Background Factors that Hospital-Based Geriatricians and General Practitioners Associate with Difficulty in Treating Older People with Multimorbidity: A Cross-Sectional Survey

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In recent years, hospital-based geriatricians and general practitioners in Japan who frequently manage older people with multimorbidity in an acute setting have often found treating these patients difficult. In this study, we surveyed geriatricians and general practitioners who treat older people with multimorbidity in hospitals to identify patient characteristics that make treatment provision difficult in these patients. In June 2022, we mailed an anonymous questionnaire to 3,300 family medicine specialists, primary care-certified physicians, and geriatric specialists in Japan. We used a four-point Likert-type scale to score items specific to diseases, patient backgrounds, clinical factors, and important clinical strategies that make treatment provision difficult. We used logistic regression analysis to identify factors that hospital-based geriatricians and general practitioners associate with difficulty in treating older adults with multimorbidity. In total, 490 cases were included in the analysis. The factors that were associated with difficulty in treating older people with multimorbidity were experience as a physician (adjusted odds ratio [AOR]: 0.935; 95% confidence interval [95% CI]: 0.905-0.965), the overall scores for difficult disease (AOR: 1.028; 95% CI: 1.004-1.053) and difficult background (AOR: 1.065; 95% CI: 1.005-1.129), and the lack of emphasis on general practice guidelines (AOR: 2.91; 95% CI: 1.305-6.491). To facilitate the treatment of older people with multimorbidity, it is desirable to enhance education and training and strengthen support systems within Japan's healthcare system based on the characteristics of hospital physicians who find treating these patients difficult.

Introduction

In recent years, an increase has been observed in the number of older people with multimorbidity, a condition in which the coexistence of two or more multiple chronic diseases in a single patient makes defining a central disease difficult (Valderas et al. 2009; Wallace et al. 2015; Skou et al. 2022). Moreover, the prevalence of multimorbidity has been increasing among older patients in Japan (Kojima et al. 2020). The prevalence of multimorbidity among those aged ≥ 65 years is 62.8% and increases to 64.7% for those aged ≥ 75 years (Aoki et al.2018; Mitsutake et al. 2019). In Japan, multimorbidity is associated with increased polypharmacy, reduced health-related quality of life, high health care resource utilization, and mortality (Aoki et al. 2021; Kato et al. 2021; Honda et al. 2022). When hospitalized, older people with multimorbidity are more likely to experience falls, delirium, and longer hospital stays than those without the condition. The complexity associated with the hospitalization of older people with multimorbidity has been demonstrated, and physicians in charge of these patients may experience difficulty in treating them

(Tanriover et al. 2015; National Institute for Health and Care Excellence 2016; Bernabeu-Wittel et al. 2023).

In Europe and the United States, geriatricians and general practitioners are best suited for the medical management of older adults and are mainly engaged in the hospital care of older people with multimorbidity (Guiding principles for the care of older adults with multimorbidity: an approach for clinicians 2012; National Institute for Health and Care Excellence 2016). The Japanese Geriatrics Society is a professional organization of geriatric health care professionals with a total membership of 6,541; as of April 2022, only 1,650 geriatric specialists were in the organization. Membership for geriatric specialists requires training and a written exam (Japanese Geriatrics Society 2024). The Japanese Primary Care Association (JPCA) is a professional organization of primary care specialties with a total membership of 11,506; as of April 2022, only 1,091 family medicine specialists and 5,435 primary care-certified physicians were in the organization. Whereas family medicine specialists require training, a written exam, and a practical exam, primary care-certified physicians can obtain membership by passing a case report test and a written exam if they have at least 7 years of experience as a physician (Japanese Primary Care Association 2024).

Therefore, the number of geriatricians and general practitioners in Japanese hospitals is limited, and the number of these physicians must be increased. Promoting the treatment of older adults with multimorbidity is required in Japan, and education and training in this area are increasingly important (Maguire et al. 2015; Lewis et al. 2016).

It is thus helpful to increase physician awareness of the relationship between the difficulty that they experience in treating older people with multimorbidity and their treatment approaches by identifying factors such as diseases, patient backgrounds, and important clinical factors. In addition, it is useful to identify how much geriatricians and general practitioners in Japan emphasize management methods such as multidisciplinary cooperation with medical professionals other than physicians (i.e., nursing and welfare professionals and administrative professionals) and multifaceted approaches, including social support, which have been identified as necessary for the management of older adults with multimorbidity in the United States and Europe. The relationship between these factors and difficulty in treating older people with multimorbidity is unknown; therefore, clarifying these relationships is meaningful (Guiding principles for the care of older adults with multimorbidity: an approach for clinicians 2012; National Institute for Health and Care Excellence 2016).

Applying practice guidelines for treating older people with multimorbidity that are important for controlling the quality of medical care is difficult (Ong et al. 2020; Michielsen et al. 2023). However, the extent to which hospital physicians in Japan value practice guidelines for treating older people with multimorbidity, and whether physicians find the use of practice guidelines or the treatment of older people with multimorbidity challenging remain unclear. Identifying the characteristics of physicians who perceive that treating older people with multimorbidity is difficult may be useful in supporting the development of educational programs for physicians who treat these patients in hospitals.

We conducted a survey in Japan to determine the differences in background and approach between hospital-based geriatricians and general practitioners who treat older people with multimorbidity and those who do not and the extent to which adherence to practice guidelines is associated with difficulty in practice. The purpose of the survey was to determine the differences in practice backgrounds and approaches between "difficult-to-practice" physicians and "non-difficult-to-practice" physicians, and the extent to which adherence to practice guidelines is associated with difficulty in the treatment of older people with multimorbidity.

Materials and Methods

Participants

Between June and July 2022, we conducted an unregistered survey using a questionnaire delivered by postal mail. The survey involved 3,300 participants, including all of the 1,650 geriatric specialists in the Japan Geriatric Society (100% of the specialty) and 1,650 primary care specialists who were randomly selected from a pool of the 1,091 family medicine specialists and 5,435 primary care-certified physicians in the JPCA (25.3% of these specialties).

Questionnaires

The questionnaire contained 15 items and 125 questions over 10 pages and included questions about the physicians' practice approach to multimorbidity, the personal characteristics of the respondents, and research questions for other studies. Multimorbidity was defined in the questionnaires as the presence of two or more chronic diseases or chronic conditions that make it difficult to define a central disease for treatment. The chronic diseases or chronic conditions that should be included in the definition of multimorbidity were not yet determined. The questionnaires for geriatric specialists and those for primary care specialists were labeled "G" and "P," respectively.

The questions about the approach to treating multimorbidity were discussed among the researchers, who drew on previous studies. The following practice model was constructed: when treating multimorbidity, each physician is aware of diseases or patient backgrounds that may cause difficulty in the provision of treatment and recognizes important clinical factors and clinical strategies in the treatment process. Moreover, the degree to which general practice guidelines are followed varies between physicians depending on physician experience. Therefore, each physician has a different view of the level of difficulty in treating multimorbidity (Charlson et al. 1987; Quan et al. 2011;

Guiding principles for the care of older adults with multi-morbidity: an approach for clinicians 2012; Luijks et al. 2012; Muth et al. 2014; National Institute for Health and Care Excellence 2016; Schiøtz et al. 2017; Cramm et al. 2018; Oksavik et al. 2020).

Approach to treating older people with multimorbidity: In the questionnaire, physicians were asked to rate issues on a Likert-type scale from 1 ("not at all") to 4 ("very much"). The issues were "diseases that cause difficulty in treating multimorbidity" (Difficult Diseases; 43 items, Supplementary Table S1), "patient backgrounds that cause difficulty in treating multimorbidity" (Difficult Backgrounds; 14 items, Supplementary Table S2), "clinical factors that are important in treating multimorbidity" (Important Clinical Factors; 32 items, Supplementary Table S3), and "clinical strategies that are important for treating multimorbidity" (Important Clinical Strategies; 19 items, Supplementary Table S4).

Next, the respondents were asked about their emphasis on practice guidelines (i.e., "To what extent do you consider general practice guidelines in treating multimorbidity?") and were asked to indicate "not at all," "not very much," "sometimes," or "often."

For the main outcome, "degree of difficulty in treating patients with multimorbidity," the respondents were asked, "Do you find it more difficult to treat older patients (65 years and older) with multimorbidity than older patients who do not have multimorbidity?" The respondents were asked to answer "not at all," "not very much," "sometimes," or "often."

Background of the respondents: The respondents were asked about their sex, age, and length of professional experience (years and months). The participants were also queried about the facility where they worked and were asked to choose one of the following options: non-bedded clinic, bedded clinic, hospital with < 200 beds, hospital with > 200 beds, university hospital, or care facility. The respondents were further queried about the clinical settings in which they worked; multiple answers were allowed from the following options: outpatient clinic, home medical care, Long-term care facility, and hospital ward. Finally, the respondents were asked about the size of the population in the municipality in which they practiced and how often they treated patients aged 65-74, 75-89, and ≥ 90 years old; the options were "never," "not often," "sometimes," and "often." The respondents also disclosed their qualifications.

Ethical considerations

This study was approved by the Ethical Review Committee of the Maruki Memorial Medical and Social Welfare Center, the first author's previous institution (No. 37). The cover page of the questionnaire included an outline of the survey and its purpose, information on privacy protection, and contact information. Consent was considered to have been provided when participants returned the questionnaire.

Data analysis

Degree of difficulty in treating older people with multimorbidity: Regarding the main outcome of this study, "degree of difficulty in medical treatment," the respondents who answered either "often" or "sometimes" were classified into the "difficulty" group, and those who answered "not often" or "not at all" were classified into the "non- difficulty" group for analysis.

Approach to treating older people with multimorbidity: Each item—Difficult Diseases, Difficult Backgrounds, Important Clinical Factors, and Important Clinical Management—was first scored from "not at all" (1 point) to "very much" (4 points), and then the scores for each of these items were calculated. The scores were then added for each factor to obtain an overall Difficult Diseases score (a maximum of 172 points; the higher the score, the more difficult the disease), an overall Difficult Backgrounds score (a maximum of 56 points; the higher the score, the more difficult the patient background), an overall Important Clinical Factors score (a maximum of 128 points; the higher the score, the more important the clinical factor), and the overall Important Clinical Management score (a maximum of 76 points; the higher the score, the more important the clinical management strategy).

Those who responded "often" or "sometimes" to Emphasis on Practice Guidelines were classified as the "emphasize group" and those who responded "not often" or "not at all" were classified as the "non-emphasize group" for analysis.

Background of the respondents: The frequencies with which physicians treated patients aged 65-74, 75-89, and over 90 years of age were grouped as "low frequency" for the participants who answered "never" or "not often," and "high frequency" for those who answered "sometimes" or "often."

Statistical analysis

Background of the respondents: We used the Chi-square test, Fisher's direct probability test, and the t-test to check for any differences in the degree of difficulty between the "difficulty" and the "non-difficulty" groups by sex, age, facility, type of practice, population size, and frequency of practice by age group.

Scores for Diseases, Backgrounds, Clinical Factors, and Clinical Management: Using the t-test, we tested for any differences between the "Difficulty" and "Non-Difficulty" groups by Diseases, Backgrounds, Clinical Factors, and Clinical Management scores.

Background factors that physicians consider difficult to treat older people with multimorbidity: First, we tested for differences between the "difficulty" and "non-difficulty" groups based on the practice model: experience as a physician, overall score for Difficult Diseases, overall score for Difficult Backgrounds, overall score for Important Clinical Factors, overall score for Important Clinical Management, and Emphasis on Practice Guidelines ("emphasize" or

"non-emphasize" group), using the Chi-square test and t-test.

Next, using Difficulty in Medical Care (=1) as the outcome for older people with multimorbidity, multivariate logistic regression analysis was performed to calculate odds ratios and 95% confidence intervals. On the basis of the practice model, Experience as a Physician; the overall scores for Difficult Diseases, Difficult Backgrounds, Important Clinical Factors, and Important Clinical Management; and Emphasis on Practice Guidelines ("emphasize" group or "non-emphasize" group) were used as explanatory variables with forced entry. Two-tailed tests were used, significance levels were set at 5% or less, and the statistical package IBM SPSS Statistics 29.0.1 was used.

Results

A total of 836 questionnaires were received (25.3% response rate). Of geriatric specialists who responded, although the respondents were eligible for geriatric specialty certification, four respondents indicated that they lacked geriatric specialization or left the response blank. Additionally, among the JPCA respondents, 11 respondents did not have family medicine or primary care certification or left the response blank despite being eligible for these certifications. Thus, questionnaires from 15 respondents were excluded. Next, we excluded 60 respondents who did not indicate their facility affiliation and 253 respondents who were not in a hospital (clinic or long-term care facility). Finally, 490 participants were included in the analysis after the 18 participants who did not respond to the main outcome of this study, "degree of medical difficulty," were excluded (Fig. 1). Of the 490 participants included in the analysis, 286 (58.4%) were geriatric specialists (Japan Geriatrics Society) and 204 (41.6%) were primary care specialists (Japan Primary Care Association).

In total, 228 (46.5%) participants responded "often," 215 (43.9%) responded "sometimes," 42 (8.6%) responded "not often," and 5 (1.0%) responded "not at all" regarding the main outcome "degree of medical difficulty." Therefore, the "difficulty" and "non-difficulty" groups included 443 (90.4%) and 47 (9.6%) participants, respectively.

Background of the respondents (Table 1): Sex was not statistically different between the "difficulty" and "non-difficulty" groups. Age was statistically lower in the "difficulty" group than in the "non-difficulty" group. No statistical difference was observed between the "difficult" and "non-difficult" groups by facility, clinical setting, population size of the municipality, frequency of treatment by age group (65-75, 75-90, and ≥ 90 years old), and qualification.

Scores for Disease, Background, Clinical Factors, and Clinical Management: As shown in Table 2, the Cronbach's alpha coefficients for the Disease and Background scores were 0.947 and 0.893, respectively, indicating that internal consistency in each score was relatively preserved.

As shown in Table 3, the Cronbach's alpha coefficients for the Clinical Factors and Clinical Management scores were 0.999 and 0.871, respectively, indicating that internal consistency in each score was relatively preserved.

A comparison of the "difficulty" and "non-difficulty" groups is shown for each of the overall scores and emphasis on practice guidelines (Table 4).

Approach to treating older people with multimorbidity (Table 4): Experience as a physician (in years) was significantly shorter in the "difficulty" than in the "non-difficulty" group.

The overall scores for Difficult Diseases, Difficult Backgrounds, and Important Clinical Factors were significantly higher in the "difficulty" than in the "non-difficulty" group. The overall score for Important Clinical Management was not statistically different between the "difficulty" and "non-difficulty" groups.
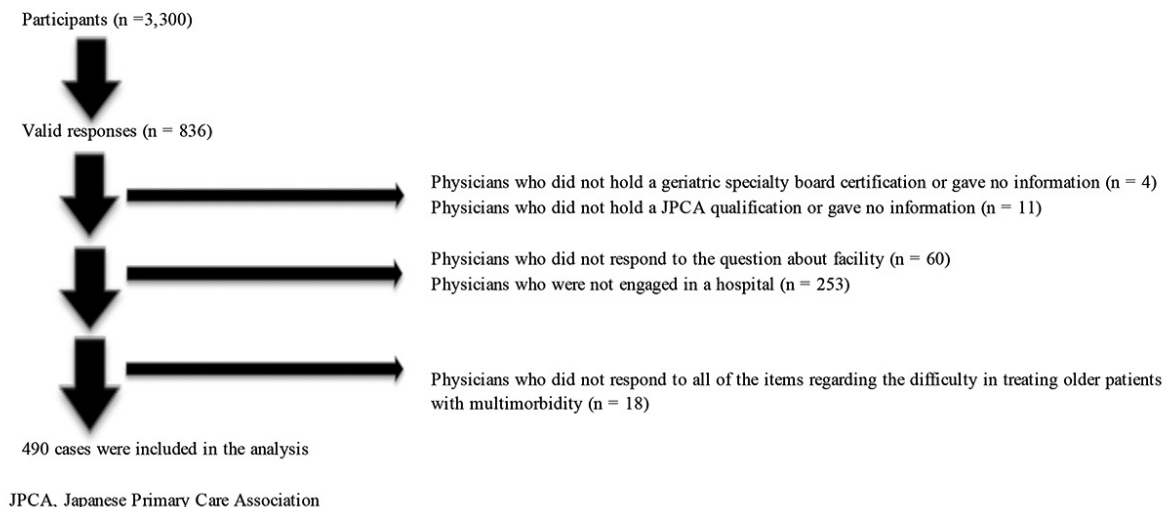

Fig. 1. Population flow diagram of the study participants.

Table 1. Backgrounds of respondents (n = 490).

	Treating older patients with multimorbidity				p-value
	"Non - difficulty" groups (n = 47, 9.6%)		"Difficulty" groups (n = 443, 90.4%)		
	N or mean	% or SD	N or mean	% or SD	
Sex					0.305
Male	41	89.1%	359	82.2%	
Female	5	10.9%	78	17.8%	
Age (years)	61.2	13.3	52.2	11.3	< 0.001
Facility					0.004
Hospital under 200 beds	27	57.4%	153	34.5%	
Hospital over 200 beds	17	36.2%	201	45.4%	
University hospital	3	6.4%	89	20.1%	
Clinical setting					
outpatient practice	43	91.5%	429	96.8%	0.083
home medical care	11	23.4%	115	26.0%	0.703
Long-term care facility	8	17.0%	91	20.5%	0.568
ward	32	68.1%	341	77.0%	0.174
Population size of the municipality					0.516
under 100,000	11	23.4%	122	27.9%	
over 100,000	36	76.6%	316	72.1%	
Treating patients aged 65 to 75 years					0.262
high frequency group	1	2.1%	2	0.5%	
low frequency group	46	97.9%	439	99.5%	
Treating patients aged 75 to 90 years					1.000
high frequency group	47	100.0%	440	99.5%	
low frequency group	0	0.0%	2	0.5%	
Treating patients aged 90 years or older					1.000
high frequency group	45	95.7%	419	94.6%	
low frequency group	2	4.3%	24	5.4%	
Qualifications					
Board Certified Member of the Japanese Society of Internal Medicine	31	66.0%	308	69.5%	0.614
Fellow of the Japanese Society of Internal Medicine	21	44.7%	258	58.2%	0.074
geriatric specialists	34	72.3%	256	57.8%	0.054
primary care certified physicians	17	36.2%	205	46.3%	0.186
family medicine specialists	4	8.5%	52	11.7%	0.508

SD, Standard deviation

Regarding emphasis on practice guidelines, 24 (5.0%) respondents stated "not at all," 375 (78.1%) stated "not very much," 75 (15.6%) stated "sometimes," and 6 (1.3%) stated "often." Therefore, the "non-emphasize" and "emphasize" groups had 399 (83.1%) and 81 (16.9%) participants, respectively. Significantly more respondents who did not emphasize guidelines were in the "difficulty" group than in the "non-difficulty" group.

Factors associated with hospital physicians experiencing difficulty in treating older patients with multimorbidity: logistic regression model (Table 5): In the multiple logistic regression model, the difficulty level in treating older people with multimorbidity decreased by 6.5% (adjusted odds ratio: 0.935, 95% confidence interval: 0.905-0.965) for each additional year of experience as a physician. A one-point increase in the overall score for Difficult Diseases increased difficulty by 2.8% (adjusted odds ratio: 1.028, 95% confidence interval: 1.004-1.053), and a one-point increase in the overall score for Difficult Backgrounds increased difficulty by 6.5% (adjusted odds ratio: 1.065, 95% confidence interval: 1.005-1.129). The adjusted odds ratio for Emphasis on Practice Guidelines was 2.91 (95% confidence interval: 1.305-6.491) for the "non-emphasize" compared with the "emphasize" group.

Discussion

To the best of our knowledge, this is the first study to reveal the background factors that hospital geriatricians and general practitioners in Japan consider to be associated with difficulty in treating older people with multimorbidity.

Table 2. Scores for Diseases and Backgrounds (n = 490).

| | To treat older patients with multimorbidity | | | | |
| | "Non - difficulty" groups (n = 47, 9.6%) | | "Difficulty" groups (n = 443, 90.4%) | | p-value |
	mean	SD	mean	SD	
Score for Diseases (Cronbach's alpha coefficient: 0.947)					
1) Congestive heart failure	2.17	0.79	2.93	0.69	< 0.001
2) Hypertension	1.38	0.49	1.98	0.66	< 0.001
3) Atrial Fibrillation	1.90	0.76	2.54	0.66	< 0.001
4) Ischemic heart disease	2.17	0.86	2.74	0.69	< 0.001
5) Peripheral arterial disease	2.29	0.92	2.93	0.70	< 0.001
6) Diabetes mellitus (severe)	2.07	0.71	2.74	0.76	< 0.001
7) Diabetes mellitus (mild)	1.57	0.50	2.13	0.69	< 0.001
8) Dyslipidemia	1.38	0.49	1.66	0.58	0.002
9) Gout/hyperuricemia	1.45	0.55	1.71	0.59	0.008
10) Thyroid disease	1.88	0.77	2.06	0.63	0.092
11) Chronic lung disease	2.21	0.75	2.87	0.70	< 0.001
12) Chronic kidney disease	2.43	0.89	3.18	0.76	< 0.001
13) Cerebrovascular disease	1.88	0.63	2.39	0.78	< 0.001
14) Hemiplegia	2.05	0.73	2.64	0.77	< 0.001
15) Neurological intractable disease	2.88	0.99	3.37	0.77	< 0.001
16) Peptic ulcer	1.88	0.77	2.18	0.68	0.007
17) Inflammatory bowel disease	2.67	0.82	2.79	0.70	0.335
18) Constipation	1.76	0.66	2.23	0.72	< 0.001
19) Collagen disease	2.74	0.80	3.02	0.70	0.034
20) Liver disease	2.24	0.73	2.46	0.66	0.036
21) Moderate to severe hepatic dysfunction	2.81	0.92	3.18	0.70	0.015
22) Solid tumor	2.43	0.86	2.62	0.84	0.165
23) Cancer metastasis/metastatic solid cancer	2.93	1.02	3.25	0.75	0.056
24) Lymphoma	3.07	0.97	3.29	0.72	0.165
25) Leukemia or true erythrocytosis	3.31	0.84	3.48	0.69	0.216
26) Depression	2.73	0.87	3.04	0.67	0.006
27) Dementia	2.39	0.92	2.99	0.82	< 0.001
28) Sleep disorders	2.20	0.81	2.53	0.68	0.003
29) Benign prostatic hyperplasia	2.12	0.84	2.32	0.62	0.142
30) Vertigo	2.07	0.75	2.43	0.59	< 0.001
31) Hearing loss	2.61	1.02	2.75	0.74	0.409
32) Low back pain	2.10	0.74	2.42	0.68	0.004
33) Epilepsy	2.44	0.87	2.72	0.71	0.047
34) Spinal canal stenosis	2.39	0.83	2.59	0.69	0.080
35) Osteoporosis	1.98	0.72	2.17	0.65	0.069
36) Osteoarthritis	2.10	0.70	2.38	0.65	0.009
37) Visual impairment	2.83	0.80	2.77	0.69	0.605
38) Glaucoma	2.88	0.87	2.69	0.75	0.129
39) Cataract	2.44	0.90	2.27	0.74	0.243
40) Dental problems	2.49	0.93	2.54	0.75	0.723
41) Bedsores	2.56	0.90	2.98	0.74	0.006
42) Eczema/dermatitis	2.24	0.83	2.38	0.67	0.212
43) AIDS	3.50	0.75	3.37	0.84	0.338
Score for Backgrounds (Cronbach's alpha coefficient: 0.893)					
1) Severe comorbidities	2.88	0.75	3.49	0.60	< 0.001
2) Many social problems	3.07	0.69	3.56	0.59	< 0.001

3) Many psychiatric/psychological problems	3.00	0.71	3.54	0.59	< 0.001
4) Difficulty in setting the goals and outcomes for medical treatment	2.85	0.73	3.33	0.64	< 0.001
5) Difficult communicating with patients	2.83	0.86	3.35	0.67	< 0.001
6) Difficult to communicate with family members	2.85	0.91	3.35	0.70	0.002
7) No key person is available	2.88	0.78	3.31	0.68	< 0.001
8) Patient lives alone	2.59	0.84	3.18	0.68	< 0.001
9) Difficult to identify the department/medical institution where the patient is receiving treatment at another clinics or hospital	2.63	0.70	3.10	0.69	< 0.001
10) Difficulty in collecting clinical information during outpatient visits to other clinics or hospitals	2.78	0.72	3.11	0.69	0.003
11) Difficulty in collecting clinical information when the patient is admitted to or discharged from another hospital	2.71	0.72	3.02	0.71	0.008
12) Unable to follow general practice guidelines	2.45	0.64	2.86	0.71	< 0.001
13) Difficulty in collaborating with specialist in organs/areas	2.40	0.78	2.87	0.70	< 0.001
14) Differences of opinion on goal setting with the specialist in the organ/area	2.58	0.78	2.96	0.72	0.002

Response patterns were based on a 4-point Likert scale from "totally disagree" = 1 to "totally agree" = 4.
SD, Standard deviation
AIDS, Acquired Immunodeficiency Syndrome

First, compared with the physician group with long experience, the group with short experience expressed more difficulty in treating older people with multimorbidity, suggesting that differences in clinical experience were related to the difficulty hospital physicians experienced in treating such patients. However, the average age of the physicians who reported difficulty in treating older people with multimorbidity in this study was 61.2 years, the age at which they are hospital administrators. As administrators, these physicians may have fewer opportunities to practice than younger physicians and may not be as aware of the difficulties faced in their practices. Notably, although the perception of difficulty decreases with clinical experience, whether or not a physician recognizes difficulty in treating a patient is not the same as whether or not they are providing the desired care (Lewis et al. 2016).

Next, the higher the overall score for Difficult Diseases and Backgrounds, the more difficulty hospital physicians expressed about treating older people with multimorbidity. This suggested that the type of disease and patient background affect treatment and that physicians find it difficult to treat older people with multimorbidity. It is hoped that education and training programs on diseases, clinical backgrounds, and approaches to complex cases—consistent with the items that were incorporated into the Disease and Background scores—will be enhanced in the future to reduce the level of difficulty perceived by physicians, especially those with limited experience in medical care. In addition, mortality rates and the number of readmissions during hospitalization differ depending on the disease pattern of the patient in the multimorbidity ward. Therefore, the relationship between the disease pattern of multimorbidity and difficulty in treatment, rather than the sum of diseases and backgrounds, should be examined (Matesanz-Fernández et al. 2022).

It should be noted that, contrary to the hypotheses, the overall scores for Important Clinical Factors and Important Clinical Management were not associated with a decrease in the perceived difficulty of care among hospital physicians, possibly because physicians do not focus on these patient backgrounds or specific interventions. Furthermore, the identification of patient outcomes on which to focus—a prerequisite for intervention—may be challenging given the multiple diseases that coexist in older adults with multimorbidity. In Europe and the United States, guidance is provided on the outcomes on which to focus in older people with multimorbidity. A guide that is adapted to the realities of the Japanese healthcare system is needed to support the treatment of older people with multimorbidity (Guiding principles for the care of older adults with multimorbidity: an approach for clinicians 2012; National Institute for Health and Care Excellence 2016). Finally, determining the relationship between the existence of such a guide and the perception of difficulty in treatment is desirable in the future.

In this study, the lack of emphasis on general practice guidelines was associated with the difficulty hospital physicians experienced in treating older people with multimorbidity. General practice guidelines often present evidence from a single disease model, making it impractical for physicians to adapt the evidence when treating multimorbid older adults (Ong et al. 2020; Michielsen et al. 2023). In addition, the use of multiple general practice guidelines for older people with multimorbidity is less practical for physicians than for non-multimorbid patients (Hughes et al. 2013; Luijks et al. 2015). The application of multiple general practice guidelines to older people with multimorbidity may lead to an increase in the number of medications and thus to an increase in the patient's treatment burden. Physicians' attention to the number of medications may

Table 3. Score for clinical factors and clinical strategies (n = 490).

	Treating older patients with multimorbidity				
	"Non - difficulty" groups (n = 47, 9.6%)		"Difficulty" groups (n = 443, 90.4%)		p-value
	mean	SD	mean	SD	
Score for Clinical factors (Cronbach's alpha coefficient: 0.999)					
1) Comorbidities in the primary disease	3.38	0.58	3.31	0.51	0.429
2) Hearing loss	2.71	0.69	2.71	0.64	0.998
3) Visual impairment	2.80	0.69	2.80	0.63	1.000
4) Wheelchair ADLs	2.87	0.66	3.04	0.65	0.086
5) Bedridden ADLs	3.11	0.83	3.40	0.64	0.005
6) Cognitive impairment	3.13	0.69	3.48	0.56	< 0.001
7) Depression	3.11	0.61	3.19	0.56	0.371
8) Low nutrition	3.53	0.59	3.44	0.56	0.296
9) Psychiatric complications	3.22	0.70	3.33	0.55	0.336
10) Urinary incontinence	2.83	0.64	2.72	0.60	0.270
11) History of falls	3.17	0.71	3.22	0.55	0.683
12) Certified as requiring long-term care insurance	2.96	0.79	3.16	0.63	0.042
13) Poor adherence to medications	3.43	0.54	3.51	0.53	0.347
14) Polypharmacy	3.43	0.54	3.42	0.56	0.860
15) Burdened by waiting time for outpatient department	3.02	0.65	2.88	0.60	0.129
16) Burdened by visits to the doctor and outpatient department	3.30	0.59	3.20	0.56	0.210
17) Exercise therapy decreases QOL	2.72	0.78	2.84	0.63	0.297
18) Dietary therapy decreases QOL	2.85	0.76	3.01	0.62	0.175
19) Medication decreases QOL	3.15	0.67	3.17	0.57	0.856
20) Burden of treatment	3.37	0.61	3.42	0.58	0.554
21) Limited support of daily living	3.39	0.54	3.50	0.51	0.176
22) Decreased ability to home care for the patient	3.46	0.55	3.59	0.50	0.119
23) Repeated emergency room visits	3.42	0.66	3.47	0.57	0.612
24) Repeated hospitalization and discharge	3.33	0.63	3.53	0.52	0.037
25) Financial problems	3.22	0.73	3.36	0.57	0.202
26) Living alone	3.22	0.73	3.38	0.59	0.089
27) Absence of a physician who coordinates and decides the overall medical policy	3.24	0.79	3.26	0.66	0.823
28) Number of medical institutions attended	2.96	0.63	2.97	0.58	0.876
29) Number of coexisting disease	2.96	0.67	3.11	0.57	0.096
30) Age	2.85	0.84	3.10	0.64	0.052
31) Estimated life expectancy	3.24	0.85	3.48	0.58	0.064
32) Frailty	3.37	0.61	3.37	0.54	1.000
Score for Clinical strategies (Cronbach's alpha coefficient: 0.871)					
1) Refer to practice guidelines with the older adults in mind	3.07	0.71	3.14	0.57	0.393
2) Review evidence on important outcomes	2.96	0.67	3.04	0.52	0.409
3) Review indications for drug therapy for primary prevention	3.15	0.79	3.01	0.61	0.245
4) Review indications for drug therapy for secondary prevention	3.22	0.76	3.18	0.52	0.749
5) Re-evaluate drugs	3.41	0.65	3.33	0.53	0.380
6) Reassess treatment strategy	3.48	0.59	3.35	0.51	0.152
7) Evaluate patient treatment burden	3.52	0.66	3.37	0.54	0.084
8) Listen to the patient's wishes and values	3.67	0.47	3.61	0.50	0.402
9) Listen to the opinions of the family	3.50	0.62	3.51	0.53	0.916
10) Ask opinions of other professionals	3.33	0.60	3.33	0.53	0.945
11) Ask opinions of people the patient trusts	3.11	0.67	3.05	0.65	0.590
12) Present options to the patient regarding treatment goals	3.39	0.58	3.40	0.53	0.900

13) Present treatment priorities to the patient	3.43	0.62	3.40	0.54	0.712
14) Consolidate physicians who will treat patients	2.87	0.58	2.98	0.59	0.211
15) Identify a physician who will determine the overall treatment plan	3.11	0.74	3.15	0.58	0.627
16) Examine the intervals between visits to organ/area specialist	2.89	0.56	2.91	0.53	0.845
17) Clarify the role of the organ/area specialist	3.00	0.63	3.06	0.55	0.512
18) Use of long-term care insurance services	3.49	0.62	3.62	0.51	0.177
19) Provide multidisciplinary intervention	3.53	0.58	3.52	0.54	0.889

Response patterns were based on a 4-point Likert scale from "totally disagree" = 1 to "totally agree" = 4.
SD, Standard deviation
ADL, Activities of Daily Living
QOL, Quality of Life

Table 4. Difficult-to-treat older patients with multimorbidity (n = 490).

	To treat older patients with multimorbidity				
	"Non - difficulty" groups (n = 47, 9.6%)		"Difficulty" groups (n = 443, 90.4%)		p-value
	N or mean	% or SD	N or mean	% or SD	
Experience as a physician (years)	35.6	13.3	26.8	11.1	< 0.001
Overall score for Difficult Diseases	98.38	20.85	113.16	16.97	< 0.001
Overall score for Difficult Backgrounds	37.40	8.92	44.88	6.22	< 0.001
Overall score for Important Clinical Factors	97.94	16.62	103.05	10.56	0.044
Overall score for Important Clinical Management	61.09	9.80	61.93	5.71	0.563
How important do you consider general practice guidelines for treating multimorbidity?					0.007
Non-emphasize group	31	68.9%	368	84.6%	
Emphasize group	14	31.1%	67	15.4%	

take their focus away from general practice guidelines, potentially leading to difficulties for physicians in their practices (Ong et al. 2020; Michielsen et al. 2023).

The use of guideline-recommended drugs for certain diseases has been reported to prolong prognosis even in older adult patients with multimorbidity, and therefore caution should be exercised in practices that do not focus on general practice guidelines (Tinetti et al. 2015). In Japan, a more detailed examination of the reasons for physicians not emphasizing general practice guidelines in the treatment of older people with multimorbidity is required. However, although physicians who focus on general practice guidelines do not perceive difficulty in their practices, these physicians do not consider the burden of treatment on patients, which may lead to undesirable patient outcomes. Further study is needed to determine the role of general practice guidelines in the treatment of older adult patients with multimorbidity.

In recent years, the Japanese Geriatrics Society and other organizations have published practice guidelines in which multimorbidity is considered (Japan Geriatrics Society and The Japan Diabetes Society 2023). We anticipate that more practice guidelines will be developed that consider the cumulative impact of treatment recommendations for patients with multimorbidity to ensure that the rel-

ative benefits and risks can be weighed in the application of these treatments (Tanriover et al. 2015; National Institute for Health and Care Excellence 2016). Concerning the types of educational programs that should be developed based on these recommendations (Guiding principles for the care of older adults with multimorbidity: an approach for clinicians 2012; Tinetti et al. 2015), our study findings support the value of educational programs such as workshops to allow physicians with relatively limited experience and those with relatively long experience to discuss approaches—including practice guidelines—for the treatment of older people with multimorbidity (Maguire et al. 2015; Lewis et al. 2016).

This study has three limitations. First, the study included all geriatric specialists in Japan, all family medicine specialists in the JPCA, and primary care physicians who were randomly selected. As physicians who play a central role in the treatment of older people with multimorbidity in Japan, these respondents are generally representative. However, given that the collection rate was only 25.3%, caution must be exercised when considering the generalizability of the results.

Second, this study was based on the results of a questionnaire survey, which may differ from those in actual practice. Each of the scores generated in this study had a

Table 5. Factors associated with difficult-to-treat older patients with multimorbidity: Multiple logistic regression model.

		Univariate model				Multiple logistic regression model			
		Crude odds ratio	95% confidence interval Lower	Higher	p-value	Adjusted odds ratio	95% confidence interval Lower	Higher	p-value
Experience as a physician (years)		0.937	0.911	0.963	<0.001	0.935	0.905	0.965	<0.001
Overall score for Difficult Diseases		1.044	1.026	1.062	<0.001	1.028	1.004	1.053	0.023
Overall score for Difficult Backgrounds		1.144	1.09	1.2	<0.001	1.065	1.005	1.129	0.034
Overall score for Important Clinical Factors		1.034	1.01	1.058	0.005	1.022	0.979	1.066	0.323
Overall score for Important Clinical Management		1.021	0.975	1.069	0.373	0.977	0.911	1.047	0.504
How important do you consider general practice guidelines for treating multimorbidity?	Non-emphasize group	2.481	1.253	4.909	0.009	2.910	1.305	6.491	0.009
	Emphasize group	Reference	-	-		Reference	-	-	

high Cronbach's alpha coefficient, and we believe that internal consistency was ensured. However, the validity of the scores is limited.

Third, this study was a cross-sectional survey and only considered inter-relationships at the time of the survey. Therefore, unmeasured items or potential confounding factors regarding the factors that were perceived as difficult may have been missed. Moreover, perceived difficulty may change over time.

In the future, including internal medicine physicians and physicians with organ/field specialties in such a survey would be useful for clarifying the role of and intervals between visits to organ/field specialties in patients with multimorbidity, which would allow a deeper discussion of the survey items.

Conclusion

The following factors were associated with difficulty in treating older people with multimorbidity: short experience as a physician, diseases and patient backgrounds that are perceived as difficult, and a lack of emphasis on general practice guidelines. The importance of treating older people with multimorbidity is expected to increase in the future. Inpatient care for this population offers an excellent opportunity to reassess patient function and status and initiate new interventions (Tanriover et al. 2015; Kimura et al. 2024). A guide for the inpatient care of older people with multimorbidity in Japan should be developed based on the background of physicians who experience difficulty in treating multimorbidity, as identified in this study. Furthermore, it is anticipated that the background of physicians who consider multimorbidity difficult to treat, as identified in this study, can support the development of guidelines and the strengthening of education and training in using these guidelines to establish better care for older people with multimorbidity.

study design, data collection, analysis, manuscript preparation, or decision to publish this manuscript.

Conflict of Interest

First Author: Grant from C.U.C. Inc. The others declare no conflict of interest.

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Supplementary Files

Please find supplementary file(s);
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