Research

Virtual Horticultural Therapy: A Qualitative Study Capturing University Students' Perspectives on Benefits, Challenges and Future Issues

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Abstract

The purpose of this study was to qualitatively analyze and clarify the benefits, barriers, challenges, and identification of future issues of virtual horticultural therapy (HT) by surveying university students who have delivered virtual HT under the guidance of a horticultural therapy practitioner, also credentialed as an occupational therapist. This study adopted the methodology of qualitative research - Structure Construction Qualitative Research Method. Five university students were involved in the delivery of virtual HT sessions. Students completed a questionnaire after practicing virtual horticultural therapy. Simple tabulations were conducted for the questionnaire contents. For the free text written comment, Steps for Coding and Theorization (SCAT) were used for the data analysis. As a result, five benefits, four barriers and challenges, and nine suggestions for future delivery of virtual HT practice were extracted. Subsequent studies will investigate how to make this setting more adaptable to virtual delivery. In this unprecedented era of COVID-19 with many restrictions related to health, virtual HT can be an alternative means of delivering horticultural therapy.

Key words: virtual delivery, horticultural therapy, elderly care facility, qualitative study, university students' perspectives, COVID-19

Introduction

Japan is facing a super-aged society where one in three people will be elderly by 2025. The aging rate is expected to continue to increase in the future. Against this backdrop, it is important not only to provide health interventions, but also to adjust the living environment and create a place where people can live with a sense of purpose and have a role in the community as measures against the super-aging society [1]. In Japan, horticultural therapy as defined by Yamane as "a program that aims to maintain and restore physical and mental functions and improve quality of life through a focus on growing plants, the environment in which plants grow, and various activities related to plants" [2].

Studies on the effects of HT indicate that daily gardening is reducing the incidence of dementia in future years [3], suggesting that when older adults are offered outdoor gardening versus indoor activities, gardening is popular and less stressful [4]. Research by Chu et al. demonstrated that an 8-week horticultural program improved attitudes toward aging, hand–eye coordination, and sense of hope by the participants [5]. In addition, a study interviewing frail nursing home residents found that HT is an enjoyable activity, a positive leisure pastime for nursing home living, with improved mood outcomes [6]. There have been numerous studies of HT practices for residents of elderly care facilities in Japan, and much attention has been paid to such practices [7-12]. Thus, horticultural activities, particularly when delivered as HT, have been shown to be beneficial for elderly people. However, face-to-face HT has not been available since 2020 due to the spread of COVID-19 in many locations. Therefore, online practices are beginning to be explored [13]. Ryhikov's 2021 study of virtual therapeutic horticulture, a social wellness program for adults with intellectual and developmental disabilities touches on the topic of virtual delivery using this modality, though with a different population and program type [14].

Other research using virtual horticultural therapy has not been identified, due in large part to the recent use of this methodology.

But there was nothing published about virtual HT that we can find. New delivery mechanisms for HT programs are needed to reduce the risk of infection of COVID-19. Limited number of studies have been undertaken where infection prevention or the restrictions placed on delivery of activity programming including HT have been taken into consideration during COVID-19 [13]. The environment and methods of practice are very different between regular face-to-face HT and virtual horticultural therapy; many issues are different between the two methods of delivery. The purpose of this study was to qualitatively analyze and clarify the benefits, barriers and challenges, and identify future issues for virtual HT, by surveying university students who have delivered virtual HT with an HT practitioner.

Subjects and Methods

Study sample

Five university students in their early 20's in the Department of Occupational Therapy were involved in the delivery of virtual HT sessions in conjunction with the HT practitioner/occupational therapist. Of the 5 students, 2 were female, 3 were male.

This research protocol was approved by the Ethics Committee of Kibi International University (22-08).

Methods

Description of virtual horticultural therapy delivery

Virtual meeting platforms, such as Zoom meetings are used to conduct virtual HT sessions. The HT session is conducted in a format where two locations, the elderly facility and the university delivering the session, participate in Zoom, with video and audio connected.

### Zoom settings and room preferences

A total of three laptops were used: two at the eldercare facility and one at the university, for communication between the two locations. The university used a portable microphone placed close to its laptop computer to transmit audio from this source. Likewise, the elder facility used a portable microphone placed close to the facility's laptop computer, amplifying the audio through speakers. Audio using a handheld microphone close to elder par-

ticipants transmitted their comments and questions. Live time Zoom video from the facility, managed by facility staff, showed activities undertaken by elderly participants using two cameras. One camera showed a full image of the elderly person and a second mobile camera showed the elderly person's hands. The university students involved in delivering virtual HT sessions consisted of three to five university students working in conjunction with a horticultural therapy practitioner/educator also licensed as an occupational therapist. The occupational therapist had 9 years of experience practicing HT in eldercare facilities. Ten to thirteen elderly residents and three to five staff members from the eldercare facility participated in each session. Elder participants were seated two to a (long) desk to avoid crowding. All participants were seated facing forward to optimize visual instructions from the HT practitioners, these projected on the wall at the front of the room. Set-up for the virtual sessions took approximately 30 to 40 minutes connecting the laptop and Zoom and moving desks into position at the eldercare facility. Elder participants were brought to the Zoom room by facility staff. Several virtual HT sessions have been conducted (Figure 1). The benefits, barriers and challenges of virtual HT are summarized in Table 1.

Horticultural therapy activities - preparation and transport of horticultural kits

The HT activities were selected based on the elder program participants' abilities. The activities were selected so that they would be feasible for this population - elders with and without dementia cognitive and behavioral deficits. Participants faced the screen, receiving visual and auditory guidance from the off-site HT practitioner and students for the gardening activities involving plant-based cultivation and crafts. The plant activities, an essential element of HT also provided program thematic continuity.

Plant activities were chosen to provide variety, utilizing varying functional tasks like fine motor skills, hand-eye coordination, visual and sensory stimulation. Materials deemed safe for participants were selected and closely monitored (i.e. large seeds and beans vs small items, succulents without thorns). Activities included: making a photo frame using beans and seeds (September 2021); making a basket for saffron cultivation (October 2021); planting violas (November 2021); planting white radish seeds
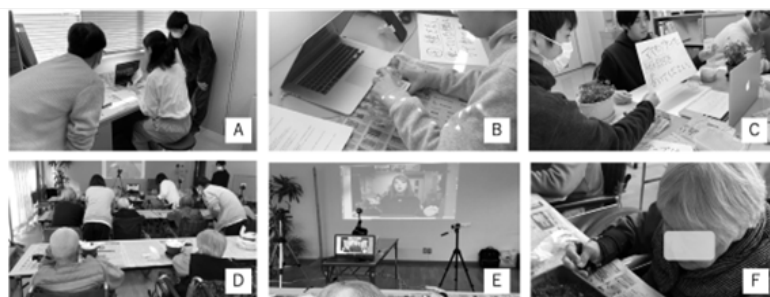
Figure 1. Virtual Horticultural Therapy in Eldercare Facility.
A: A view of the delivery from the university side. A student sits in front of a laptop computer and gives instructions to the participants on the facility side through the computer's camera.
B: The camera zooms in close-up on one particpant's hand.
C: Instructions are presented verbally, but also by writing them on drawing paper. This makes them easier to understand, particularly for elders with hearing loss.
D: Elderly facilities. Facility staff assist with activities.
E: The wall in front of the room with projected image from the university side of the room.
F: An elder participants is filling a planter with soil while checking the project image.

Table 1. Virtual Horticultural Therapy: Benefits and Barriers and Challenges

	Benefits	Barriers/Challenges
Convenience	– Elderly are able to join virtual HT from elderly facilities with the help of facility staff. – Interaction is possible through the screen.	– Some elderly facilities do not have robust Internet access or digital devices. – Create new challenges for elderly and elderly facilities who are less tech savvy. – Take longer than face to face leading to halting elderly-practitioner communication. – Lack of live personal contact hampers exchange of difficult and emotional information with group programming is not always possible to see each individual's reaction. – Distraction by other participants. – Direct intervention is precluded. Where appropriate, practitioner calms/reassures/praises the client using a touch of the hand, pat on shoulder…this is not possible virtually and replacing this with verbal praise is not quite the same. – If elderly people's vision is not so good, watching a virtual session, seeing supplies or process well enough to do it on their own may be challenging (which can be addressed by closer positioning). – Some clients do not like impersonal interactions and definitely prefer live engagement. – Practitioner's verbal cues must be really good for virtual delivery; in person we can use more non-verbal cues, stand closer to clients if need be, use laughter to offset negative dynamics (this can be done virtually but with less effect).
Cost savings	– Reduction of travel costs to elderly facilities.	– Need to pay for installation if no Internet access. – Cost of transportation of horticulture kits.
Infection control	– No outside access to the facility prevents infections.	None
Advance preparation	– Preparation is completed before the day of practice.	– Prepare horticulture kits for each participant – tools that are used repeatedly by the practitioner (practitioner's set of scissors, spades, and watercan, among others, are not available as if the practitioner was bringing these in person for session.

for germination/sprouts in 3 days (December 2021); and replanting succulents into a dish container (December 2021). Subsequent activities included: harvesting radish sprouts; planting tulip and grape hyacinth bulbs (December 2021); drying viola flowers (November 2021); and making potpourri with dried viola (January 2022). Extensions of the elders' hands-on activities included staff planting the saffron bulbs post-bloom in outdoor gardens, tulip/grape hyacinth (bulb) planters moved into the garden for observation from indoors, and succulents placed in the day room for enjoyment by participants, staff and visitors.

The HT practitioners – a university student and the occupational therapist, prepared horticultural kits, one per person per activity. The horticultural kits were delivered to the eldercare facility prior to the day of the sessions. The HT practitioners practiced delivering each activity prior to the actual session including demonstrations to confirm the flow, effectiveness of verbal and visual cues, inclusion of all necessary materials, and anticipation of problems (solving). For example, accommodation for an elderly participant with hearing deficits included pre-made instructions written on drawing paper, made available during sessions.

Design

The purpose of this study was to investigate the benefits, barriers and challenges, and future issues related to the delivery of virtual HT, specifically for university students and HT practitioner delivering virtual HT. This study adopted the methodology of qualitative research, not quantitative research. For this qualitative study, SCQRM (Structure Construction Qualitative Research Method) was used, for the purpose of making small sample sizes applicable to the study. SCQRM, developed by Saijo [15,16], determines the number of cases or samples based on the research questions (or interest) of researchers, therefore preserving scientific validity and falsifiability in a small case study by structuring the model of target and showing construction trail [17,18].

Contents of questionnaire

In accordance with the objectives of the study the students completed the questionnaire that gathered data re virtual delivery of HT. The following items were covered: (1) Manpower (preparation before the day of the event, preparation on the day of the event, and progress on the day of the event), (2) Communication between the elderly facility and the university through Zoom (voice, visibility of hands during work, understanding of activity content and instructions, and participants' understanding), (3) Satisfaction, (4) Benefits, (5) Barriers/Challenges, and (6) Devices and measures to be taken when incorporating virtual HT at elderly facilities. Answers to items (4) through (6) were obtained from free text written comments. The questionnaire, designed by two researchers with experience in virtual horticultural therapy, was designed to ask opinions of the students supporting the virtual HT delivery.

Analysis

Simple tabulations were conducted for the questionnaire contents from (1) to (3). For the free text written comments from (4) to (6), Steps for Coding and Theorization (SCAT) were used for the data analysis. SCAT, a qualitative data analysis method developed by Otani from Nagoya University in Japan is relatively easy to perform using an Excel spreadsheet without using any software [19]. It has been used and validated in many inter-

Table 2. Evaluation of Virtual Horticultural Therapy from a Student's Perspective

list	N	%
Manpower		
Very satisfied	0	0
Mostly satisfied	5	100
Somewhat dissatisfied	0	0
Dissatisfied	0	0
Preparation before the day of the event		
No problems	4	80
Some problems	1	20
Preparation on the day of the event		
No problems	4	80
Some problems	1	20
Progress on the day of the event		
No problems	4	80
Some problems	1	20
Communication between elderly facility and HT practitioner through Zoom		
Very satisfied	0	0
Mostly satisfied	3	60
Somewhat dissatisfied	2	40
Dissatisfied	0	0
Ease of hearing video audio		
Audio was easy to hear	2	40
Audio was sometimes difficult to hear	3	60
Audio was generally difficult to hear	0	0
Was it easy to see the hand of the elderly when working?		
Easy to see	4	80
Sometimes it was hard to see	1	20
Couldn't see at all	0	0
Did the elderly understand the activity and what you were talking about throughout Zoom?		
They understood me	2	40
Sometimes not understood	3	60
Not understood at all	0	0
Satisfaction with virtual horticultural therapy		
Very satisfied	1	20
Mostly satisfied	3	60
Somewhat dissatisfied	1	20
Dissatisfied	0	0

national papers since 2013 [19-22]. SCAT is relatively easy to conduct even for beginners of qualitative research and, since the analysis process is explicit, the validity of the analysis can be constantly checked. This method is appropriate for small-scale qualitative studies with a limited amount of qualitative data including answers to open-ended questions in surveys [23,24]. The analysis method consists of a 4-step coding process as follows [23-25].

(1) Focused words from within the interview text.

(2) Words outside of the text which are replaceable with the words from (1).

(3) Words which explain the words in (1) and (2).

(4) Themes and constructs, including the process of writing a storyline and offering theoretical descriptions that weave together the themes and constructs. Since many of the free-text statements in the questionnaire were bulleted texts, the textual data was categorized into groups of similarities, paraphrased, and then organized through a conceptualization procedure, referring to Fukushi et al. method [26]. And the purpose of this study was limited to the generation of themes and constructs for SCAT in order to identify the benefits, barriers, challenges, and

Table 3. Extracted Themes and Constructs

	Themes and constructs
Benefits	Creative activities using plants
	Realistic experience through cultivation activities
	Practices adapted re infectious disease epidemic
	Delivery of activity using virtual audio-visual stimuli
	Repeatable evaluations
Barriers/Challenges	Difficulties in evaluating individual's responses at times, particularly in group settings
	Environmental set up of the practice site (audio, visual, camera, computer)
	Clarification of roles and ability to do thorough preparation
	Reduction of interactions that occur when work processes become more complex
Future measures	Environmental settings/set-up where video and volume are taken into consideration
	Improving the Internet environment at the location where the therapy occurs
	Rehearsal by the practitioner prior to session
	Facility staffing appropriate for activity
	Explanations using audio-visual stimuli
	Practitioner response in consideration of ability level
	Use of activities and tools based on previous experience
	Activities that provide a sense of fulfillment
	Appropriate group size and activities according to participants' level of mental and physical functioning

future measures for virtual HT delivery. The analysis was conducted primarily by the occupational therapist experienced in HT practice in the field of aging as well as experience in qualitative research.

Results

The results of the questionnaire are shown in Table 2. The open-ended items in the questionnaire were analyzed by the SCAT, and the themes and constructs resulting from the SCAT are shown in Table 3. As a result, five benefits, four barriers and challenges, and nine suggestions for future delivery of virtual HT practice were extracted:

Benefits for delivery of virtual HT practice

Five themes of benefits of virtual HT were identified: "Creative activities using plants", "Realistic experience through cultivation activities", "Practices adapted re infectious disease epidemic", "Delivery of activity using virtual audio-visual stimuli", and "Repeatable evaluations".

Barriers and Challenges for delivery of virtual HT practice

Four barriers and challenges to the practice of virtual HT were extracted: "Difficulties in evaluating individual's responses at times, particularly in group settings", "Environmental set up of the practice site (audio, visual, camera, computer)", "Clarification of roles and ability to do thorough preparation", "Reduction of interactions that occur when work processes become more complex".

Suggestions for future delivery of virtual HT practice

The following nine concepts were identified as necessary for virtual HT.

Two environmental requirements were extracted: "Environmental settings/set-up where video and volume are taken into consideration" and "Improving the Internet environment at the location where the therapy occurs".

As for preparations in advance, two items were extracted: "Rehearsal by the practitioner prior to session" and "Facility staffing appropriate for activity".

The following five concepts were generated as considerations during the activity: "Explanations using audio-visual stimuli", "Practitioner response in consideration of ability level", "Use of activities and tools based on previous experience", "Activities that provide a sense of fulfillment", and "Appropriate group size and activities according to participants' level of mental and physical functioning"

Discussion

The results of a questionnaire from university students who participated in the delivery of virtual HT programming allowed benefits, barriers and challenges, and future issues to be identified.

Manpower: The number of students and HT practitioners delivering virtual HT sessions appeared sufficient when three or four university students and one occupational therapist participat-

ed. However, one subject indicated trouble with the preparation and progress of the event in advance and on the day of the event. Students did not feel they had enough time to shop for materials to implement virtual HT, create horticultural kits, and perform delivery exercises using their free time outside of lectures. The degree and time required for preparation of virtual HT delivery appeared to be greater than required for traditional in-person HT from the students' perspective.

Communication between the elderly participants and the HT practitioner: Two students indicated difficulty hearing each other, and elder participants, at times, due to the distance between elder's mouth and microphone. Difficulties viewing elder's hands through Zoom was challenging at times, particularly when moving onto next work process, according to one respondent.

Three students commented on elderly participants' difficulties understanding directions - when elders began working before the student's explanations, when complicated instructions were used, or when there were multiple work processes, and when pace of activities/directions proceeded a little faster, these contributing to reduced comprehension.

Overall satisfaction level with virtual delivery of HT, from the perspective of 4 students was favorable.

Analyzing the results of the free text written comments using SCAT revealed diverse comments or experiences, for example.

Benefits for delivery of virtual HT practice

Respondents mentioned "Creative activities using plants" and "Realistic experience through cultivation activities" as well as face-to-face activities, and "Practices adapted re infectious disease epidemic".

In addition, it became clear that "Delivery of activity using audio-visual stimuli" were also possible through use of visual and audio screens. In particular, more visual stimuli could be presented to the elderly by presenting a sheet of paper with written instructions held up to the computer's camera. For the hearing-impaired elder, the ability to give both auditory and visual instructions was an advantage. For the university students, the recording function of Zoom allowed them to record their activities, which was an advantage for them to be able to evaluate sessions and conduct "Repeatable evaluations".

Barriers and challenges for delivery of virtual HT practice

The elder facility's fixed camera did not provide good coverage of all elders at all times, for students to view, engage and evaluate in a group setting. Evaluation of sessions given this, and improvement for subsequent sessions was impeded.

The environmental setting of the practice site had issues including the brightness of the room for optimal viewing of images on wall or screen, adjustments to audio set-up, and the need for facility staff to be familiar with the operation of personal computers to be able to provide the technical elements essential for the delivery of HT activities. Greater clarification of roles and greater emphasis on thorough preparation were identified as challenges. Implementable solutions were evident.

Reduction of interactions between elder participants and those delivering virtual HT can be diminished, particularly in situations where work processes become more complex – when students and HT practitioner need to look at their own hands doing demonstration and the video image.

Suggestions for future delivery of virtual HT practice

Finally, nine concepts identifying future issues were extracted from the student survey.

"Environmental settings/set-up where video and volume are taken into consideration" and "Improving the Internet environment at the location where the therapy occurs" are essential methodology in the delivery of virtual HT. Unlike face-to-face HT practice delivered by trained HT practitioners, virtual HT involves video and audio communication in an internet environment. Therefore, it is first necessary to set up internet environment and download online conferencing tools such as Zoom and Teams. Preparation in advance requires "Rehearsal by the practitioner prior to session" and "Facility staffing appropriate for activity". Five items were identified as necessary during activities: "Explanations using audio-visual stimuli", "Practitioner response in consideration of ability level", "Use of activities and tools based on previous experience", "Activities that provide a sense of fulfillment", and "Appropriate group size and activities according to participants' level of mental and physical functioning". These become more critical during virtual HT versus face-to-face HT.

The immediateness of the HT practitioner responding to participant's responses or difficulties (understanding, hearing etc.) is delayed and diminished by the relayed audio and the more limited visual cues of virtual delivery. Virtual HT has its advantages, but it is necessary to examine the issues and countermeasures required to deliver effective HT.

The survey revealed that appropriate support systems are essential when delivering virtual HT. These are most effective on a case-by-case basis, taking into account each participant and their particular challenges related to audio and visual prompts and interactions using virtual delivery. HT practice can be effectively delivered using virtual methods as was demonstrated during the COVID-19 disaster, with this study involving elders with a range of health status, some with cognitive dementia impairment, some with hearing difficulties, and some with no identified health challenges. Of note is research by Asai et al. [13] which implemented a home-based HT program for healthy elderly people using an Internet-based delivery method and where the psychological effects of the program were examined. The results show significant improvements in scores for Fatigue-Inertia, Vigor-Activity, and friendliness. The Asai et al. [13] study suggests that online interventions can be implemented and can be effective for delivering plant-based activities where health benefits result.

In this unprecedented era of COVID-19, there is a need to provide continuous services in the medical and health service fields. Virtual delivery of HT evolved as an adaptation of these services. Future research expanding the body of knowledge on the effectiveness of virtual HT as newer methodological tools, particularly when used with elder populations with their characteristic health challenges will broaden practitioner understanding, while offering elder facilities options in therapeutic programming.

Conclusion

This study reveals the benefits, barriers, challenges, and future

issues for virtual HT delivered in elder facilities as reported by a qualitative survey completed by students working with an HT practitioner. The benefits outweigh the challenges when HT is delivered virtually. The limitations of the preferred indoor room environment, requiring internet connections, computer set-up, and stationary seated participants still provided for effective plant-based interventions. Though the delivery of outdoor activities becomes even more challenging where participants are not stationary, moving around the garden, with lesser ability to track movement and activity by camera/computer setups, subsequent studies will investigate how to make this setting more adaptable to virtual delivery. In this unprecedented era of COVID-19 with many restrictions related to health, virtual HT can be an alternative means of delivering horticultural therapy. It was used effectively at an elder facility to the satisfaction of the elder participants and facility staff.

Acknowledgments

Conflicts of Interest

The authors declare no conflict of interest.

References

1. Tsuruta S. Future Directions of the Long-term Care Prevention. Sogo Rehabilitation. 2015; 43 (9): 803-808.

2. Yamane H. Use and Possibility of Plants in Rehabilitation; https://hiroshima-ota.jp/220606-1siryou.pdf, (accessed 2022 8 June).

3. Simons LA, Simons J, McCallum J, et al. Lifestyle Factors and Risk of Dementia: Dubbo Study of the Elderly. Med J Aust. 2006; 184(2): 68-70.

4. Rodiek S. Influence of an Outdoor Garden on Mood and Stress in Older Persons. Journal of Therapeutic Horticulture. 2015; 13: 13-21.

5. Chu HY, Chan HS, Chen MF. Effects of Horticultural Activities on Attitudes toward Aging, Sense of Hope and Hand-Eye Coordination in Older Adults in Residential Care Facilities. Int J Environ Res Public Health. 2021; 18(12).

6. Lo SKL, Lam WYY, Kwan RYC, et al. Effects of Horticultural Therapy: Perspectives of Frail and Pre-frail Older Nursing Home Residents. Nurs Open. 2019; 6(3): 1230-1236.

7. Miyake Y, Ueda E, Yamanaka S, et al. Horticultural Activities and Their Relationship with Quality of Life in Special Elderly Nursing Home. Journal of Japanese Society of People-Plant Relationships. 2017; 16 (2): 15-20.

8. Miyake Y, Isomura Y, Kawakami S. Effects of the Horticultural Therapy Project in Which Special Elderly Nursing Homes, University and its Students Collaborate: Changes in the Awareness of Staff who Provided Assistance in Horticultural Activities. Journal of Japanese Society of People-Plant Relationships. 2020; 20(1): 9-18.

9. Miyake Y, Iwata M. Assessment and Interventions Focusing on the Classification of Occupational Dysfunction in Special Elderly Nursing Home Practice Using Horticultural Activities. Japanese Occupational Therapy Research. 2020; 39 (3): 341-347.

10. Miyake Y, Kyougoku M, Koura S. Survey on Horticultural Activities in Elderly Facilities : Perspective of Occupational Dysfunc-tion. Journal of Japanese Society of People-Plant Relationships. 2017; 16(2): 7-14.

11. Teraoka S, Harada H. A Study on a Way of Horticultural Therapy for Continual Improvement of QOL of Elderly with Dementia. Study for Nursing Education. 2007; 14: 73-84.

12. Teraoka S, Konishi M, Harada H, et al. The Effects of Horticultural Activities on the Cognitive and Psychological Functions of Elderly with Dementia. Hiroshima Daigaku Hokengaku Journal. 2012; 11(1): 10-19.

13. Asai S, Toyoda M, Hayashi M. Psychological Effects of Home-based Horticultural Therapy Program Looking Ahead After COVID-19. JJpnSocReveget Tech. 2021; 47(2): 298-303.

14. Ryzhikov, K. Virtual therapeutic horticulture – A social wellness program for adults with intellectual and developmental disabilities. Acta Hortic. 2021; 1330: 55-62.

15. Saijo T. Live Lecture Series. What is Qualitative Research? (SC-QRM basics) (In Japanese). 2007: Shin-yo-sha.

16. Saijo T. Live Lecture Series. What is Qualitative Research? (SC-QRM advanced) (In Japanese). 2008: Shin-yo-sha.

17. Miyazaki K, Taguchi T, Takemura Y. Effect of Daily Multidisciplinary Team Reflection in Ambulatory Care: A Qualitative Analysis. J Multidiscip Healthc. 2022; 15: 323-331.

18. Iwata K, Shirai C, Kimura K, et al. How Were the High-fever Consultation Center Perceived by the Officers Who Provided it in Kobe City, During Swine-origin Influenza A (H1N1) Outbreak? A Qualitative Study Utilizing SCQRM. Kobe J Med Sci. 2011; 56(5): E195-203.

19. Oishi Y, Son D, Hotta S. The Value and Impact of a Health Café Organized by Primary Care Physician, On Visitors, Clinics, and the Community: A Qualitative Study. J Prim Care Community Health. 2022; 13: 21501319221088668.

20. Suematsu M, Okumura K, Hida T, et al. Students' Perception of a Hybrid Interprofessional Education Course in a Clinical Diabetes Setting: A Qualitative Study. Int J Med Educ. 2021; 12: 195-204.

21. Kuroda M, Ohta R, Kuroda K, et al. The Seamless Communication on a Rural Island in Japan: A Qualitative Study from the Perspective of Healthcare Professionals. Int J Environ Res Public Health. 2021; 18(18).

22. Takahashi N, Aomatsu M, Saiki T, et al. Listen to the Outpatient: Qualitative Explanatory Study on Medical Students' Recognition of Outpatients' Narratives in Combined Ambulatory Clerkship and Peer Role-play. BMC Med Educ. 2018; 18(1): 229.

23. Otani T. A Proposal of SCAT, a Qualitative Data Analysis Method with 4-step Coding: Theorization Procedure That is Easy to Start and Applicable to Small-scale Data. Bull Grad Sch Educ Dev Sci Nagoya Univ. 2008; 54(2): 27-44.

24. Otani T. Pardigm and Design of Qualitative Study from Research Methodology to SCAT (2nd ed.). 2019, Nagoya: The University of Nagoya Press.

25. Otani T. SCAT: Steps for Coding and Theorization, Qualitative Data Analysis Method; https://www.educa.nagoya-u.ac.jp/~otani/scat/index-e.html, (accessed 2021 15 May).

26. Fukushi M, Nago N. Clinical Educators Unable to Accept the Clinical Medical Training System and Residents with No Sense of Belonging: Results of Needs Assessment Involving Clinical Educators in Faculty Development Workshops. Igaku Kyoiku. 2011; 42(2): 65-73.