment and treatment revealed that patients and staff members that met outsiders were avoided for fear of infection. To prevent the effects of discontinuation of OT outside the facilities, the use of online services needs to be considered (Bartolo et al., 2020; De Biase et al., 2020; Markus & Brainin, 2020; Prvu Bettger et al., 2020; Zhao et al., 2020).

However, many facilities that implemented infection control, continued OT without online services in this study, which suggests the importance of the implementation of infection control. Since there were many limitations of evaluation and treatment in OT, occupational therapists took some measures to deal with the limitations. In particular, the measures against the limitation of treatment were reported in this study. In order to avoid crowding of patients, <change to intervention in a ward>, <change to intervention in the room or at the bedside> were conducted without using rehabilitation room. In addition, <fixed time for avoiding contact> was also useful for avoiding the contact between patients. By taking the measures mentioned above, many facilities continued OT. Moreover, we thought <modification of treatment to suit the location> was also effective in continuing OT.

In "restrictions and measures on OT except for evaluations and treatments due to COVID-19," there were not only [restrictions on participation of patients] and [restrictions on outpatient services], but [restrictions on operations of OT], such as <cancellation or change of the methods of meetings and workshops> and so on. Additionally, [changes in treatment structure] and [setting criteria for discontinuation of participation] were utilized in some facilities to prevent to reduce the risk of infection. Furthermore, measures to continue the training and program by [changes in treatment structure], such as <change to intervention in a ward> and <modification of treatment to suit the location>, were observed. This kind of change in the organization or operating methods for OT and the reorganization and restructuring of rehabilitation systems have been recommended (Bartolo et al., 2020; Japanese Association of Occupational Therapists, 2020). Therefore, it is safe to say that OT can continue by utilizing these changes for a smooth transition to infection control.

In "changes in the assessment of OT due to COVID-19," general measures, such as <measurement of body temperature before OT> and <confirmation of physical condition before OT>, were reported as the category of [increased need for assessment]. In addition to [infection control of occupational therapists] as standard precautions, <adjustment of work content through reassignment> were introduced to reduce the possibility of infection as much as possible. Infection prevention implemented by occupational therapists to avoid COVID-19 is the most important measure for the continuation of rehabilitation and patient protection (Bersano et al., 2020; Japanese Association of Occupational Therapists, 2020; Prvu Bettger et al., 2020). "Closed spaces," "crowded places," and "close-contact settings" were unavoidable, therefore, <discontinuation of group therapy> was practiced. It was indicated that [decrease or discontinuation of training and program] was adopted in many facilities. There was a small number of the code, <decrease in intervention with palpation>, which was unavoidable in the interventions of physical disorders. Instead, [thoroughness of standard precautions] including <disinfection of materials and common use areas>, <hand hygiene>, and [changes in treatment structure] including <restriction on use of materials> were implemented. The restrictions and measures reported in the categories of [thoroughness of standard precautions] and [changes in treatment structure] in this study, were also mentioned in previous guideline and report (Bartolo et al., 2020; Japanese Association of Occupational Therapists, 2020). Therefore, some restrictions and measures for infection prevention are required to maintain OT.

However, in "changes in the assessment of OT due to COVID-19," more than half of the responses reported that there was [no change from pre-declaration period] in each period. In "changes in the OT treatment due to COVID-19," there were [no change from pre-declaration period] >40% in each period, and the case of [total discontinuation] in "restrictions on OT except for evaluations and treatments due to COVID-19," were only 1 (1.2%) in period II, and only 2 (2.2%) in period III. It was expected that more need for contact with patients with physical disorders than in other areas. However, it was presumed that the facilities could continue OT without [total discontinuation] through not only [thoroughness of standard precautions] but complete implementation of [infection control of occupational therapists] reported as <adjustment of work content through reassignment> and <risk reduction of face-to-face opportunities during work>. Discontinuation of OT has been reported to increase risks, such as decreased adherence to rehabilitation treatments, increased risk of health problems, and risk of falling due to reduction in exercise causing muscle weakness (Bersano et al., 2020; De Biase et al., 2020; Prvu Bettger et al., 2020). In addition to patients with COVID-19, rehabilitation is necessary for patients with other diseases (De Biase et al., 2020). Assessment of current health status, functional outcomes, and continuation of treatment are significant (Markus & Brainin, 2020; Prvu Bettger et al., 2020). Many facilities continued OT with measures to address the situation by COVID-19, could lead to the risk reductions and benefits reported in previous study.

We investigated the restrictions and measures to continue OT. However, duplication of recording units between "changes in the assessment and treatment," and "restrictions and measures on OT" were expected. Therefore, it is possible that duplication of responses was not sufficiently avoided. Additionally, no restrictions or measures specific to patients with COVID-19 were identified. Based on the measures and problems in this study, OT in patients with COVID-19 should be studied further. Furthermore, there may be regional and disease-related differences in the number and content of responses in the questionnaire. Depending on the size of cities, the population, the number of responses to the questionnaire, and the number of patients of COVID-19 may differ. Moreover, depending on the diseases, the restrictions and measures of other disorders may be

different from physical disorders. Therefore, the influence of these factors needs to examined further.

Conclusion

The influence of COVID-19 on the OT for physical disorders and strategies of measures was clarified. By revisiting assessment and treatment with attention to infection control, it is possible to provide continuous OT by dealing with the needs and challenges posed by COVID-19. Based on the measures and problems in this study, OT in patients with COVID-19 should be studied further.

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