Factors Associated With Self-Medication Among Family Caregivers: A Cross-Sectional Study

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Abstract

Background: Although healthcare professionals pay attention to the drugs prescribed by physicians, few reports have assessed self-medication by family caregivers and associated factors. This study aimed to describe self-medication among family caregivers of community-dwelling adult patients, and to explore the factors related to self-medication.

Methods: We conducted a cross-sectional survey from November to December 2020 in Ibaraki Prefecture, Japan. Family caregivers between 40 and 74 years old and caring for community-dwelling adult patients with chronic conditions were recruited. The use of any self-medication in the last 2 weeks by family caregivers was the dependent variable. Independent variables were covariates including baseline characteristics of family caregivers and their experience with healthcare professionals in the care of patients, using the Japanese version of the Caregivers' Experience Instrument (J-IEXPAC CAREGIVERS).

Results: Of the 887 family caregivers who responded to the survey, 776 were included in the analysis. A total of 267 (34.4%) family caregivers reported having used self-medication in the last 2 weeks. Logistic regression analysis showed that the gender women (odds ratio 1.85) and having a lower score on the J-IEXPAC CAREGIVERS (odds ratio 0.81 per 1 SD increase) were associated with self-medication.

Conclusions: This study revealed that about one-third of family caregivers self-medicate, and this practice is associated with a less positive experience of interprofessional care. These results suggest that it is important for healthcare professionals to be aware of the health condition of family caregivers and to provide appropriate advice regarding self-medication.

Background

The number of family caregivers who provide informal care to community-dwelling elderly patients with chronic diseases is increasing, and their role is becoming essential to the continuing care of patients at home. Family caregivers usually experience stress related to their provision of care, and are reported to be vulnerable to health problems and neglectful of their own health and self-care [1].

Self-medication, defined by the WHO as “the selection and use of medicines by individuals to treat self-recognized illnesses or symptoms”, is one measure of self-care in dealing with daily health problems [2]. Some 20–60% of elderly people are reported to self-medicate [3]. The reported rate of self-medication among outpatients in Japan is 30% [4]. Recently, self-medication has been promoted in Japan as a means of reducing the frequency of medical consultation and the national healthcare burden, and a self-medication tax system for special exemption of medical costs was established in 2017 to promote a shift from prescription drugs to over-the-counter (OTC) medicines [5]. Inappropriate self-medication carries its own risks and hazards, however, including adverse interactions between OTC medicines and prescription drugs and the adverse effects of the former on their own [6]. Although previous reports have focused on self-medication among elderly people and patients themselves, self-medication by family caregivers has not been sufficiently studied or fully recognized by medical and nursing care professionals.

Factors associated with self-medication among the community at large have been studied. Women, those of a younger age, and those with higher educational qualifications, higher income, and chronic conditions are reported as more likely to use dietary supplements or OTC medications [7–9]. Optimizing medication safety in community-dwelling older adults in the context of home healthcare is dependent on improved communications with healthcare providers [10]. Accordingly, the self-medication behavior of family caregivers is considered to be influenced not only by personal attributes such as age, gender, income, and education, but also by communication with healthcare professionals who support community-dwelling adult patients. However, previous studies have not focused on self-medication among family caregivers and associated factors.

The aim of this study was to clarify the prevalence of self-medication among family caregivers, and to explore factors that influence it. In particular, we evaluated whether self-medication was associated with the family caregivers' experience with healthcare professionals in caring for patients.

Methods

Study Design

This study was conducted as part of a cross-sectional survey in Ibaraki Prefecture, located northeast of Tokyo, between November and December 2020. Family caregivers who were caring for community-dwelling adult patients under the supervision of care managers in three municipalities in Ibaraki were recruited. In Japan, care managers support adult patients and their family caregivers by managing and coordinating the roles of other healthcare and social care professionals under the Long-Term Care Insurance (LTCI) system [11]. The LTCI system is based on the concept of "community-based integrated care," a model integrating healthcare and social care to provide comprehensive care for older adults with activity limitations [12]. The care managers were instructed to invite family caregivers to participate consecutively, in order of their appointments to visit patients. The family caregivers were required to be caring for patients suffering from chronic conditions, and to not be paid for doing so. Chronic conditions were defined as "health problems that require continuous management over a period of years or decades" [13].

We collected all data on family caregivers using a self-administered questionnaire. The family caregivers provided informed consent via the questionnaires and directly returned the questionnaires by mail. We also obtained some patient characteristics from distribution ledgers recorded by the care managers.

Inclusion Criteria

Participants were eligible for this study if they were aged 40–74 years and had been using LTCI for ≥ 1 year.

Exclusion Criteria

Family caregivers who declined to participate in the study, had participated in the study more than once, had difficulty answering the questionnaire, or were caring for a patient in the terminal stage of cancer were excluded.

Independent variables

Independent variables consisted of the following characteristics of family caregivers: age, gender, living together with the patient or not, relationship to the patient, care hours, educational background, household income, subjective health condition, and occurrence of regular visits to medical facilities. Patient characteristics included age, gender, level of support and care required, place of care (outpatient or home care), use of nursing care services, and underlying diseases.

Family caregivers' experience was assessed using IEXPAC CAREGIVERS Japanese version (J-IEXPAC CAREGIVERS). This instrument was originally developed in Spain to measure family caregivers' experience of integrated health and social care from multi-professionals [14]. We previously developed a Japanese version, and verified its reliability and validity [15]. It assesses the quality of integrated care for people with chronic conditions and their family caregivers from the latter's perspective. It does not focus on a specific profession, but rather on the entire experience of care provided by multiple health professionals, such as physicians, nurses, and care managers. The strength of using such a quality evaluation scale is that it can objectively evaluate care through the caregiver's experience, which cannot be adequately captured by conventional patient satisfaction measures, and thereby facilitate the identification of quality improvement issues.

The scale consists of 12 questions answered via five-point Likert scales ranging from 1 (Never) to 5 (Always). The score is calculated by simply summing the scores for each of the 12 items, giving a total score range of 12 to 60. A higher total score indicates higher quality of experienced integrated care from the caregiver's perspective.

Dependent variables

Use of self-medication by family caregivers was defined based on previous studies, namely whether or not they had self-medicated in the past two weeks [3]. In this study, we asked about over-the-counter medications, dietary supplements or health foods, and other medications.

Statistical analysis

After conducting descriptive statistics on the characteristics of caregivers and patients, and on caregivers' self-medication, we conducted univariate and multivariate analyses of the association between each independent variable and family caregivers' use of self-medication. The univariate analysis used Student's t-test for continuous variables and the chi-square test for categorical variables. For multivariate analysis, binomial logistic regression analysis was used. The independent variables were caregivers' characteristics, including socioeconomic status, as well as those variables that were significant in the univariate analysis. Participants with missing data on age, J-IEXPAC CAREGIVERS, or self-medication by

caregivers were excluded from all analyses. Those with missing independent variable data were excluded from the corresponding analysis (pairwise deletion). For this study, comprising 12 independent variables including multiple nominal variables, we estimated that a sufficient sample size would be 400, assuming that the percentage of self-medicating caregivers was 30%. The statistical package IBM SPSS version 26 was used for statistical analysis, and statistical significance was set at the 5% level (two-sided).

Ethical considerations

This study was conducted as an anonymous questionnaire survey. Participants were informed that their participation was voluntary and their intention to participate was confirmed by a check box on the questionnaire. This study was conducted with the approval of the Ethics Committee of the Faculty of Medicine, University of Tsukuba (Approval No. 1518-2).

Results

The number of family caregivers recruited by care managers was 1,091, of whom 887 (81.3%) responded and 776 were included in the analysis (Fig. 1). The mean age of family caregivers was 61.4 (SD 7.5) years, with 199 (25.6%) men and 577 (74.4%) women (Table 1). In contrast, the mean age of patients with chronic diseases was 84.4 (SD 9.2) years, with 199 (27.8%) men and 517 (72.2%) women (Table 1).

Table 1
Characteristics of family caregivers and patients receiving care (n = 776)

Characteristics of family caregivers(n = 776)	
Age, years, mean $\pm$ SD (min–max)	61.4 $\pm$ 7.5 (40–74)
Gender- women, n (%)	577 (74.4)
- men, n (%)	199 (25.6)
Relationship with patients, n (%) (n = 775)	
Spouse	147 (19.0)
Child	464 (59.9)
Child-in-law	132 (17.0)
Others	32 (4.1)
Caregiving time per day, n (%) (n = 764)	
Almost all day	119 (15.6)
Half day	121 (15.8)
2–3 h	125 (16.4)
Lend a hand when needed	334 (43.7)
Once or less in several days	65 (8.5)
Education, n (%) (n = 775)	
Elementary or junior high school	24 (3.1)
High school	364 (47.0)
Career college or junior college, Professional school	224 (28.9)
College or graduate school	163 (21.0)
Annual household income (million JPY), n (%) (n = 772)	
< 2.50 (about USD 24,000)	260 (33.7)
2.50–4.99	303 (39.2)
$\geq$ 5.00	209 (27.1)
Self-rated health, n (%) (n = 767)	
Poor	39 (5.1)
Not very good	138 (18.0)
Good	452 (58.9)

Characteristics of family caregivers(n = 776)	
Very good	138 (18.0)
Regular visit to medical facilities, n (%) (n = 775)	
No	281 (36.3)
Yes	494 (63.7)
Family caregivers' self-medication, n (%) (n = 776)	
No	509 (65.6)
Yes	267 (34.4)
Over-the-counter medicines	138 (17.8)
Supplements	174 (22.4)
Others	13 (1.7)
Characteristics of patients receiving care (n = 776)	
Age, years(n = 719)	84.4 ± 9.2 (43–103)
Gender(n = 716)- women, n (%)	517 (72.2)
- men, n (%)	199 (27.8)
Level of dependence, n (%) (n = 721)	
Lower (Support levels 1 and 2)	57 (7.9)
Middle (Care levels 1–3)	542 (75.2)
Higher (Care levels 4 and 5)	122 (16.9)
Primary health condition, n (%) (n = 723)	
Dementia	206 (28.5)
Joint/spinal cord/bone fracture	178 (24.6)
Stroke	141 (19.5)
Malignancy	23 (3.2)
Others	175 (24.2)
Clinical setting, n (%) (n = 775)	
Outpatient	670 (86.5)
Home medical care	92 (11.9)
Others	13 (1.7)

Characteristics of family caregivers(n = 776)	
Care services, n (%) (multiple answers)	
Home visit care	81 (10.4)
Home visit nursing	106 (13.7)
Home visit rehabilitation	82 (10.6)
Pharmacist home visit	14 (1.8)
Day care, outpatient rehabilitation	627 (80.8)

Of the family caregivers, 267 (34.4%) reported having used self-medication in the last 2 weeks. Among these, 138 (17.8%) used over-the-counter medications, 174 (22.4%) used supplements or health foods, and 13 (1.7%) used other medications (Table 1). Among the over-the-counter medications, anti-cold medicines and analgesics were most commonly used, and among the supplements or health foods, vitamins were most commonly used.

Factors related to family caregivers' use of self-medication

In the univariate analysis, gender ($P = 0.003$), subjective health status ($P = 0.003$), and caregiver's regular visits to medical facilities ($P = 0.008$) were significantly related to the use of self-medication by family caregivers (Table 2). The mean J-EXPAC CAREGIVERS total score was 40.6, and was significantly higher in the non-self-medicating group (41.2, SD 8.9) than in the self-medicating group (39.3, SD 8.0) ($P = 0.004$) (Table 3).

Table 2

Univariate analysis of independent variables and self-medication by family caregivers (n = 776)

Characteristic	Self-medication by family caregivers		P value
	No: n = 509	Yes: n = 267	
Gender, n (%)			0.003
Men	148 (29.1)	51 (19.1)	
Women	361 (70.9)	216 (80.9)	
Age (years), mean $\pm$ SD	61.6 $\pm$ 7.5	60.9 $\pm$ 7.5	0.210 [†]
Education, n (%)			0.583
Elementary or junior high school	16 (3.1)	8 (3.0)	
High school	248 (48.7)	116 (43.6)	
Career college, junior college, or professional school	142 (27.9)	82 (30.8)	
College or graduate school	103 (20.2)	60 (22.6)	
Annual household income (million JPY), n (%) (n = 772)			0.374
< 2.50 (about USD 24,000)	176 (34.8)	84 (31.6)	
2.50–4.99	201 (39.7)	102 (38.3)	
$\geq$ 5.00	129 (25.5)	80 (30.1)	
Self-rated health, n (%)			0.003
Poor	23 (4.6)	16 (6.1)	
Not very good	80 (15.9)	58 (22.0)	
Good	292 (58.1)	160 (60.6)	
Very good	108 (21.5)	30 (11.4)	
Regular visit to medical facilities, n (%)			0.008
No	201 (39.6)	80 (30.0)	
Yes	307 (60.4)	187 (70.0)	
Caregiving time per day, n (%) (n = 764)			0.398

† Student's t-test, others are analyzed by chi-square test

J-IEXPAC CAREGIVERS, Japanese version of the Caregivers' Experience Instrument

Characteristic	Self-medication by family caregivers		P value
	No: n = 509	Yes: n = 267	
Almost all day	74 (14.8)	45 (17.1)	
Half day	83 (16.6)	38 (14.4)	
2–3 h	90 (18.0)	35 (13.3)	
Lend a hand when needed	212 (42.3)	122 (46.4)	
Once or less in several days	42 (8.4)	23 (8.7)	
† Student's t-test, others are analyzed by chi-square test			
J-IEXPAC CAREGIVERS, Japanese version of the Caregivers' Experience Instrument			

Table 3
J-IEXPAC CAREGIVERS and unadjusted association with self-medication by family caregivers (n = 776)

	Total	Self-medication		P value
	(n = 776)	No (n = 509)	Yes (n = 267)	
J-IEXPAC CAREGIVERS Total score*	40.6 (8.6)	41.2 (8.9)	39.3 (8.0)	0.004
J-IEXPAC CAREGIVERS, Japanese version of the Caregivers' Experience Instrument				
Values indicate mean (SD), *Scores range from 12 to 60.				

Logistic regression analysis showed that the gender women was significantly associated with caregiver self-medication, with an adjusted odds ratio of 1.85 (P = 0.002) and a 1 SD higher score on the J-IEXPAC CAREGIVERS, with an adjusted odds ratio of 0.81 (P = 0.010) (Table 4).

Table 4

Factors associated with caregivers' self-medication by Logistic regression analysis(n = 761)

Characteristic	Adjusted OR (95% CI)	P value
Age (years)	0.99 (0.96–1.01)	0.18
Gender: Women(ref = Men)	1.85 (1.25–2.75)	0.002
Education		
Elementary school, Junior high school	reference	
High school	0.84 (0.34–2.08)	0.70
Career college, junior college, or higher professional school	0.94 (0.37–2.40)	0.90
College or graduate school	1.27 (0.49–3.30)	0.63
Annual household income (million JPY)		
< 2.50 (about USD 24,000)	reference	
2.50–4.99	1.13 (0.78–1.63)	0.53
≥ 5.00	1.22 (0.80–1.86)	0.36
Self-rated health		
Poor	reference	
Not very good	1.04 (0.49–2.17)	0.93
Good	0.87 (0.44–1.73)	0.70
Very good	0.47 (0.21–1.05)	0.065
Regular visit to medical facilities (ref = No)	1.42 (1.00–1.42)	0.053
J-EXPAC CAREGIVERS Total score	0.81 (0.68–0.95) *	0.010
* per 1SD increase, 95% CI = 95% confidence interval		

Discussion

In this study, we found that one-third of family caregivers of home-dwelling adult patients used self-medication, and family caregivers with more positive experience of interprofessional care were less likely to engage in self-medication. To our knowledge, this is the first survey study in Japan to clarify the prevalence of self-medication by family caregivers and to identify related factors.

Family caregivers who care for chronically ill patients at home are getting older, in accompaniment with the general aging of the population, and are often at risk for non-communicable diseases and their own health problems [16]. The physical condition of caregivers is important, because the health condition of

family caregivers directly influences their ability to care for patients at home [17]. Previous reports suggest that family caregivers generally neglect their own health and self-care, and are less likely to engage in preventive health behaviors [1]. Self-medication can be beneficial in managing daily health problems without visiting medical facilities and with less expenditure. However, because it can be used without consulting medical professionals, it carries the possibility of unexpected adverse events and interactions with prescribed drugs [18, 19]. Furthermore, particular attention should be paid to the use of over-the-counter drugs by elderly caregivers with prescribed medications [20].

It has been reported that access to medical institutions and relationships with healthcare professionals, in addition to knowledge about medicine, severity of symptoms, and past experience with medication contribute toward the decision to use over-the-counter medications [21, 22]. Therefore, the availability of healthcare professionals with whom family caregivers can consult about their own health problems and who can give appropriate advice may influence their decision to use self-medication. In the present study, family caregivers tended to self-medicate if they had less positive experiences with care from healthcare professionals. By contrast, the better their experience, the less likely they were to use self-medication. A qualitative analysis of use of over-the-counter medications found that elderly people who feel unwell can be divided into two groups: those who try to improve their symptoms on their own and those who seek the recommendation of a doctor [22]. We therefore speculate that family caregivers with less positive experience with healthcare professionals in the care of patients try to solve health problems by themselves, without consulting professionals, and self-medicate by their own judgment. In contrast, family caregivers with more positive experience with interprofessional care may try to solve their health problems without self-medication by consulting healthcare professionals and seeking appropriate advice. A previous report suggests that distrust of medical professionals and lack of communication are among factors that lead to the use of self-medication [23], consistent with our finding.

Our results also suggest that women caregivers are more likely than men to use self-medication. This finding is compatible with previous reports that women are more likely to self-medicate than men [7, 8]. As women predominate among family caregivers, healthcare professionals need to be aware that women caregivers may turn to self-medication when they have health problems.

A previous study has found that only about one-third of self-medication users report doing so to their healthcare providers [24]. Thus, because self-medication may be difficult for healthcare professionals to discern, it is desirable that they actively try to evaluate the use of self-medication by patients and caregivers. When family caregivers consult with healthcare professionals about their own health problems, the latter should proactively assess their self-medication and provide appropriate advice, for example, regarding appropriate use of self-medication and medical consultation with their doctors or specialists.

The first limitation of this study is the possibility of selection bias. As we targeted family caregivers aged 40 years or older and younger than 75 years, we were not able to evaluate self-medication use among younger and older caregivers; additional evaluation including these latter groups is desirable. Second,

confounding factors may be present. In particular, family caregivers could not be asked if they received prescription medications or not. However, this issue was considered to be addressed by the variable “regular visits to healthcare facilities.” Third, the cross-sectional nature of the study means that we cannot draw conclusions about causal relationships between independent variables and the use of self-medication. However, since the J-IEXPAC CAREGIVERS evaluates the experience quality of integrated care in the past 6 months and we asked about self-medication in the past 2 weeks, it is unlikely that any causal relationship would be in the reverse direction.

Conclusions

About one-third of family caregivers use self-medication. Self-medication is more prevalent among women and those reporting more negative experiences with interprofessional care. It is important for medical practitioners involved in the care of community-dwelling adult patients to be aware of the health condition of family caregivers and to provide appropriate advice on self-medication.

Abbreviations

J-IEXPAC CAREGIVERS: the Japanese version of the Caregivers’ Experience Instrument; OTC: over-the-counter; LTCI: Long-Term Care Insurance; SD: Standard deviation

Declarations

Ethical approval and consent to participate

All methods were performed in accordance with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. This study was approved by the ethics committee of University of Tsukuba (Approval No. 1518-2). Participants received written information and provided informed consent.

Consent for publication

Not applicable.

Availability of data and materials

The datasets used and analysed during the current study are not publicly available due to their containing information that could compromise the privacy of research participants, but are available from the corresponding author on reasonable request.

Competing interests

The authors declare no conflict of interest.

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Authors' contributions

SM, GN and JH designed the study. GN and SM conducted the study, supervised by JH and TM. SM analyzed the data. SM drafted the first manuscript which was critically reviewed by GN, JH and TM. All authors read and approved the final manuscript.

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Figures

Figure 1

Flow chart of participants included in the survey

J-IEXPAC CAREGIVERS, Japanese version of the Caregivers’ Experience Instrument