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ORIGINAL ARTICLE

Influences of lower limb edema on daily lives of elderly individuals in an elderly day care center

Sayumi Tsuchiya[1] | **Takuto Sawazaki**[2] | **Shuji Osawa**[3,4] | **Makoto Fujiu**[3] | **Mayumi Okuwa**[5] | **Junko Sugama**[5,6]

[1]Division of Health Sciences, Graduate School of Medical Sciences, Kanazawa University, Kanazawa, Japan

[2]Department of Nursing, Nagoya City University Hospital, Nagoya, Japan

[3]Faculty of Geosciences and Civil Engineering, Institute of Science and Engineering, Kanazawa University, Kanazawa, Japan

[4]Research Fellow of Japan Society for the Promotion of Science, Tokyo, Japan

[5]Department of Clinical Nursing, Institute of Medical, Pharmaceutical and Health Sciences, Kanazawa University, Kanazawa, Japan

[6]Innovative Integrated Bio-Research Core, Institute for Frontier Science Initiative, Kanazawa University, Kanazawa, Japan

Correspondence
Junko Sugama, Department of Clinical Nursing, Institute of Medical, Pharmaceutical and Health Sciences Innovative Integrated Bio-Research Core, Institute for Frontier Science Initiative, Kanazawa University 5-11-80 Kodatsuno, Kanazawa, Ishikawa 920-0942, Japan.
Email: junkosgm@mhs.mp.kanazawa-u.ac.jp

Abstract

Aim: The purpose of this study is to describe the influences of lower limb edema on the daily lives of elderly individuals in elderly day care to describe the necessity of care for lower limb edema.

Methods: Semi-structured interviews based on a quality of life questionnaire for limb lymphedema were conducted. Two types of text mining analysis methods were used: a frequent word analysis and a content analysis. The edema severity was graded on a scale of 0 to 3, and the sum of the numerical values of the grades for each person was defined as the pitting score.

Results: The seven participants had a mean age of 83.4 ± 4.6 years (mean ± SD). The pitting scores ranged from 1 to 25 in the participants. The words "think" (389 times), "walk" (136 times), and "put on" (135 times) were extracted frequently. The content analysis focused on the words "walk" and "put on." The participants complained of difficulty walking, pain, and numbness when walking, weakness of their lower limbs, difficulty putting on shoes, restrictions on shoe types, and difficulty finding shoes.

Conclusions: These results demonstrate that elderly individuals experienced troubles during their daily lives caused by lower limb edema, which highlights the necessity of symptom management. Active interventions for edema by nurses are necessary to improve quality of life in elderly individuals.

KEYWORDS

edema, elderly, lower extremity, quality of life

1 | INTRODUCTION

Elderly individuals can easily develop lower limb edema due to their physical characteristics. The prevalence of diseases that cause edema such as heart diseases, kidney diseases, liver diseases, thyroid diseases, and lymphatic disorders increase with age. Most elderly individuals also have malnutrition, low skin tension, low cardiovascular function, and low muscle strength because of aging (Smith, 1996). Moreover, their plasma oncotic pressures and tissue pressures are weaker, and they have increased capillary pressure (Pomero et al., 2017). In addition to these characteristics, edema typically occurs in their lower limbs because of the influences of gravity and the decline of muscle pump activity as a result of decreased mobility and activity.

Elderly persons are more likely to develop lower limb edema because of their reduced walking ability. Previous studies reported a high prevalence of lower limb edema in elderly individuals, including 24.1% in ambulant

outpatients and 62% in persons who walk with walking aids (Oya, 2001). Additionally, some studies have reported that 75% of chair-bound persons in nursing homes have lower limb edema (Kitamura & Shirai, 2014). These results indicate that the prevalence of lower limb edema is related to walking ability.

Elderly individuals with lower limb edema in Japan have not received any specific treatments because many medical and nursing professions do not place much emphasis on this condition; they believe that lower limb edema is a normal aging phenomenon (Iijima & Kusunoki, 2004). However, various symptoms and risks have been reported for lower limb edema in elderly individuals. The typical symptoms include skin color change, decrease in skin temperature, dry skin, decrease in urine output, weight gain, and difficulty flexing limbs (Smith, 1996). Furthermore, chair-bound elderly persons with lower limb edema report that their lower limbs feel heavy and they have difficulty moving these limbs (Blazek et al., 2013; Mercier, Pastor, Moffatt, Franks, & Quéré, 2019). Skin with edema also becomes weak, easily damaged, and prone to pressure ulcers and skin tears (Greene & Meskell, 2017; Lewin et al., 2016). Therefore, studies must provide evidence demonstrating the necessity of care for lower limb edema in elderly persons by describing the influences of lower limb edema on the daily lives of elderly individuals in specific ways.

Some previous studies have described the influences of lymphedema and lipedema on patients' daily lives. In these previous studies, edema affected walking, standing, sitting in the seiza position, putting on clothes and shoes, and leisure activities, for example, walking, swimming, dancing, and skiing. Additionally, edema affected appearance by influencing the patients' body image, self-esteem, and choosing the appropriate size of clothes and shoes (Klernäs, Johnsson, Horstmann, & Johansson, 2018). Furthermore, patients were psychologically affected by edema, for example, they became annoyed, anxious, and nervous (Greene & Meskell, 2017; Person et al., 2008). However, the influences of lower limb edema on the daily lives of elderly individuals have not been described. Lymphedema is a common condition, and nearly 80% of lymphedema patients receive treatment for edema (Moffatt et al., 2003). However, unlike lymphedema and lipedema patients, elderly individuals who experience lower limb edema due to aging have not received appropriate treatment. Therefore, there is a possibility that lower limb edema may have a greater influence on the daily lives of elderly individuals compared with lymphedema or lipedema patients.

The purpose of this study was to describe the influences of lower limb edema on the daily lives of elderly individuals who can walk independently or with a walking aid in an elderly day care center. We chose an elderly day care setting because although day care users have reduced activity and edema, most of these persons spend their daily lives at their own home and are likely affected by edema in their daily lives. This study suggests that it is necessary to provide care for lower limb edema in ambulatory elderly individuals.

2 | METHODS

2.1 | Study design

This study was a quantitative content analysis study. Each participant was interviewed three times about the influences of edema on their daily lives, and their edema status was observed. The second interview was conducted 3 months after the first interview, and the third interview was conducted 6 months after the first interview. The interval between interviews was set as mentioned because a previous study reported worsening of edema severity in elderly persons 3 months after the first observation by the researcher (Sato et al., 2015). Therefore, we surmised that at least 3 months were needed to observe correlation of changes in the edema status with changes in participants' complaints. The investigations were conducted between January 2017 and October 2017.

2.2 | Participants

This study was conducted with elderly persons over the age of 65 years who had lower limb edema and attended an elderly day care center for outpatient long-term care. The capacity of the day care center was 35 persons for each day. The inclusion criteria were as follows: those who could walk independently or walk with walking aids, those who could participate in an interview according to the nurses' judgment, and those who provided consent to participate in the study. The exclusion criteria were as follows: those who had difficulty participating in the interviews due to cognitive decline, those who did not provide consent to participate in the study, and those who were judged by the nurse to be inappropriate for the study.

2.3 | Investigation method

2.3.1 | Interview about influences on daily life

The semi-structured interviews were conducted based on the contents of a quality of life (QOL) measure for limb

lymphedema (LYMQOL) questionnaire. The original English version of the LYMQOL has been verified for reliability and validity (Keeley et al., 2010), and the Japanese version has demonstrated reliability and validity for lower limbs (Yoshizawa, Aoyama, Takeishi, Nakamura, & Atogami, 2017). We considered that LYMQOL could be used for this study because this tool can specifically evaluate the influences of lower limb edema on daily life. However, it would be insufficient to evaluate QOL numerically using LYMQOL to achieve the aim of this study. Thus, we adopted the interview method because there were no previous studies on the influences of lower limb edema on the daily lives of the elderly. The interview guide is shown in Table 1 and the interviews lasted for 20 to 30 min. At the time of the interviews, the subjects were asked to confirm their consent to the recording of the interview, and if consent was obtained, they were recorded with a voice recorder. The interviews were

TABLE 1 Interview guide

Domains	Questions
Function	1) Does your swollen leg affect the following daily activities? *If it affects, please relate the details of them.*
	a) your walking
	b) your ability to bend, for example, to tie shoelaces or cut toenails
	c) your ability to stand
	d) your ability to get up from a chair
	e) your occupation
	f) your ability to do housework
	g) *Is there anything else you are having trouble with?*
	2) Does the swelling affect your leisure activities? Please give example(s) of this.
	3) Do you have to depend on other people because of your swollen leg? *Please give example(s) of this.*
Appearance	4) Do you feel the swelling affects your appearance? *If you feel, please relate the detail of this.*
	5) Do you have difficulty finding clothes to fit? *If you have, please relate the detail of this.*
	6) Do you have difficulty finding clothes you would like to wear? *If you have, please relate the detail of this.*
	7) Do you have difficulty finding shoes to fit? *If you have, please relate the detail of this.*
	8) Do you have difficulty finding socks/tights/stockings to fit? *If you have, please relate the detail of this.*
	9) Does the swelling affect how you feel about yourself? *If it affects, please relate the detail of this.*
	10) Does it affect your relationships with other people? *If it affects, please relate the detail of this.*
	11) Do you have any effects on your daily activities caused by them? *If you have, please relate the detail of this.*
Symptoms	12) Does your lymphedema cause you pain? *If it causes, please relate the detail of this.*
	13) Do you have any numbness in your swollen leg? *If you have, please relate the detail of this.*
	14) Do you have any feelings of "pins and needles" or tingling in your swollen leg? *If you have, please relate the detail of this.*
	15) Does your swollen leg feel weak? *If you feel, please relate the detail of this.*
	16) Does your swollen leg feel heavy? *If you feel, please relate the detail of this.*
	17) Do you have any other physical symptom with swollen leg? *If you have, please relate the detail of this.*
Mood	In the past week
	18) Have you had trouble sleeping? *If you have, please relate the details of them.*
	19) Have you had difficulty concentrating on things, for example, reading? *If you have, please relate the details of them.*
	20) Have you felt tense? *If you feel, please relate the details of it.*
	21) Have you felt worried? *If you feel, please relate the details of it.*
	22) Have you felt irritable? *If you feel, please relate the details of it.*
	23) Have you felt depressed? *If you feel, please relate the details of it.*
	24) Do you have any other psychological (mood) symptoms? *If you have, please relate the details of them.*

Note: The italics indicate that questions which were added for this study.
Note: The reference of the questioner is the manuscript by Yoshizawa et al. (2017).

conducted in a private room, and all the interviews were conducted by the researcher.

2.3.2 | Observation of edema status

The edema severity was evaluated using the pitting method of Sato et al. (2015). This method grades the edema severity on a scale of 0–3 or non-pitting edema (NPE). Higher numbers indicate more severe edema. We considered NPE to be the most severe edema condition.

There were 22 observation sites in the left and right lower limbs, including those in the feet. The sum of the numerical values of the grade of indentation in each lower limb was defined as the pitting score of the lower limb. All observations of edema severity were performed by the same investigator.

2.3.3 | Demographic data

The investigated characteristics included age, gender, body mass index, diseases, walking state, activities of daily living, number of cohabitants, and duration of edema.

2.4 | Analysis

The data were analyzed via the text mining approach using the text mining software KH Coder (Higuchi, 2016; Higuchi, 2017; Higuchi, 2020). We used the text mining approach because it was an analysis method that was objective and reproducible, and it could avoid the effect of personal perspective of the researcher on the results.

Transcripts were created based on the interview records and the recorded voice data. A response to each question was regarded as one analysis unit, and a morphological analysis was performed. Before starting the analysis, words to be forcibly extracted and words to be excluded were determined during preprocessing. The words to be forcibly extracted were determined by detecting compound words, and the words to be excluded were "yes" and "no," which are responses to closed questions and do not include specific content.

Two types of analysis methods were used in this study: frequent word analysis and content analysis by keyword in context (KWIC). First, a frequent word analysis was conducted to confirm the words that appeared frequently in all of the interviews. In this study, even if one person said the same word many times, we counted each as one. The frequent words for each part of speech are listed. Then, two nurses who were involved in the research of lower limb edema examined which domain of LYMQOL the word would fall into based on the meaning of the sentence, obtained a consensus, and finally classified each domain. When the researchers classified the words, the LYMQOL domains were used as a framework.

Second, a content analysis was conducted by analyzing the meaning of the contents of the targeted words. In this analysis, we targeted the words related to physical function status. The sentences that included targeted words were listed by KWIC (Tsukamoto, 2002) to describe the meaning of the words.

2.5 | Ethical consideration

The present study was conducted in accordance with the Declaration of Helsinki. The Ethics Review Board at Kanazawa University approved this study (Examination number: 40-1). This study was implemented after obtaining the participants' written and oral consent. The following explanations were provided to the participants: participation in the study was voluntary, there were no disadvantages from not participating in the study, and personal information would be protected and so on.

3 | RESULTS

3.1 | Participants

Thirteen persons met the inclusion criteria in the elderly day care center. Among them, five persons could not complete all the interviews because of their physical condition, and one person could not complete the entire first interview or the second interview because of the center's schedule. Therefore, seven participants' data were analyzed. The mean age was 83.4 ± 4.6 years (mean ± SD), one participant was male (14.3%), and six participants were female (85.7%). No participants were affected with venous diseases (Table 2).

3.2 | Frequent word analysis

A total of 46,503 words were extracted during the morphological analysis. The most frequently extracted words were "think" (389 times), "say" (207 times), "now" (182 times), "go" (143 times), "walk" (136 times), and "put on" (135 times), (Table 3).

The words were classified to five domains: function, appearance, symptoms, mood, and other. The most frequently stated words related to functions of daily activities were "buy" (88 times), "stand" (52 times), "use"

TABLE 2 Characteristics of participants

ID	a	b	c	d	e	f	g
Age (years)	85	88	83	85	73	83	87
Gender	Female	Female	Female	Female	Female	Male	Female
Body mass index (kg/m^2)	25.3	23.0	25.0	29.6	29.2	22.5	26.0
Diseases	Sezary syndrome	Angina pectoris	Hypertension	After total knee arthroplasty	Lumbar compression fracture	Gastric ulcer	Reflux esophagitis
	Hypertension	Hypertension	Heart disease	Hypertension	Pulmonary emphysema	Reflux esophagitis	Hyperlipidemia
	Hypercholesterolemia		Insomnia		Asthma	Parkinson-like symptoms	Osteoarthritis
	Osteoarthritis		Osteoarthritis			Hypertension	
						Dementia with Lewy bodies	
Walking state	Pick up walker	Ambulant	Inside: cane, outside: walker	Cane	Inside: ambulant, outside: cane	Ambulant	Ambulant
ADL	A2	J2	J2	J2	A2	J2	J1
Number of cohabitants	3	0 (private nursing home)	4	0	1	2	0
Duration of edema	7–8 years	1.5 years	2–3 years	20 years	4–5 years	50 years	10 years
Pitting score (right/left) 1st	6/7	8/7	8/7	1/0	2/2	2/1	6/5
2nd	5/5	9/9	5/5	2/1	2/2	3/3	6/4
3rd	6/6	11/14	5/3	3/2	3/4	4/0	5/4

Abbreviation: ADL, activity of daily living means bedridden level.

Note: According to the "Criteria for determination of the daily life independence level of the elderly with disability" [Grade J] A person, a little handicapped, can make his daily life and go out by himself.

1. Can go out using public transportation system. / 2. Can go neighborhood by himself. [Grade A] Lives independently indoors but requires assistance to go out.

1. Goes out with assistance, stays out of bed most of the day. / 2. Seldom goes out, has several rests in bed during the day.

TABLE 3 Frequent word list

	Noun	Verb formed by adding "suru" to a noun	Adjectival verb	Adverbal noun	Verb	Adjective
Function	Stair (38)	Exercise (30)			Go (143)	
		Seiza (27)			Walk (136)	
		Physical exercise (21)			Put on (135)	
					Buy (88)	
Appearance	Trousers (48)					Thick (70)
	Socks (35)					Thin (58)
Symptoms	Pain (31)					Painful (113)
						Heavy (67)
Mood			Anxiety (13)			
Other	Oneself (94)	Same (45)	Easy (26)	Now (182)	Think (389)	Bad (46)
	Feeling (48)	Operation (24)	No good (25)	Before (117)	Say (207)	Good (46)
		Hospitalization (21)	Hate (23)	Time (59)		
			Hard (20)	Recently (38)		
			Like (16)	Old days (35)		
				Today (27)		

Note: The top six words which were observed frequently were picked up in each part of speech and classified to domains. The values given in parentheses are for frequency.

(50 times), "hold" (49 times), "wear" (48 times), and "sit" (47 times), in addition to the previously stated "go," "walk," and "put on." The following words related to appearance were frequently observed: "thick" (70 times), "can wear" (69 times), "shoes" (58 times), "thin" (58 times), and "trousers" (48 times). In term of symptoms, "painful" (113 times) and "heavy" (67 times) were frequently mentioned. The frequency of words related to mood, such as "sleep" (41 times) and "anxiety" (13 times), was low.

3.3 | Content analysis

We specifically focused on two words that appeared frequently: "walk" and "put on." We chose these terms because they indicate specific actions that involved using their bodies in their daily lives.

Table 4 shows the KWIC of the first to third interviews for "walk." The participants complained of difficulty walking, pain, numbness when walking, and weakness of their lower limbs. The complaints observed not only the participants with more severe edema (e.g., ID b; total pitting score was 18) but also milder edema (e.g., ID d; total pitting score was 3).

Table 5 describes the KWIC of the first to third interviews for "put on." The participants complained of difficulty putting on shoes, restrictions on shoe types, and difficulty finding shoes to fit. The complaints observed not only the participants with more severe edema (ID b; total pitting score was 18) but also milder edema (ID d; total pitting score was 3).

4 | DISCUSSION

There were two new findings in this study. First, in the interviews describing the influences of lower limb edema on the participants' daily lives, more words related to function were extracted than words related to other domains in elderly persons with lower limb edema. Second, most of the elderly persons with lower limb edema complained of difficulty walking and difficulty putting on shoes.

The frequent word analysis in this study extracted more words related to function than words related to other domains. This indicates that elderly persons with lower limb edema primarily experienced influences on their daily lives in terms of function. There were two reasons why the complaints about function were observed frequently in our study. First reason is because of aging. In Greene & Meskell's (2017) study, lower limb chronic edema patients were not much affected in function. The average age of participants in the previous study was 54 ± 16.11 years, which was much younger than in the present study. Another possible reason was that the participants' body movements were affected by the osteological diseases because the participants in the present study had

TABLE 4 Keyword in context (KWIC) analysis for "walk"

Interview	ID	Keyword in context
First	c	It's hard to *walk*. I don't want to go anywhere.
	e	My lower limbs cramp when *walking*.
	e	I don't want to *walk* too much.
Second	a	Because my lower limbs are swollen, I have to *walk* with a pick up walker. I can't go anywhere.
	b	I feel a bit harder to *walk* than before. It is a little difficult to *walk*.
	c	I went to the neighborhood to play and have a tea before, but now it became difficult because difficulty *walking*.
	c	I *walk* with cane at last.
	c	I *walk* with a shuffle.
	c	It's hard to *walk*.
	d	There is no pain after the knee surgery, but it is a bit heavy when *walking*.
	d	I have unsteady lower limbs when *walking*.
	d	If I *walk* hard, my back will hurt.
	e	My soles become numb after *walking* or exercising.
	e	If I *walk* for about 5 or 6 min, I will be leaned forward.
	f	I can't *walk* straight.
	f	It's hard to *walk*.
	f	It is the most difficult to *walk* when I go to the bathroom at night. My lower limbs hurt and get stuck.
	f	It becomes painful when *walking* in the evening.
	f	It hurt when *walking*.
	f	*Walking* is still the hardest part.
	f	It is inconvenient when *walking*.
	g	I don't *walk* so much in the house.
	g	In the evening, my lower limbs may become tired, or I may not like *walking* and sit down on a chair.
	g	In the evening, I feel tired after a long *walk*.
	g	Everyone is getting old, so the situations that hard to *walk* are same.
	g	The way I *walk* is weird.
Third	a	After getting off the car, I have unsteady lower limbs when *walking*.
	c	At the beginning of *walking*, there is no power on my lower limbs, so I grabbed the stick and finally moved.
	c	It is hard to *walk*. If I grab a pick up walker, I will *walk* all the way.
	d	My lower limbs are heavy or difficult to *walk*. So I rent an electric wheelchair when I go shopping.
	e	Sometimes the inside of the lower limbs hurts. I feel numbness when *walking*.
	e	If I *walk* a longer distance, I will feel numb in my lower limbs.
	f	It is hard to put the power of the lower limbs. I have unsteady lower limbs when *walking*.
	f	I don't *walk* because it's dangerous if I fall.
	g	*Walking* distance is reduced.
	g	*Walking* distance has been shortened.
	g	My legs are bent when I *walk* in the mirror.
	g	Just *walking* distance is shorter, but it doesn't hurt. However, I get tired after *walking* a lot.
	g	It will be difficult if I *walk* a long distance. So I grab my hands with a walker and *walk* around the store.

some osteological diseases. It has been proposed in a previous study that musculoskeletal disorders affect morbidity, QOL, and mortality (Beaudart et al., 2018).

There are two possible reasons why the current study reported fewer complaints about symptoms. First was changes in sensations with aging. Aging has been shown

TABLE 5 Keyword in context (KWIC) analysis for "put on"

Interview	ID	Keyword in context
First	a	I was told that there was no such large size shoes you can *put on*.
	a	I can *put on* only magic tape shoes.
	e	I usually *put on* only this type of shoes. I can *put on* only magic tape shoes.
	g	It's a bit narrow when I *put on* the old shoes.
Second	a	I want my lower limbs and insteps to be thinner. When I *put on* my shoes, my lower limbs are thick and it is hard to wear.
	a	It's hard to *put on* my shoes, so I want my lower limbs to be thin.
	a	I hope the lower limbs become thinner. I think that makes shoes easier to *put on*.
	a	I don't want to be told that there aren't any shoes that I can *put on* because my lower limbs are big.
	b	I have button shoes but I do not wear today. I usually wear magic tape shoes because it's easy to *put on*.
	c	The edema status does not change much, but it is hard to *put on* shoes.
	c	It takes time to *put on* shoes.
	c	I can't move my lower limbs well, so it is hard to *put on* shoes.
	c	I *put on* shoes with a shoehorn. I wonder how to get my feet in easily.
	d	I can't *put on* and take off my shoes at once.
	d	I *put on* and take off my shoes with my feet like this, but my legs were very weak.
Third	a	My daughter told me that there aren't any big shoes I can *put on*.

to dull the sense of pain in people (Lautenbacher, 2012). Therefore, there were few complaints about symptoms because this study included only elderly persons. Second, edema in the present study was not lymphedema. Lymphedema fluid has a higher protein content than in other types of edema. Some pathognomonic symptoms such as inflammation of subcutaneous tissue, hard skin, and fluid leaking through the skin can be caused by the high protein content of the lymphedema (Tiwari, Cheng, Button, Myint, & Hamilton, 2003). We considered this condition to have played a role in the low QOL of symptoms in the previous study (Greene & Meskell, 2017). However, complaints about symptoms should not be viewed lightly because words related to symptoms (e.g., painful, and heavy) appeared frequently in the present study.

When questioned about the influences of lower limb edema on function, the participants complained about activities using the terms "go," "walk," "put on," "buy," "standing," "hold," and "sit." The items about walking, standing, and sitting were also included in the LYMQOL questionnaire, and these are general problems caused by lower limb edema. The unique finding in this study was that elderly individuals reported particular difficulty regarding "go". Some participants complained that they cannot "go anywhere" because of the difficulty walking, as analyzed by KWIC. Therefore, we considered that difficulty regarding "go" was caused by a decreased walking ability. Reduced opportunities for going out have various adverse effects on elderly persons (e.g., cognitive decline, muscle weakness) (Nakamura & Yamada, 2009). Therefore, it is important to care for lower limb edema, which is one of the factors responsible for walking disorders (Dix, Brooke, & McCollum, 2003), to maintain the ability to walk.

The content analysis results about "walk" in this study demonstrated that all participants experienced difficulties with walking. This rate is higher than that reported in a previous study on chronic edema patients (Greene & Meskell, 2017). We believe that the difficulties in walking experienced by the participants of this study occurred not only because of the lower limb edema but also due the characteristic physical conditions of the elderly (e.g., muscle weakness, high prevalence of osteological diseases) (Beaudart, Rizzoli, Bruyère, Reginster, & Biver, 2014). However, the complaints of difficulty in walking were observed in both participants with diseases that might affect walking (e.g., osteoarthritis, Parkinson-like symptoms) and those without such diseases. Therefore, we concluded that lower limb edema may affect walking ability. Specifically, they complained not only of the difficulties of walking but also pain, heaviness, and weakness when walking. Physical symptoms such as pain, heaviness, and weakness are common symptoms of chronic edema (Moffatt et al., 2003). However, these symptoms have not been reported while walking in previous studies. The present study showed that elderly individuals with lower limb edema experience these symptoms particularly when walking.

The content analysis results for "put on" demonstrated that elderly persons with lower limb edema experienced difficulties with putting on shoes, restrictions on shoe types, and difficulty finding shoes that fit. In the previous study, approximately 50% of lymphedema patients had trouble finding clothes and shoes that were

comfortable and attractive, the right size, and the right type of material (Klernäs et al., 2018). Participants of our study also complained about difficulties putting on shoes or finding shoes to fit. Elderly individuals who have decreased walking ability often have severe edema in their ankles or feet (Tsuchiya et al., 2018). Therefore, difficulties related to shoes may occur frequently in this study due to swelling of the foot and impaired range of movement in the ankle.

In the present study, the complaints of difficulty in walking and putting on shoes were observed not only in the participants with severe edema (e.g., ID b; total pitting score was 18) but also in those with mild edema (e.g., ID d; total pitting score was 3). This indicates that these influences in elderly individuals occurred regardless of the edema severity. A previous study also showed that increased limb volume is poorly related to the impact of lymphedema on patients (Morgan, Franks, & Moffatt, 2005). Therefore, we concluded that influences of lower limb edema on the daily lives occur from early stages of chronic edema.

To provide appropriate care for edema, we would like to highlight the importance of assessment to understand the influences of lower limb edema on the daily lives of elderly people. Nurses and care givers who have many opportunities to be involved with elderly persons must understand how edema affects the lifestyle of elderly individuals and complaints and problems that arise in their daily lives due to edema. Furthermore, we believe that other medical professionals must be consulted to provide care actively and to improve the QOL of elderly individuals.

This study has some limitations. This study included only elderly persons with edema. Elderly persons have various comorbidities and decreased physical function compared with healthy adults. Therefore, not all complaints are solely due to lower limb edema. Although the interviews were conducted according to the interview guide, interviewer's interest may affect the word frequency through interaction between the interviewer and participants. In addition, the results of this study may not be applicable to elderly persons in different contexts since the survey was conducted at only one facility, the number of subjects was small, and only day care service users were targeted.

5 | CONCLUSION

Interviews were conducted to describe the influences of lower limb edema in elderly individuals who can walk independently or with walking aids in an elderly day care center. The participants complained of the influences of edema, particularly regarding functioning during their daily lives. These results indicate that elderly individuals experience difficulties in their daily lives caused by lower limb edema, which highlights the necessity of symptom management. Nurses must provide active interventions for edema to improve QOL in elderly individuals.

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CONFLICT OF INTEREST

The authors declare no conflicts of interest associated with this manuscript.

AUTHOR CONTRIBUTIONS

T. S., M. O., and J. S. contributed to the conception and design of this study; S. T., S. O., and M. F. performed the statistical analysis; S. T. drafted the manuscript; and J. S. critically reviewed the manuscript and supervised the entire study process. All authors read and approved the final manuscript.

ORCID

Sayumi Tsuchiya https://orcid.org/0000-0002-0204-7772

Junko Sugama https://orcid.org/0000-0003-4050-074X

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