

Original Article

## Factors Associated with Work Efficiency in Home Health Care by Pharmacists

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In recent years, medical staff including physicians and nurses have been participating in home health care, reflecting the needs of an aging society in Japan. Pharmacists are also asked to work on home health care teams to ensure the medical safety of patients. It currently remains unclear whether direct communication, *i.e.* a meeting, between home-visiting physicians and pharmacists contributes to the proper use of medications and continuous medical care. We retrospectively analyzed the medication management guidance records of home-visited patients who received their first home visit between April 2014 and March 2017. We collected data on pharmacist inquiries, the duration of visits, and details from a meeting between home-visiting physicians and pharmacists. Thirty-five patients were included. At the first visit, the inquiry rate by pharmacists was 65.7%. The prescription question rate was significantly lower in patients with a meeting than in those without ( $p=0.033$ ). The average duration of visits was significantly shorter for home-visited patients whose health care providers had a meeting ( $p=0.007$ ). These results suggest that pharmacists who held a meeting with the home-visiting physician before the first patient visit were able to resolve drug-related issues earlier, which increased the work efficiency of home-visiting pharmacists.

**Key words:** home visit, pharmacist, meeting, inquiry, home health care

The population in Japan is rapidly aging, and the average age is predicted to continue increasing. In 2019, the percentage of individuals aged 65 years or older in Japan was 28.4% [Statistics Bureau of Japan: <https://www.stat.go.jp/english/data/handbook/index.html> (accessed 23 May 2021)]. Aged individuals are more likely to encounter difficulties going to hospitals; home health care, in which medical staff visit the patient's home, is an approach that can provide appropriate medical care to this population. Home health care is promoted by the Ministry of Health, Labor and Welfare, and more than 60% of the adult population in

Japan want to receive home health care in the future [End-of-life, Ministry of Health, Labor and Welfare: <https://www.mhlw.go.jp/stf/shingi/2r9852000000yp23-att/2r9852000000ypwi.pdf> (accessed May 23, 2021)]. The demand for home health care is increasing, particularly for elderly individuals, patients with physical disabilities, patients with psychiatric disorders, patients with dementia, and terminally ill individuals. According to a report by the Ministry of Health, Labor and Welfare in Japan, 156,400 patients used a home-visiting service in 2014, and the number of patients receiving these services is predicted to increase in the future [Ministry of Health, Labor and

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Welfare: [https://www.mhlw.go.jp/english/database/db-hss/dl/sps\\_2014\\_01.pdf](https://www.mhlw.go.jp/english/database/db-hss/dl/sps_2014_01.pdf) (accessed by May 23, 2021)].

Many patients experience drug-related issues during home health care, and the prompt identification of these issues by pharmacists contributes to patient safety and wellbeing. Akers *et al.* reported that pharmacists identified drug-related issues (*e.g.*, non-adherence, the need for additional drug therapy, adverse drug reactions, and unnecessary drug therapy) through monthly visits and follow-up telephone calls to patients, and frequently performed interventions and recommendations (*e.g.*, education, coordination of care, and discontinuation or addition of medication) for the proper use of medication [1]. Braund *et al.* showed that 25% of all hospital discharge prescriptions received by community pharmacies had a number of issues, including the omission of the quantity or period of supply of medications, medications not being available in a community pharmacy, and the unnecessary prescription of multiple analgesics [2]. Furthermore, pharmacists are skilled at identifying drug-related issues during home visits and performing interventions and recommendations for the proper use of medication [3-5]. Therefore, home-visiting pharmacists are needed to promote the proper use of medications in home care. Currently in Japan, 55.0% of pharmacies provide home visits [Ministry of Health, Labor and Welfare: <https://www.mhlw.go.jp/content/000507664.pdf> (accessed by May 23, 2021)].

Pharmacists can contribute to continuous medical care by supporting the shift from outpatient and/or hospital care to home health care. However, in Japan, the percentage of patients who regularly receive prescriptions from medical institutions and fill these prescriptions at one consistent community pharmacy is low, at 41.8% [<https://www.pref.chiba.lg.jp/yakumu/kikaku/documents/yakkyoku-nees-anke-to-houkokusyo.pdf> (accessed by May 23, 2021)]. There are other barriers to efficient use of a home-visiting pharmacist. Such a pharmacist may not have information on the patient's medications during outpatient care; the first home visit may be their first patient encounter. To the best of our knowledge, previous studies have examined home health care-related duties by pharmacists using questionnaire surveys regarding implementation situations and activities for home health care by pharmacists, such as the frequency of home visits, working hours at patient homes, and the contents of consultations with patients [6,7]. Their findings have suggested that the

pharmacist's role ensuring appropriate medication use requires information obtained from a meeting with physicians. Furthermore, it is important to obtain information at the patient's home regarding medication usage from the patient or their family [8]. Daliri *et al.* reported that communication with patients at hospital discharge, informing pharmacists of patient's medical information, and home visits by pharmacists within 5 days of discharge reduced the number of drug-related issues 4 weeks after discharge [9]. Further studies are needed to clarify whether cooperation between home-visiting physicians and pharmacists in the home health care transition period contributes to the proper use of medications and continuous medical care.

The present study investigated the practices of home-visiting pharmacists in the home health care transition period with the aim of identifying factors contributing to the efficiency of home health care-related duties as well as reduction of drug-related issues.

## Materials and Methods

**Data collection.** We retrospectively examined patient characteristics (sex, age, and main diagnosis), whether prescriptions were dispensed before the home visit, the frequency of home visits, the reason for ending home visits, the distance from the pharmacy to the patient's home, the numbers of prescription questions and proposals, the duration of visits, and the number of visits. Data were retrospectively collected on all 35 home-visited patients who started home health care between April 2014 and March 2017 by 6 home-visiting pharmacists employed by Muscat Pharmacy Co., Ltd. in the cities of Bizen, Takahashi, Nagi, and Mimasaka. Data were collected during each home visit up to the 24<sup>th</sup> visit or 1 year of home visits. Patients were enrolled in a medical insurance system or long-term care insurance system. The present study was approved by the Okayama University Graduate School of Medicine, Dentistry, and Pharmaceutical Sciences Ethics Committee (No. 1707-005). All procedures involving human participants were performed in accordance with the Ethical Guidelines for Medical and Health Research Involving Human Subjects in Japan and with the Declaration of Helsinki. Since the present study was retrospective and anonymity was secured, the Institutional Review Board at the Okayama University Graduate School of Medicine, Dentistry, and

Pharmaceutical Sciences Ethics Committee waived the requirement for written informed consent. An opt-out method was advertised by notifications displayed on the website of the Department of Pharmacy, Okayama University Hospital.

**Workflow of home health care for home-visited patients.** The workflow of home health care for home-visiting physicians and pharmacists is shown in Fig. 1. At the physician's request, a home-visiting pharmacist was assigned to a patient. The home-visiting pharmacist and physician held an in-person or telephone meeting to discuss the patient before the physician's first visit. After each subsequent visit to the patient's home, the home-visiting pharmacist reported medication management details (e.g., confirmation of adherence and the presence/absence of symptoms of adverse drug reactions) to the home-visiting physician.

**Definitions.** We defined "prescription question" as a question asked to the home-visiting physician by

the home-visiting pharmacist concerning the medication regimen of a patient, including the addition of a drug, discontinuation of a drug, and optimization of a drug dose or use to prevent adverse drug reactions or other unwanted effects of a particular drug. We defined "prescription proposal" as a proposal to the home-visiting physician by the home-visiting pharmacist for a specific medication to consider prescribing to a patient.

**Classification of prescription questions and the prescription proposals.** We classified "prescription questions" and "prescription proposals" into three types of inquiries: 1) "pharmaceutical inquiries", defined as asking the home-visiting physician to consider the appropriate use of drugs accompanying changes in a patient's status, such as the addition of a drug, discontinuation of a drug, and optimization of a drug dose or use; 2) "non-medical inquiries", defined as asking the home-visiting physician about an insufficient description format or confirmation of insurance coverage criteria, including the lack of a description on the dose/use or insurance certificate information; and 3) "adjustments for leftover drugs", defined as adjusting the prescribed amount by noting the amount of leftover drugs at collection.

**Meeting between the home-visiting pharmacist and physician.** When the home-visiting physician received a discharge summary from the hospital physician, the home-visiting pharmacist was provided with the discharge summary by the home-visiting physician. In the present study, the home-visiting pharmacist and physician had a meeting about the patient's medical information and the pharmacist's view regarding prescriptions. The home-visiting pharmacist reviewed drug-related issues during the meeting to promote the proper use of medications.

**Analysis.** Fisher's exact test was used for comparisons of the association of each patient characteristic and pharmacist duty with having the home-visiting physician-pharmacist meeting before the first visit. Student's *t*-test was performed after confirming an equal distribution for cases in which the meetings occurred before or after the first visit. To reduce the effect that covariant differences had on our statistical results, a propensity score matching analysis was conducted. A multivariable logistic regression analysis was employed to estimate the propensity score using the 3 categorical variables of sex, age, and main diagnosis, and this was followed by 1 : 1 propensity score matching using near-

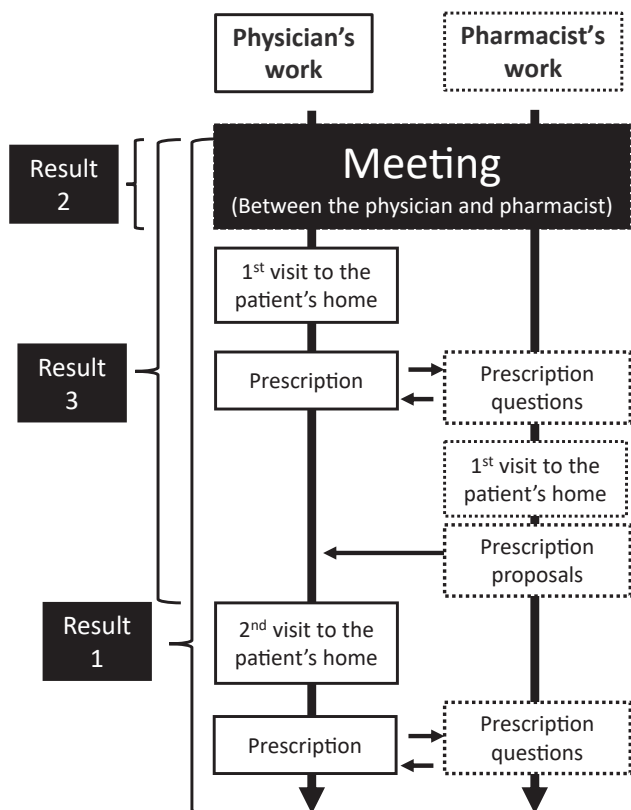


Fig. 1 Workflow of home health care for home-visited patients. A meeting is defined as a discussion between a physician and pharmacist before the physician's first visit. Data were collected during each home visit up to the 24<sup>th</sup> visit or 1 year of home visits.

est-neighbor matching with a caliper width of 0.2 standard deviations of the propensity score. *P* values of <0.05 were considered to indicate significance. All analyses were conducted using EZR, a graphical user interface for R (The R Foundation for Statistical Computing, Vienna, Austria) [10].

## Results

**Sex, age, and main diagnosis of home-visited patients.** The sex, age, and main diagnosis of home-visited patients are shown in Table 1. We included 35 patients in the present study (females, *n* = 15). The mean ± standard deviation of the age of patients was 80.7 ± 11.8 years. Twenty-six patients were 75 years or older. The main underlying medical condi-

tions were cancer in 10 patients, respiratory tract disease in 5, heart disease in 4, and dementia in 4. Only 3 patients had their prescriptions dispensed before the start of home health care. The frequency of pharmacist visits was four or more times a month for patients with cancer and two times a month for patients with chronic diseases (respiratory diseases, heart diseases, and dementia). In 19 patients, home visits ended within 1 year of the start of the study period due to death or relocation. The distance from each community pharmacy to the patient's home ranged between 5 and 10 km for the 18 patients on whom this data was collected, with an average distance of 5.5 km for all patients.

**Characteristics of home-visiting pharmacists.** Six pharmacists engaged in home visits. One pharmacist was female. Pharmacists had been working as

**Table 1** Sex, age, and main diagnosis of home-visited patients and distance from pharmacies to their homes

(A) Patient characteristics

Characteristics	Total number	Frequency of visits			Reason for ending visits		
		Once or more a week	Twice a month	Once a month or less	Death	Relocation	Other
<b>Sex</b>							
Male	20	8	10	2	8	2	3
Female	15	1	8	6	2	2	2
<b>Age</b>							
< 75 years	9	5	2	2	4	1	1
≥ 75 years	26	4	16	6	6	3	4
<b>Main diagnosis</b>							
Cancer	10	7	1	2	6		2
Respiratory disease	5		5				2
Heart disease	4		4		1		
Dementia	4	1	3		1		
Cerebral infection	2		1	1			
Other	10	1	5	4	2	4	1

(B) One-way distance from pharmacies to patients' homes

Distance	One-way distance from pharmacies				Average one-way distance	Median distance
	< 1 km	≥ 1 km, < 5 km	≥ 5 km, < 10 km	≥ 10 km		
Number of patients	4	12	18	1	5.5 km	6.5 km

(C) Use of a home-visiting pharmacy by home-visited patients

	Total number
<b>Home-visiting pharmacy</b>	
Same pharmacy (always used)	3
Different pharmacy (first time)	32

home-visiting pharmacists for an average of  $6.2 \pm 5.6$  years (range: 1-16).

**Result 1: Pharmaceutical inquiries, non-medical inquiries, and adjustments for leftover drugs for home-visited patients by home-visiting pharmacists.** Pharmaceutical inquiries, non-medical inquiries, and adjustments for leftover drugs for home-visited patients by home-visiting pharmacists are shown in Table 2. The total number of home visits was 590. The total number of inquiries was 161, The number of pharmaceutical

inquiries was 72, the number of non-medical inquiries was 28, and the number of adjustments for leftover drugs was 61. Many inquiries were related to a change in prescription. There was a high inquiry rate (65.7%: 95% confidence interval (CI) 50.0-81.4%) at the first home visit. During subsequent home visits, the rates of all inquiries, including pharmaceutical inquiries, adjustments for leftover drugs, and non-medical inquiries, decreased. Among inquiries at the first visit, there were 9 (39.1%: 95% CI 19.2-59.1%) pharmaceutical

**Table 2** Visit number-dependent changes in various inquiries to home-visited patients by home-visiting pharmacists

(A) The inquiry rate

Inquiries	Number of home visits			Whole period
	First time	2-4 times	5-24 times	
Total number of inquiries	23	36	102	161
Total number of home visits	35	104	451	590
Inquiry rate (95% CI)	65.7% (50.0-81.4)	34.6% (25.5-43.8)	22.6% (18.8-26.5)	27.3% (23.7-30.9)

CI, confidence interval.

(B) Types of inquiries

Inquiries	Number of home visits			Whole period
	First time	2-4 times	5-24 times	
Pharmaceutical inquiries	9 (39.1%: 19.2-59.1)	19 (52.8%: 36.5-69.1)	44 (43.1%: 33.5-52.7)	72 (44.7%: 37.0-52.4)
Non-medical inquiries	6 (26.1%: 8.1-44.0)	4 (11.1%: 0.8-21.4)	18 (17.6%: 10.2-25.0)	28 (17.4%: 11.5-23.2)
Adjustments for leftover drugs	8 (34.8%: 15.3-54.2)	13 (36.1%: 20.4-51.8)	40 (39.2%: 29.7-48.7)	61 (37.9%: 30.4-45.4)

Data were expressed as the number of the sample size, a ratio, and the 95% confidence interval.

(C) Types of pharmaceutical inquiries

Pharmaceutical inquiries	Number of home visits			Whole period
	First time	2-4 times	5-24 times	
Change drugs	5 (55.6%: 23.1-88.0)	6 (31.6%: 10.7-52.5)	22 (50.0%: 35.2-54.8)	33 (45.8%: 34.3-57.3)
Support adherence	3 (33.3%: 2.5-64.1)	3 (15.8%: -0.6-32.2)	4 (9.1%: 0.6-17.6)	10 (13.9%: 5.9-21.9)
Addition of drugs	1 (11.1%: -9.4-31.6)	5 (26.3%: 6.5-46.1)	8 (18.2%: 6.8-29.6)	14 (19.4%: 10.3-28.6)
Discontinuation of drugs		3 (15.8%: -0.6-32.2)	6 (13.6%: 3.5-23.8)	9 (12.5%: 4.9-20.1)
Optimize dose or use		2 (10.5%: -3.3-24.3)	4 (9.1%: 0.6-17.6)	6 (8.3%: 1.9-14.7)

Data were expressed as the number of the sample size, a ratio, and the 95% confidence interval.

(D) Acceptance rates of pharmaceutical inquiries

Inquiries	Number of home visits			Whole period
	First time	2-4 times	5-24 times	
Number of accepted inquiries	9	19	44	72
Number of rejected inquiries			6	6
Acceptance rate (95% CI)	100% (100)	100% (100)	88.0% (79.0-97.0)	92.3% (86.4-98.2)

CI, confidence interval.

inquiries, and the number of adjustments for leftover drugs was 8 (34.8%: 95% CI 15.3-54.2%). Pharmaceutical inquiries were the most frequent during the survey period, with the most common type of inquiry being about a change in drugs. Home-visiting physicians accepted 92.3% (95% CI 86.4-98.2%) of pharmaceutical inquiries during the survey period. In the early period, home-visiting physicians accepted 100% of pharmaceutical inquiries.

**Result 2: The number of patients for whom a meeting was held before the first visit and details collected in the discharge summary.** The number of patients for whom a home-visiting physician and pharmacist had a meeting before the first visit and the details of the discharge summary are shown in Table 3. Such a meeting was held for 19 (54.3%: 95% CI 37.8-70.8%) home-visited patients. Discharge summaries included the main diagnosis, physical findings, treatment progress, and hospital discharge medications. However, limited information was available on test results, family structure, and activities of daily living.

**Result 3: Comparison between the meeting with the home-visiting physician before the first visit and the home-visiting pharmacist's duties.** After matching of propensity scores, 10 matched pairs of patients were examined. Patient characteristics before and after propensity score matching are shown in Table 4. Before the

propensity score matching analysis, no significant differences were observed between "75 years and older" and "younger than 75 years" or between "cancer patients" and "non-cancer patients". After the propensity matching analysis, the standardized mean difference was  $<0.001$ , and patient characteristics were balanced between the two groups. Associations between physician-pharmacist meetings held before the first visit and the home-visiting pharmacist's inquiries are shown in Table 5A. After the propensity matching analysis, inquiry rates related to prescription questions were 0% (95% CI 0.0-0.0%) for patients with a prior meeting and 50.0% (95% CI 19.0-81.0%) for those without. Inquiry rates related to prescription questions were significantly lower in patients with than in those without a meeting. The home-visiting pharmacist resolved drug-related issues with the home-visiting physician during the meeting, and the number of prescription questions decreased. Inquiry rates related to the prescription proposal were 20.0% (95% CI -4.8-44.8%) for patients with a prior physician-pharmacist meeting and 10.0% (95% CI -8.6-28.6%) for those without. No significant differences were observed between inquiry rates related to prescription proposals for patients with and without a prior meeting. Associations between a prior physician-pharmacist meeting and the duration of the visit of the home-visiting pharmacist are shown in Table 5B. After

**Table 3** Number of patients for whom a meeting was held and details of collected discharge summaries before the first visit

(A) Holding of a meeting

	Meeting before the first visit	
	Yes	No
Total number of patients	19 (54.3%: 37.8-70.8)	16 (45.7%: 29.2-62.2)

Data were expressed as the number of patients, a ratio, and the 95% confidence interval.

(B) Collected discharge summaries

Number of collected discharge summaries before the first visit	19
Information details	
Main diagnosis	19 (100%: 100)
Physical findings and treatment progress	19 (100%: 100)
Discharge medications	16 (84.2%: 67.8-100.6)
Test results	6 (31.6%: 10.7-52.5)
Family structure	4 (21.1%: 2.7-39.4)
ADL	3 (15.8%: -0.6-32.2)
MRI	1 (5.3%: -4.8-15.3)

ADL, activities of daily living; MRI, magnetic resonance imaging.

Data were expressed as the number of the sample size, a ratio, and the 95% confidence interval.

**Table 4** Patient characteristics with or without a meeting before and after propensity score matching

Characteristics	All patients			Propensity score matching patients			SMD
	Meeting before the first visit		P-value	Meeting before the first visit		P-value	
	Yes (N = 19)	No (N = 16)		Yes (N = 10)	No (N = 10)		
Sex							
Male	14 (73.7%: 53.9–93.5)	6 (37.5%: 13.8–61.2)	0.044	5 (50.0%: 19.0–81.0)	5 (50.0%: 19.0–81.0)	1.000	<0.001
Female	5 (26.3%: 6.5–46.1)	10 (62.5%: 38.8–86.2)		5 (50.0%: 19.0–81.0)	5 (50.0%: 19.0–81.0)		
Age							
<75 years	5 (26.3%: 6.5–46.1)	4 (25.5%: 3.8–46.2)	1.000	3 (30.0%: 1.6–58.4)	3 (30.0%: 1.6–58.4)	1.000	<0.001
≥75 years	14 (73.7%: 53.9–93.5)	12 (75.5%: 53.8–96.2)		7 (70.0%: 41.6–98.4)	7 (70.0%: 41.6–98.4)		
Main diagnosis							
Cancer	4 (21.1%: 2.7–39.4)	6 (37.5%: 13.8–61.2)	0.454	4 (40.0%: 9.6–70.4)	4 (40.0%: 9.6–70.4)	1.000	<0.001
Non-cancer	15 (78.9%: 60.6–97.3)	10 (62.5%: 38.8–86.2)		6 (60.0%: 29.6–90.4)	6 (60.0%: 29.6–90.4)		

SMD, standardized mean difference.

Data were expressed as the number of the sample size, a ratio, and the 95% confidence interval.

**Table 5** Comparisons between a home-visiting pharmacist’s work and a meeting with a home-visiting physician before the first visit before and after propensity score matching

(A) Number of inquiries

Evaluation index	All patients			Propensity score matching patients		
	Meeting before the first visit		P-value	Meeting before the first visit		P-value
	Yes (N = 19)	No (N = 16)		Yes (N = 10)	No (N = 10)	
Prescription questions	5 (26.3%: 6.5–46.1)	11 (68.8%: 46.0–91.5)	0.018	0 (0.0%: 0.0–0.0)	5 (50.0%: 19.0–81.0)	0.033
Prescription proposals	4 (21.1%: 2.7–39.4)	1 (6.3%: –5.6–18.1)	0.347	2 (20.0%: –4.8–44.8)	1 (10.0%: –8.6–28.6)	1.000

Data were expressed as the number of the sample size, a ratio, and the 95% confidence interval.

(B) Visit duration

Evaluation index	All patients			Propensity score matching patients		
	Meeting before the first visit		P-value	Meeting before the first visit		P-value
	Yes (N = 6)	No (N = 6)		Yes (N = 5)	No (N = 5)	
First visit (min)	23.5 ± 10.9	36.7 ± 5.2	0.024	20.2 ± 8.2	36.0 ± 5.5	0.007

Data were expressed as the mean ± standard deviation of the mean.

propensity score matching, the average duration of the pharmacist’s visit was significantly shorter for home-visited patients whose providers had a prior meeting.

**Discussion**

The Japanese government recommends that the elderly and infirm continue to live in their own custom in a familiar house and neighborhood until the end of their lives. Therefore, it is desirable to build a “community-based integrated care system” that combines hous-

ing, medical care, long-term care, and life support. Home-visiting pharmacists may be needed to support patients with their medication use in this type of care system. In the present study, many patients received their first pharmaceutical prescriptions when they started receiving home health care. The centralized management of all medications from outpatient care to care provided in the home by a single community pharmacy has not yet been sufficiently implemented in Japan. This means that home-visiting pharmacists are often unaware of a patient’s medical information, such as their main diagnosis, medications, and care pro-

vided, before visiting the home. Therefore, the inquiry rate for home-visiting pharmacists at their first home visit was high (65.7%). Home-visiting pharmacists identified various drug-related issues at the first visit, such as leftover drugs, non-adherence, and inappropriate prescriptions, including inadequate prescription formats and insurance coverage issues. Akers *et al.* previously reported that 71% of all drug-related issues were identified during the first visit, and interventions were performed by pharmacists in the early stages of home visits [1]. Home visits by pharmacists contributed to the earlier identification of drug-related issues and the proper use of medications. The rate of prescription changes resulting from prescription questions during home health care was 74.8% in cases in which prescription questions were asked [11]. In the present study, all pharmaceutical inquiries offered during the early period of home visits (up to the 4<sup>th</sup> visit) were accepted, with an average acceptance rate that was higher than that previously reported. In subsequent visits (5<sup>th</sup> to 24<sup>th</sup> visits), 88% of pharmaceutical inquiries were accepted. Therefore, regular home visits by home-visiting pharmacists were useful for supporting the proper use of medications in the home health care transition period. Since there were many inquiries in the first visit in the present study, a meeting with the home-visiting physician before the first visit was considered useful for the early resolution of drug-related issues.

In Japan, medical professionals, such as hospital physicians, home-visiting physicians, nurses, pharmacists, rehabilitation staff, and various caregivers, share medical information about patients during the hospital discharge meeting. This is useful for smoothly transitioning a patient to home health care. However, only 3.7% of community pharmacies participate in discharge meetings [6]; therefore, there is insufficient sharing of patient information with pharmacists at the time of discharge. The reasons for this may be that the discharge meeting is held at a time that is difficult for the pharmacist to participate or at a location that is far from the pharmacy. In some cases in the present study, pharmacists held an in-person or telephone meeting with the home-visiting physician before the physician's first visit. Previous studies demonstrated that pharmacists contributed to the more appropriate use of medications when more information was provided about patients [12,13]. Meetings between home-visiting pharmacists and physicians were held when the discharge summary

was provided before the first visit. The prescription question rate during the first visit was significantly lower among patients for whom a prior meeting was held between the home-visiting pharmacist and physicians. This reduction may have been due to the identification of drug-related issues during the meeting. Furthermore, among patients whose home-visiting pharmacist and physician held a prior meeting, the duration of visits was significantly shorter. Previous studies reported that the average visit time by home-visiting pharmacists was 15 to 20 min, which is short and beneficial for home-visiting pharmacists because it allows them to allocate more time for other duties [14]. The present results demonstrated that the holding of a meeting with a home-visiting physician before the physician's first visit increased the efficiency of home health care-related duties and the identification of drug-related issues by home-visiting pharmacists.

The present study had some limitations. It was not possible to evaluate the effects of pharmaceutical inquiries in each patient because data were not collected on symptom aggravation or hospital readmission. Furthermore, unknown confounders were not removed by the propensity score matching analysis. Since this was a small-scale retrospective study of newly home-visited patients, difficulties were associated with clarifying the frequency of visits, changes in patient conditions, and pharmaceutical inquiries regarding the primary disorders of patients. Therefore, the results obtained are difficult to generalize. The examination of a larger number of cases in future studies is required, and the effects of several factors, including the number of medications, diseases, and degree of cognitive function, need to be considered.

In conclusion, the present results demonstrated that a meeting between the home-visiting physician and pharmacist before the first home visit increased the efficiency of home health care-related duties by home-visiting pharmacists and contributed to the early identification of drug-related issues.

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