



## Primary health care practitioners' perception of patient loneliness in Japanese older adults: A cross-sectional study

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### ABSTRACT

Loneliness is a serious social issue in Japan. We aimed to examine the frequency and patient characteristics of Japanese family physicians and nurses overlooking or misjudging patient loneliness. This cross-sectional study involved 470 patients aged 50 years or older who visited two family medicine clinics in Fukushima Prefecture in August 2020. Statistical analysis was performed using the chi-squared test and logistic regression models. Patient loneliness was self-assessed using the University of California's Los Angeles Loneliness Scale. Family physicians and nurses assessed patient loneliness prior to the consultation by independently reviewing medical records for the previous 6 months. For family physicians, the proportion of misjudging loneliness, in which patients self-assessed as not lonely but were perceived to be lonely, was 20.2%. The proportion overlooking loneliness, in which patients self-assessed as lonely but were perceived not to be lonely, was 20.9%. Similarly for nurses, the proportions of misjudging and overlooking loneliness were 9.6% and 29.8%, respectively. The odds of a family physician overlooking loneliness was significantly higher for unmarried, divorced, or bereaved patients than for married (adjusted odds ratio [aOR]: 1.94; 95% confidence interval [CI]: 1.08–3.50), and for patients not participating in community activities compared with those participating (aOR: 2.10; 95% CI: 1.24–3.54). The odds of a nurse misjudging a patient as lonely was significantly higher for unmarried, divorced, or bereaved patients than for married (aOR: 3.02; 95% CI: 1.24–7.36) and for patients living alone compared with those cohabiting with someone (aOR: 3.61; 95% CI: 1.17–11.17). The odds of a nurse overlooking loneliness was significantly higher for patients who did not participate in community activities (aOR: 1.96; 95% CI: 1.26–3.06). These findings indicate that perceiving patient loneliness based on marital status, living arrangements, and involvement in community activities is difficult for family physicians and nurses in Japan.

### 1. Introduction

Although loneliness is a common feeling, prolonged and extreme exposure to loneliness can have a serious impact on an individual's well-being and social functioning (Office for National Statistics, 2018). The definition of loneliness that is broadly accepted and used by health professionals in the context of health and social care was first proposed in 1981 by Perlman and Peplau (Perlman & Peplau, 1981, 1998, pp. 571–581), and on this basis, the Jo Cox Commission defines loneliness as follows: 'a subjective, unwelcome feeling of lack or loss of companionship. It happens when we have a mismatch between the quantity and

quality of social relationships that we have, and those that we want' (Crouch & Wright, 2018, pp. 17–22). Similarly, the National Academy of Science defines loneliness as 'the subjective feeling of being lonely' (National Academies of Sciences, Engineering, and Medicine., 2020).

The field of public health has long been concerned with loneliness, with some pointing to an epidemic of loneliness in many countries (Kung et al., 2021; Murthy, 2020), which has been shown not only to increase mortality, but also to increase the incidence of major psychological, cognitive, and physical conditions, and lower perceived well-being or quality of life (National Academies of Sciences, Engineering, and Medicine., 2020). On the Prosperity Index, which measures a country's

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prosperity in terms of both its economic and social well-being, Japan scores highly for the 'health' and 'safety and security' indicators, but noticeably lower for 'social capital', ranking 143rd out of 167 countries (Legatum Institute, 2021, pp. 21–23). According to the Organisation for Economic Co-operation and Development, the proportion of people who seldom socialize with friends, colleagues, and other community members was 15.3% – the highest among member countries – against the member country average of 6.7% (Organisation for Economic Co-operation and Development, 2005). As expected, the feeling of loneliness especially among the elderly was reported to associate with dementia and higher mortality (Shibata et al., 2021; Takagi & Saito, 2020).

In recent years, lockdowns and stay-at-home orders associated with the coronavirus disease 2019 (COVID-19) pandemic have brought the issue of loneliness to worldwide attention (Bu et al., 2020; Cerbara et al., 2020; Cooke et al., 2020; Sugaya et al., 2021). In a cross-cohort study of UK adults before and after the COVID-19 pandemic, 18.3% felt loneliness frequently during the pandemic, an increase of around 10% compared with before the pandemic (Bu et al., 2020). In addition, social isolation itself exacerbates the existing pandemic of loneliness among older people and amplifies the burden associated with physical and mental ill-health (Armitage & Nellums, 2020). In Japan, the government set up an office in the Cabinet Secretariat to deal with the increasing severity of loneliness and isolation in the wake of the COVID-19 pandemic and appointed the world's second Minister for Loneliness and Isolation, the first being the Minister for Loneliness in the UK (Kawaguchi, 2021).

There are, however, multiple factors in this loneliness that make it hard to recognize. First, loneliness has a stigma; it is so stigmatized that lonely people are less likely to identify themselves as lonely (Office for National Statistics, 2018; Ishitani, 2020). The first UK-Japan Ministerial Meeting on Loneliness also identified the elimination of this stigma as one of the issues to be addressed (Cabinet Secretariat, 2021). Second, loneliness is often confused with other concepts and terms, such as social isolation (Office for National Statistics, 2018; Koyama et al., 2021). The presence of social isolation does not necessarily mean loneliness, as it is possible that some people in social isolation also have a preference for solitude (Cacioppo and Patrick, 2008). It may be the subjective experience of loneliness that is the problem, rather than the literal state of being alone (Cacioppo and Patrick, 2008; Green et al., 2021). Third, there is the lack of a standardized scale to measure loneliness (Office for National Statistics, 2018). The Jo Cox Commission has highlighted the need in the UK for a national indicator of loneliness to more accurately measure progress towards its prevention and alleviation. Recommending measures that focus on the subjective experience of loneliness would allow for more robust comparisons between studies and address the lack of conceptual clarity (Kennedy, Reeves, & Cox, 2017). The University of California's Los Angeles (UCLA) Loneliness Scale (3rd edition), developed in the US, attempts to measure and assess loneliness, but its suitability for general use in international contexts is untested (Masuda et al., 2012).

As such, health professionals working in primary health care find it difficult to identify lonely patients. In Denmark and the Netherlands, family physicians in outpatient clinics report difficulty in recognizing loneliness in their patients, especially when the patient does not live alone or if physicians believe the patient to be well-socialized (Due et al., 2018). Another qualitative study among family physicians in the Netherlands found that the definition and the perception of loneliness varied between family physicians (van der Zwet et al., 2009). Primary care professionals require improved skills to identify loneliness in their consultations and to perform social prescribing for those in need. The Royal College of General Practitioners encourages general practitioner surgeries to employ social prescribers to facilitate direct referrals of family physicians to social prescribers (Royal College of General Practitioners, 2018), and the Royal College of Nursing's General Practice Nursing Forum has outlined a nurse-led model of social prescribing

(Pickering & Smyth, 2020). In Japan as well, the understanding of social prescribing among medical practitioners is growing (Nishioka & Kondo, 2020). Family physicians in Japan are certified by the Japan Primary Care Association (JPCA), and the social determinants of health are one of its portfolios (Japan Primary Care Association, 2020). (For clarity, the term 'family physicians' is used throughout this paper to denote Japanese certified general practitioners, in line with the JPCA's preferred English terminology.) Nurses in Japan do not provide independent medical care, but rather support the physician, and social prescribing is becoming increasingly recognized in the nursing field (Takeda, 2021).

In light of the above, the present study aimed to investigate the difficulties of recognizing loneliness among Japanese family physicians and nurses, and to clarify which patient characteristics were associated with these service providers overlooking or misjudging patients as being lonely.

## 2. Methods

### 2.1. Study design and participants

This was a cross-sectional study using a self-administered questionnaire implemented at two family medicine clinics staffed by family physicians certified by the JPCA. Patients aged 50 years or older, who received regular clinic visits between 1 and August 31, 2020, were included. Patients were excluded if they were on the first visit or assessed by family physicians or nurses as not being able to understand the study or unable to complete the questionnaire, or if they were in receiving palliative or end-of-life care.

### 2.2. Survey items

Patients' loneliness was self-assessed by the UCLA Loneliness Scale (3rd edition) (Russell, 1996) before or after the consultation. The scale score ranged from 20 to 80, and a score of 44 or above was categorized as being lonely. A Japanese version of this questionnaire has been developed and has shown acceptable reliability and validity (Masuda et al., 2012; Toyoshima & Sato, 2013). It consists of 20 questions, which are evaluated by the total score; 9 of the questions are reverse-scored, and there are 4 possible responses ('never', 'rarely', 'sometimes', and 'always') for all questions. A different approach was used to assess family physicians' and nurses' perceptions of patient loneliness. Prior to the consultation, primary health care practitioners reviewed the patient's medical records for the previous six months, and then used a four-point scale ('yes', 'possible', 'unlikely', and 'no') to answer the question: 'based on your review of this patient's medical records, do you believe that he or she is likely to be experiencing loneliness?'

Other patient data included basic characteristics (age, sex, education level, employment status, marital status), living conditions and social network (type of house, living condition, participation in community activities), lifestyle behavior (smoking, alcohol intake), current medical conditions (hypertension, dyslipidemia, diabetes mellitus, stroke, cardiovascular disease, depression), and medical services used (period of clinical visits, long-term care insurance, physical disability certificate). For basic characteristics, the cut-off age was set at 65 years, and education was divided into the completion of junior high school or high school and above. Living conditions and social network indicators were whether the patient was living in a nursing home or other institution, whether they were cohabiting with someone, and whether they participated in community or neighbourhood-led organized activities. For current medical conditions, the data were self-reported by the patients. For medical services, the cut-off for the duration of hospital visits was 5 years.

### 2.3. Survey procedure

A questionnaire containing these survey items was handed to the

patient by the family physician or nurse with consent before or after the consultation, and the patient completed it while waiting for or after the consultation. The completed questionnaires were collected immediately after completion. The physicians and nurses recorded their assessment of the patient's loneliness state before the consultation in order to avoid confirming the assessment during consultation knowing the research purpose.

#### 2.4. Analysis

First, patients were categorized into four groups depending on primary health care practitioners' perception of and their own assessment of loneliness. The primary health care practitioners' response was classified into two categories: 'perceived as lonely' for the survey responses 'yes' or 'possible', and 'not perceived as lonely' for the survey responses 'unlikely' or 'no'. Patients' self-assessment of loneliness was also classified into two categories: 'lonely' for a UCLA Loneliness Scale score of 44 or above, and 'not lonely' for those with a score lower than 44. Using these two dimensions, we divided patients who had been assessed by family physicians into four groups: Group A for those who were categorized as lonely and were perceived as such by the family physician; Group B for those who were categorized as not lonely but were perceived as lonely by the family physician; Group C for those who were categorized as lonely but were not perceived as such by the family physician; and Group D for those who were categorized as not lonely and not perceived as such by the family physician. Similarly, patients who had been assessed by nurses were also grouped into four groups (Groups E, F, G and H) based on the patient's self-assessed loneliness category and the nurse's preconsultation assessment of the patient's loneliness. In other words, Groups A and E, or D and H, were groups that showed no discrepancy between the patient's self-assessed loneliness and the primary health care practitioner's preconsultation assessment of the patient's loneliness, so these groups are hereafter referred to as the 'aware groups'. Groups B and C, or F and G, were groups that showed a discrepancy between the patient's self-assessed loneliness and the preconsultation assessment of the primary health care practitioner, and are hereafter referred to as the 'unaware groups'. Groups B and F could be interpreted as representing 'misjudged loneliness', and Groups C and G as representing 'overlooked loneliness' (Table 2a).

Second, we analyzed the characteristics of the patients in the family physician unaware groups (B and C) compared with Group D, and those of the nurse unaware groups (F and G) compared with Group H, in order to explore when discrepancies arose between the primary health care practitioners' preconsultation assessment and the patient's own assessment of loneliness. Each pair was compared by using the Chi-square test for the following items: basic characteristics, living conditions and social network, lifestyle behavior, current medical conditions and medical services. We then conducted multivariable logistic regression by entering items that showed statistical significance in the univariate analyzes along with age, sex, and site. Stata/SE version 16.1 (StataCorp LLC, Texas, USA) was used for the above analyzes.

### 3. Results

#### 3.1. Patient characteristics

A total of 532 people were surveyed, and 492 (92%) responded. Of these, 470 were included in the final analysis, after excluding home care patients (n = 12) and patients with dementia (n = 14). The basic characteristics of the patients are shown in Table 1. As for survey sites, 56.4% were recruited at Site 1. The mean age was 70.1 years (standard deviation [SD] = 9.42); 51.9% were men; 73.7% were in high school or above; 47.2% were employees; 29.4% were unmarried, divorced, or bereaved; 98.1% were lived your own home; 12.9% lived alone; and 50.9% participated in community or neighbourhood-led organized activities. In addition, 73.5% were non-smokers and 49.1% were non-

**Table 1**  
Basic characteristics of the participants (N = 470).

		N	%
Site	Site 1	265	56.4
	Site 2	205	43.6
Basic characteristics			
Age (years)	≥65	342	72.8
	<65	128	27.2
Sex	Male	244	51.9
	Female	226	48.1
Education	Junior high school and below	123	26.3
	High school or above	344	73.7
Employment	Employee	218	47.2
	Non-employee	244	52.8
Marital status	Married	326	70.6
	Unmarried, divorced, or bereaved	136	29.4
Living conditions and social network			
Housing	Your own home	457	98.1
	Nursing homes and other institutions	9	1.9
Living	Cohabiting	405	87.1
	Living alone	60	12.9
Community activities <sup>a</sup>	Participating	235	50.9
	Not participating	227	49.1
Lifestyle behavior			
Smoking	No	344	73.5
	Yes	64	13.7
	Former smoker	60	12.8
	Drinking	No	227
Drinking	Sometimes	123	26.6
	Every day	112	24.2
Current medical conditions			
Hypertension	Yes	292	62.1
	No	178	37.9
Dyslipidemia	Yes	168	35.8
	No	301	64.2
Diabetes mellites	Yes	99	21.1
	No	371	78.9
Stroke	Yes	16	3.4
	No	454	96.6
Cardiovascular disease	Yes	45	9.6
	No	425	90.4
Depression	Yes	17	3.6
	No	453	96.4
Medical services			
Period of clinic visit (years)	<5	167	35.7
	≥5	301	64.3
Long-term care insurance	Using	25	5.7
	Not using	414	94.3
Physical disability certificate	Using	18	15.5
	Not using	98	84.5

<sup>a</sup> Community activities: Activities within the community or neighbourhood-led organized activities, etc.

drinkers. Hypertension was more than half of the cases (62.1%), but less than half of the cases for other conditions. 64.3% had been regular patients for more than five years, 94.3% had no long-term care insurance and 84.5% had no physical disability certificate.

#### 3.2. Perception of patient loneliness

The discrepancy between patients' self-assessment of loneliness on the UCLA Loneliness Scale and family physicians' perception of patient loneliness is shown in Table 2b. From a total of 470 respondents, 179 (38%) were judged to be lonely on the UCLA Loneliness Scale. Cohen's Kappa coefficient between patient loneliness and family physician perceptions was 0.13, and that between patient loneliness and nurse perceptions was 0.07. The proportion of Group B (misjudged loneliness), in which patients self-assessed as not lonely but were perceived as lonely by family physicians, was 20.2%. The percentage for Group C (overlooked loneliness), in which patients self-assessed as lonely but were perceived as not lonely by family physicians, was 20.9%. Similarly for

**Table 2a**  
Group labelling.

		UCLA Loneliness Scale (Version 3)	
		Loneliness (≥44)	No loneliness (<44)
Family physician perception of patient loneliness	Yes	* Group A	** Group B Misjudged loneliness
	No	** Group C Overlooked loneliness	* Group D
Nurse perception of patient loneliness	Yes	* Group E	** Group F Misjudged loneliness
	No	** Group G Overlooked loneliness	* Group H

\*Groups A and E, or D and H, were ‘aware groups’ that showed no discrepancy between the patient’s self-assessed loneliness and the primary health care practitioner’s preconsultation assessment of patient loneliness.

\*\*Groups B and C, or F and G, were ‘unaware groups’ that showed a discrepancy between the patient’s self-assessed loneliness and the primary health care practitioner’s preconsultation assessment of patient loneliness.

nurses, the proportions for Group F (misjudged loneliness) and Group G (overlooked loneliness) were 9.6% and 29.8%, respectively (Table 2b).

### 3.3. Analysis of unaware groups and patient characteristics

In univariable analyses, the unaware groups were characterized by significant differences in marital status, living conditions, and community activities as compared with aware groups (Tables 3 and 4). In the multivariable analysis (Tables 5 and 6), the odds of a family physician overlooking loneliness when a patient has self-assessed as lonely was higher for unmarried, divorced, or bereaved patients (adjusted odds ratio [aOR] 2.02; 95% confidence interval [CI], 1.14–3.59) and higher if the patient did not participate in community activities (aOR 1.91; 95% CI, 1.17–3.12). The odds of a nurse incorrectly categorizing a patient as lonely when that patient has self-assessed as not lonely was higher for unmarried, divorced, or bereaved patients (aOR 2.77; 95% CI, 1.12–6.83) and highest for patients living alone (aOR 4.12; 95% CI, 1.31–13.0). The odds of a nurse overlooking loneliness when a patient had actually self-assessed as lonely was higher for patients who did not participate in community activities (aOR 2.08; 95% CI, 1.33–3.27).

## 4. Discussion

To the best of our knowledge, this is the first cross-sectional study of discrepancies between patients’ self-perception of loneliness and assessments made by family physicians and nurses in a primary health care setting in Japan, focusing not only on family physicians’ but also on nurses’ perception of patient loneliness. A high proportion of family

physicians (21%) and nurses (30%) overlooked loneliness in their patients, and also misjudged loneliness (family physicians 20%; nurses 10%). In multivariate analysis, there were significant odds ratios for marital status, participation in community activities, and living alone.

In this study, as in the Dutch and Danish studies (Due et al., 2018; van der Zwet et al., 2009), family physicians had difficulty in recognizing the loneliness of their patients. The Danish study focused on the aware groups and analyzed the association with patient characteristics (Due et al., 2018). In our study, we focused on the unaware groups, which had a high proportion, and divided this group into two groups: the ‘misjudged loneliness’ group and the ‘overlooked loneliness’ group. The uniqueness of our study is that we focus on which patient characteristics are overlooked or misjudged.

Another unique aspect of our study is that we focus on not only family physicians, but also the nurses who work with them. In a longitudinal study in the UK, people who felt lonely were three times more likely to contact community nurses than those who did not (Wang et al., 2019). In a cross-sectional study of home care in Indonesia, the more care provided by nurses in home care, the less lonely the patients became (Sya’diyah et al., 2020). While there are no standardized rapid screening tools to measure loneliness in an emergency care setting, emergency nurses reported that simply asking elderly patients some questions such as whether they live alone, how many social contacts they have, how many family contacts they have, whether they are satisfied with these contacts, and whether they feel isolated or lonely can be a first step in improving isolation and loneliness (Somes, 2021). Nurses can play a significant role in identifying and supporting patients feeling loneliness. Nigel Crisp, who is a co-founder of the Campaign and a Member of the UK House of Lords, stated that ‘the greatest impact of the new roles of nurses will be in primary care and public health’ as the nature of nursing combines intimate hands-on care, professional knowledge, and person-centered humanitarian values (Crisp, 2018).

In this study, as shown in Table 2b, the agreement between patient loneliness and family physicians’ or nurses’ assessments as indicated by Cohen’s Kappa coefficients was slight, indicating that both family physicians and nurses were not fully aware of patient loneliness. In the Danish study, Cohen’s Kappa coefficient between patient loneliness and family physician assessments was 0.18, which is similar to the results of the present study (Due et al., 2018). Therefore, the errors of family physicians and nurses in overlooking or misjudging the loneliness of patients were notable. As shown in Tables 5 and 6, both family physicians and nurses were likely to miss patients who were lonely if they did not participate in community activities. In addition, family physicians were commonly unable to perceive loneliness in those patients who are lonely if the patients were not married (i.e., unmarried, divorced, or bereaved). Nurses likewise tended to misjudge loneliness if patients were unmarried, divorced, or bereaved, or lived alone. It has been reported previously that predictors of elderly patients’ loneliness were anxiety and depressive symptoms, living alone, and low social participation, and that lonely patients rarely share these issues with their

**Table 2b**  
Distribution of family physician/nurse’s perception of patient loneliness.

		UCLA Loneliness Scale (Version 3)		Total	* Kappa coefficient	p-value
		Loneliness (≥44)	No loneliness (<44)			
Family physician perception of patient loneliness	Yes	179 (38%) Group A 81 (17.2%)	291 (62%) Group B 95 (20.2%)	470 (100%)	0.13	0.003
	No	98 (20.9%) Group C	196 (41.7%) Group D			
Nurse perception of patient loneliness	Yes	39 (8.3%) Group E	45 (9.6%) Group F	470 (100%)	0.07	0.04
	No	140 (29.8%) Group G	246 (52.3%) Group H			

\*Landis and Koch: 0.00–0.20 Slight, 0.21–0.40 Fair, 0.41–0.60 Moderate, 0.61–0.80 Substantial, 0.81–1.00 Almost perfect.

**Table 3**  
Univariable analysis of factors associated with physicians' perception of patient loneliness.

Characteristics of patients		Family physicians' perception of patient loneliness <sup>a</sup>				
		Group D (N = 196)	Group B (N = 95)	Group B vs. D p-value <sup>b</sup>	Group C (N = 98)	Group C vs. D p-value <sup>b</sup>
Site	Site 1	97 (49.5)	59 (62.1)	0.043	62 (63.3)	0.025
	Site 2	99 (50.5)	36 (37.9)		36 (36.7)	
Basic characteristics						
Age (years)	≥65	142 (72.5)	78 (82.1)	0.072	63 (64.3)	0.151
	<65	54 (27.6)	17 (17.9)		35 (35.7)	
Sex	Male	104 (53.1)	42 (44.2)	0.157	58 (59.2)	0.320
	Female	92 (46.9)	53 (55.8)		40 (40.8)	
Education	Junior high school and below	37 (18.9)	30 (31.9)	0.014	28 (28.9)	0.053
	High school or above	159 (81.1)	64 (68.1)		69 (71.1)	
Employment	Employee	104 (53.6)	34 (37.0)	0.008	50 (51.6)	0.740
	Non-employee	90 (46.4)	58 (63.0)		47 (48.5)	
Marital status	Married	159 (82.4)	60 (64.5)	0.001	67 (69.8)	0.015
	Unmarried, divorced, or bereaved	34 (17.6)	33 (35.5)		29 (30.2)	
Living conditions and social network						
Housing	Your own home	196 (100.0)	90 (96.8)	0.011	97 (99.0)	0.157
	Nursing homes and other institutions	0 (0.0)	3 (3.2)		1 (1.0)	
Living	Cohabiting	183 (94.3)	77 (82.8)	0.002	88 (89.8)	0.157
	Living alone	11 (5.7)	16 (17.2)		10 (10.2)	
Community activities	Participating	120 (61.9)	44 (47.3)	0.020	45 (45.9)	0.009
	Not participating	74 (38.1)	49 (52.7)		53 (54.1)	
Lifestyle behavior						
Smoking	No	146 (74.9)	76 (80.0)	0.378	65 (66.3)	0.154
	Yes	24 (12.3)	12 (12.6)		12 (12.2)	
	Former smoker	25 (12.8)	7 (7.4)	0.012	21 (21.4)	0.325
Drinking	No	77 (39.9)	55 (58.5)		47 (49.0)	
	Sometimes	60 (31.1)	21 (22.3)	24 (25.0)		
	Every day	56 (29.0)	18 (19.2)	25 (26.0)		
Current medical conditions						
Hypertension	Yes	124 (63.3)	64 (67.4)	0.492	56 (57.1)	0.310
	No	72 (36.7)	31 (32.6)		42 (42.9)	
Dyslipidemia	Yes	77 (39.5)	32 (33.7)	0.338	33 (33.7)	0.332
	No	118 (60.5)	63 (66.3)		65 (66.3)	
Diabetes mellitus	Yes	38 (19.4)	21 (22.1)	0.589	22 (22.5)	0.539
	No	158 (80.6)	74 (77.9)		76 (77.6)	
Stroke	Yes	6 (3.1)	3 (3.2)	0.964	2 (2.0)	0.612
	No	190 (96.9)	92 (96.8)		96 (98.0)	
Cardiovascular disease	Yes	16 (8.2)	9 (9.5)	0.708	11 (11.2)	0.392
	No	180 (91.8)	86 (90.5)		87 (88.8)	
Depression	Yes	7 (3.6)	2 (2.1)	0.498	1 (1.0)	0.205
	No	189 (96.4)	93 (97.9)		97 (99.0)	
Medical services						
Period of clinic visit (years)	<5	65 (33.3)	32 (33.7)	0.953	41 (41.8)	0.153
	≥5	130 (66.7)	63 (66.3)		57 (58.2)	
Long-term care insurance	Using	5 (2.7)	7 (7.7)	0.059	5 (5.5)	0.251
	Not using	178 (97.3)	84 (92.3)		86 (94.5)	
Physical disability certificate	Using	8 (16.3)	3 (12.5)	0.668	1 (5.3)	0.227
	Not using	41 (83.7)	21 (87.5)		18 (94.7)	
Whether the patient has talked about their loneliness with family physicians or nurses	Talked to family physicians	15 (8.0)	16 (17.4)	0.069	8 (9.0)	0.730
	Talked to nurses	1 (0.5)	1 (1.1)		1 (1.1)	
	Talked to both family physicians and nurses	3 (1.6)	0 (0.0)		3 (3.4)	
	Never talked	168 (89.8)	75 (81.5)		77 (86.5)	

<sup>a</sup> B: misjudged loneliness, C: overlooked loneliness, D: patients who were categorized as not lonely and not perceived as such by their family physician.

<sup>b</sup> The chi-squared test was adopted for the analysis of categorical variables.

family physicians (Due et al., 2017). The above suggests that judgments based solely on risk should be avoided, and that without consultation with the patient, it may be difficult for family physicians and nurses to adequately address the problems of patients not participating in community activities or those of patients who are unmarried, divorced, or bereaved. Given these results, raising awareness among family physicians and nurses in Japan about the epidemiology and nature of patient loneliness is both warranted and desirable. It appears clear that even when a patient's detailed medical records are shared and reviewed closely, family physicians and nurses may not be able to share information about the complex inner feelings of the patient. More precise

assessments of loneliness (such as introduction of the UCLA Loneliness Scale) in general practice is therefore recommended. One idea would be to screen for loneliness in the waiting room before a consultation with a physician, which is similar to the screening process for dementia and mood and anxiety disorders conducted by nurses at the study sites.

The rate of loneliness in this study was 38%, which is similar to the result from the first national survey on loneliness conducted by the Japanese Government among people aged 16 years and older (Cabinet Secretariat, 2022). However, patients are unlikely to come to the hospital with complaints of loneliness, and it is not routine practice among physicians to diagnose loneliness (Liu & Mantwill, 2021). Despite this,

**Table 4**  
Univariable analysis of factors associated with nurses' perception of patient loneliness.

Characteristics of patients		Nurses' perception of patient loneliness <sup>a</sup>				
		Group H (N = 246)	Group F (N = 45)	Group F vs. H p-value <sup>b</sup>	Group G (N = 140)	Group G vs. H p-value <sup>b</sup>
Site	Site 1	139 (56.5)	17 (37.8)	0.021	98 (70.0)	0.009
	Site 2	107 (43.5)	28 (62.2)		42 (30.0)	
Basic characteristics						
Age (years)	≥65	181 (73.6)	39 (86.7)	0.060	90 (64.3)	0.055
	<65	65 (26.4)	6 (13.3)		50 (35.7)	
Sex	Male	129 (52.4)	17 (37.8)	0.071	82 (58.6)	0.245
	Female	117 (47.6)	28 (62.2)		58 (41.4)	
Education	Junior high school and below	54 (22.0)	13 (29.6)	0.271	39 (27.9)	0.192
	High school or above	192 (78.1)	31 (70.5)		101 (72.1)	
Employment	Employee	122 (50.6)	16 (35.6)	0.063	67 (48.9)	0.748
	Non-employee	119 (49.4)	29 (64.4)		70 (51.1)	
Marital status	Married	198 (81.8)	21 (47.7)	0.000	92 (67.2)	0.001
	Unmarried, divorced or bereaved	44 (18.2)	23 (52.3)		45 (32.9)	
Living conditions and social network						
Housing	Your own home	245 (99.6)	41 (95.4)	0.011	137 (99.3)	0.678
	Nursing homes and other institutions	1 (0.4)	2 (4.7)		1 (0.7)	
Living	Cohabiting	231 (94.7)	29 (67.4)	0.000	124 (89.2)	0.048
	Living alone	13 (5.3)	14 (32.6)		15 (10.8)	
Community activities	Participating	146 (60.1)	18 (40.9)	0.018	59 (43.4)	0.002
	Not participating	97 (39.9)	26 (59.1)		77 (56.6)	
Lifestyle behavior						
Smoking	No	183 (74.7)	39 (86.7)	0.218	92 (66.2)	0.186
	Yes	33 (13.5)	3 (6.7)		23 (16.6)	
	Former smoker	29 (11.8)	3 (6.7)		24 (17.3)	
Drinking	No	104 (43.0)	28 (62.2)	0.059	67 (49.3)	0.463
	Sometimes	72 (29.8)	9 (20.0)		34 (25.0)	
	Every day	66 (27.3)	8 (17.8)		35 (25.7)	
Current medical conditions						
Hypertension	Yes	160 (65.0)	28 (62.2)	0.716	84 (60.0)	0.323
	No	86 (35.0)	17 (37.8)		56 (40.0)	
Dyslipidemia	Yes	91 (37.1)	18 (40.0)	0.716	50 (35.7)	0.780
	No	154 (62.9)	27 (60.0)		90 (64.3)	
Diabetes mellitus	Yes	49 (19.9)	10 (22.2)	0.724	31 (22.1)	0.604
	No	197 (80.1)	35 (77.8)		109 (77.9)	
Stroke	Yes	8 (3.3)	1 (2.2)	0.714	4 (2.9)	0.830
	No	238 (96.8)	44 (97.8)		136 (97.1)	
Cardiovascular disease	Yes	22 (8.9)	3 (6.7)	0.616	15 (10.7)	0.570
	No	224 (91.1)	42 (93.3)		125 (89.3)	
Depression	Yes	7 (2.9)	2 (4.4)	0.569	7 (5.0)	0.276
	No	239 (97.2)	43 (95.6)		133 (95.0)	
Medical services						
Period of clinic visit (years)	<5	82 (33.3)	15 (34.1)	0.922	57 (41.0)	0.132
	≥5	164 (66.7)	29 (65.9)		82 (59.0)	
Long-term care insurance	Using	6 (2.6)	6 (14.0)	0.001	6 (4.7)	0.291
	Not using	225 (97.4)	37 (86.1)		122 (95.3)	
Physical disability certificate	Using	8 (13.1)	3 (25.0)	0.293	3 (8.8)	0.531
	Not using	53 (86.9)	9 (75.0)		31 (91.2)	
Whether the patient has talked about their loneliness with family physicians or nurses	Talked to family physicians	24 (10.2)	7 (15.9)	0.311	17 (13.3)	0.287
	Talked to nurses	1 (0.4)	1 (2.3)		3 (2.3)	
	Talked to both family physicians and nurses	3 (1.3)	0 (0.0)		2 (1.6)	
	Never talked	207 (88.1)	36 (81.8)		106 (82.8)	

<sup>a</sup> F: misjudged loneliness, G: overlooked loneliness, H: patients who were categorized as not lonely and not perceived as such by the nurse.

<sup>b</sup> The chi-squared test was adopted for the analysis of categorical variables.

Family medicine clinics could be the most accessible source of health advice for the population. The Institute of Medicine in the United States recommends that a variety of lifestyle factors, including social connection/isolation, should be recorded in electronic health records (Matthews et al., 2016). Yet, Holt-Lunstad points out the difficulties in systematizing electronic recording of these lifestyle factors in clinical practice because of the variety of questionnaires that are used to assess them (Holt-Lunstad, 2021). Moreover, he added that some physicians may feel uncomfortable in discussing sensitive topics such as social connection/isolation with their patients in their consultations. However, if physicians have the opportunity to talk to their patients about the

health importance of social connection, assess their risk, and follow up on their patients' condition, this may help to remove the stigma of loneliness (Holt-Lunstad, 2021). It is recommended that family physicians make efforts to understand the context of illness (Freeman, 2016, pp. 17–20), for nurses working with family physicians to be actively involved in encouraging frank communication about feelings of loneliness, and for clinics to systematize assessment of such sensitive topics involving a patient's personal situation.

Loneliness is likely to have been affected by the COVID-19 pandemic, as the rate of loneliness in this study was 38%, compared with the 20% loneliness rate identified among people aged 18 years and older in two

**Table 5**  
Multivariable analysis of factors associated with physicians' perception of patient loneliness.

		Family physicians							
		Group B vs. D				Group C vs. D			
		OR	95%CI	Adjusted OR	95%CI	OR	95%CI	Adjusted OR	95%CI
Characteristics of patients									
Education	Junior high school and below	Ref		Ref					
	High school or above	0.50	0.28–0.87	0.71	0.37–1.38				
Employment	Employee	Ref		Ref					
	Non-employee	1.25	1.06–1.49	1.19	0.96–1.46				
Marital status	Married	Ref		Ref		Ref		Ref	
	Unmarried, divorced or bereaved	2.57	1.46–4.52	1.41	0.66–3.03	2.02	1.14–3.59	2.07	1.14–3.78
Living situation	Cohabiting	Ref		Ref					
	Living alone	3.46	1.53–7.80	2.77	0.94–8.15				
Community activities	Participating	Ref		Ref		Ref		Ref	
	Not participating	1.81	1.10–3.00	1.72	0.97–3.06	1.91	1.17–3.12	2.23	1.31–3.78
Drinking	No	Ref		Ref					
	Sometimes	0.49	0.27–0.90	0.50	0.24–1.04				
	Every day	0.45	0.24–0.85	0.61	0.26–1.40				

B: misjudged loneliness, C: overlooked loneliness, D: patients who were categorized as not lonely and not perceived as such by the family physician. CI: confidence interval; OR: odds ratio; Ref: reference value used.

**Table 6**  
Multivariable analysis of factors associated with nurses' perception of patient loneliness.

		Nurses							
		Group F vs. H				Group G vs. H			
		OR	95%CI	Adjusted OR	95%CI	OR	95%CI	Adjusted OR	95%CI
Characteristics of patients									
Marital status	Married	Ref		Ref		Ref		Ref	
	Unmarried, divorced or bereaved	4.93	2.51–9.69	2.77	1.12–6.83	2.20	1.36–3.57	1.68	0.94–3.00
Housing	Own home	Ref		Ref					
	Nursing homes and other institutions	12.0	1.10–134	4.00	0.25–64.4				
Living situation	Cohabiting	Ref		Ref		Ref		Ref	
	Living alone	8.60	3.67–20.0	4.12	1.31–13.0	2.15	0.99–4.66	1.44	0.56–3.65
Community activities	Participating	Ref		Ref		Ref		Ref	
	Not participating	2.17	1.13–4.18	1.25	0.59–2.70	1.96	1.28–3.01	2.08	1.33–3.27
Long-term care insurance	Using	Ref		Ref					
	Not using	0.16	0.05–0.54	0.38	0.08–1.82				

F: misjudged loneliness, G: overlooked loneliness, H: patients who were categorized as not lonely and not perceived as such by the nurse. CI: confidence interval; OR: odds ratio; Ref: reference value used.

US primary care research networks before the pandemic (Mullen et al., 2019). Similarly, increased loneliness among older adults during the pandemic was also reported in Japan (Khan & Kadoya, 2021). For some older people, a visit to a family medicine clinic may be one of their few points of social contact (Freedman & Nicolle, 2020), and this has been especially true during the pandemic, as social interactions have been limited (Takashima, Onishi, Saeki, & Hirano, 2020). It thus presents a serious problem that family physicians and nurses miss such opportunities by overlooking or misjudging the loneliness of their patients. The COVID-19 pandemic has made the roles of family physicians and nurses more crucial than ever in preventing and detecting loneliness, as well as supporting people who suffer from it (Lahlou & Daaleman, 2021; Rodney, Josiah, & Baptiste, 2021).

Our study has several potential limitations. First, as the study was conducted in two family medicine clinics in a suburban area in one prefecture, the results cannot be generalized. It is worth noting, however, that we were able to obtain data from nurses as well as family physicians. Second, during outpatient clinics, family physicians and nurses collected data by seeing and checking on the patients. Therefore, it was not possible to administer the questionnaire to all patients attending the clinics. The total number of outpatients during the study period was 1,210, but we accessed only 532 (44%) of these. However, the study has the advantage of providing realistic data in a primary health care setting. The strength of this study is that it was performed in general practice with patients who regularly consulted their family

physicians independently of the study. Third, the patient's loneliness was assessed before or after the consultation, and family physicians and nurses assessed patient loneliness before the consultation. Although it was ensured that patients, family physicians, and nurses did not see each other's questionnaires, and that family physicians and nurses did not focus on loneliness during the consultation, it is still possible that the patients' perceptions of loneliness were influenced to the questionnaires. Fourth, as the diseases studied were self-applied by the patients, there may be a discrepancy between the diagnosis and the patients' perception of the disease. This might have resulted in an underestimation of the association between a patient's medical history and their loneliness. For example, no association was found between loneliness and depressive disorders in the present study, although these conditions are difficult to differentiate in older people. Finally, many patient characteristics related to loneliness overlap with social isolation, and family physicians and nurses might have confused loneliness and social isolation, leading to a high proportion of discrepancies. If this is the case, this confusion in itself further indicates the importance of raising awareness about patient loneliness among primary health care practitioners in Japan.

**5. Conclusion**

Our analysis identified that it is difficult for family physicians and nurses in Japan to perceive a patient's loneliness based on whether the

patient is active in the community, married, or living alone. Despite the fact that loneliness has become a serious problem due to the COVID-19 pandemic, and that the role of family physicians and nurses has become increasingly important, it is still a serious problem that family physicians and nurses often overlook or misjudge loneliness due to patient characteristics. First, these findings suggest that there is an urgent need to raise awareness about the social issue of loneliness among primary health care practitioners in Japan. Second, our results suggest that family physicians and nurses need to be more actively involved in conversations about feelings of loneliness, thereby making patients more aware of their own loneliness. They then need to work together to form strategies around how to cope with and overcome loneliness. Finally, the selection and recommendation of an appropriate tool is needed to allow for assessment of loneliness in clinical practice in Japan.

## Declaration of interest

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

## Ethical statement

This study was approved by the Fukushima Medical University's Human Research Ethics Committee and was conducted according to the principles of the Declaration of Helsinki.

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