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## Relationship between swallowing function, nutrition, and quality of life during the coronavirus disease pandemic among older adults in Japan

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### Abstract

This study's purpose was to determine the connection between swallowing function, nutrition, and quality of life among older adults in Japan who stayed at home during this period of the COVID-19 pandemic. A questionnaire survey was administered to adults aged 65 years or higher who were staying at home during the COVID-19 pandemic. I collected response data from 471 participants. Associations among swallowing function scores, nutrition scores, and quality of life scores were analyzed using stepwise multiple regression analysis. Swallowing function scores were significantly associated with nutrition and QOL scores.

**Keywords:** Swallowing function, nutrition, life during, coronavirus disease pandemic

### 1. Introduction

The coronavirus (COVID-19) emerged in December 2019 as its first case was documented. In the coming months, the disease spread to the extent that it was declared a worldwide pandemic situation. Japan documented its first case of COVID-19 in January of 2020, and restrictions were imposed on daily activities. Because of these restrictions, ordinary people's lives changed significantly, including the mandating of masks and various movement restrictions. Any kind of lifestyle change can manifest changes in their health as well. Older adults are particularly vulnerable, and there is a concern that they may be negatively affected.

One of the pleasures of daily life for older adults is eating. The swallowing function, which is essential for eating, is an important factor related to nutrition (which is the foundation of life) <sup>[1]</sup> and quality of life (QOL) <sup>[2]</sup>. Environmental changes caused by the pandemic may have altered these relationships.

This research aimed to determine the connection between swallowing function, nutrition, and QOL among older adults in Japan who stayed at home during this period of the COVID-19 pandemic.

### 2. Methods

#### 2.1 Participants

The participants of this study included adults 65 or older who were staying at home during the COVID-19 pandemic. Older adults living independently within community centers were approached and invited to respond to a survey. Some requiring nursing care participated from their facilities of care.

#### 2.2 Survey Period

The survey was conducted from 2021 to 2022, during the COVID-19 pandemic.

#### 2.3 Survey Methods

If possible, participants answered the survey on their own without assistance. If assistance was required for whatever reason, their responses were recorded by an assistant from the staff. Once completed, response sheets were deposited in a collection box for a designated period.

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## 2.4 Survey Contents

The participants' age, sex, nature of care (independent or in need of care), swallowing function, nutrition, and QOL were surveyed.

### 2.4.1 Swallowing function

The Dysphagia Risk Assessment for the Community-dwelling Elderly (DRACE) tool [3] was used to assess swallowing function. It is a twelve-item series of questions designed to identify the risk of dysphagia in older adults. The questionnaire includes well-balanced items that cover all phases of swallowing. High scores indicated a risk of dysphagia.

### 2.4.2 Nutrition

To assess Nutrition, because it was designed for older adults, we employed the Mini-Nutrition Assessment Short-Form (MNA®-SF) [4, 5]. Six individual items that assess the nutrition of older adults comprise this form. The following were used as assessment items: mobility, body mass index (BMI), food intake, psychological stress or acute neuropsychological problems, and weight loss. Each assessment item had a scored response option, and the scores from each item were collated to form a screening score (0–14 points). Low scores indicated a higher risk of hyponutrition.

### 2.4.3 QOL

QOL was assessed using the Short Form-8 (SF-8) scale [6, 7]. SF-8 is used globally to evaluate health-related QOL as it facilitates measurements of QOL in eight health-related areas. The eight areas were mental health (MH), role emotional (RE), bodily pain (BP), physical functioning (PF), role physical (RP), general health (GH), vitality (VT), and social functioning (SF). Mental Component Summary (MCS) and Physical Component Summary (PCS) scores were calculated from scores of these eight areas. Each score was calculated based on national standards using the SF-8 scoring program. The national standard value for these scores is 50. A high score indicated a high QOL.

## 2.5 Analysis Methods

Associations among swallowing function, nutrition, and QOL were assessed through stepwise multiple regression analysis. The significance level was set at  $p < 0.05$ . The statistical software IBM SPSS Ver. 28.0 (SPSS Inc., Tokyo, Japan) was used for the statistical analyses.

## 2.6 Ethical Considerations

Before starting the study, all participants were fully informed of the following: the purpose of the study, our procedural methods, the fact that the study was entirely optional, our guarantee of privacy protection regarding personal information, and that we intended to publish the aggregated results. The Research Ethics Review Committee of Himeji University approved the study before its commencement.

## 3. Results

### 3.1 Summary of Participants [Table 1]

Responses were obtained from 471 participants. The participants included 330 (70.1%) women and 141 (29.9%) men and their mean age was  $81.5 \pm 7.1$  years. Of these, 169 (36.7%) were independent and 292 (63.3%) needed care.

The participants' average DRACE, MNA®-SF, PCS, and MCS scores were  $3.65 \pm 3.78$ ,  $10.25 \pm 2.64$ ,  $46.31 \pm 6.36$ , and  $47.61 \pm 6.31$ , respectively.

**Table 1:** Summary of Participants (N = 471)

Survey contents	M±SD or n (%)
<b>Sex</b>	
Women	330 (70.1)
Men	141 (29.9)
<b>Age</b>	
Need of care	$81.5 \pm 7.1$
Independent	169 (36.7)
In need of care	292 (63.3)
DRACE	$3.65 \pm 3.78$
MNA®-SF	$10.25 \pm 2.64$
<b>SF-8</b>	
PCS scores	$46.31 \pm 6.36$
MCS scores	$47.61 \pm 6.31$

### 3.2 Analysis of relationship with swallowing function

The analysis was conducted with DRACE scores as the dependent variables and the age, sex, nature of care, MNA®-SF, PCS, and MCS scores as the independent variables. A significant association was observed among DRACE scores, MNA®-SF ( $\beta = -0.40$ ,  $p < 0.01$ ), PCS ( $\beta = -0.15$ ,  $p < 0.01$ ), and MCS scores ( $\beta = -0.14$ ,  $p < 0.01$ ).

## 4. Conclusions

Previous studies have shown that swallowing function in older adults is associated with nutrition [1] and QOL [2]. The findings suggested an association among swallowing function, nutrition, and QOL even during the pandemic. Therefore, swallowing is an important function related to nutrition and QOL, even during periods of environmental changes. In any environment, older adults with impaired swallowing function may have poorer nutrition and reduced QOL, and observation of them is also needed at the same time.

## 5. Acknowledgments

I offer my thanks to the older adults who graciously participated in this study. Further gratitude is offered for the grant-in-aid at Himeji University, which made the study possible.

## 6. Conflict of interest

The authors declare that they have no conflict of interest.

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