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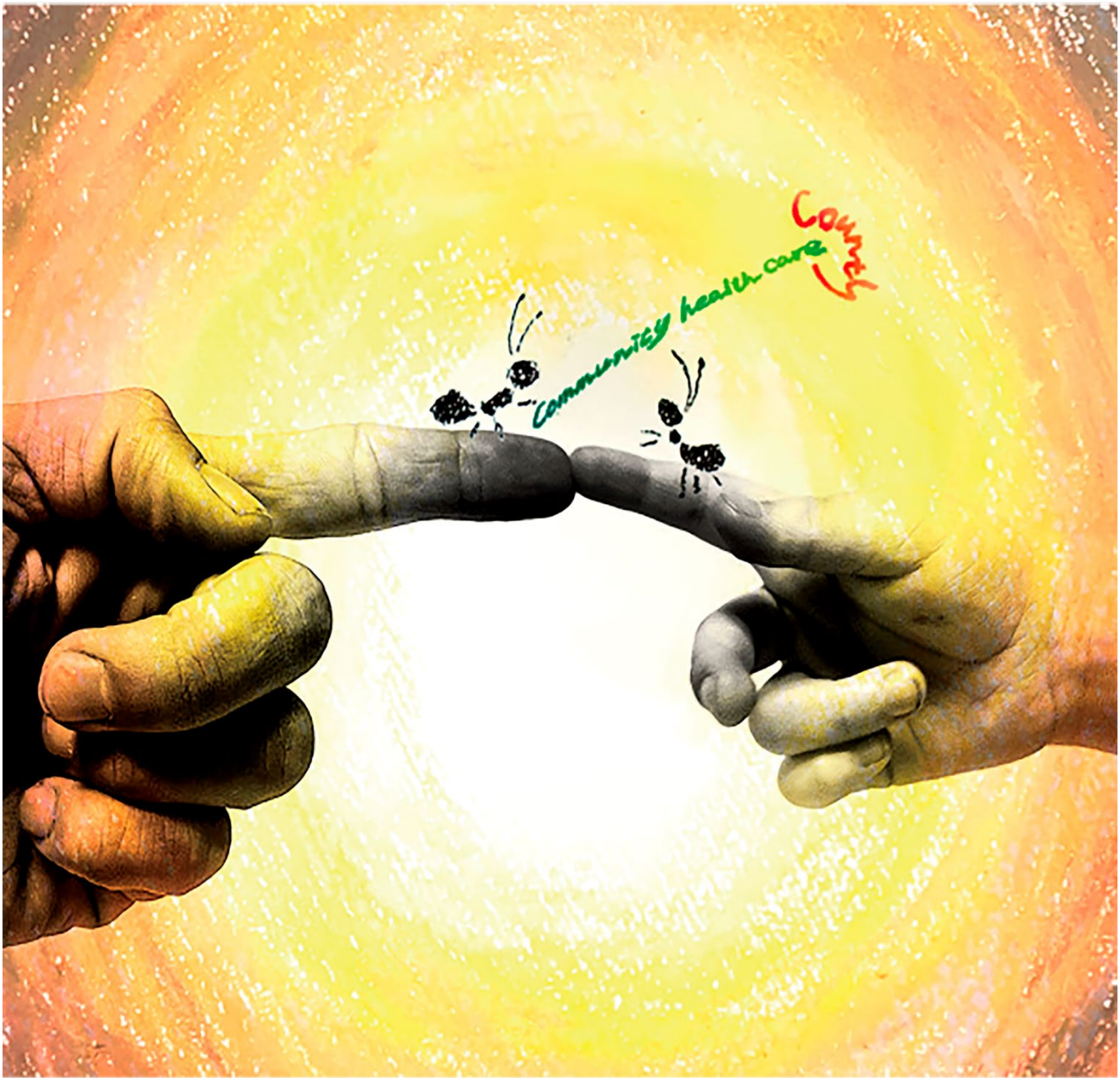

ASIAN SOCIETY OF HUMAN SERVICES

Asian Society of Human Services

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ORIGINAL ARTICLES

SHORT PAPER

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ORIGINAL ARTICLE

Structure of Nutrition Improvement Approaches for Care-dependent Older People and Related Challenges in Community-based Integrated Care

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ABSTRACT

To structure nutrition improvement approaches for care-dependent older people and related challenges, this study examined 12 medical and welfare professionals engaged in community-based integrated care services using the semi-structured interview method. **[Devising measures for nutrition improvement and related collaboration]** and **[organizing nutrition improvement approaches]** represented the approaches actually provided by these professionals to improve the nutritional status of care-dependent older people in community-based integrated care, and this indicates that all of these professionals engaged in community-based integrated care services were aware of the **[correlation between the nutritional status and environmental factors]** and **[correlation between the nutritional status and mental/physical functions]** in these people. On the other hand, they faced various challenges such as **[difficulty in collaborating with other professionals/institutions for nutrition improvement]**, **[a lack of nutrition education and its necessity]**, and **[non-implementation of nutritional assessment and its necessity]**. The results clarified a structure, where **[difficulty in collaborating with other professionals/institutions for nutrition improvement]** is the major challenge in **[devising measures for nutrition improvement and related collaboration]** and **[organizing nutrition improvement approaches]**, suggesting the necessity of opportunities for interprofessional education (IPE) and interprofessional work (IPW) beyond occupations and institutions to improve the nutritional status of care-dependent older people in community-based integrated care.

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I. Introduction

The share of older people aged 65 or over in the total global population (aging rate) increased from 5.1% in 1950 to 8.3% in 2015, and it is estimated to reach 18.1% in 2060. The World Health Organization (WHO) published the WHO Guideline on Integrated Care for Older People (ICOPE)[1] in 2017, defining "mobility loss", "malnutrition", "visual impairment", "hearing loss", "cognitive impairment", "depressive symptoms", "urinary incontinence", "risk of falls", and "caregiver support" as 9 elements of integrated care for older people.

In 2005, when the Long-term Care Insurance Act was initially revised, Japan's care system became more prevention-focused, placing importance on improvements in motor function, nutrition, and oral function. However, reports on the outcomes of the new prevention-focused care system[2,3] revealed that older people requiring nutritional improvement still account for 30%, and malnutrition among these people remains unsolved.

The effectiveness and reliability of nutritional assessment using a simple inventory (Mini Nutritional Assessment Short-Form: MNA-SF), including nutritional intervention and nutrition education, were confirmed in a previous study[4], but methods for nutritional improvement have yet to be established[5]. On examining the causes, the principal investigator and co-investigators identified various challenges, including poor awareness of nutritional improvement among long-term care insurance service providers[6], an association between a poor nutritional status and mental/physical dysfunction in care-dependent older people[7], and lack of nutrition education for care managers[8]. They also reported the necessity of organic collaboration based on standardized assessment and ICT use for more effective nutritional improvement[9].

The present study aimed to clarify the structure of nutrition improvement approaches for care-dependent older people and related challenges by analyzing the narratives of medical and welfare professionals of facilities providing community-based integrated care that requires community-wide collaboration such as medical institutions, long-term care insurance-covered facilities, and home care service facilities. Japan's government aims to establish a system to provide integrated support/care services in each community (community-based integrated care system) by 2025, in order to support older people to maintain their dignity and independence by helping them continue their personal lives in their communities, if possible, until their last days[10]. In the present study, "nutritional improvement" was defined as "restoring the nutritional status while preventing declines in it".

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II. Subjects and Methods

1. Study and Procedures

1) Study Design

A qualitative descriptive study design (semi-structured interview-based survey).

2) Study Period

Between July 1, 2019, and September 30, 2019

3) Subjects

Medical and welfare professionals working in medical institutions, long-term care insurance-covered facilities, or home care services.

4) Study Items

In addition to basic attributes, such as the sex, age, occupation, length of experience, type of facility, and relevant department, the following items were examined through interviews: the correlation between older people' nutritional status and levels of mental and physical independence, usefulness of assessing the nutritional status and assessment scales, practical methods for nutritional improvement and collaborating professionals, information-sharing with other facilities and service offices, and nutrition education. For these interviews, the interview guide shown in Table 1 was used.

<Table 1> Interview Guide

1. Have you ever noted a correlation between older peoples' nutritional status and levels of mental/physical functional independence? If you have, please describe the circumstances in detail.
2. How do you assess the nutritional status of care-dependent older people? What are your opinions about the usefulness of the assessment tools actually used and related challenges.
3. What are your approaches to improve the nutritional status of care-dependent older people? What occupations are you collaborating with?
4. How do you share information about nutritional improvement approaches for care-dependent older people with other community-based facilities and service offices? What challenges do you face in sharing such information?
5. Have you ever received education or training on nutritional improvement approaches for care-dependent older people? Please describe the details of the education needed, including teaching methods.

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5) Ethical Considerations

The study facilities and subjects were previously provided with written and oral explanations of the study objective, methods, voluntary cooperation, participants' right to withdraw at any time, and measures to ensure anonymity to obtain their consent. The study was approved by the Ethics Committee of the Faculty of Health Science and Nursing, Juntendo University (approval number: 1-02).

2. Data Collection

Candidate facilities were selected using the opportunistic sampling method. One acute care hospital, 1 post-acute rehabilitation hospital, 1 home-visit nursing service office, 1 special nursing home for older people, and 1 day care service office, a total of 5 facilities, were involved, asking their managers to introduce professionals playing a core role in the facility.

3. Data Analysis

The interview data were organized as narrative records, which were carefully read and divided into minimum paragraphs with semantic contents as units for analysis. These units were encoded, focusing on nutrition improvement approaches for care-dependent older people and related challenges, and classified into categories based on similarities with enhanced abstractness after careful deliberation on the data and codes to determine the characteristics and names of these categories. To enhance their validity, repeated discussions were held between the principal investigator and co-investigators. Additionally, word frequency analysis and correspondence analysis based on bubble charts were performed using Text Mining Studio Ver. 6.1 to confirm the relationships among attributes, categories, and words. Furthermore, the relationships among the categories were explored by comparing similarities and differences to structure them.

III. Results

1. Basic Attributes (Table 2)

The interviews were conducted with the following medical and welfare professionals working in an acute care hospital, post-acute rehabilitation hospital, special nursing home for older people, day care service office, or home-visit nursing service office: 7 nurses (58.3%), 2 physical therapists (16.7%), 2 care workers (16.7%), and 1 social worker (8.3%), a total of 12 professionals. Their mean age was 46.08±11.91. There were 4 males (33.3%) and 8 females (66.7%). The mean length of professional experience was 18.83±11.92 years, ranging from 44 to 5 years. The number of those working in each facility was as follows: acute care hospital: 2 (16.7%), post-acute rehabilitation hospital: 3 (25.0%), special nursing home for older people: 3 (25.0%), home-visit nursing service

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office: 2 (16.7%), and day care service office: 2 (16.7%). The mean duration of interview was 17.92±7.90 minutes. The medical/welfare professionals' basic attributes are summarized in Table 2.

<Table 2> Basic Attributes

	Type of profession	Age	Sex	Years of experience	Institution	Interview time (sec)
1	Care worker	42	Male	10	Nursing home	1,510
2	Care worker	43	Male	15	Nursing home	795
3	Social worker	54	Male	17	Day service facility	915
4	Nurse	57	Female	19	Day service facility	1,460
5	Physical therapist	43	Male	5	Nursing home	183
6	Physical therapist	43	Female	5	Rehabilitation hospital	1,065
7	Ward nurse	42	Female	21	Rehabilitation hospital	1,699
8	Discharge support nurse	48	Female	27	Rehabilitation hospital	1,784
9	Ward nurse	42	Female	20	Acute hospital	1,181
10	Ward nurse	29	Female	8	Acute hospital	961
11	Visiting nurse	65	Female	44	Home-visit nursing station	740
12	Visiting nurse	62	Female	35	Home-visit nursing station	616
	Ave.	46.08±11.91		18.83±11.92		17.92±7.90 min

2. Categorization of the interview data (Table 3)

The interview data were classified into 425 codes ({ }), 21 sub-categories (< >), and 7 categories ([ ]). In the following paragraphs, categories/sub-categories are listed from those with a larger number of codes. There were no characteristic differences among the occupations or facilities. The categories are also listed in Table 3.

[Devising measures for nutrition improvement and related collaboration (152)]

{Having an established system for nutrition assessment} and {making a meal round and conducting nutritional assessment through interprofessional collaboration each

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month} were classified into <assessing users' nutritional status using a system and through interprofessional/-institutional collaboration (54)>. {Using supplementary foods for users with malnutrition} and {ordering lunches to provide well-balanced meals for users living alone} were classified into <devising measures for nutrition improvement (38)>. {Discussing each user's nutritional status at admission and discharge conferences} and {describing users' nutritional status in summaries and liaison pathways and giving special notes on their favorite foods} were classified into <sharing information effectively using tools and promoting face-to-face communication (35)>. {Having an established interprofessional collaboration system for nutrition management within the facility} and {collaborating with a multidisciplinary nutrition support team} were classified into <sharing information through interprofessional collaboration within the facility (25)>. These sub-categories were finally summarized into **[devising measures for nutrition improvement and related collaboration]**, consisting of 152 codes, which was the largest number.

[Correlation between the nutritional status and mental/physical functions (68)]

{Feeling that the nutritional status is correlated with mental/physical functions} and {having realized the correlation between the nutritional status and mental/physical functions in some cases} were classified into <realizing the correlation between the nutritional status and mental/physical functions (30)>. {Having experienced a successful case of nutritional improvement for recovery from a bedridden condition} and {having encountered an end-stage user requiring full assistance for eating, who became able to eat normal foods after eating a sponge cake} were classified into <increasing users' levels of mental/physical functional independence by improving their nutritional status (17)>. {Feeling that a reduced food intake leads to a marked physical decline} and {finding it difficult to provide rehabilitation for users with a poor nutritional status} were classified into <noting an association between a worsened nutritional status and decreased level of mental/physical functional independence (14)>. {Being thanked by a family for the maintenance of oral food intake until the end} and {defining users' true independence as their ability to swallow until the last moment of life} were classified into <correlation between the maintenance of eating ability until the end of life and level of independence (5)>. {Having encountered many cases, where swallowing dysfunction led to eating difficulty, resulting in a rapid functional decline} and {observing that swallowing dysfunction accelerates physical decline} were classified into <correlation between the swallowing function and nutritional status (2)>. These sub-categories were finally summarized into **[correlation between the nutritional status and mental/physical functions]**, consisting of 68 codes.

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[Organizing nutrition improvement approaches (64)]

{Having a well-functioning multidisciplinary nutrition support team} and {providing nutritional improvement approaches through collaboration among multiple professionals, including physical therapists for positioning during meals and dentists to address poor dentures, in addition to nurses and nutritionists} were classified into <providing nutritional approaches through the nutrition support team and interprofessional collaboration (33)>. {Regularly holding training seminars led by the nutrition support team within the facility} and {increasingly discussing methods for nutritional improvement at conferences} were classified into <raising awareness of nutritional improvement among facility workers (21)>. {Starting rehabilitation from approaches to become able to eat regular foods} and {progressing nutritional improvement approaches by charging additional fees for the maintenance of oral food intake when calculating additional fees related to nutrition} were classified into <calculating additional fees for nutritional management and providing approaches to become able to eat regular foods as part of nutritional improvement (10)>. These sub-categories were finally summarized into **[organizing nutrition improvement approaches]**, consisting of 64 codes.

[Difficulty in collaborating with other professionals/institutions for nutrition improvement (61)]

{Not realizing that the facility is collaborating with other institutions for nutritional improvement} and {not having the facility systematically connected with other institutions} were classified into <having difficulty in collaborating with other institutions for nutrition improvement (38)>. {Realizing occupational differences in the level of collaboration for nutritional improvement} and {having a limited number of nurses creating nutrition information due to differences in the length of experience among facility workers} were classified into <difficulty in collaborating for nutrition improvement due to occupational differences and insufficient personal capacities (13)>. {Requiring sharable assessment tools to more actively collaborate with other professionals} and {recognizing the necessity of systems to share nutrition information with other community-based facilities and service offices} were classified into <difficulties due to the unavailability of collaboration tools (10)>. These sub-categories were finally summarized into **[difficulty in collaborating with other professionals/institutions for nutrition improvement]**, consisting of 61 codes.

[A lack of nutrition education and its necessity (47)]

{Having insufficient knowledge of nutrition due to a lack of experience of learning practical methods for nutritional improvement} and {lacking sufficient knowledge for nutritional improvement} were classified into <a lack of nutrition education (24)>. {Seeking more opportunities for training with other professionals and institutions} and {desiring to receive nutrition education and recognizing its necessity} were classified into

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<necessity of interprofessional nutrition education (23)>. These sub-categories were finally summarized into **[a lack of nutrition education and its necessity]**, consisting of 47 codes.

[Correlation between the nutritional status and environmental factors (17)]

{Noting a tendency of users living alone to rapidly and markedly lose weight due to difficulty in going for shopping and maintaining a sufficient food intake} and {feeling that hospitals worsen patients' nutritional status} were classified into <correlation between the living environment and nutritional status (14)>. {Observing that the physical conditions of users cared by aged family caregivers or sons tend to be poor, as they only eat rice balls bought at convenience stores day and night} and {realizing the difficulty of proceeding with nutritional improvement approaches without cooperation from families} were classified into <correlation between the family situation and nutritional status (3)>. These sub-categories were finally summarized into **[correlation between the nutritional status and environmental factors]**, consisting of 17 codes.

[Non-implementation of nutritional assessment and its necessity (16)]

{Finding it unnecessary to conduct nutritional assessment for users with eating ability} and {not having nutrition assessment tools available} were classified into <unavailability of assessment tools and non-implementation of nutritional assessment (14)>. {Hoping that tools for nutritional assessment will become available} and {hoping that parameters for assessment based on the body type and age will become available} were classified into <necessity of nutritional assessment tools (2)>. These sub-categories were finally summarized into **[non-implementation of nutritional assessment and its necessity]**, consisting of 16 codes.

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<Table 3> Nutrition Improvement Approaches for Care-dependent Older People in Community-based Integrated Care (n=425)

Category	Sub-category	Number
Devising measures for nutrition improvement and related collaboration (152)	Assessing users' nutritional status using a system and through interprofessional/-institutional collaboration	54
	Devising measures for nutrition improvement	38
	Sharing information effectively using tools and promoting face-to-face communication	35
	Sharing information through interprofessional collaboration within the facility	25
Correlation between the nutritional status and mental/physical functions (68)	Realizing the correlation between the nutritional status and mental/physical functions	30
	Increasing users' levels of mental/physical functional independence by improving their nutritional status	17
	Noting an association between a worsened nutritional status and decreased level of mental/physical functional independence	14
	Correlation between the maintenance of eating ability until the end of life and level of independence	5
	Correlation between the swallowing function and nutritional status	2
Organizing nutrition improvement approaches (64)	Providing nutritional approaches through the nutrition support team and interprofessional collaboration	33
	Raising awareness of nutritional improvement among facility workers	21
	Calculating additional fees for nutritional management and providing approaches to become able to eat regular foods as part of nutritional improvement	10
Difficulty in collaborating with other professionals/institutions for nutrition improvement (61)	Having difficulty in collaborating with other institutions for nutrition improvement	38
	Difficulty in collaborating for nutrition improvement due to occupational differences and insufficient personal capacities	13
	Difficulties due to the unavailability of collaborate on tools	10
A lack of nutrition education and its necessity (47)	A lack of nutrition education	24
	Necessity of interprofessional nutrition education	23
Correlation between the nutritional status and environmental factors (17)	Correlation between the living environment and nutritional status	14
	Correlation between the family situation and nutritional status	3
Non-implementation of nutritional assessment and its necessity (16)	Unavailability of assessment tools and non-implementation of nutritional assessment	14
	Necessity of nutritional assessment tools	2

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3. Analysis of the relationships among the categories and between them and frequent words (Figure 1)

The medical/welfare professionals' narratives were analyzed using Text Mining Studio Ver. 6.1 to examine the relationships among attributes and the categories and between them and relevant words. First, each word (morpheme)'s frequency of appearing was confirmed. The following words ranked among the top 20 through word frequency analysis: "nutritional status", "meal", "food intake", "nutrition", "correlation", "mental/physical functions", "nutritional improvement", "improvement", "nutrition information", "person", "nutritionist", "assessment", "hospital", "body weight", "nurse", "status", "collaboration", "training", "care manager", and "family". These frequent words were included in fragmentated codes.

Subsequently, the levels of correlation among attributes and the created categories and between these categories and the frequent words were confirmed using bubble charts for correspondence analysis. These charts examine correlations based on the distances between mapped attributes and words. There were no characteristic differences in the relationship between the occupation/type of facility and frequent words. On analyzing the relationships among the categories created from the interview data, with attributes converted into categories, the most frequent categories **[devising measures for nutrition improvement and related collaboration]** and **[correlation between the nutritional status and environmental factors]** were close to and strongly correlated with each other. **[Correlation between the nutritional status and mental/physical functions]** was distant and alone, but it was close to **[devising measures for nutrition improvement and related collaboration]** and **[difficulty in collaborating with other professionals/institutions for nutrition improvement]**, suggesting correlations with these categories. **[Difficulty in collaborating with other professionals/institutions for nutrition improvement]** was found between the 2 categories representing approaches to improve the nutritional status of care-dependent older people, **[devising measures for nutrition improvement and related collaboration]** and **[organizing nutrition improvement approaches]**, explaining that this is a challenge faced by these professionals when providing such approaches in community-based integrated care. As other challenges in this area, **[organizing nutrition improvement approaches]** and **[a lack of nutrition education and its necessity],** as well as **[devising measures for nutrition improvement and related collaboration]** and **[non-implementation of nutritional assessment and its necessity]**, were also close to and strongly correlated with each other.

As for the relationships between the categories and frequent words, "meal", "nutrition information", "person", "collaboration", "nutritionist", "assessment", "body weight", "care manager", "nurse", "family", and "hospital" belonged to the major category **[devising measures for nutrition improvement and related collaboration]**, and "nutritional status", "food intake", "improvement", and "status" were close to and strongly correlated with it. These words were included in the following codes, comprising [**devising measures for**

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nutrition improvement and related collaboration]: {adopting measures, such as conducting "assessment" based on the pattern of daily "meal" consumption and "food intake" representing the "nutritional status", and sharing "nutrition information" through "collaboration"}, {conducting "assessment", focusing on a loss of "body weight" that indicates a poor "nutritional status"}, {having the "nutritionist" attend all conferences with the "care manager" to discuss together}, {devising measures for each user to take meals through "collaboration" with his/her "family", in addition to professionals}, {recommending food delivery services for each "person" (user) with difficulty going for shopping}, {collecting information by asking the "hospital" "nurse" in charge to interview the user, when "collaboration" to obtain "nutrition information" is difficult}, {asking the "hospital" "nurse" in charge about the user's "food intake" and feasible measures for "improvement"}, and {asking the user's "family" about his/her "meal" "status"}. "Mental/physical functions" and "correlation" were close to and strongly correlated with **[correlation between the nutritional status and mental/physical functions]**. These words were included in the following codes, comprising this category: {having encountered many cases, where nutritional improvement paved the way for the recovery of "mental/physical functions"}, {realizing the "correlation" between the nutritional status and level of mental/physical independence}, and {realizing the "correlation" between a decrease in oral food intake and physical decline due to a loss of vitality}. "Nutrition" belonged to **[organizing nutrition improvement approaches]**, and "nutritional improvement" was close to and strongly correlated with it. These words were included in the following codes, comprising this category: {progressing "nutritional improvement" approaches by charging additional fees for the maintenance of oral food intake when calculating additional fees related to "nutrition"}, {noting that facility workers are increasingly devising measures to promote "nutrition" while increasing activity levels}, {having a committee for "nutritional improvement" as an institutional approach of the facility}, and {actively managing "nutrition" with a certified nurse in dysphagia nursing on the ward}. "Training" and "nutritional improvement" were close to and strongly correlated with **[a lack of nutrition education and its necessity]**. These words were included in the following codes, comprising this category: {not participating in "training" for "nutritional improvement" outside the facility}, {lacking opportunities to receive education for "nutritional improvement"}, {seeking "training" to develop insight into "nutritional improvement" approaches to be provided in an acute care hospital}, and {expecting that such "training" will provide a basis for career development in the aspect of "nutritional improvement"}. Most of the top 20 words were strongly correlated with **[devising measures for nutrition improvement and related collaboration]**. Figure 1 shows the results of correspondence analysis using bubble charts to analyze the relationships between the categories and words.

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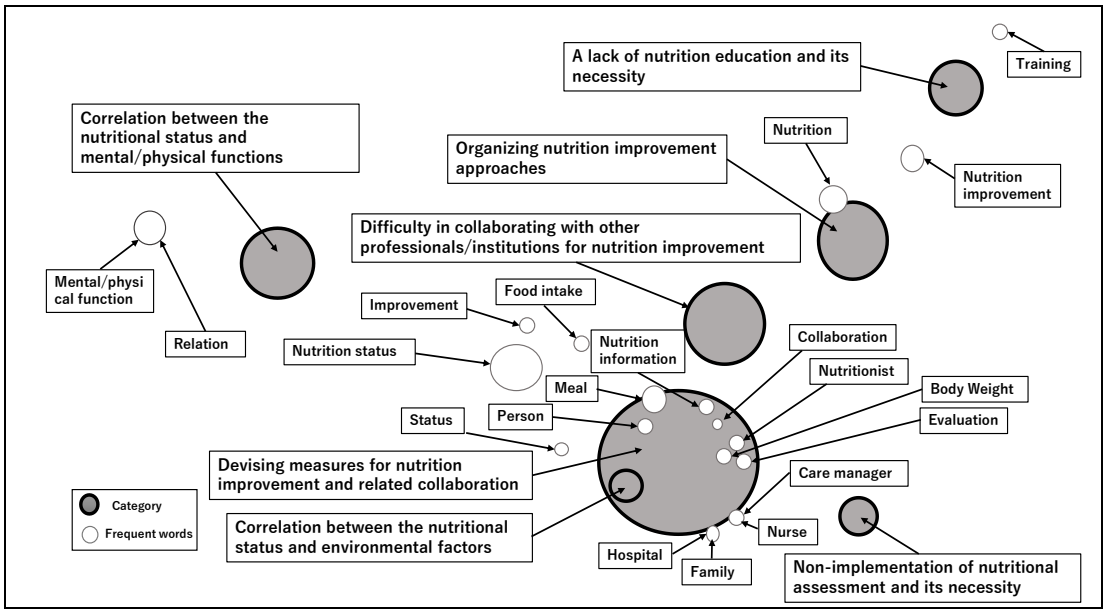

<Figure 1> Correspondence between categories and frequent words Bubble analysis results

4. Structure of nutrition improvement approaches for care-dependent older people in community-based integrated care and related challenges (Figure 2)

Based on the created categories, nutrition improvement approaches for care-dependent older people in community-based integrated care and related challenges were structured.

[Devising measures for nutrition improvement and related collaboration] and **[organizing nutrition improvement approaches]** represented the approaches actually provided to improve the nutritional status of care-dependent older people in community-based integrated care, and this indicates that all of the medical/welfare professionals engaged in community-based integrated care services were aware of the **[correlation between the nutritional status and environmental factors]** and **[correlation between the nutritional status and mental/physical functions]** in these older people. On the other hand, they faced various challenges such as **[difficulty in collaborating with other professionals/institutions for nutrition improvement], [a lack of nutrition education and its necessity]**, and **[non-implementation of nutritional assessment and its necessity]**. The results clarified a structure where **[difficulty in collaborating with other professionals/institutions for nutrition improvement]** is the major challenge in **[devising measures for nutrition improvement and related collaboration]** and **[organizing nutrition improvement approaches]**. Table 2 shows the structure of nutrition improvement approaches for care-dependent older people in community-based integrated care and related challenges.

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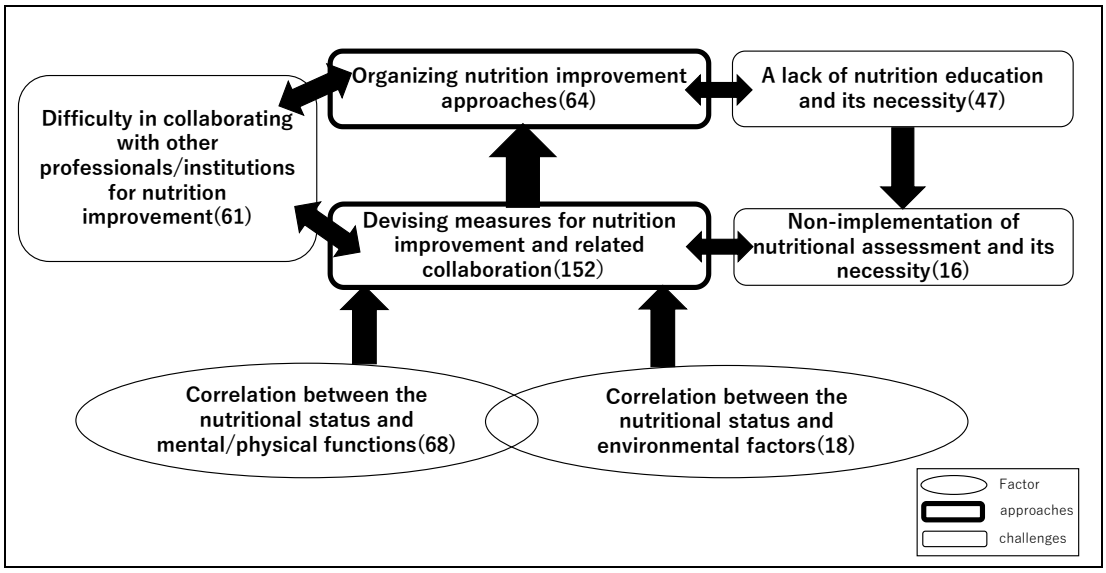

<Figure 2> Structure of the approaches and challenges of "nutrition improvement" for care-dependent older people in community-based integrated care

IV. Discussion

The interviewees were 12 medical and welfare professionals with a mean age of 40-49 and mean length of professional experience longer than 18 years. They were engaged in community-based integrated care services, playing a core role in each institution. Although the occupation and type of facility varied among them, the results clarified their overall tendencies regarding nutrition improvement approaches for care-dependent older people in community-based integrated care and related challenges.

The major category was **[devising measures for nutrition improvement and related collaboration]**, consisting of 152 codes. Most of the top 20 words extracted through correspondence analysis using bubble charts were strongly correlated with this category, clearly reflecting the medical/welfare professionals' awareness. The category represents the approaches actually provided by them to improve the nutritional status of care-dependent older people. Background factors associated with the category may be explained in connection with other categories. For example, another category strongly correlated with **[devising measures for nutrition improvement and related collaboration]** was **[correlation between the nutritional status and environmental factors]**, and this category consisted of the following codes: {suspecting malnutrition in most older people staying at hospitals}, {attributing a loss of appetite in many patients with dementia and older people to environmental changes caused by hospitalization}, {noting a tendency of users living alone to rapidly and markedly lose weight due to difficulty in maintaining a sufficient food intake}, and {noting a tendency of users living in special nursing homes for older people to have a reduced appetite}. Thus, the medical/welfare professionals noted

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care-dependent older people's poor nutritional status in each field of community-based integrated care. At the same time, the realization of the **[correlation between the nutritional status and environmental factors]** may have motivated them to adopt the representative approach, **[devising measures for nutrition improvement and related collaboration]**. Mizuno described motivation as follows: "Motivation is a mechanism to induce the drive to work. It is not forcibly executed by a third person, but it promotes individuals' spontaneous actions. Human beings adopt spontaneous actions from some motives"[11]. The major category **[devising measures for nutrition improvement and related collaboration]** represents the medical/welfare professionals' spontaneous actions, revealing that nutrition improvement approaches for care-dependent older people are spontaneously provided in the current community-based integrated care system. Another motive may have been the **[correlation between the nutritional status and mental/physical functions]**. The codes comprising this category include: {observing that eating simulates even people with no response}, {having encountered cases, where nutritional improvement markedly promoted speech} (effects of nutritional improvement), {mentioning cases, where fracture caused pneumonia, eating difficulty, and consequent malnutrition, resulting in a bedridden condition}, and {noting a correlation between a decrease in oral food intake and loss of vitality, leading to a bedridden condition} (risk of malnutrition). Thus, the realization of these effects and risk may have spontaneously led to **[devising measures for nutrition improvement and related collaboration]**. In a previous study conducted by the principal investigator, a correlation between the nutritional status and mental/physical functions of care-dependent older people living in residences for the elderly was also suggested[12]. Another representative approach actually provided was **[organizing nutrition improvement approaches]**, mainly consisting of the following codes: {providing approaches for users with markedly low albumin levels through nutrition support team intervention}, {holding training seminars led by the Nutrition Management Section and nutrition support team within the facility}, and {having been continuously providing nutritional improvement approaches in the facility, and becoming entitled to charge additional fees for nutritional management}. These codes explain that each institution begins to address this issue on an organization-wide basis. Tada noted, "Motivation for work requires reviews from an organizational perspective, and it places importance on the sharing of goals and information"[13]. When focusing on the sharing of goals and information, the following codes, comprising **[organizing nutrition improvement approaches]**, are suggestive: {improving users' nutritional status through collaboration between nutritionists and nurses}, {collaborating with the Department of Dentistry in the facility to examine users' oral conditions and adjust their dentures}, {finding interventions provided by physical therapists indirect, but effective}, and {collaborating with helpers to provide appropriate meals for each user}. Thus, when **[organizing nutrition improvement approaches]**, the sharing of goals and information may have promoted interprofessional collaboration. These approaches indicate that

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nutrition improvement approaches for care-dependent older people in community-based integrated care proceed from **[devising measures for nutrition improvement and related collaboration]** as a spontaneous action to **[organizing nutrition improvement approaches]**.

On the other hand, the results of correspondence analysis using bubble charts revealed various challenges. **[Difficulty in collaborating with other professionals/institutions for nutrition improvement]** was found between **[devising measures for nutrition improvement and related collaboration]** and **[organizing nutrition improvement approaches]**. **[Difficulty in collaborating with other professionals/institutions for nutrition improvement]** consisted of various codes, revealing insufficient collaboration with other institutions for nutritional improvement such as {not sharing information about nutritional improvement approaches for older people with other service offices}, {not actively collaborating with other institutions to improve users' nutritional status}, and {not obtaining information about users' past conditions, but starting their management by assessing their status on admission}. **[A lack of nutrition education and its necessity]** and **[non-implementation of nutritional assessment and its necessity]** are also challenges that have yet to be addressed. **[A lack of nutrition education and its necessity]** mainly consisted of {having not received formal nutrition education} and {hoping that sharable nutrition education will be provided to promote interprofessional collaboration}, while **[non-implementation of nutritional assessment and its necessity]** were represented by {not regularly conducting nutrition assessment for all users} and {hoping that tools for nutritional assessment will become available}. These challenges are similar to those reported by the principal investigator in a previous study involving care managers, who provided care management based on Japan's long-term care insurance system: [the importance of performing nutritional management through collaboration with other professionals and services], [insufficient nutrition education], and [difficulty in accurately assessing the nutritional status][14]. Thus, the present study additionally clarified challenges in improving the nutritional status of care-dependent older people in community-based integrated care.

[Devising measures for nutrition improvement and related collaboration] and **[organizing nutrition improvement approaches]** represented the approaches actually provided by the medical/welfare professionals for such a purpose, and this indicates that all of these professionals engaged in community-based integrated care services were aware of the **[correlation between the nutritional and status environmental factors]** and **[correlation between the nutritional status and mental/physical functions]** in these people. On the other hand, they faced various challenges such as **[difficulty in collaborating with other professionals/institutions for nutrition improvement], [a lack of nutrition education and its necessity]**, and **[non-implementation of nutritional assessment and its necessity]**. The results clarified a structure, where **[difficulty in collaborating with other professionals/institutions for nutrition improvement]** is the major challenge in **[devising measures for nutrition improvement and related**

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collaboration] and **[organizing nutrition improvement approaches]**, suggesting the necessity of opportunities for interprofessional education (IPE) and interprofessional work (IPW) beyond occupations and institutions to improve the nutritional status of care-dependent older people in community-based integrated care. Yoshimoto defines IPW as "collaborative work to achieve common goals with professionals from different specialty areas according to their skills and roles"[15]. Based on this, it may also be necessary to promote IPW or collaboration among multiple professionals toward the common goal of improving the nutritional status of care-dependent older people in community-based integrated care. Regarding this, Kohno reported as follows: "The promotion of teamwork has the most marked impact on interprofessional collaboration in the community-based integrated care system, and IPW has the most marked impact on the promotion of teamwork"[16]. Moreover, Hugh Barr of the Center for the Advancement of Interprofessional Education (CAIPE) in the United Kingdom described IPW as "a collaborative relationship based on interactive learning among multiple professionals"[17]. WHO also advocates IPE as an indispensable step for the development of medical human resources[18]. However, IPE is not a required subject in Japan's curricula to educate and train health, medical, and welfare professionals, and there is no occupation that should be educated and trained based on legally designated rules specifying IPE in Japan[19]. This may be a factor associated with the challenges identified in the present study, **[difficulty in collaborating with other professionals/institutions for nutrition improvement]**, **[a lack of nutrition education and its necessity]**, and **[non-implementation of nutritional assessment and its necessity]**. Although IPE is increasingly being recognized in actual educational settings[20], the results of the present study indicate the necessity of IPE and IPW to promptly address these challenges, and improve the nutritional status of care-dependent older people in community-based integrated care.

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ORIGINAL ARTICLE

Rapid E-mail Response to First-Contact E-mails Increases Consultation Continuation Rates for Suicide Prevention

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ABSTRACT

Online gatekeeping is a psychological consultation service using e-mail intended for Internet users with suicide risk. One of the problems is that some users do not respond to initial contact e-mails sent. This research aimed to clarify the relation between continuation rate of the service and the reply speed to user's first-contact e-mails. Specified Nonprofit Corporation OVA received initial mails from 324 people from June 2017 to June 2018, out of which 23 replies were error e-mails, and 11 people were not covered by our services; therefore, 290 users participated. We conducted a chi-square test to assess the association between three types of reply speed (within 12 h, between 12 and 24 h, and 24 h or more) and the consultation continuation rate. Reply speed for the e-mails arriving between 10 a.m. and 10 p.m. was related to consultation continuation: responses sent within 12 hours and those sent in over 12 hours produced continuation rates of over 70% and approximately 44%, respectively. Help-seeking intention of users with high-risk of suicide might begin to decline after they have waited for the reply from consultants for more than 12 hours. This study contributes to effectiveness of future suicide prevention consultation using media. Systems that consultants to reply to first-contact e-mails within 12 hours are important for initiation and continuation of consultation for suicide prevention.

< Key-words >
Suicide prevention, Online gatekeeping, E-mail consultation

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I. Introduction

A strategy to prevent suicide involves crisis intervention using media such as mobile phones and telephones to provide consultation activities and psychotherapy[1-3]. Internet usage rates have increased, and researchers have reported several methods of online crisis intervention[4-7]. One such technique is online gatekeeping, in which advertisements encourage individuals to use psychological consultation services when they search suicide-related words online, such as those that pertain to suicide methods[8]. This enables Internet users at high risk of suicide to access consultation services, which assess them for suicide risk and the types of issues they encounter, such as health, economic, work, and interpersonal relationships, and empowers them to seek help in the form of appropriate support.

The important advantages of online gatekeeping are twofold. First, advertisements linked to suicide-related words attract the attention of people at a higher suicide risk as opposed to those who do not search these words, and at risk individuals are then offered consultation services[9]. A previous study showed that many consultation service users were women under 30, of whom about 80% reported suicidal ideation, about 40% reported suicide plans, and about 40% reported suicide attempts[7]. Half of them had previously visited a psychiatric hospital. Thus, getting in contact with such high-risk groups is a clear advantage. Second, e-mail consultation leads to positive psychological changes among individuals as well as help-seeking behaviors that open opportunities for appropriate support. Of course, positive psychological changes are difficult to achieve in some cases (e.g., difficulty in developing rapport with a user because of cognitive distortion or their strong mistrust of service providers), but studies have reported that about 40% of users experience psychological or behavioral changes that prevent suicide[7]. This makes online gatekeeping a promising suicide prevention technique.

A problem related to continuous psychological consultation via e-mail for Internet users at high risk of suicide is the high dropout rate[8]. In a study on online gatekeeping, Sueki et al. replied to all first consultation e-mails from Internet users (hereafter called "first-contact e-mail/s"), but about 30% of users did not respond, and therefore, the consultation dropout rate was highest after the first-contact e-mail[8]. Online treatments for suicidal ideation have also shown that high dropout rates are a limitation[10,11]. In studies that have examined dropout rates from psychiatric services, one may assess dropout factors based on personal and medical information at the first consultation[12,13]. Meanwhile, with online gatekeeping, it is difficult to consider which personal factors are associated with dropouts from the first-contact e-mail, as users do not always divulge their personal information in these e-mails.

The discontinuation of consultation after a first-contact e-mail has been sent remains an issue, with two possible factors: the contents of the consultant's e-mail response to the user's first-contact e-mail and the urgency with which it is sent. For example, a study on

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suicide intervention via direct messages on social media showed that users prefer brief messages and an emphasis on their purpose[14]. Moreover, quick responses to online consultations are crucial[15,16]. In online gatekeeping practice, the contents of the reply to the first-contact e-mail have been developed based on the experience of the consultants; thus, there are not a lot of differences among the contents of the reply to the first-contact e-mail (e.g., empathetic understanding for user's story and assessment questions). On the other hand, the speed of consultants' response would likely vary depending on the consulting situation and the type of first-contact e-mails from users. Therefore, the current research aims to examine the speed of replies to first-contact e-mails.

In general, mental health counseling services conducted via e-mail do not have the apparatus to respond quickly. For example, a public e-mail consultation service for the mental health of workers has specified a one-week response window[17]. E-mail consultation services at the Federation of Inochi No Denwa, which originated from Samaritans helpline organization founded in London, have stated that replies may take several days[18]. Similarly, a human rights counseling service using e-mail responds after several days[19]. Nevertheless, a study on online gatekeeping factors that can lead to consultation success has suggested replying to first-contact e-mails within a short time span[20]. This study showed no differences in consultation continuation rates for consultants' replies to first-contact e-mails within 6 or 12 hours, but the rate was lower when the consultants replied to first-contact e-mails 12 to 18 hours after receiving them. However, the study used a small sample of first-contact e-mails (N = 157) and failed to significantly specify how quickly a consultant must respond. Therefore, the current research intends to examine differences in consultation continuation rates depending on whether an online consultant replied to a first-contact e-mail within 12 hours or more.

To achieve this purpose, we need to consider three factors associated with reply speed: (a) the day when the first-contact e-mails arrived, (b) the time when the first-contact e-mails arrived, and (c) the textual content of the first-contact e-mails.

Regarding (a) and (b), Tirel et al. showed that 3,291 people were inclined to contact online counselors during the evening and afternoon[21]. An online counseling service for problem gambling also showed that more than half of users accessed real-time chat during the evening, overnight, or weekends[22]. Thus, there seems to be a certain range of time in which individuals use online consultation services. A study on suicide timing in Japan showed that many middle-aged males committed suicide on Monday mornings while nonworking older people often took their own lives in the morning or the early afternoon[23]. However, according to this study, the time of day referred to when the individual was found dead and not the time they attempted suicide[23]. Combining these factors, one may receive more first-contact e-mails in the evening and overnight.

Currently, the online gatekeeping service is not available 24 hours a day, and our staff, who work in shifts, generally respond to users between 10:00 a.m. and 10:00 p.m. In reality, however, night-shift staff sometimes reply earlier than 10:00 a.m. or later than 10:00 p.m.

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in emergency cases where a user is in imminent danger of dying by suicide. Nevertheless, while users can e-mail us anytime, they may not receive our responses at the time they expect. Therefore, we examine whether consultation continuation rates differ according to the interaction between the arrival time of the first-contact e-mail and the speed of response.

With regard to (c), response time also must depend on whether the first-contact e-mail contains user consultation information. First-contact e-mails are often blank, and we have no choice but to reply with a fixed message; however, if these e-mails contain full consultation details, we need more time to read them so that we can assess the person and write a reply. The second purpose of the current research is to investigate whether consultation continuation rates differ according to the interaction between the presence of such details in the first-contact e-mail and the reply speed.

II. Methods

1. Online Gatekeeping Process

First, when Internet users search Google for suicide-related keywords, online gatekeeping displays advertisements with headings such as “If you want to die” and “If you are thinking about how to die” on the result pages. Clicking these links sends the user to a specific website that encourages them to use psychological consultation services. This website explains the process in which a team of licensed experts (for example clinical psychologist and psychiatric social worker) conducts e-mail consultations on suicidal ideation and then provides an e-mail address for this purpose. Users can either send a first-contact e-mail to the address by themselves after clicking on “send e-mail from here” button or provide their name, address, and consultation details in the website form, which was developed by WordPress. At this point, the users were explained regarding the website, the precautions regarding the consultation, the possibility that the anonymized consultation used for research, and that as they give their consent to them, they could send this service an e-mail.

After receiving the first-contact e-mail from users in Gmail, we send them an online questionnaire to evaluate their psychological state and obtain informed consent to use their answer for this research project; we then start the gatekeeping activity. Figure 1 shows an example reply to a first-contact e-mail. Specifically, we establish rapport with users by warmly paying attention to them and showing an appreciation for the great effort they have made. We then assess their issues and evaluate their risk of suicide. The final purpose is to encourage users to seek help so that they can access more appropriate in-person support. Several studies have focused on online gatekeeping[6-8]. After directing users to face-to-face support (e.g., consultation at a psychiatric hospital near the user’s residence), we follow up with them once every three to seven days for about one month to

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inquire about their current situation. The consultation concludes after we confirm the transition of support.

Dear [User's name],

Hi, we are members of [Supporter group's name].
Thank you for your e-mail.

You must be in pain about your troubles.
Thank you for telling us your story with such great courage.

We would like to think about how to ease your pain after discussing your story with you.

We would like you to answer the below questionnaire so that we can know more about your mental and physical condition while exchanging e-mails.
We would appreciate it if you could tell us about your feelings as much as you can.

We're waiting for your response.

[Supporter group's name]

<Figure 1> An Example Reply to Users' First-Contact E-mail

2. Data Collection and Analysis

The online gatekeeping service follows this process: A user clicks on a Google ad and sends us a first-contact e-mail, to which we respond. When the user replies, this would be considered a continuation of the consultation.

From June 2017 to June 2018, Specified Nonprofit Corporation OVA conducted an online gatekeeping project for residents in the Tokyo Metropolitan Area, Japan. Google displayed advertisements that encouraged our consultation services 610,670 times with 16,587 clicks (2.72% click rate). We received a total of 324 first-contact e-mails, which consisted of 184 from a previous study, collected from June 2017 to March 2018, and 140 new e-mails from March to June 2018[20].

We recorded the day and the time when we received the first-contact e-mails, whether they contain consultation details, and any user attributes that can be extracted from them. First, we used the chi-squared test to determine whether the day and time we received the first-contact e-mails and the presence of consultation information were associated with the speed of response. Second, we examined the relation between factors associated with reply speed and consultation continuation rate.

We calculated the reply speed to the first-contact e-mails by subtracting the date and time the first-contact e-mails arrived from the date and time of our reply. Although online gatekeeping prioritizes responses to first-contact e-mails, we sometimes take a long time

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to send our replies because of staffing issues; nevertheless, our responses rarely take more than 24 hours. To examine differences in consultation continuation rates depending on reply speed, we categorized reply speed into three: within 12 hours, between 12 and 24 hours, and after 24 hours or more.

For the e-mail arrival times, we used two shifts during which the first-contact e-mails were received—from 10:00 a.m. to 10:00 p.m. (Shift 1) and from 10:00 p.m. to 10:00 a.m. (Shift 2)—as most of our employees generally work in Shift 1 and Shift 2. The e-mails were also classified into two groups: blank or with text. Then, we ran chi-squared tests using HAD to analyze the relation between reply speed and consultation continuation rates based on these two categories[24]. We did not collect any personal information from the users when they clicked the advertisements or when they used the website.

III. Results

1. Information on First-Contact E-mails

1) First-contact e-mail arrival time

Table 1 shows that most first-contact e-mails were received on Thursdays (17.6%) and the least number of e-mails were received on Sundays (12.0%). However, no statistically significant differences were observed from this data.

<Table 1> Day and Time when the First-Contact E-mails Arrived

Day	Mon	Tue	Wed	Thu	Fri	Sat	Sun
N	44	46	45	57	49	44	39
%	13.6	14.2	13.9	17.6	15.1	13.6	12.0

Figure 2 shows the arrival times of the first-contact e-mails, most of which we received at midnight. The number of e-mails showed a decreasing trend in the early morning. From 7:00 a.m. to 11:00 p.m., we received about 5 to 15 e-mails per hour. In total, 154 first-contact e-mails (47.5%) arrived during Shift 2, and 170 first-contact e-mails (52.5%) arrived during Shift 1.

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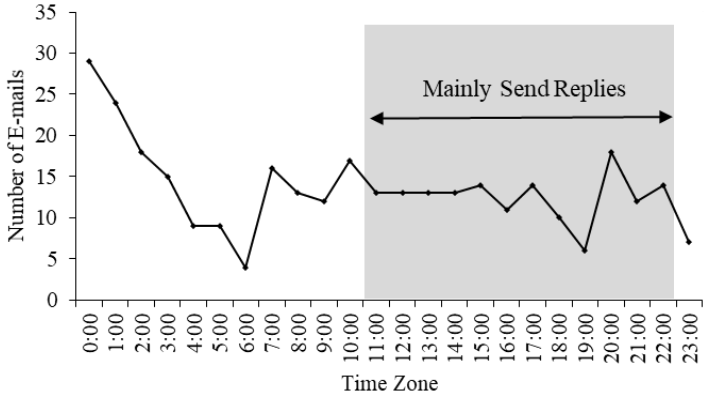

<Figure 2> Time Zones of the Total Number of First-Contact E-mails that Arrived during the Survey Period. The gray zone is the time zone in which our staff could generally send replies during Shift 1 (between 10:00 a.m. and 10:00 p.m).

2) Contents of first-contact e-mails

Of the 324 e-mails we received, 111 (34.2%) did not contain any consultation details.

3) Attributes of e-mail senders

Table 2 shows the individual characteristics (sex and age) of the e-mail senders. Personal attributes are not often provided in the contents of the first-contact e-mails. Judging from the number of people we could identify, many individuals were female and in their 20s and 30s. Two people stated in their e-mails that they were foreigners; however, all individuals could understand Japanese, as they search suicide-related keywords and read specific websites in Japanese.

<Table 2> Analyzed Individuals who Sent First-Contact E-mails

	Responses to Our Reply			
	Yes (n = 192)		No (n = 98)	
	N	%	*N*	%
Male	53	27.60	8	8.16
Female	128	66.67	25	25.51
Unknown	11	5.73	65	66.33
0–19	33	17.19	9	9.18
20–29	70	36.46	3	3.06
30–39	37	19.27	7	7.14
40–49	23	11.98	6	6.12
50–59	13	6.77	0	0.00
Unknown	16	8.33	73	74.49

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2. Correlation with Reply Speed

We replied to 223 e-mails (68.8%) within 12 hours, 54 e-mails (16.7%) between 12 and 24 hours, and 14 e-mails (4.3%) after 24 hours or more.

1) Reply process

Out of the 324 people who sent first-contact e-mails, we failed to deliver responses to 23 senders (7.1%) while 11 individuals (3.4%) were not covered by our services (e.g., they already had continuous consultations with psychiatric hospitals). Thus, we used the remaining 290 users to analyze consultation continuation. Among these individuals, 192 (66.2%) responded to us at least once.

Correlation between day of the week and reply speed. No significant differences were observed between reply speed and the day the first-contact e-mails arrived ($\chi^2(12)= 11.46$, $p=.49$, Cramer's V=.14, 95%CI=.00–1.00).

Correlation between arrival time and reply speed. The time when the first-contact e-mails arrived was relevant to the speed of response ($\chi^2(2) =15.31$, $p<.001$. Cramer's V=.23, 95%CI=.13–.35), as shown in Table 3. We replied more frequently to first-contact e-mails arriving during Shift 2 (adjusted residual=3.31, $p=.001$) between 12 and 24 hours whereas for first-contact e-mails arriving during Shift 1 (adjusted residual=−2.43, $p=.02$), we replied more often after 24 hours or more. We found no significant differences in replies within 12 hours regardless of the time when the first-contact e-mails arrived.

Correlation between e-mail contents and reply speed. We also observed no significant differences between reply speed and the presence of consultation content in the first-contact e-mails ($\chi^2(2)=5.67$, $p=.06$, Cramer's V=.14, 95%CI=.00–1.00).

<Table 3> Relation between Reply Speed and Time of Users' First-Contact E-mails Arrived

Time when Users' First-Contact E-mails Arrived	Reply Speed		
	within 12 h	between 12–24 h	24 h or more
Shift 1[a] (n = 136)	111	14	11
	81.6%	10.29%	8.1%
	(1.79)	(–3.31)	(2.43)
Shift 2[b] (n = 154)	112	39	3
	72.7%	25.3%	2.0%
	(–1.79)	(3.31)	(–2.43)

a Shift 1 = between 10:00 a.m. and 10:00 p.m. b Shift 2 = between 10:00 p.m. and 10:00 a.m.; first line = number of e-mails; second line = percentage of total e-mails received for a given time that were replied to within the time range; third line = adjusted residual.

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2. Correlation with Consultation Continuation Rate

Day of the week when the first-contact e-mails arrived. Table 4 shows the results of the chi-squared test. No significant associations were found between reply speed and consultation continuation rates based on the day of the week when the first-contact e-mails arrived (Mon:$\chi^2(2)=4.73$, $p=.09$, Cramer's V=.35; Tue: $\chi^2(2)=1.36$, $p=.51$, Cramer's V=.18; Wed:$\chi^2(2)=1.97$, $p=.37$, Cramer's V=.22; Thu: $\chi^2(2)=2.59$, $p=.27$, Cramer's V=.22; Fri:$\chi^2(2)=1.61$, $p=.45$, Cramer's V=.20; Sat:$\chi^2(2)=0.57$, $p=.75$, Cramer's V=.12; Sun:$\chi^2(2)=5.82$, $p=.05$, Cramer's V=.41; all days of the week Cramer's 95%CI=0.0–1.0).

<Table 4> Relation between Reply Speed and the Existence of Consultation Contents in Users' First-Contact E-mails

Existence of Consultation Contents in Users' First-Contact E-mails	Reply Speed		
	within 12 h	between 12–24 h	24 h or more
Full (n = 195)	146	42	7
	74.9	21.5	3.6
	(–1.17)	(2.06)	(–1.41)
Blank (n = 95)	77	11	7
	81.1	11.6	7.4
	(1.17)	(–2.06)	(1.41)

First line = number of e-mails; second line = percentage of total e-mails with/without consultation contents that were replied to within the time range (%); third line = adjusted residual.

Reply speed and time when the first-contact e-mails arrived. Figure 3 shows that, in the case of first-contact e-mails arriving during Shift 1, the consultation continuation rates were 72.1% (80/111) when we replied within 12 hours, 42.9% (6/14) when we replied in between 12 and 24 hours, and 45.5% (5/11) when we replied after 24 hours or more. The chi-squared test on reply speed revealed differences in continuation rates ($\chi^2(2)= 7.28$, $p=.03$, Cramer's V=.23, 95%CI=0.0–1.0). Moreover, residual analysis showed that more users continued with the consultation services (adjusted residual=2.70, $p<.01$) when replied within 12 hours, but the number of users decreased (adjusted residual=−2.02, $p<.05$) when we responded in between 12 and 24 hours. The continuation rate when we replied after 24 hours or more was not significant (adjusted residual=−1.58, $p=.12$). Among the 11 first-contact e-mails whose responses took 24 hours or more, six arrived during the holidays and the remaining e-mails arrived on weekdays.

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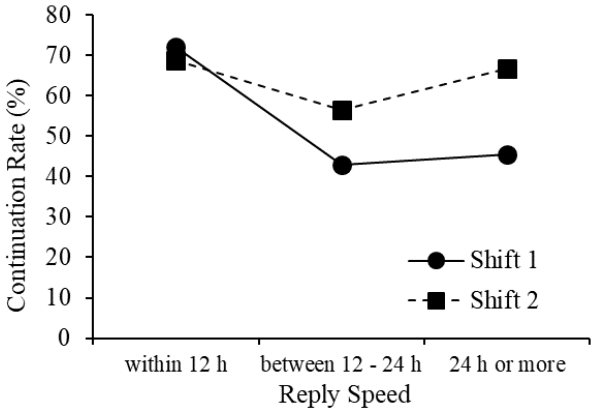

<Figure 3> Relation of Consultation Continuation Rate and Reply Speed within the Time when the First-Contact E-mails Arrived. The black solid line is the continuation rate (continuation e-mails/all e-mails) of the first-contact e-mails arriving during Shift 1 (between 10:00 a.m. and 10:00 p.m.); the black dashed line is the continuation rate of the first-contact e-mails arriving during Shift 2 (between 10:00 p.m. and 10:00 a.m.)

For first-contact e-mails arriving during Shift 2, the consultation continuation rates were 68.8% (77/112) when we replied within 12 hours, 56.4% (22/39) when we replied in between 12 and 24 hours, and 66.7% (2/3) when we replied after 24 hours or more. The chi-squared test on reply speed was not significant ($\chi^2(2)=1.95$, $p=.38$, Cramer's V=.11, 95%CI=0.0–1.0). Residual analysis showed no significant differences in consultation continuation when we replied within 12 hours (adjusted residual=1.35, $p=.18$), in between 12 and 24 hours (adjusted residual=−1.40, $p=.16$), and after 24 hours or more (adjusted residual=−0.04, $p=.97$). All three first-contact e-mails whose replies took 24 hours or more arrived on weekdays.

Reply speed and presence of consultation contents in the first-contact e-mails. We analyzed the relation between reply speed and consultation continuation rates based on the two categories for the contents of the first-contact e-mails. As shown in Figure 4, for first-contact e-mails with text, the consultation continuation rates were 73.3% (107/146) when we replied within 12 hours, 57.1% (24/42) when we replied in between 12 and 24 hours, and 42.9% (3/7) when we replied after 24 hours or more. The chi-squared test on reply speed revealed differences in continuation rates ($\chi^2(2)=6.21$, $p<.05$, Cramer's V=.18, 95%CI=0.0–1.0). Moreover, residual analysis showed that more users continued with the consultation services (adjusted residual=2.38, $p=.018$) when we responded within 12 hours.

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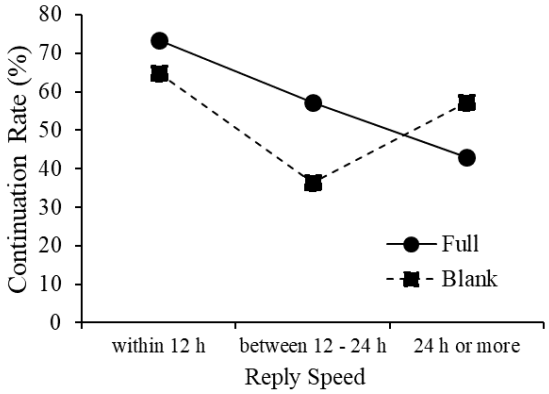

<Figure 4> Relation of Consultation Continuation Rate and Reply Speed with the Presence of First-Contact E-mail Contents. The black solid line is the continuation rate (continuation e-mails/all e-mails) of first-contact e-mails with text; the black dashed line is the continuation rate of empty first-contact e-mails.

When the blank first-contact e-mails arrived, the consultation continuation rates were 64.9% (50/77) when we replied within 12 hours, 36.4% (4/11) when we replied in between 12 and 24 hours, and 57.1% (4/7) when we replied after 24 hours or more. The chi-squared test on reply speed was not significant ($\chi^2(2)=3.35$, $p=.19$, Cramer's V=.19, 95%CI=0.0–1.0). Residual analysis showed no significant differences in consultation continuation when we responded within 12 hours (adjusted residual=1.61, $p=.11$), between 12 and 24 hours (adjusted residual=−1.79, $p=.07$), and after 24 hours or more (adjusted residual=−0.22, $p=.83$).

Ⅳ. Discussion

We observed that the possibility of continuing e-mail consultation services for suicide prevention increases when replies were sent within 12 hours, which supports the hypothesis. The results showed that reply speed for first-contact e-mails arriving during Shift 1 and reply speed for first-contact e-mails that contain text were related to consultation continuation rates. These results suggest that the help-seeking behaviors of some users at risk of suicide did not recur after they have waited for 12 hours to receive a response from the consultants.

The data also imply that users' expectations for urgency of response differ depending on when they sent and what they write in the first-contact e-mail. We speculate that their expectations regarding consultation diminish quickly, as they experience difficulty seeking professional assistance and face-to-face help to begin with. For example, those who send first-contact e-mails at night or in the early morning may be willing to wait

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longer for a reply than those who reach out during the day, as the former are likely to think that the "reply will not come soon." Similarly, users who sent blank e-mails are inclined to send e-mails as a trial with low expectations for replies in the first place, and the time to respond might not influence their help-seeking intentions. In that respect, we may have to reply more quickly to first-contact e-mails arriving during the day.

In addition, the need for consultation may have also diminished, as users' suicidal ideation and difficulties may have weakened after they sent the first-contact e-mails. Moreover, some people may have stopped consulting after reading our responses. The worst case would be that they may not reply anymore, as they may have already died by suicide. Indeed, to reduce these risks, we conclude that it is imperative that first-contact e-mails be responded to within 12 hours.

The first-contact e-mails for the online gatekeeping service arrived whenever people were in pain and thought about suicide regardless of the day. This was different from previous research on online consultation services that were often used on weekends[22]. On the other hand, as with some studies, many first-contact e-mails arrived at midnight, with the number decreasing in the morning[21,22]. This shows that people often search suicide-related keywords and send e-mails before going to bed at night. While individuals who are aware of consultation needs may actually afford to take action on weekends, online gatekeeping prompts a consultation whenever a user searches for such statements as "I want to die," thus the high possibility that they are not yet aware of their latent consultation needs at the time.

These findings have emphasized the importance of reply speed in suicide prevention consultations, thus contributing to the literature on e-mail consultations for other issues as well as next-generation consultation systems via media such as online chat.

V. Conclusion and Implications

Consultation organizations that implement outreach activities for people at risk of suicide using search-linked advertising are required to organize their staff in such a way that users receive responses to their first-contact e-mails within 12 hours. This study highlights the need for adequate staff at all times, if at all possible, rather than simply on weekends. As mentioned in the introduction, most current e-mail counseling services declare that responses would take several days.[18,19] Thus, budget allocations for suicide countermeasures would allow for more staff to be deployed and trained. To quickly reply to first-contact e-mails with consultation details, consultation organizations and the government must provide intervention skill training such as psychological assessment and improve consultants' ability to respond to first-contact e-mails within 12 hours.

This study has three limitations that require consideration. First, the present data were insufficient in determining whether users would continue consultation services if our

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responses took 24 hours or more, as the sample size for this category was small. Although day of the week and reply speed were not statistically related, half of the e-mails whose responses took 24 hours arrived on holidays, which means replies may take longer when human resources are limited, especially on holidays.

Second, because the service users' attributes were unknown in this study, other factors may be confounded. As such, we were compelled to determine their attributes and desired services from their first-contact e-mails. Therefore, these factors were not incorporated into the analysis. For example, it may have been difficult for male users to continue consultation e-mails because, hypothetically, we inadvertently took a long time to reply to them. Similarly, a user's suicidal ideation may play a role in consultation continuation. Van Spijker et al. showed that severe symptoms could interrupt the accomplishment of online self-care programs for suicide prevention, suggesting that severe suicidal ideation decreases one's tendency to seek help[11]. Hence, future studies that examine consultation continuation rates after a certain period has passed since obtaining information about a user's suicide risk would offer insights into the relation between suicidal ideation severity and consultation continuation.

Third, the speed of response depends on the consulting organization's business hours, which is not a random factor. In the present study, we could not completely dismiss the influence of the correlation between the time of day when a user's first-contact e-mail arrived and the time of day when we replied to them. Therefore, future research would benefit from randomizing the day and time of response to the first-contact e-mails, as this would allow for a more precise examination of its influence on consultation continuation rates.

Little evidence has been presented regarding how online consultations, including those that use e-mails, can be effectively conducted. While this research focused on the issue of reply speed to first-contact e-mails, other factors may affect the continuation of consultation as well as its success or failure. Thus, future research efforts need to analyze how users' attributes and the reception systems of online consultation can help build a consultation service system that effectively uses human/economic capital[25].

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ORIGINAL ARTICLE

Factors that Affect the Estimated Revenue of Kantaki Services:
Multifunctional in-home Long-term Care in Japan

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ABSTRACT

Objectives: In order to cope with a rapidly aging national population, the Japanese government promotes the use of a comprehensive community care system known as Kantaki, which was established in 2012. Aimed at older populations, Kantaki offers a variety of services, including home-visit nursing care, day care, and overnight care. This study clarified the factors that affect the estimated revenue of Kantaki services through a secondary analysis of detailed information released by the Ministry of Health, Labour and Welfare (MHLW). Our goal was to provide information that may facilitate the stable management of Kantaki operations across Japan.
Methods: We conducted a secondary analysis of official statistics data and detailed information released by the MHLW in April 2020. As such, we calculated the estimated revenue for Kantaki services. We then conducted a logistic regression analysis with estimated revenue set as the dependent variable in order to assess the magnitude of each influencing factor.
Results: A total of 594 multifunctional in-home long-term care services were established. Of these, 506 met the requirements for Kantaki set in this study's analysis. The logistic regression analysis showed that items with large odds ratios included tube feeding (2.59), enhanced working conditions for care workers (I) (2.58), and colostomy/ileostomy care (1.76).
Conclusion: To achieve stable management practices for Kantaki, it is important to handle at-home medical needs through the use of skilled care workers, who must be properly trained and ensured stable employment.

< Key-words >
long-term care, community health care, estimated revenue, facility management, profitability

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I. Background

The 2019 White Paper on the Aging Society[1] reported that 35.58% of the Japanese population was aged 65 years or older as of October 1, 2018, thus comprising 28.1% of the total national population. This is the highest such proportion in the world. In the context of an aging society, the increasing demand for long-term care services previously resulted in the establishment of the Japanese long-term care insurance system in the year 2000. The Long-Term Care Insurance Law provides nursing care services to individuals aged 65 years or older with long-term care needs according to their specific level of need (certified into five levels based on their condition) at a cost of 10% of the total cost. To further cope with a rapidly aging population, the Japanese government implemented a 2012 amendment to the Long-Term Care Insurance Law, which clearly states that a comprehensive community care system should be promoted through several subsystems, including multifunctional in-home care services. Here, the primary aim is to provide seamless service provisions.

These multimodal services are run through businesses, in which a single office provides a variety of unique services. For example, provisions include a combination of home health services, home care services, short-stay services, and day care services in order to meet different client needs to remain in the community. These businesses have been referred to as Kantaki services since 2015. In theory, there is a high need for Kantaki services, as they can support individuals who are highly dependent on medical care and who may thus require comprehensive life support.

There were 479 Kantaki businesses in Japan as of December 2018. However, this only covered around 13% of all municipalities, thus showing limited availability[2,3]. This lack of widespread coverage is primarily due to the difficulty associated with achieving stable management practices for Kantaki services. There are two main reasons for this. First, it is difficult for small-scale businesses to secure the human resources needed to provide complex services; second, it is difficult to secure a sufficient number of service users[4]. As a result, it has been revealed that many Kantaki are operating at a loss[4]. Despite these concerns, there is a lack of scholarly research on the factors that influence Kantaki profitability. The Ministry of Health, Labour and Welfare (MHLW) publishes data related to Kantaki operations on its public website[5], and will also release more detailed information upon request.

Therefore, the purpose of this study was to investigate the factors that affect the stability of Kantaki operations, and in particular, to use the data related to income to calculate the revenue of Kantaki services and to estimate the factors that affect it.

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II. Objectives

This study clarified the factors related to estimated service revenue through a secondary analysis of detailed information on Kantaki operations released by the MHLW. In this regard, our goal was to provide information that could facilitate the stable management of Kantaki operations across Japan.

III. Methods

1. Research design

Secondary analysis (descriptive correlation study) using data released by the MHLW.

2. Implementation period

April 2020

3. Data collection

As of the end of March 2020, we obtained public information on all Kantaki services managed by the MLHW, then created a database.

4 . Data contents

1) User information

Number of users based on the Care Needs Levels (CNL), number of users by gender

2) Estimated revenue

To estimate actual revenue for Kantaki services, we defined and calculated basic revenue using the allowance of CNLs among users, number of users, and regionally adjusted unit price as the estimated revenue[6]. Specifically, estimated revenue was calculated as follows:

{(¥12,341× number of users at CNL1) + (¥17,268 × number of users at CNL2) + (¥24,274 × number of users at CNL3) + (¥27,531 × number of users at CNL4) + (¥31,141 × number of users at CNL5)} × regionally adjusted unit price

The regionally adjusted unit price is set by the government to reflect the wage levels of private sector workers in municipalities, ranging from 10-11.4 to yen/unit[7]. In addition to estimated revenue, additional allowances are given for special conditions, such as provisions involving specialized skilled nursing care (e.g., dementia care, terminal care, etc..) and enhanced working conditions for care workers. The latter of these refers to a system of improvement that offers relevant career paths and enhanced working

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environments. For example, salaries must be systematically raised based on experience and/or qualification; there must also be an appraisal process occurring on regular bases, in which documentation is available to all care workers. Payments are reduced in cases the additional allowance requirements are not fully met.

3)Facility characteristics

Duration of continuous operation, utilization status (average age of users, capacity of day care services, capacity of overnight services, establishment type, managerial occupation)

4)Employee characteristics

Number of full-time equivalent nursing staff, number of full-time equivalent care workers, number of full-time care workers with certifications (e.g., national certification for care workers, completion of initial training), number of employees based on years of experience, number of staff on night shifts, and on-call nighttime staff.

5)Information on service provisions

Whether medical care is available (13 total items, such as indwelling bladder catheter care, home oxygen therapy), whether additional allowances for special conditions are obtained.

5. Analysis method

To clarify the factors related to estimated revenue for Kantaki services, we divided them into high estimated revenue and low estimated revenue groups; these groups were compared based on their characteristics, including the employee characteristics and service provision status. Among these characteristics, the number of consecutive months and utilization status were compared between groups using the Mann-Whitney U test. After cross-tabulation, we conducted χ^2 tests to compare three establishment types (for-profit corporations, medical corporations, and social welfare corporations) × the two estimated revenue groups and two managerial credentials (nurse or care worker) × the two estimated revenue groups. We then examined the magnitude of each factor's influence on estimated revenue using a logistic regression analysis with estimated revenue set as the dependent variable (high revenue group: 1, low revenue group: 0); variables shown as significant via the single regression analysis were entered stepwise as independent variables. To avoid collinearity, we confirmed that the correlation coefficients with estimated revenue were less than 0.7; the correlation coefficients between the independent variables were also less than 0.7. We used the IBM SPSS ver26 software to conduct all such analyses (significance probability was set to 5%).

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IV. Results

A total of 594 multifunctional in-home long-term care services had been established by the end of March 2020. Of those, 13 did not meet the requirements for Kantaki services, and were thus excluded from this analysis. As our examination was focused on the stability of Kantaki operations, another 75 were eliminated because they had been in operation for less than two years. Ultimately, a total of 506 Kantaki services were subjected to the analysis.

1. User information (Table 1)

The means and standard deviations for the registered capacity and actual number of users were 26.7±4.5 and 20.7±6.0, respectively. The system contained a maximum number of 29 registered users, while the average user age was 83.7±5.0 years, and the average numbers of male and female users were 6.7±3.2 and 14.0±4.9, respectively. Users were aggregated based on their CNLs, in decreasing order of need; 3.6±2.8 were deemed CNL1, 4.4±2.6 were CNA2, 4.1±2.3 were CNL3, 4.2±2.5 were CNL4, and 4.4±3.4 were CNL5.

2. Estimated revenue and business characteristics (Table 2)

The means and standard deviations of estimated revenue for the entire Kantaki was 4,982,837.8 ± 1,615,919.1 yen/month, with a mean continuous business duration of 48.8 months (range of 15-92). Duration was significantly longer in the high revenue group. In terms of establishment type, 252 (49.8%) were for-profit corporations, while 114 (22.5%) were medical corporations, and 91 (18.0%) were social welfare corporations. In terms of managerial occupations, 220 (43.5%) were nurses and 249 (49.2%) were certified care workers; more nurses were managers in the high revenue group.

3. Employee information (Table 3)

The mean number of full-time equivalent nursing staff was 4.4±2.5, while the mean number of full-time equivalent care workers was 9.03.1. In both cases, the number of employees was significantly higher in the high revenue group. In terms of the number of employees based on years of experience, the largest number of care workers had between one and three years of experience, with 2.0±2.4 full-time employees and 1.6±2.6 part-time employees. The largest number of nursing staff had more than 10 years of experience (1.4±2.0 full-time and 1.0±2.1 part-time). Both groups had more care workers than nursing staff; however, the high revenue group had significantly more care workers at most experience levels. There was also a significant tendency for the high revenue group to have more certified full-time care workers.

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4. Service provision information for receiving additional allowances (Table 4)

An average of 7.8±3.9 of the 13 total care procedures were performed. The most frequently performed procedures were indwelling bladder catheter care (433, 85.6%) and tube feeding (407, 80.4%), while the less frequently performed procedures were ventilator care (132, 26.1%) and home self-peritoneal dialysis (141, 27.9%). Among the 13 procedures, there were no significant intergroup differences in the three items of home central venous nutrition, ventilator care, and self-peritoneal dialysis. Special conditions that provide additional allowances were reported for 12. Regarding the Kantaki that handled these, the following numbers were obtained: dementia care I (464, 91.7%), dementia care Ⅱ (441, 87.2%), strengthened service provision system Ⅲ (20, 4.0%), and enhanced working conditions for care workers Ⅲ (21, 4.2%).

5. Logistic regression analysis with estimated revenue set as the dependent variable(Table 5)

The logistic regression analysis with estimated revenue set as the dependent variable revealed three items with large odds ratios, including tube feeding (2.59), enhanced working conditions for care workers (I) (2.58), and colostomy/ileostomy care (1.76).

<Table 1> User information in Kantaki (n=506)

	Mean	SD
Number of users	20.7	6.0
Number of users at CNL1	3.6	2.8
Number of users at CNL2	4.4	2.6
Number of users at CNL3	4.1	2.3
Number of users at CNL4	4.2	2.5
Number of users at CNL5	4.4	3.4
Men	6.7	3.2
Women	14.0	4.9

(persons)

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<Table 2> The estimated revenue and characteristics of Kantaki

	All n=506		High n=253		Low n=253		*p*
	Means	SD	Means	SD	Means	SD	
Estimated revenue (1,000 yen)	4982	1615	6263	878	3702	1081	—
Duration of continuous operation (month)	48.8	22.2	51.2	21.8	46.5	22.3	.017※
Utilization status							
Average age of users (age)	83.7	5.0	84.0	3.0	83.5	6.4	.770※
Capacity of day care service (persons)	15.6	3.0	16.5	2.9	17.3	2.5	.000※
Capacity of overnight service (persons)	7.5	1.8	7.5	1.8	7.6	1.7	.411※
	n	%	n	%	n	%	*p*
Establishment type							
For-profit corporation	252	49.8	127	50.2	125	49.4	
Medical Corporation	114	22.5	56	22.1	58	22.9	.936¶
Social welfare corporation	91	18.0	44	17.4	47	18.6	
NPO	17	3.4	9	3.6	8	3.2	
Incorporated associations and foundations	15	3.0	8	3.2	7	2.8	
Co-op	11	2.2	8	3.2	3	1.2	
Other corporations	3	0.6	0	0.0	3	1.2	
Others	3	0.6	1	0.4	2	0.8	
Managerial occupation							
Registered Nurse	220	43.5	121	47.8	99	39.1	
Certified care worker	249	49.2	116	45.8	133	52.6	.079¶
Others	37	7.3	16	6.3	21	8.3	

※:Mann-Whitney U test, ¶:$\chi 2$ test

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<Table 3> Employee characteristics

	All n=506		High n=253		Low n=253		*p*
	Means	SD	Means	SD	Means	SD	
Nurse							
Number of full-time equivalent nursing staff	4.4	2.5	4.8	2.9	4.0	2.0	.001
Number of employees by years of experience							
1 year full-time	0.6	1.0	0.6	1.0	0.6	1.0	.691
part-time	0.6	1.3	0.5	1.0	0.6	1.4	.226
1-3 years full-time	0.9	1.5	1.0	1.5	0.9	1.6	.259
part-time	0.8	1.5	0.9	1.5	0.8	1.4	.592
3-5 years full-time	0.5	1.1	0.6	1.3	0.4	0.8	.478
part-time	0.4	0.8	0.4	0.9	0.3	0.7	.334
5-10 years full-time	0.5	1.0	0.5	1.1	0.4	0.9	.160
part-time	0.4	1.0	0.4	1.0	0.4	0.9	.193
over 10 years full-time	1.4	2.0	1.6	2.3	1.1	1.8	.091
part-time	1.0	2.1	1.2	2.4	0.9	1.7	.609
Care worker							
Number of full-time equivalent care workers	9.0	3.1	10.4	2.8	7.6	2.8	.000
Number of employees by years of experience							
1 year full-time	1.1	1.6	1.2	1.6	1.1	1.6	.370
part-time	1.1	1.7	1.1	1.7	1.1	1.8	.491
1-3 years full-time	2.0	2.4	2.2	2.6	1.7	2.1	.043
part-time	1.6	2.6	1.7	2.6	1.4	2.6	.108
3-5 years full-time	1.3	1.7	1.6	1.8	1.0	1.4	.000
part-time	0.9	1.4	1.0	1.5	0.7	1.3	.019
5-10 years full-time	1.4	1.8	1.6	1.9	1.2	1.6	.036
part-time	0.8	1.4	0.9	1.5	0.6	1.2	.008
over 10 years full-time	1.4	1.9	1.7	2.2	1.1	1.6	.002
part-time	0.6	1.5	0.8	1.8	0.5	1.1	.126
Number of care workers with national certification	3.9	2.8	4.7	2.9	3.2	2.4	.000
Number of care workers with completion of the initial training	1.3	1.6	1.4	1.7	1.2	1.6	.332
Number of staff on night shifts	4.3	3.5	4.8	3.9	3.8	3.0	.009
Number of staff on call at night	2.1	2.7	2.3	3.0	2.0	2.5	.527

(persons) Mann-Whitney U test

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<Table 4> Information on service provision

	All n=506		High n=253		Low n=253		*p*
	n	%	n	%	n	%	
Medical care							
Indwelling bladder catheter care	433	85.6	234	92.5	199	78.7	.000
Home oxygen therapy	410	81.0	220	87.0	190	75.1	.001
Tube feeding	407	80.4	226	89.3	181	71.5	.000
Suction	394	77.9	208	82.2	186	73.5	.024
Intravenous infusion/injection	392	77.5	205	81.0	187	73.9	.070
Colostomy/ileostomy care	351	69.4	197	77.9	154	60.9	.000
Pain management using narcotics	302	59.7	166	65.6	136	53.8	.009
Renal and bladder transplantation care	282	55.7	153	60.5	129	51.0	.039
Home central venous feeding	263	52.0	151	59.7	112	44.3	.001
Artificial bladder care	220	43.5	121	47.8	99	39.1	.060
Tracheal care	212	41.9	118	46.6	94	37.2	.038
Peritoneal dialysis	141	27.9	72	28.5	69	27.3	.843
Ventilator care	132	26.1	71	28.1	61	24.1	.362
Item receives additional allowance							
Dementia care (I)	464	91.7	238	94.1	226	89.3	.075
Dementia care (Ⅱ)	441	87.2	228	90.1	213	84.2	.062
Attending hospital discharge conference	286	56.5	153	60.5	133	52.6	.088
Emergency home visit by nurse	423	83.6	230	90.9	193	76.3	.000
Enhanced special management (Ⅰ)	380	75.1	211	83.4	169	66.8	.000
Enhanced special management (Ⅱ)	366	72.3	204	80.6	162	64.0	.000
Terminal care	333	65.8	183	72.3	150	59.3	.003
Strengthed service provision system (Ⅱ)	66	13.0	33	13.0	33	13.0	1.00
Strengthed service provision system (Ⅲ)	20	4.0	13	5.1	7	2.8	.254
Enhanced working condition(Ⅰ)	419	82.8	229	90.5	190	75.1	.000
Enhanced working condition (Ⅱ)	40	7.9	19	7.5	21	8.3	.869
Enhanced working condition (Ⅲ)	21	4.2	6	2.4	15	5.9	.072

χ^2 test

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<Table 5> Results of logistic regression analysis

Variables	Odds	95% Confidence interval			*p*
Enhanced working condition(Ⅰ)	2.58	1.39	−	4.78	.003
Tube feeding	2.57	1.42	−	4.65	.002
Colostomy/ileostomy care	1.80	1.11	−	2.94	.018
Number of full-time equivalent care workers	1.38	1.27	−	1.50	.000
Capacity of day care service	1.20	1.09	−	1.32	.000
Number of full-time equivalent nursing staff	1.12	1.02	−	1.22	.017

V. Discussion

This study examined the factors that affected estimated revenue for Kantaki services by conducting a secondary analysis of national data. Based on this, we offer the following suggestions to stabilize Kantaki operations and promote utilization:

1. Characteristics of Kantaki Management

The results of this study were compared with the 2017 Kantaki report[4] to discuss the characteristics of the Kantaki Management. The fact that the group with the high revenue group had a longer operating period (Table2) was consistent with the previous reports[4] that a certain period of time is needed to convert to profitability. It was suggested that setting up a system to provide financial support after the opening would be effective for Kantaki management.

The mean values of the capacity of daycare service and capacity of overnight service were similar to those in the previous reports[4]. Only the former remained as a significant variable for estimated revenue in the regression analysis (Table5), which was a new finding in this study. The reason for this might be the daycare service including medical services which contribute to a comprehensive community care system[8]. On the other hand, organizational structures such as establishment body and managerial occupation did not have any effect on the revenue.

2. Improve the ability to meet medical needs

This study revealed that the provision of medical care improved the estimated revenue (Table 4).

Results showed that Kantaki users were a mixture of elderly persons with wide ranging differences in independence (Table1). In addition, indwelling bladder catheter care, home oxygen therapy, and tube feeding were performed in more than 80% of Kantaki services, while more than 90% provided additional services for dementia, thus indicating that Kantaki services are currently responding to a variety of home care needs(Table4).

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Further, the regression analysis showed that tube feeding and colostomy/ileostomy care had particularly notable impacts on estimated revenue(Table5). In this regard, a 2011 survey showed that 10% of those utilizing home care nursing received tube feeding; among these individuals, 90% with gastrostomy were bedridden, which may increase the associated workload[9]. A survey conducted by the Japan Ostomate Association[10] also reported that 61.3% of ostomates were over 70 years of age, while 19.6% were over 80 years of age. Finally, a 2011 report on the level of care required by ostomates showed that the percentage of ostomates requiring care was higher than the percentage of the total population requiring care, even when adjusted for age[11]. Advances in perioperative management have made it possible to introduce stomas at older ages; however, due to shorter hospital stays, there has also been an increase in the number of patients treated at home without sufficient knowledge and skills of procedures and self-care, thereby resulting in a wide range of stoma problems reported by home care nurses[12].

3. Retain care work personnel

In this study, it was a new finding that in addition to providing medical care, management systems such as enhanced special management and enhanced working condition were significantly associated with the estimated revenue (Table4).

Regarding the areas of additional allowance, only enhanced working conditions for care workers (I) was related to estimated revenue; given the high odds ratio, this was one of the factors with the greatest impacts(Table5). This additional allowance provides incentives for Kantaki management to ensure career paths and better working environments for care workers, including improved training and retention.

In addition, the odds ratio was higher for the number of full-time equivalent care workers than that for the number of full-time equivalent nursing staff, which impacted estimated revenue(Table5). In terms of employee characteristics, there were more care workers than nursing staff(Table3). Further, the high revenue group tended to have more care workers(Table3). This suggests that increased workloads resulting from increased user numbers and CNL levels were met by increasing the number of care workers. A previous study by Fukui[13] examined the factors influencing the profitability of visiting nurse agencies in Japan, thus finding that both the number of care workers (≥5) and number of nurses (≥5) were significant variables. Although employee availability is often important for profitability among visiting nurse agencies and Kantaki, the number of care workers had a stronger impact on estimated revenue than nursing staff when specifically looking at Kantaki. However, when looking at the number of staff based on years of experience, many nurses working at Kantaki services had more than 10 years of experience, while most care workers had between one and three years of experience(Table3). This indicates that many care workers had less experience than the nursing staff. While the overall turnover rate for care workers has not changed from the 15.4% found in 2019, more than 60% of those who leave the workforce have been with

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their respective companies for fewer than three years[14]. The reports[14] have also shown that educational opportunities and training must be strengthened for staff who have remained with their companies for fewer than three years. As estimates show there will be a shortage of 377,000 care workers by 2025[15], it is highly important for Kantaki to develop and retain experienced care workers, which will also increase their estimated revenue.

4. Study limitations

While this study used data that were obtained through the MHLW, data entry was conducted by personnel at each Kantaki, which limits reliability. In addition, the revenue used as the dependent variable was only an approximation, not an analysis of actual revenue and expenditures. Future studies should therefore investigate the break-even point of each Kantaki in order to obtain more specific suggestions for Kantaki management; that is, suggestions that are based on actual conditions.

VI. Conclusion

A secondary analysis of data from all Kantaki in Japan revealed the factors that influenced their estimated revenue.

Factors that significantly affected estimated income included tube feeding, enhanced working conditions for care workers, and colostomy/ileostomy care. To achieve stable management practices, Kantaki services must be able to respond to a variety of home care medical needs. In this regard, it is highly important to train and retain skilled care workers.

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ORIGINAL ARTICLE

The Verification of Reliability and Validity of Shimonoseki City University Lecturer Evaluation Scale (SLES)

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ABSTRACT

Lecturer evaluation by students is one of the methods that are likely to provide important information in evaluating the "quality" of education. However, the current situation is that it is being promoted without investigation of reliability and validity. The purpose of this study is to verify the reliability, content validity, and construct validity of Shimonoseki city university Lecturer Evaluation Scale (SLES), which is a lecturer evaluation by students. The subjects were 1,286 students in the freshman to senior of economics. SLES is a comprehensive scale can be applied to three types of lectures: face-to-face lecture, simultaneous bidirectional lecture, and on-demand lecture. The reliability was verified using Cronbach's α coefficient, and construct validity was verified using structural equation modeling. As a result of the analysis, the reliability was 0.912 for the face-to-face type, 0.930 for the simultaneous bidirectional type, and 0.919 for the on-demand type. In terms of construct validity, a high degree of suitability was shown in all lecture form. This study suggests that SLES can be used effectively with undergraduate students.

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I. Introduction

Since the 1990s, Japanese universities have been promoting university reforms, and in particular, lecturer evaluation by students have been introduced with the aim of improving higher education centering on bachelor's programs[1]. According by the Ministry of Education, Culture, Sports, Science and Technology, the number of universities that conduct lecturer evaluation by students in FY2016 was 720 universities, accounting for approximately 95% of the total number of universities in Japan[2]. Lecturer evaluation by students is one of the evaluation methods that is highly likely to provide extremely important information in evaluating the "quality" of education. It is because by having the students who are actually taking the lecture evaluated directly, it becomes possible to know what bad things and good things in that class is[3].

However, as explained above, although lecturer evaluation by students has been introduced as one of the measures to improve quality of education, the evaluation systems generally has not been established, and the current situation is that no general methods or evaluation items can be seen[3]. On the other hand, student evaluations are not welcomed by all lecturers, and the reason is that student evaluations are unreliable. It has also been pointed out that question about the validity of lecturer evaluation by students are often subjective and do not always reflect the results[4]. Although the lecturer evaluation by students is often conducted without statistical investigation in universities, there are rarely reported that have investigated the reliability and validity of lecturer evaluation by students[5]. Reliability and validity were confirmed as a result with 467 university students of a municipal liberal arts university, which has four faculties of economics, management, humanities, and law, evaluate the teaching of the lecturer. However, this result has not been evaluated for all students from freshman to senior, and the construct validity has not been evaluated[5].

In addition, the spread of the coronavirus disease 2019 (COVID-19) pandemic became prolonged and the remote classes using digital technology were actively utilized so that students can learn anywhere at any time in universities and technical colleges. Remote classes are courses for participants in distant locations using two-way communication systems[6]. Few studies have investigated the reliability and validity of lecturer evaluations for remote classes[7,8]. A number of studies focusing on analyzing lecturer evaluation questionnaires in universities including those for course using e-learning, have been reported, but there have been reported to analyze questionnaires conducted in individual class[9].

Therefore, it is necessary to establish the usefulness as a scale by verifying reliability and validity of lecturer evaluation in the face-to-face but also the simultaneous bidirectional and the on-demand lectures. This study aims to verify the reliability and validity of Shimonoseki city university Lecturer Evaluation Scale (SLES).

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II. Methods

1. Procedures & participants

Participants of this study were 1,286 undergraduate students from freshman to senior at Shimonoseki City University's Faculty of Economics. The students answered question form about the impressions of lecturer's teaching after the lecture. In order to prevent the spread of COVID-19 pandemic, all participants have answered by Google forms which is a web-based survey administration software included as part of the free, web-based Google Docs Editors suite offered by Google. The response period was from January 19 to January 29, 2021 for face-to-face lectures, January 19 to January 30, 2021 for simultaneous bidirectional lectures, and January 19 to January 29, 2021 for on-demand lectures. When students took multiple lecture forms, all taken lectures were answered.

2. Lecture Form

1) Face to face lecture

The lecturer carried out thorough infection control by alcohol disinfection and temperature measurement to reduce the risks for COVID-19 for all students who took the lecture. In addition, lecturers and students were obliged to wear masks during lectures, and a small number of face-to-face lectures were held, such as devising diversification by grouping.

2) Simultaneous bidirectional lecture

The lecturer communicated remotely with students using a cloud-based group video conferencing services provided by Zoom Video Communications, and students can take lectures at home using a computer or tablet.

3) On-demand lecture

The lecturer recorded the lecture content in advance using PowerPoint with audio. The students attend the lectures through the internet at any time and for anywhere during the course period.

3. Shimonoseki city university Lecturer Evaluation Scale (SLES)

SLES is a lecturer evaluation scale developed by the authors to improve the quality of education. SLES is a comprehensive scale that can evaluate three types of lectures: face-to-face lecture, simultaneous bidirectional lecture, and on-demand lecture. Each type of lectures consists of 10 items in three domains: "Overall satisfaction", "use of teaching materials" and "teaching methods". Participants are rated on a five-point scale: 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, and 5 = strongly agree. The total score is 100 points, and the higher the score, the higher the rating for the lectures.

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4. SLES process and statistical analyses

1) Collection of questions

The scale items were created according to the following procedures. Completed the scale by referring to the other lecturer evaluation scale conducted at 67 national and public universities where the Faculty of Economics is established in Japan excluding Shimonoseki City University[10,11].

2) Verification of content validity

For the verification of the content validity, the opinion investigation by interview was carried out for 2 teaching staffs of Shimonoseki City educational and research institute. One of teaching staff included those who had more than a decade of experience in scale development. In order to evaluate lecturer's teaching from the student's point of view, they asked whether domains and question items were appropriate, and they freely stated their opinions on the content of the question items and the notation of words. After that, 2 university students enrolled at Shimonoseki city university were asked to give answers, and they were also asked to freely state their opinions on the contents of question items and the notation of words.

3) Verification of reliability

The validation of the reliability examined the internal consistency by calculating the Cronbach α value. The α value was more than 0.7, it is considered highly reliable[12].

4) Verification of construct validity

Structural-equation modelling (SEM) is used to verify the construct validity of SLES. Comparative Fit Index (CFI), Tucker-Levis Index (TLI), and Root Mean Square Error of Approximation (RMSEA) were used as goodness-of-fit for the SEM according to previous studies. When analyzed SEM, it is up to researcher's judgement to determine which goodness-of-fit indicators to focus on. Generally, it is a good model when two or more indicators including RMSEA meets the standard value[13]. The maximum likelihood method was used to estimate the parameters.

5) Statistical analysis

For descriptive statistics, the chi-square test was performed for the relationship between lecture types and academic year and sex, and one-way analysis of variance (ANOVA) was performed for the relationship between lecture types and the scale's domain score and overall score. All statistical analysis was used by IBM SPSS ver.25.0 and Amos ver.25.0.

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III. Results

1. Summary of lecturer evaluation questionnaires at other universities

We unified the questionnaire items on the lecturer evaluation which is carried out at present in national and public universities, there was a tendency to be divided into four question types related to student itself, lecturer, teaching materials, and overall impression in face-to-face lecture, simultaneous bidirectional lecture and on-demand lecture (Tables 1 to 3).

<Table 1> Content of questionnaire on face-to-face lecture conducted at national and public universities.

1. Questions related to students	Attendance, preparation and review, reasons for taking lecture, attitude to study, recommendations to juniors, achievement of study goals, degree of interest, what they learned the most, what they disappointed things, what they want to know it in future, and acquisition of new knowledge
2. Questions related to lecturer	Lecturer's teaching skills, feedback for questions and opinions of students, lecture time allocation, consideration for whisper, confirmation of student understanding, enthusiasm about teaching, communication with students, and promotion of learning motivation
3. Questions related to teaching materials	Appropriateness of using the letters and figures in teaching materials, appropriateness of handouts and textbooks, and understanding of board writing and presentations
4. Overall impression	Overall satisfaction, achievement of syllabus goals, amount of lecture content, adherence to lecture time, and preparation of lecture

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<Table 2> Content of questionnaire on simultaneous bidirectional lecture conducted at national and public universities.

1.	Questions related to students	Attendance, lecturer's preparation, ease-to-use video conferencing tools, and lecturer's handling mistakes video conferencing tools
2.	Questions related to lecturer	Communication with students, tension about teaching, assignment presentation, building relationship of the study group, and response to students' physical and psychological stress
3.	Questions related to teaching materials	Build-up of internet environment, use of video conferencing tools, support for information literacy, and appropriateness of screen sharing
4.	Overall impression	Concentration on online lecture, desire to attend online lecture in the future, and overall satisfaction

<Table 3> Content of questionnaire on on-demand lecture conducted at national and public universities.

1.	Questions related to students	Attendance, preparation and review, attitude to study, acquisition of new knowledge, degree of interest after the end of lecture, and attendance on-demand lecture in the future
2.	Questions related to lecturer	Systematic content of lecture, lecturer's teaching way, lecturer's communication skills, and provision of lecture materials for ease-to-understand
3.	Questions related to teaching materials	Defects in video and audio materials, and confirmation of typographical errors in teaching materials
4.	Overall impression	Appropriateness of lecture progress, explanation of grade evaluation method, achievement of syllabus goals, understanding of learning goals, overall satisfaction

2. Demographic characteristics

Of the 1,286 students, 481 students responded (response rate 37.4%). In regard to the face-to-face, the sophomore was the most frequent (89.2%), and the freshman was the most frequent in the simultaneous bidirectional and on-demand (63.4%, 56.6%) ($p < 0.001$). In addition, male students accounted for more than 55% in all lecture types. There was no

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significant difference between the score of the overall satisfaction and lecture types in three domains of the SLES, but also no relationship between the score of the use of teaching materials and lecture types. On the other hand, there was the significant difference between the score of the teaching methods and lecture types ($p < 0.001$). There was no significant difference between the total score of the SLES and the lecture types (Table 4).

<Table 4> Characteristics of the sample (n = 481)

	Face-to-face (n=139)	Simultaneous bidirectional (n=159)	On-demand (n=183)	p*
Grade, person (%)				
Freshman	0 (0.0)	90 (56.6)	116 (63.4)	
Sophomore	124 (89.2)	49 (30.8)	44 (24.0)	
Junior	12 (8.6)	19 (11.9)	15 (8.2)	＜0.001
Senior†	3 (2.2)	1 (0.6)	7 (3.8)	
Other§	0 (0.0)	0 (0.0)	1 (0.5)	
Sex, person (%)				
Male	77 (55.4)	92 (57.9)	104 (56.8)	
Female	61 (43.9)	67 (42.1)	79 (43.2)	0.628
Both	1 (0.7)	0 (0.0)	0 (0.0)	
lectures, n (%)				
Computer utilization Ⅰ・Ⅱ	139 (100)	0	0	
Introduction to Mathematics	0	62 (39.0)	0	
Literature B	0	48 (30.2)	0	
Mathematics for Liberal Arts B	0	49 (30.8)	0	
Psychology B	0	0	119 (65.0)	
Introduction to Internal Economics	0	0	64 (35.0)	
Overall satisfaction, score, mean (SD)	26.8 (3.5)	26.0 (4.5)	26.7 (4.2)	0.154
Use of teaching materials, score, mean (SD)	26.6 (4.0)	26.5 (4.2)	26.2 (3.8)	0.734
Teaching methods, score, mean (SD)	34.0 (6.4)	33.7 (6.5)	36.4 (5.1)	＜0.001
Total score, mean (SD)	87.3 (12.8)	86.2 (14.0)	89.4 (11.8)	0.063

† Senior includes professional.
§ Other means students who were course students and special auditing students.
* The Chi-square test was performed to determine every relationship between participants and lecture types and sex and lecture types. The one-way ANOVA was performed to determine every relationship between each domain and lecture types and total score and lecture types.

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3. Content validity

As a result of examining the content validity, question items were revised. The scale distributed consisted of three domains were completed: "Overall satisfaction", "Use of teaching materials", and "teaching methods". In the domain of overall satisfaction, three question items were completed: "Q1. Was the lecture satisfactory overall?", "Q2. Was the lecturer teaching with sincerity?" and "Q3. Do you think the goals indicated in the syllabus were achieved?". In the domain of use of teaching materials, the following three questions were completed: "Q4. Did the textbooks and references properly used to understand the lecture content?", "Q5. Did the resumes and materials properly used to understand the lecture content?", and "Q6. Was it easy to read materials such as board writing and presentation such as PowerPoint?". In the domain of teaching methods, the following four question items were completed: "Q7. Was the lecturer's teaching speed appropriate?", "Q8. Were you able to communicate interactively between the lecturer and the student?", "Q9. Was the lecturer's teaching easy to understand?" and finally, "Q10. Was the lecturer's instruction and how to present the issues appropriate?".

4. Reliability

Table 5 shows the results of reliability. The Chronbach coefficient was very high more than 0.9 in all lecture forms of face-to-face, simultaneous bidirectional lecture, and on-demand. In regard to each domain, the overall satisfaction was 0.845, the use of teaching material was 0.782, and the teaching methods was 0.812 in the face-to-face lecture. In the simultaneous bidirectional lecture, the overall satisfaction was 0.836, the use of teaching material was 0.819, and the teaching methods was 0.854. In the on-demand lecture, the overall satisfaction was 0.837, the use of teaching material was 0.718, and teaching methods was 0.882 (Table 5).

<Table 5> The results of reliability in SLES

	Face-to-Face	Simultaneous bidirectional	On-demand
	α	α	α
Overall satisfaction（Q1～Q3）	0.845	0.836	0.837
Use of teaching materials（Q4～Q6）	0.782	0.819	0.718
Teaching methods（Q7～Q10）	0.812	0.854	0.882
Total	0.912	0.930	0.919

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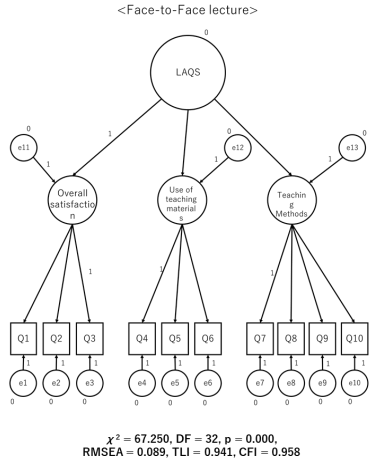
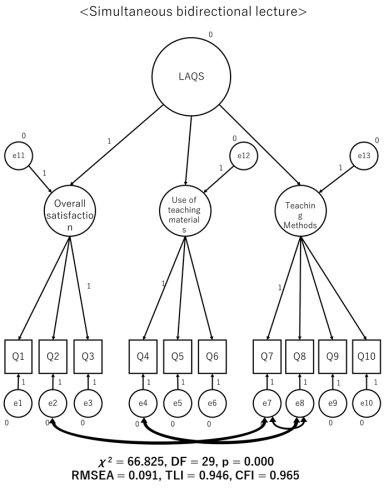
5. Construct validity

Figure 1 shows the results of the construct validity of the face-to-face lecture. Higher goodness-of-fit was shown in the 3 domains and 10 items (χ^2 = 67.250; RMSEA= 0.089; TLI=0.941; and CFI= 0.958) (Figure 1). Figure 2 shows the results of verification of the simultaneous bidirectional lecture. Higher goodness-of-fit was also shown in the 3 domains and 10 items (χ^2= 66.825; RMSEA= 0.091; TLI=0.942; and CFI= 0.960) (Figure 2). Figure 3 shows the results of the on-demand lecture. Higher goodness-of-fit was also shown in the 3 domains and 10 items (χ^2 = 75.166; RMSEA= 0.088; TLI=0.942; and CFI= 0.960) (Figure 3).



<Figure 1> The construct validity of face-to-face lecture in SLES



<Figure 2> The construct validity of simultaneous lecture in SLES

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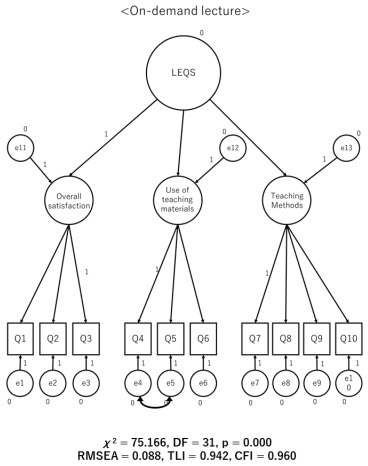

<Figure 3> The construct validity of on-demand lecture in SLES

IV. Discussion

This study focuses on verifying the reliability and validity of SLES. As a result of the analysis, 3 domains and 10 question items of "overall satisfaction", "use of teaching materials", and "Teaching methods" were finally developed. In terms of the characteristics of the subjects, the students who responded were the most common in the sophomore students, and male students accounted for more than 55%. In addition, there was no relationship between all lecture forms and overall satisfaction and use of teaching materials, but there was a relationship between all lecture forms and teaching methods. There was no significant difference between the overall score of SLES and all lecture form.

To the best of our knowledge, this is the first study to evaluate the reliability and validity on the face-to-face lecture as the traditional form of lecture, and simultaneous bidirectional and on-demand lectures as online lecture. As a result of investigating the question items on the lecturer evaluation carried out in national public universities nationwide, there was a tendency to be divided into four: questions related to the students, questions related to lecturer, questions related to the teaching materials, and overall impressions. However, in this study, the lecturer evaluation is mainly conducted by students to evaluate the teaching of lecturers. Therefore, this study excludes questions related to students such as the status of students' efforts, and focuses on the questions related to lecturer, the teaching materials and overall satisfaction. As a result of investigating the question item which is easy for students to answer through the confirmation of the content validity, 10 question items were summarized finally.

Regarding the reliability factor of SLES, it was 0.782 in the use of teaching materials which was the lowest in the face-to-face form, but it was more than 0.800 except for it. Regarding the simultaneous bidirectional form, the reliability coefficient was more than

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0.800 in all domains. The reliability coefficient of use of teaching materials was 0.718 which was the lowest in the on-demand form, but it was more than 0.800 except for it. The reliability coefficient is more than 0.70, that means the scale is highly reliable[12]. Therefore, SLES is considered to have been sufficiently reliable.

In this study, the fit of models investigated using chi-square, CFI, TLI, and RMSEA indices by the authors. The RMSEA of the models in the face-to-face form, the simultaneous bidirectional form, and on-demand form were 0.089, 0.091, and 0.088. RMSEA was interpreted as inappropriate if it had to be greater than or equal to 0.1[11]. RMSEA were found to be acceptable in all lecture form. In summary, the construct validity was verified in the face-to-face form.

On the other hand, construct validity was verified by using structural equation modeling for simultaneous bidirectional and on-demand lecturer evaluation for all university students. This study can contribute to a few studies on the validity of online lectures. This study also used Google Form for COVID-19 control. There are very few reports that students who are dislike in dealing with computers are inconvenient to evaluate online lecture, and that students' self-reports on online issues are not associated with the performance score. However, in this study, the reliability and validity were confirmed by conducting the lecturer evaluation by the on-line system.

This study has several limitations. First, the results of this study selected a few lectures among all faculty lectures and assessed the scales. In particular, there is a critical selective bias in the results of these reliability and validity. Secondly, the study is a test survey to verify the reliability and validity of SLES and therefore is not common for all outcomes. Due to the nature of testing and research, there are definitive limitations in subjects and outcome analyses. More sample sizes and longer-term surveys will be needed in the future. In the final third, this study evaluates lectures based on subjective perception of students and does not perform objective lecture evaluations. In the future, after ensuring the confidentiality of students' responses, it will be necessary to conduct objective lecture evaluations such as performance score. Nevertheless, in this study, lecturer evaluation was carried out from the first year to the fourth year, and high reliability and validity were able to be secured. This means that despite the different attitudes and attitudes to study in different years, the reliability and validity of the scales are verified and effective.

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V. Conclusion

This study suggest that can verify the reliability, content validity, and construct validity of SLES in the face-to-face but also the simultaneous bidirectional and the on-demand lectures. Further investigation with large samples with larger sample size is recommended.

Acknowledgements

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Human Services

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SHORT PAPER

Expected Characteristics for New Home-Visiting Nurses According to Experienced Nurses

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ABSTRACT

Background: This study aimed to examine the qualities required for new graduate visiting nurses from the perspective of experienced home-visiting nurses.
Methods: An anonymous survey was mailed to 2,000 home-visiting nurses randomly selected from 5,565 home-visit nursing stations.
Results: We extracted four subscales using an exploratory factor analysis: (a) being well-mannered, (b) acquiring basic knowledge and skills, (c) giving consideration to the patient and their family members, and (d) actually practicing trained concepts in nursing education.
Conclusion: Our findings indicated that nursing education should focus more on developing appropriate bedside manner and that it may be useful to develop tools such as virtual reality simulation to translate and apply new nurses' theoretical knowledge and skills to clinical contexts.

< Key-words >
home care, home-visit nursing, home-visiting nurse, nursing education, Japan

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I. Introduction

To retain necessary human resources for home-based medical and end-of-life care, we should support active learning for new graduate nurses[1]. Previous studies reported that new graduate nurses cannot realistically work at home-visit nursing stations because these jobs require specialized and extensive experience[2,3].

Therefore, Fukuyama et al. first conducted a qualitative study to explore actual conditions in practice, identifying challenges reported by new graduate visiting nurses[4]. Akiyama et al. then conducted a qualitative study, asking skilled home-visiting nurses to describe required characteristics for performing their duties effectively[5]. The purpose of this study was to examine the components that constitute necessary qualities for new graduate visiting nurses.

II. Methods

1. Study design and Participants

An anonymous survey was mailed to 2,000 home-visiting nurses randomly selected from 5,565 registered home-visit nursing stations (Hokkaido: 124, Tohoku region: 118, Kanto region: 578, Chubu region: 305, Kinki region: 441, Chugoku/Shikoku region: 173, Kyusyu/ Okinawa region: 261). In the seven Japanese regions, the questionnaire's distribution rate ranged from 43.4 to 30.7. As of February 2019, these stations are full members of the National Association for Visiting Nurse Services. The study was performed between August and September 2019. A letter attached to the survey clearly stated study purpose, along with explanations regarding the right to refuse participation, privacy protection, and publication of anonymized data only. All participants provided written informed consent.

2. Questionnaire

The questionnaires sought information about the characteristics, type of home-visit nursing station, the number of healthcare workers, and components of the qualities required for new graduate visiting nurses measured using 20 items. Qualities required for new graduate visiting nurses were determined through a 20-question interview based on our previous qualitative surveys[4,5]. We asked subjects to assign a score ranging from 1 (highly disagree) to 5 (highly agree).

3. Statistics analysis

We conducted item analysis, followed by exploratory factor analysis, on survey results. All statistics were performed in SPSS 22.0J for Windows.

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4. Ethical considerations

This study protocol was approved by the institutional review boards of Kio university (No: H30-21). A letter attached to the survey clearly stated study purpose, along with explanations regarding the right to refuse participation, privacy protection, and publication of anonymized data only. All participants provided written informed consent.

III. Results

Of the 2,000 mailed questionnaires, 74 were returned because of incorrect addresses. We received 328 responses (response rate: 17.0%). After excluding 16 responses from home-visiting nurses with <2 years of experience, the final analysis included 312 surveys. Table 1 shows participant characteristics. The exploratory factor analysis extracted four subscales consisting of 17 items (Table 2).

<Table 1> Characteristics of the home-visiting nurses

Variables		
Age (years)†	51.8±7.8	
Sex (Female)	289	(92.6)
(Male)	19	(6.1)
(Unknown)	4	(1.3)
Years of experience as nurse†	26.6±8.2	
Years of experience as visiting nurse†	12.0±7.7	
Type of Home-visit nursing station		
Single	79	(25.3)
Multiple (established other institution in parallel)	229	(73.4)
Hospital	80	(25.6)
Clinic	40	(12.8)
Home help services	87	(27.9)
Unknown	4	(1.3)
Type of healthcare workers†	13.3±11.3	
Home-visit nurses, full-time	4.5±2.6	
Home-visit nurses, part-time	3.2±3.0	
Physical therapist, Occupational therapist, Speech therapist	3.1±3.9	
Others	3.4±7.4	
Components of the qualities required for new graduate visiting nurses†‡		
Being well-mannered	4.8±0.3	
Acquiring basic knowledge and skills	4.3±0.5	
Giving consideration to the patient and his/her family members	4.5±0.5	
Actually practicing trained concepts in nursing education	4.0±0.7	

N=312, n (%), †Mean ± SD, ‡1 (highly disagree) to 5 (highly agree)

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<Table 2> The components of the qualities required for new graduate visiting nurses

Items	Factor loading
1. Being well-mannered (7 items, α= 0.90)	
He/she is well groomed.	.897
He/she can handle the goods politely.	.847
He/she can put his/her shoes off neatly.	.834
He/she can use polite language.	.815
He/she can use the appropriate honorific.	.680
He/she can correspond on the telephone appropriately.	.600
He/she can be careful about the behavior at the patient's home (opening and closing the door, etc.)	.560
2. Acquiring basic knowledge and skills (4 items, α= 0.86)	
He/she has the prerequisite basic knowledge needed for patient assessment.	.889
He/she understands the pathophysiology at a level that can pass the national exam for nurses.	.832
He/she understands the scientific basis of basic nursing skills.	.676
He/she understands basic nursing skills.	.646
3. Giving consideration to the patient and his/her family members (3 items, α= 0.78)	
He/she can ponder the feelings of patients and their family members.	.814
He/she has a sense of proper distance between patients and their family members.	.805
He/she can treat patients and their family members sincerely.	.567
4. Actually practicing trained concepts in nursing education (3 items, α= 0.78)	
He/she can provide nursing skills necessary for home-visit nursing.	.827
He/she can practice nursing skills experienced in practical training.	.697
He/she can properly carry out patient assessments.	.493

Exploratory factor analysis of the 20-item instrument assessing the qualities required for new graduate visiting nurses (number of items, Cronbach's alpha). Responses were provided for all items on a five-point scale ranging
from 1 ("highly disagree") to 5 ("highly agree"). The mean of the total score for each subscale was used in this study.

Ⅳ. Discussion

Our study identified four qualities that experienced visiting nurses felt were required for new graduate visiting nurses: (a) being well-mannered, (b) acquiring basic knowledge and skills, (c) giving consideration to the patient and their family members, as well as (d) actually practicing trained concepts in nursing education.

A novel finding in this study is that experienced home-visiting nurses felt being well-mannered was the most important quality for new nurses. Therefore, we may need to focus more on developing appropriate bedside manner during nursing education[3,4].

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The components that mostly corresponded to current Japanese nursing curriculum were qualities b and d. Previously, Fukuyama et al. found that new graduate visiting nurses had difficulties with: (1) understanding client needs, (2) providing daily-life care, (3) providing medical assistance, and (4) collaborating with other stakeholders[5]. These results suggest that new graduate visiting nurses experience problems translating and applying their theoretical knowledge and skills in a clinical context. A previous study that investigated virtual reality simulation as a teaching tool in endoscopy virtual reality endoscopic simulation found that trainees who used this tool improved in all areas of learning[6]. Therefore, future models can consider using virtual reality simulation to help nursing students integrate theory and practice in nursing education.

In conclusion, our findings indicated that nursing education should focus more on developing appropriate bedside manner. It may be useful to develop tools such as virtual reality simulations that help new nurses translate and apply their theoretical knowledge and skills to a clinical context.

This study has several limitations. First, the response rate was low at 17.0%. Second, we did not examine criterion validity. Therefore, our results may not be generalizable to other settings. We recommend that future studies make efforts to increase sample size and link the identified characteristics with actual success in clinical practice.

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Asian Journal of Human Services
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2. Languages shall be English, and use "century" except for thesis titles and subject matter provisions.

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8. When specifying the name of a specific device or chemical in the body, the following provisions shall be followed.

- Apparatus name: Generic name (company name, product name).
  e.g.) MRI (Siemens, Magnetom)

- The name of the drug is generic name (trade name ®).
  e.g.) Hydrochloric acid eperison (Myonal®)

9. The mention of reference in text shall be subject to the following provisions.

- At the end of the quoted sentence, the appropriate number of the bibliographic list is given in "Upper half-brackets". When multiple documents are cited, the references cited should be numbered separated by "(comma)". If the numbers of the cited documents are consecutive, they are linked by "-(hyphen)" and the first and last numbers are given.
  e.g.) This sentence was written by editor of Asian Journal of Human Services.[1)] This sentence was written by editor of Asian Journal of Human Services.[1,3,7)] This sentence was written by editor of Asian Journal of Human Services.[1-3)]

- When referring to a particular author's report, the year should not be filled in, but only the family name of the first author should be filled in, and "et al." should be added.
  e.g.) 1 person: Smith reported that further research is needed. [1)]
  2 or more: Smith et al. reported that further research is needed. [1)]

10. The reference should be followed below provisions. Parentheses, commas, periods, spaces, and hyphens used in the literature list are unified in half-width.

① Yamauchi M & Hirakawa M. Issues in spousal bereavement support for elderly men in Japan. *Asian J Human Services.* 2020, 1, 1-19. DOI: 10.14391/ajhs.18.33

② Park LT & Zarate CA Jr. Depression in the primary care setting. *N Engl J Med.* 2019, 380, 559-568. DOI: 10.1056/NEJMcp1712493

③ Yano N, Han CW & Kohzuki M. Construction Concept of Quality of Life Scale for Evaluation of Educational Outcomes. Abstract Journal, 2018 Asian Society of Human Services Congress in KYOTO, 2018, 28.

④ American Psychiatric Association. *Diagnostic & Statistical Manual of Mental Disorders,5th edition. (DSM-5)*. 2013, American Psychiatric Association Publishing,Washington DC.

⑤ Cabinet Office (2016) Annual Report on the Aging Society. February 2016.

⑥ Cabinet Office (2011) Public opinion poll on nursing care insurance system.
URL: http://survey.gov-online.go.jp/h22/h22-kaigohoken/(14, December 2017).

⑦ The order of reference articles should be in the order of citation in the main text and should be numbered consecutively in single parentheses.

- If the editor and the author are the same, the first name and last name should be followed by a "(edit)". If the editor and author are different, enter the name and name of the editor (edit) after the title.
  e.g.) Lemke T. Foucault, politics and failure. In Jakob Nilsson & Sven-Olov Wallenstein (Eds.), Foucault, biopolitics and governmentality. 2013, Sodertorn University. 35-52.

- In the case of a translation, it must be defined original document (original author name, title, year, publisher). Then the translator name, translated year, translated page should be clearly defined.

- Reference: Indication of the person name should conform to the original reference. In the case of co-authorship, up to six persons should be listed.

  1) Up to 6 authors: Separate with "," and "&".
     e.g.) Plavnick BJ, Tiffany K, & MacFarland CM. Effects of a School-Based Social Skills Training Program for Adolescents with Autism Spectrum Disorder and Intellectual Disability. *J Autism Dev Disord*, 2015, 45(9), 2674-2690. DOI: 10.1007/s10803-015-2434-5

  2) More than seven authors: After separating them with "," and add "et al."
     e.g.) Zhi Z, Zachary W, Amy W, Qiang F, Huan Z, Amy S et al. Brief Report: Evaluation of an Intelligent Learning Environment for Young Children with Autism Spectrum Disorder. *J Autism Dev Disord*, 2016, 46(11), 3615-3621. DOI: 10.1007/s10803-016-2896-0

- If different documents are cited and Author's name and year of publication are the same, distinguish them with alphabets after the year of publication. It should be combined with the notation in the text.
  e.g.) Japan Association of Geriatric Health Services Facilities. White Paper on Care in FY2016 -From the Standpoint of Geriatric Health Services Facilities-. 2016a, 78, Office TM Co., Ltd.
  e.g.) Japan Association of Geriatric Health Services Facilities. White Paper on Care in FY2016 -From the Standpoint of Geriatric Health Services Facilities-. 2016b, 10-13, Office TM Co., Ltd.

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