

Research Article

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The Use of Online Social Skill Training (SST) Based on Comparison of Online and face-to-face (F2F) SST For Adults and Adolescents with Developmental Disabilities (DD) or its Tendencies

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ABSTRACT

Introduction: The Coronavirus Disease (COVID-19) pandemic has made it difficult to conduct face-to-face (F2F) Social Skill Training (SST) based on discussions among clients. Therefore, we decided to start online SST using Zoom.

Objectives: The purpose of this study is to identify differences between online and F2F SST based on their practices, and to propose ways to use online SST in the future

Method: This questionnaire was answered by staff (9 people) who experienced both online and F2F SST. The questionnaire consisted of 5 sub-categories for a total of 23 items. The six-point scale results were analyzed using the Wilcoxon signed rank test. The open-ended questionnaire was analyzed according to the "Steps for Coding and Theorization" (SCAT) method, developed for analyzing qualitative data.

Results: Analyses revealed that in online SST it was significantly harder to see the client's facial expression compared with F2F. From the qualitative analysis results, online SST had a distinctive conversation structure. Besides, online SST had the merit of acquiring communication skills such as joining conversation using chat, adjusting the participation environment by yourself and, creating sentences using computer.

Conclusion: Although it was difficult to see the client's facial expressions on online SST, it is considered that online SSTs may be easier to participate in than face-to-face SSTs because of the unique conversational structure in which staff choose the next speaker to continue or start the conversation, the use of chat, and the ability for clients to participate in SSTs in an environment that suits them.

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Introduction

The Coronavirus Disease (COVID-19) pandemic has made it difficult to conduct face-to-face (F2F) Social Skill Training (SST) based on discussions among clients in the Counseling and Rehabilitation Center in X University (hereafter referred as X Center) [1]. We provide SST to adolescents group and adults group with developmental disabilities (DD) who have difficulty communicating. SST is a form of interpersonal skills training that involves procedures such as instruction, modeling, role-playing, and positive reinforcement for skill improvement [2].

It is known that people with DD experience a variety of communication and interpersonal problems [3,4]. Individuals with ASD are characterized by varying degrees of impairment in communication and reciprocal social interaction as well as stereotyped interests and behavior [4]. For people with ASD, it is difficult to take turns in conversation, make and keep friends, accept change, expand interests, and include trying new activities [5]. People with ADHD often appear not to be listening to others, have trouble following directions, start talking before they finish listening to questions, or talk too much [4]. Because of these communication characteristics, adults with ADHD have reported difficulty maintaining relationships [3].

On the other hand, SST for people with developmental disabilities is a form of interpersonal communication training that is offered in a variety of settings, including schools, universities, and psychiatric outpatient clinics [6-8]. Our SST programs include basic skills such as “emotional self-control”, “understanding what to say by other person”, “express what they say”, “understanding the differences between self and others”, “accept others”, and “self-assertive” [9]. Group discussions provide the opportunities for clients to practice these skills and to receive feedback from staff and other clients, to gain the positive experience because they were able to solve the other clients’ problems with their own opinion [3,10]. Also, clients have an opportunity to reflect on their daily lives and think about their own behavior. In particular, the group discussion is characterized by writing sentences of the speech content in worksheets, and then having discussions. This writing task lets clients talk and express themselves easily.

For these reasons, it was necessary to continue SST during the period of COVID-19 infection spread. However, during the SST sessions, staff and clients using zoom meeting, not wearing a face masks. Because masks hide face expressions each other. Japan was not locked down by this time. But most of Japanese schools were temporarily closed, companies shifted to home working and people were restricted from going out except for non-essential activities [11,12]. Therefore, it was difficult to gather clients to SST groups held in X Center. Under these circumstances, schools restarted online lessons and workplaces increased the number of online meetings [12]. Because of these, it is expected that online

communication will continue to expand in school life and social life, so we decided to start online SST using Zoom.

In addition, even as the corona infection situation improves, online-based classes and meetings continue to be conducted in schools and workplaces. Given this, it is expected that online-based communication will increase in the future. Therefore, the purpose of this study is to identify differences between online and F2F SST based on their practices, and to propose ways to use online SST in the future.

Method

Participants

The SST staffs (9 people: 5 graduate students studying education for children with special needs, 2 clinical psychologists and 2 occupational therapists) had experienced both online and F2F SST. Among the 9 staff members, 5 were SST staffs for adolescents and 4 were SST staffs for adults.

Overview of SST

Client overview

We provided SST (90 minutes per session) for adolescents and adults with a diagnosis or suspected diagnosis of DD who are fully capable of verbal communication (Table 1). In SST for adolescents, for each session there were 7-8 students from middle school to university. Those who took part in SST for adults were job-seekers and employees in their 20s to 30s, with 3-4 participants per session.

Table 1: F2F SST and Online SST Programs

F2F (From 2019 to 2020)				Online (From 2020 to 2021)	
SST for adolescents	May	The 1 st	Self-introduction		
	Jun	The 2 nd	How to make a listening attitude		
	Jul	The 3 rd	Time management		
	Sep	The 4 th	Friendship	The 1 st	Self-introduction · How to make a listening attitude
	Oct	The 5 th	Friendship (Cancelled due to typhoon.)	The 2 nd	Time management
	Nov	The 6 th	Report, Contact, Ask for advice	The 3 rd	Friendship
	Dec	The 7 th	How to request and rejection	The 4 th	Report, contact, Ask for advice How to request and rejection
	Jan	The 8 th	How to manage stress coping	The 5 th	How to manage stress coping
	Feb	The 9 th	Self-understanding	The 6 th	Self-understanding
	Mar	The 10 th	Completion ceremony (Cancelled due to Covid-19.)	The 7 th	Completion ceremony
SST for adults	Jun	The 1 st	Self-introduction · Self-understanding		
	Jul	The 2 nd	How to solve the problem		
	Sep	The 3 rd	Understanding sensory characteristics Discuss problem solving in daily life	The 1 st	How to use Zoom · Self-introduction Fill out a Support book※
	Oct	The 4 rd	Discuss problem solving in daily life (Cancelled due to typhoon.)	The 2 nd	Discuss their own characteristics and the support they need
	Nov	The 5 th	Team building activity (2 people 1 team) Writing draft of a speech for adolescents	The 3 rd	Assertion skill Playing a game that turns negative words into positive words (reframing game) Writing draft of a speech for adolescents
	Feb	The 6 th	Practicing a speech · Video self-monitoring	The 4 th	reframing game Practicing a speech · Video self-monitoring
	Mar	The 7 th	The speech for adolescents (Cancelled due to Covid-19.)	The 5 th	The speech for adolescents

※ : Support book: This is a tool to convey strengths and weaknesses to supporters

Discussion Overview

Each session (Table 1) consisted of psychoeducation and modeling, filling out worksheets, role-playing and discussions. After writing the text on the worksheet, they had discussions. For the Online SST for adolescents, clients were divided into groups of about 3-4 people with 2-3 staff members and held discussions in each breakout room. Then, everyone came back to the main room and the leaders of each group presented what they had discussed to all participants. For the F2F SST, participants were divided into groups of 3-4 people and discussions were held in each group. Afterwards, the leaders of each group presented what they had discussed to all participants.

For the Online SST for adults, after each person completed the worksheet, they shared the answers on the screen and made a presentation. For clients who are not good at typing, breakout room was used to provide one-on-one support. For the F2F SST discussions were held at one table. Each person completed the worksheet and then they had a discussion. The staffs wrote the content of the discussion on the whiteboard.

Procedure

A questionnaire was developed using Google Forms. The questionnaire consisted of 5 sub-categories for a total of 23 items: (1) Way to proceed with SST (5 items), (2) Ease of staff support for clients (5 items), (3) Client's utterance frequency (4 items), (4) Skills that clients can acquire (6 items), and (5) Preparations (3 items). (4) was created with reference to [9]. It is a 6-point Likert scale, rating from 1= 'Very poor', to 6= 'Very good' with high scores indicating better performance. 19 items were related to F2F and online SST respectively, and 4 items were related to online only. In addition, the participants were asked about the reason why they evaluated 1) and 2) that way, and to write "other things you noticed" in an open-ended question [1-5].

Analysis

The 4 items related to online SST were analyzed using descriptive

statistics. The 6-point Likert scale results were analyzed using the Wilcoxon signed rank test. The data was evaluated with the IBM SPSS version 28.0 for Windows. The open-ended questions summarized the characteristics of the answers to each question. The open-ended questionnaire was analyzed according to the "Steps for Coding and Theorization" (SCAT) method, developed for analyzing qualitative data [13]. This method is applicable for analysis of small-scale data as represented by one case or in the example of open-ended questionnaire responses. The analysis method consists of a four-step coding process and the creation of a storyline and theory that intertwines themes and components. The steps of coding are as follows:

1. Words to focus on in the data.
2. Words outside the data to reword 1.
3. Words to explain 2.
4. Themes and constructs that emerge from 3.

The entire process was conducted by 4 graduate students, including the author.

Results

Results of Descriptive Statistics

Descriptive statistics showed that clients used the chat and reaction buttons frequently. Staff also used the chat feature frequently, but not so much the reaction button. It was suggested that the ease with which staff spoke to clients and the frequency of conversations between clients were low, both in online and F2F SST (Table 2).

Results of Wilcoxon Statistical Analysis

There was a significant difference between F2F and online SST in staff's modeling skills ($z = 2.12$, $p < .05$) and understanding the client's facial expressions ($z = 2.31$, $p < .05$). Meaning that it was harder to understand facial expression when online than F2F SST. The staffs found that it was more difficult for the client to read emotions from people's faces during online SST more than F2F SST ($z = 2.00$, $p < .05$). However, there was no significant difference with other items (Table 2).

Table 2: Comparison of Characteristics of the F2F and Online SST

		F2F			online		
		n	M	SD	M	SD	z
Way to proceed with SST	1-1 Was Main Teacher(MT) a good facilitator for the SST?	9	4.8	8.8	4.3	.50	1.27
	1-2 Did Sub Teacher(ST) do the modeling well?	9	4.67	.70	4.00	1.12	2.12
	1-3 Could you talk to the clients and assist them while they were filling out the worksheet	8	4.13	.64	3.88	1.55	.29
	1-4 Did the clients do "role-playing" well?	8	5.00	.00	4.75	.46	1.41
	1-5 Did the clients have a discussion with each other well?	9	4.11	.78	4.78	.97	-1.40
Ease of staff support for clients	2-1 Could you catch the clients' feelings by their facial expressions well?	9	4.78	.44	3.56	.88	2.31*
	2-2 Did you hear the client very well?	9	4.89	.78	4.11	.78	1.84
	2-3 How often did you chat in online SST?	9			4.89	.93	
	2-4 How often did you use the reaction buttons in online SST?	9			3.44	1.81	
	2-5 Was it easy for you to speak at the SST?	9	3.78	1.30	3.56	1.59	.42
Client's utterance frequency	3-1 How often did clients chat in online SST?	9			5.44	.53	
	3-2 How often did clients use the reaction buttons in online SST?	9			4.56	1.01	
	3-3 Did the client talk a lot with the staff?	9	4.33	.87	4.22	.97	.26
	3-4 Did the clients talk a lot with each other?	9	3.33	.50	3.67	1.41	-.60

Skills that clients can acquire	4-1 Did the clients become friendly with each other?	9	4.11	.33	4.00	1.12	.28
	4-2 Could the clients catch other clients' feelings by their facial expressions?	9	4.33	.71	3.89	.78	2.00 *
	4-3 Did the clients insist that their opinions and positions be accepted by others?	9	4.11	.60	4.11	.78	.00
	4-4 Did the clients control their own emotions?	9	5.11	.60	5.11	.78	.00
	4-5 Could the clients change their attitude according to the situation?	9	5.11	.60	5.11	.78	.00
	4-6 Did the client talk expressively?	9	4.00	.50	4.00	.50	.00
Preparations	5-1 Did you easily prepare worksheets and other document?	9	4.11	1.45	4.89	1.05	-.96
	5-2 Did you easily prepare for the questionnaire?	9	4.33	1.58	5.11	1.17	-.95
	5-3 Did you easily set up the SST's room?	9	4.11	.93	5.11	1.05	-1.71

* $p < .05$

Results of Qualitative Analysis

Table 3 shows the results of analysis of open-ended questionnaire by SCAT. The storyline was summarized into five themes: (1) Zoom's functions, (2) ease of support, (3) conversations between clients, (4) preparation for SST, and (5) reasonable accommodation.

Table 3: SCAT Analysis From (partial)

Question	No.	Text	1. Words to focus on in the data	2. Words outside the data to reword 1	3. Words to explain 2	4. Themes and constructs that emerge from 3
The reason why they evaluated way to proceed with SST	1	I think the SST progression needs improvement because it took time to move between breakout rooms, share screen, and turn mute on and off.	The SST progression needs improvement/ It took time to move between breakout rooms, share screen, and turn mute on and off.	Zoom's functions/ Improvements in the way SST	Zoom's functions/ Way to proceed with online SST	Time loss due to moving to breakout rooms and switching screens/ Time distribution in online SST
	2	I think MT was able to lecture better while looking at the entire classroom during F2F SST because it was difficult to look at the facial expressions and attitudes of all clients while sharing the screen.	I think MT was able to lecture better while looking at the entire classroom during F2F SST/ It was difficult to look at the facial expressions and attitudes of all clients while sharing the screen.	Meeting facilitation is available while looking at the entire classroom/ Difficulty understanding client facial expressions and attitudes during screen sharing	The atmosphere of the place	Difficulty grasping the atmosphere of the place
	15	In F2F SST the staff is flexible in modeling, but in online SST it is difficult.	In F2F SST the staff is flexible in modeling.	Modeling is difficult/ The staff is flexible in modeling	limitations of observational learning online/ Assistance from ST	limitation of observational learning by modeling/ Difference in ST skills
	16	Although there are no major differences between online and F2F SST, in online SST facial expressions is emphasized because the face is projected on the screen.	In online SST facial expression is emphasized because the face is projected on the screen.	Emphasis on facial expression	Facial expression	Emphasized facial expressions
The reason why they evaluated ease of staff support for clients	17	In the online SST, staff used breakout rooms to provide individualized support, which increased the frequency of talking to	Staff used breakout rooms to provide individualized support/ Staff increased the frequency of talking to clients.	Individualized support through breakout rooms is available/ Increased client	Use of breakout rooms/ Reasonable accommodation	Use of breakout rooms/ Reasonable accommodation through individual support

	18	In both F2F and online SST, the clients were able to summarize and share their thoughts because they were able to discuss them after writing the worksheet.	The clients were able to summarize and share their thoughts./ The clients were able to discuss them after writing the worksheet.	Discussion using worksheets/ Summarize the client's own opinion	Facilitated discussion by using worksheets/ Helping to promote self-understanding by using worksheets	Facilitated discussion by using worksheets/ Helping to promote self-understanding by using worksheets
	20	In online SST it was difficult to understand nonverbal communication other than the facial expressions and voice.	It was difficult to understand other than the facial expressions and voice.	Lack of information other than facial expressions and voice	Lack of nonverbal communication other than facial expressions and voice/ Nods, gesture, body orientation and gaze	Difficulty with nods, gesture, body orientation and gaze
	30	The clients seemed to be able to use the chat to discuss their hobbies and comment casually.	The clients seemed to be able to use the chat to discuss their hobbies and comment casually.	Expanding the topic using the chat/ Increased chat-based conversations	Expanding the topic using the chat/ Chat communication/ Multimodal expression and understanding	Expanding the topic of leisure activities through the chat/ Multimodal expression and understanding
	40	It was difficult for the clients to join the conversation in the right time during the SST, so the clients and staff chose the next speaker asking "OO, what do you think?", and everyone was able to talk equally to each other.	It was difficult for the clients to join the conversation in the right time during the SST./ the clients and staff chose the next speaker asking "OO, what do you think?" /everyone was able to talk equally to each other.	Next Speaker Prediction/ Conversation by nomination/ All have the opportunity to speak	The role of a leader/ Participation structure in multi-person conversation/ Predicting the next speaker in multi-people dialogues/ Occurrence of speech behavior by nomination	Participation structure in online multi-person conversation/ Difficulty in predicting the next speaker in multi-people dialogues/ Occurrence of speech behavior by nomination
	51	I had to look at the screen to see if anyone other than myself was speaking, and I had to be careful not to overlap conversations.	I had to look at the screen to see if anyone other than myself was speaking./ I had to be careful not to overlap conversations.	Next Speaker Prediction/ Watch out for overlapping conversations	Overlapping speech/ Predicting the next speaker in multi-people dialogues/ Speech overlap in online conversation	Difficulty in predicting the next speaker in multi-people dialogues
	52	The clients were able to use chat as well as the voice, which was the same as in F2F SST.	The clients were able to use chat as well as the voice, which was the same as in F2F SST.	The clients had a lot of conversations using the chat/ Same as F2F SST	Facilitating communication through chatting/ Multimodal expression and understanding	Facilitating communication through chatting/ Multimodal expression and understanding
other things you noticed	53	It was more accessible for clients with hypersensitivity because they were able to participate while keeping their environment comfortable.	It was more accessible for clients with hypersensitivity/ they were able to participate while keeping their environment comfortable.	Clients with hypersensitivity were able to participate while keeping their environment comfortable/ Easy to participate	Environmental adjustment/ Accessibility	Adjusting the participation environment by yourself/ Ease of use of online SST
	64	We needed to be aware of client's computer skills and their experience with videoconferencing systems, Zoom passwords and privacy policy, and other information that was not necessary for F2F SST.	We needed to be aware of client's computer skills and their experience with videoconferencing systems/ Zoom passwords and privacy policy, and other information that was not necessary for F2F SST.	Differences in the level of skill in using online tools/ Zoom passwords and privacy controls	The degree of familiarity of digital communication tools/ IT literacy	Difference in the degree of familiarity of digital communication tools/ Need for lectures to improve IT literacy

Regarding Zoom's functions in the online SST, while it appears that the [use of breakout rooms] was good, [time loss due to moving to breakout rooms and switching screens] and [unexpected communication and system failures] occurred. In addition, there were [troublesome Zoom operation], and it was necessary to think about [time distribution in online SST]. [Use of Zoom function (gallery view) in which participants are displayed on the screen] also showed [low need for eye movement during speech]. [Multimodal expression and understanding] of [facilitating communication through chatting] was observed, MT and ST provided [feedback through the chat], and clients started [unexpected interaction through the chat].

Regarding the ease of support, in F2F SST, there were [Ease of desk monitoring and talking], [usefulness of body and hand gestures during teaching], and [ease of understanding nonverbal communication]. In the online SST, [emphasized facial expressions] and [emotional expression by voice] were observed. However, there were [difficulties in facial expressions and emotional expressions by voice] and [Difficulty of client recognition of facial expression and emotional expression]. Besides, while [gaze behavior, the core of nonverbal communication] was observed, there were [gaze direction that provides clues to infer participants' behaviors], [Difficulty with nods, gesture, body orientation and gaze], [difficulty in predicting speaker turnover] and [difficulty in predicting the next speaker in multi-people dialogues]. In addition, there were [difficulty grasping the atmosphere of the place], [difficulty identifying the status of worksheet entries], [difficulty understanding the progress of tasks due to not being able to see the hand], also [unclear timing of linguistic prompts], and [difficulty in managing activity time]. As well, there was [difficulty modeling related to interpersonal distance] and [limitation of observational learning by modeling].

Regarding discussion between clients, while there were [clients with high communication skills] in both F2F and online SST, there was a [difference in communication skills of clients], and there was a [inactive exchange of opinions between clients]. However, there were [facilitated discussion by using worksheets] and [helping to promote self- understanding by using worksheets]. In addition, in the online SST, [Occurrence of speech behavior by nomination] was observed to [participation structure in online multi-person conversation]. In [the small group chats], [facilitating conversation by sharing visual information such as images], [expanding the topic of leisure activities through the chat], and [cooperative problem solving for unexpected computer problems] occurred. However, compared to F2F SST, there was a decrease in chatting in online SST.

Regarding the preparation of SST, both F2F and online SST conducted the [preparation of presentation materials in advance]. In the online SST, there was [a need for lectures to improve IT literacy] considering the [difference in the degree of familiarity of digital communication tools]. There were [lack of experience in online SST], [difference in MT skills], and [difference in ST skills], so it was necessary to think about [staff participation in online SST].

Regarding reasonable accommodation, [ease of use of online SST] was possible because of [reasonable accommodation through individual support] and [consideration for those who are not good at writing] and [adjusting the participation environment by yourself].

Discussion

Quantitative Analysis Results

From the results of the questionnaire of staff who experienced both F2F and online SST, there was a statistically significant difference between staff modeling, understanding clients' facial expressions, and reading someone's emotion from facial expression; F2F SST was easier to understand.

During the group discussion using Zoom, it may have been difficult to understand facial expressions due to the small size of the individual's screen on the computer screen. It is also possible that the client's face did not fit in the angle of view [14]. However, there was no difference in teaching skills, the amount of clients' conversation, also the participants were able to communicate using chat, suggesting that online SST may have the same effect as F2F SST for improving clients' communication skills.

The reason why there was no difference in the amount of clients' conversation in this study is that there was a discussion structure in which participants took turns talking after using worksheets. In addition, since the clients often used chat in the online SST, it seems that it was easier for those of them who were not good at conversation to communicate with text, than speaking. Online SST may have been effective for clients with communication difficulties, like the reported improvement in social skills for patients with social anxiety [15]. There was no significant difference in Preparation. This may be because the online SSTs, as well as the face-to-face SSTs, were prepared by making a PowerPoint presentation in advance.

Qualitative Analysis Results

From the qualitative analysis results, 1) online SST had a distinctive conversation structure. Besides, online SST had the merit of acquiring communication skills such as 2) joining conversation using the chat, 3) adjusting the participation environment by yourself and, 4) creating sentences using computer. On the other hand, the disadvantage was the difficulty of modeling distance between people, eye contact, and body orientation.

Conversation Structure of Online SST

Because of the participants' [difficulty with nods, gesture, body orientation and gaze], [difficulty in predicting speaker turnover] and [difficulty in predicting the next speaker in multi-people dialogues], in the online SST the staff designated the next speaker to generate the client's speech behavior. Hanna (2007) stated that in face-to-face conversations, eye gaze is a communicative behavior, and where the speaker looks may speed up the listener's resolution [16]. Conversation analysis has shown that during turn-taking, body-visual movements such as eye gaze, nodding, gaze direction, and body orientation occur before and at the start of the turn [17]. In group discussions, participants need to closely monitor the direction of the speaker's gaze to respond appropriately to the ongoing conversation [17]. Therefore, information about eye gaze and body orientation is needed to predict who is the next speaker in a group conversation. On the other hand, it has been shown that individuals with developmental disabilities (ASD) spend more time looking at the mouth of the other person and less time looking at the eyes [18]. ADHD has been shown to have a peculiar tendency to ignore the direction of the other person's gaze when attention is directed to another task [19]. We believe that the short time spent looking at the eyes leads to difficulty in entering group conversations because it is hard to pay attention to the eye movement of the other person and to read the destination of the eye movement. Because of the conversation structure of

[Occurrence of speech behavior by designation], the client does not have to pay attention to the moment of entering the conversation, which we believe is a small step in the experience of talking in a group.

Joining conversation using chat feature

Clients were able to use chat feature to enter group conversations. Chat communication does not interrupt or overlap conversations as occurs in oral communication, so there is little need to pay attention to when joining a conversation [20]. Therefore, we believe that the clients may have found it easier to enter the group conversation by using the chat. In the online SST, clients also used the chat feature and screen sharing. The use of visual information such as text and images, in addition to the oral communication, may have expanded the topic and facilitated communication among clients.

Adjusting the participation environment by yourself

The ability to participate online from home, using a computer or tablet, and using the Zoom features led to individual adjustment. Some clients had hypersensitivity to sound, light, and other senses, as well as difficulty writing Kanji. The online SST allowed them to choose the input method that suited them best, such as making the environment comfortable for them and typing using a computer or tablet, etc., to create their sentences. In addition, the breakout room could be used to individually assist with writing without disrupting the flow of the group work. Based on the above, online SST may have been easier to participate than F2F SST.

Disadvantages of Online SST

There is a need for F2F SST because online SST do not allow modeling regarding distance from people, eye contact, and body orientation. According to Hall (1970) he points out that distance between people works as a tool for communication, stating that there are four types of distance depending on the relationship with the other person and that the closer the person is to the other person, the closer the distance becomes. In addition, nonverbal expressions such as eye gaze and body orientation are important in communication [21,22]. When speaking F2F, the speaker looks at the space where the gesture is being made before the gesture begins and looks at the listener just before the end of the utterance. It has been reported that listener then make responses such as nodding when speaker's gaze is directed to the listener [23]. Although it is said that when only one person is shown on a computer screen, it is possible to estimate where the other person is looking from the screen, in a group videoconference, it was difficult to estimate even who the participants were looking at [24]. Therefore, we believe that it is better to conduct F2F SST when the goal is to acquire these nonverbal communication skills.

In addition, because of differences in staff skills, it is necessary to improve the communication skills of staff. In the medical field, communication skills training for health care providers has been implemented to provide patient-centered care or to change patient behavior in a positive direction, and improvement in communication skills of health care providers has been reported [25, 26]. In the educational field, the research of using educational dialogue has been implemented and communication skills are one of the qualifications required of teachers. Therefore, for both F2F and online SST, we believe that staff communication skills need to be improved to facilitate client discussion and problem solving [27,28].

Conclusion

In this study, we conducted a questionnaire to staff members who provide SST to adolescents and adults with developmental disabilities and tendencies and analyzed the results quantitatively and qualitatively to identify differences between online and F2F SST. Quantitative data analysis showed that online SST were able to lecture and discuss communication skills as well as F2F SST, but modeling and facial expressions were difficult to understand, suggesting that online SST are better for practicing verbal expression than nonverbal expression. Clients also frequently used the chat feature, suggesting that to communication with the text is more likely to engage them in group conversations. From the qualitative data, it was difficult to determine eye gaze and body orientation, so the staff generated speech behavior through a designation system. We believe that this was a conversational structure to avoid overlapping conversations, as it was difficult to predict the next speaker. We also found that clients participated in SST in an environment that suited them.

This indicates that online SST can support lectures on communication skills and group discussions in the same way as F2F SST. In addition, it is considered that online SSTs may be easier to participate in than face-to-face SSTs because of the unique conversational structure in which staff choose the next speaker to continue or start the conversation, the use of chat, and the ability for clients to participate in SSTs in an environment that suits them. However, the difficulty in modeling (eye gaze, body orientation, facial expressions, and human distance) and role-playing suggests that F2F SST is also necessary. Therefore, we propose that implementing online SST for clients with communication difficulties will help clients acquire social skills in small steps. However, since this is a survey for staff, it is necessary to conduct a survey for clients and compare online and F2F SST when face-to-face participation becomes possible.

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