

《 Original research 》

Utilization of 'Care Manager-Pharmacist Collaboration Sheet' in Medication Assessment of Home-Care Patients in Tokai Village

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Medication compliance by home-care patients and the impact of medication on patients' activities of daily life (ADL) and quality of life (QOL) have not been sufficiently assessed. Interprofessional collaboration has not developed to a sufficient level, particularly the utilization of pharmacists.

The aim of this study was to develop a system in which pharmacists' advice/feedback could be utilized to identify and resolve issues related to patients' medication and lifestyle early on.

The subjects were sixty-four patients cared for at home (seventeen males and forty-seven females; average age: 82.1). It was found that twelve of the sixty-four home-care patients were unable to follow the instructions for use of medication. In addition, thirty of the sixty-four home-care patients had some unused medication in their possession, and twenty-one of the thirty wished to receive assistance from a pharmacist. Of the twelve patients who could not follow the instructions for use of medication, eight received assistance from a pharmacist, and two became able to comply with the instructions afterwards.

According to care managers, thirty-three of the sixty-four home-care patients had some issues related to medication and/or lifestyle. The pharmacists gave advice/feedback to the care managers in seventeen of the thirty-three cases with issues. In thirteen of the seventeen cases, the care managers were able to gain insights from the pharmacist's advice/feedback and included them in the care plan. Furthermore, six of the twelve care managers expressed their desire for a joint patient visit with a pharmacist, or participation in the medication support collaboration conference. As a result of pharmacist intervention in the disposal of unused medication, the number of and amount paid by patients for unused medication were decreased significantly.

The results suggested that this system was productive as the care managers and the pharmacists were able to collaborate, thereby identifying and resolving patients' issues related to medication and lifestyle.

Key words; pharmacist, care manager, community health care, home medical care

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1. Introduction

The demand for medical care for the elderly has seen an upsurge as our society continues to age. This entails, in most cases, some form of pharmacotherapy for chronic conditions. Faced with the rapidly changing environment surrounding medical care, community pharmacists must step out of their conventional role and play a new and active role in which they put their professional skills to use for 'well-managed pharmacotherapy.'

In a report¹⁾ on the promotion of team-based medical care released by the Ministry of Health, Labour and Welfare in March 2010, the importance of active involvement of pharmacists, who are considered medicinal drug experts, in pharmacotherapy was emphasized as pharmacotherapy has become increasingly complex with the advancement of medical technology.

The report also pointed out that pharmacists had not been sufficiently involved in community-based medical care, of which home care was a part^{2,3)}. On the other hand, the report showed that care managers were often asked questions about medication, including questions regarding instructions for use, and issues related to medication compliance were found.

Given the above circumstances, we believe that the establishment of a pharmacist-care manager collaboration system will contribute to 1) increasing pharmacists' involvement in community-based health care, 2) increasing care managers' knowledge of pharmacotherapy, and 3) improving patients' quality of life (QOL). However, there have been few reports of any form of pharmacist-care manager collaboration systems so far.

In this study, we aimed at developing a system in which pharmacists' advice/feedback could be utilized to identify and resolve issues related to patients' medication and lifestyle early on.

2. Methods

1. Project Overview

A system that enabled close collaboration among pharmacists, care managers, and the Nursing and Welfare Division, Welfare Department, Tokai Village was developed (Fig. 1).

First, patients cared for at home are identified and written consent is obtained after explaining the project to them. A Medication Assessment Preliminary Check Sheet is used by care managers to record patients' medication compliance, medication management, and physical condition. Afterwards, the care managers report medication- and lifestyle-related issues that require attention on a Collaboration Sheet. Based on the reported medication- and lifestyle-related issues, the pharmacists give advice/feedback and collaborate with the care managers. The pharmacists hold meetings with the care managers as necessary, and collect unused medication after the survey.

2. Study Method Using Medication Assessment Preliminary Check Sheet and Collaboration Sheet

Separately from the Care Plan Form prepared by the care manager, a medication assessment sheet is newly prepared to identify issues. The new form is called "Medication Assessment Preliminary Check Sheet for Care Manager" (Fig. 2-1, 2-2).

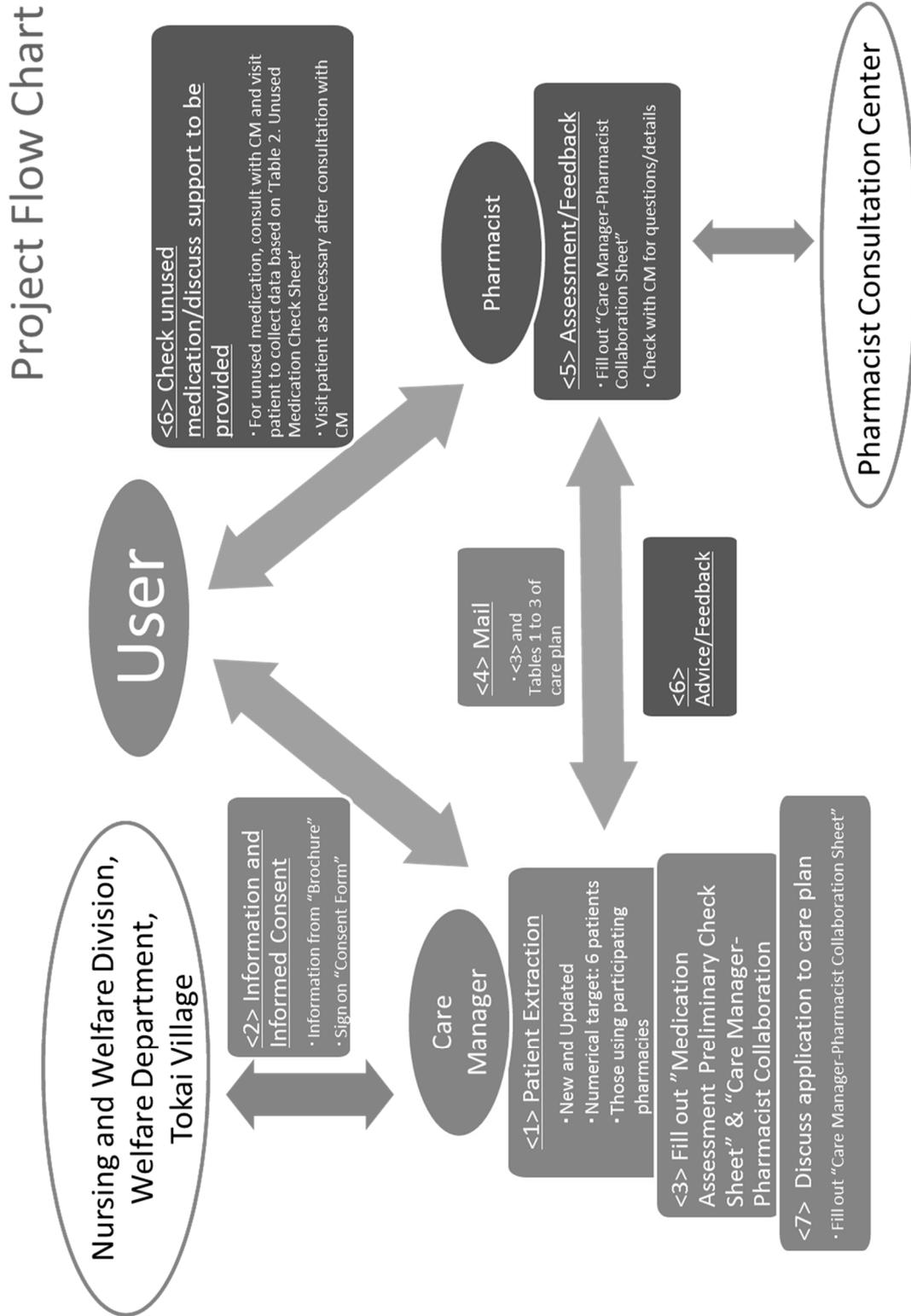


Fig.1 Summary of project

Tokai Village Project "Medication Assessment Preliminary Check Sheet for Care Manager" (No. 1)

New: / Update:

Day _____ Month _____ 2014

Name of Organization: _____ Care Manager in Charge: _____

Patient's Name: _____ Age: _____ Sex: M / F

Diagnosis: _____

Living Arrangement: Living alone / Living with someone / Other _____

(_____)

I. Medication *Encircle the best answer.

1. I am taking some kind of medication.	Yes	No	Don't know
2. I have a medication record booklet.	Yes	No	Don't know
3. I am receiving medication from two or more medical institutions.	Yes	No	Don't know
4. I have an allergic reaction to medication.	Yes	No	Don't know
5. My attending physician is aware of the medication I am taking.			
(In case you are regularly seen by multiple medical institutions)	Yes	No	Don't know
6. I am taking supplements.	Yes	No	Don't know
7. I am taking sleeping tablets or tranquilizers.	Yes	No	Don't know
8. I have consulted a pharmacist in the pharmacy I regularly visit regarding the combined use of medicines and supplements.	Yes	No	Don't know
9. I have unused medication in my possession.	Yes	No	Don't know

If you answered 'yes' to no. 9, would you like to receive assistance from a pharmacist regarding the unused medication?

	Yes	No
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10. Please write down medication currently being used, and the instructions for use.

II. Medication Management and Compliance *Encircle the best answer.

1. Who manages your medication?	Myself	Family	Other (_____)
2. Are you able to follow properly the instructions for use?	Yes	No	

If you answered "no" to the above question:

(1) What do you think is the reason why you cannot follow properly the instructions for use? *Encircle the best answer.

- I cannot swallow. - I refuse to be medicated. - I forget. - There is no one to check if medication has been taken.

- I have difficulty swallowing.

- Other (_____)

(2) Do you and your family understand why the medication was prescribed?

	Yes	No
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3. Do you have any questions about the medication?	Yes	No
4. Do you have someone whom you can consult about the medication?	Yes	No

Fig.2-1 Tokai Village Project "Medication assessment preliminary check sheet for care manager" (No.1)

<i>1</i>					
III. Could it be that medication is the cause? Let's check your physical status.					
<i>Activities of Daily Living [Encircle the most appropriate answer(s).]</i>					
Eating	Poor appetite	Eating less	Dry mouth	Bitter aftertaste	Stomachache
	Lack of sense of taste	Choking	Fluid intake (ml/day)		
Excretion	Constipated	Hard stool	Persistent diarrhea	Prostatic hyperplasia	Dry mouth
	Drowsiness	Decreased urination	No sweating	Urine color darker than usual (color:)	Excessive sweating (pale face)
	Frequent urination at night		Feeling of incomplete bladder emptying		
Sleep	Day and night reversed	Difficulty sleeping (Too excited to sleep)		Feeling dizzy when going to the toilet at night	
	Severe daytime sleepiness				
Motor function	Prone to tripping	Prone to falling	Hand tremor	Tendency to stagger	Lack muscle strength
	Lethargy	Drowsiness			
Cognition	Weakened judgement ability	Aggression	Gait (freezing of gait)	Reduced volition	Short-term memory disorder
* The medication you are taking daily may be adversely affecting your health considerably.					
Consult your pharmacy/pharmacist if you are unsure about your medication.					

Care Manager-Pharmacist Collaboration Sheet					
Day _____ Month _____ 2014					
Pharmacy in Charge:			Pharmacist in Charge: Mr./Ms.		
We are pleased to send you the "Medication Assessment Preliminary Check Sheet for Care Manager". As care manager, please share your concerns about the prescribed medication, e.g., their effects on body function, etc. from your daily interactions with the patient.					
As care manager, are there any issues related to patient's medication and/or lifestyle that you wish to report?					
Yes No					
Pharmacist's advice/feedback					
		Day	Month	Year	
Indicate care manager's insights and their application to the care plan					
		Day	Month	Year	
Would you like to have a pharmacist accompany you on your next home-care visit, or would you like to participate in medical support collaboration conferences? Yes / No / To be decided after consultation					
Return by fax to: 03-xxxx-xxxx; to the attention of XXXXX, care manager in charge					
Home Care Support Office:					
Address/TEL:					

Fig.2-2 Tokai Village Project "Medication assessment preliminary check sheet for care manager" (No.2)

The care manager conducts an interview with a patient cared for at home to collect data concerning the items below, and fills out the Sheet:

1. Status of medication compliance and unused medication;
2. Reasons why home-care patient was unable to take medication;
3. Presence/absence of medication- and lifestyle-related issues as judged by the care manager.

If the home-care patient is deemed to have any medication- and/or lifestyle-related issue(s), the care manager will write down those issues on the Medication Assessment Preliminary Check Sheet and send the Sheet by facsimile to the pharmacist in charge. The pharmacist then assesses the contents of the Sheet and uses the Collaboration Sheet to give advice/feedback for the medication- and/or lifestyle-related issue(s).

If the home-care patient is found to possess unused medication, the care manager and the pharmacist will visit the patient together to dispose of the unused medication (lower part of Fig. 2-2). We named this sheet describing the collaboration between the care manager and the pharmacist the 'Care Manager-Pharmacist Collaboration Sheet'. The Nursing and Welfare Division of the Welfare Department of Tokai Village collects the Medication Assessment Preliminary Check Sheet

and the Collaboration Sheet describing the collaboration between the pharmacist and the care manager, the identified issues, new understanding on the part of the care manager, etc., and enters the collected data in an Excel spreadsheet for data analysis. If any unused medication is found, the description and reason for failure to use as well as pharmacist intervention are added to the Excel spreadsheet for tallying and analysis. After the survey is completed, a questionnaire survey is conducted for the pharmacists and the care managers.

This study was approved by the Research Ethics Committee of Hokkaido Pharmaceutical University School of Pharmacy (No. 13-03-001).

3. Data and Statistical Analysis

The data were expressed as mean \pm S.D. or mean \pm S.E. Statistical analyses of the data were performed using Wilcoxon's signed-rank test. Statistical significance was accepted at $p < 0.05$.

3. Results

Ten pharmacists from nine pharmacies and twelve care managers from seven organizations participated in the study (Table 1).

Table 1 List of organizations participating in the study

Organization to which pharmacist is affiliated	Organization to which care manager is affiliated
AIN Pharmacy	Tokai-village regional comprehensive support center
Nemoto Pharmacy	Ai Nemoto Pharmacy care plan center
Nemoto Pharmacy (in front of Tokai-mura Hospital)	Oaks Tokai
Nemoto Pharmacy Group	Tokai-village Council of Social welfare home-care support
North Pharmacy	Home-care support center Sumire
Hitachinaka Pharmacy and others	Sunflower care plan center
AIN Pharmacy Katsuta Store	Care plan Haruka
Tokai Pharmacy	
Satsuki Pharmacy	

The subjects were sixty-four patients cared for at home (seventeen males and forty-seven females). The average age was 82.1 ± 6.4 ; it was 81.7 ± 8.7 for males and 82.2 ± 5.4 for females. The number of underlying diseases was 3.2 ± 1.6 ; it was 2.5 ± 1.4 for males and 3.3 ± 1.6 for females (Table 2).

Table 2 Patients' background

	Male	Female	Total
No. of patients	17 (26.6 %)	47 (73.4 %)	64
Age	81.7 ± 8.7	82.2 ± 5.4	82.1 ± 6.4
New	8	25	33
Update	9	22	31
No. of underlying diseases	2.5 ± 1.4	3.3 ± 1.6	3.2 ± 1.6

Mean \pm S.D.

It was found that of the sixty-four home-care patients, forty-seven were taking their medication as instructed and twelve were not doing so. Medication compliance was unknown in five of the sixty-four patients (Fig. 3A). Regarding the question of having any unused medication in their possession, of the sixty-four patients, nine answered 'Yes', thirty-one answered 'No', and three answered 'don't know'. In addition, twenty-one of the sixty-four patients responded that they would like to receive assistance from a pharmacist with regard to the unused medication in their possession (Fig. 3B).

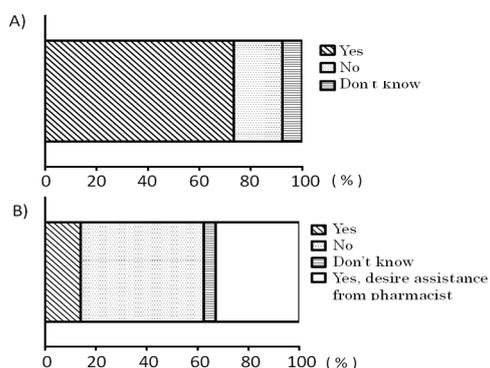


Fig.3 Questionnaire results of medication status and unused medication

- A) Can you take your medication according to the instructions for use?
- B) Do you have any unused medication in your possession?

Overall, it was found that thirty of the sixty-four home-care patients had some unused medication in their possession, and twenty-one of the thirty wished to receive assistance from a pharmacist. When asked about the reason why they failed to take their medication, twelve home-care patients who were unable to follow the instructions for use of medication gave twenty reasons, including difficulty swallowing (one reason), refusal to be medicated (six reasons), forgetfulness (eight reasons), lack of compliance check (three reasons), and others (two reasons) (Fig. 4).

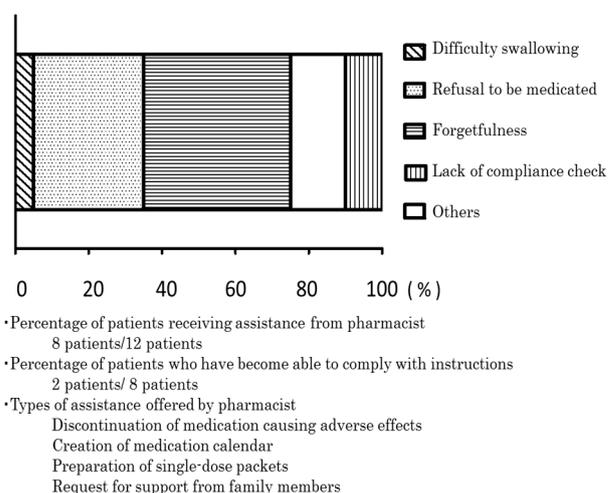


Fig. 4 Reasons for failing to take medication

Of the twelve patients who were unable follow the instructions for use of medication, eight received assistance from a pharmacist, and two became able to comply with the instructions (Fig. 4).

Pharmacist intervention included discontinuation of medication causing adverse effects, creation of a medication calendar, preparation of single-dose packets, and request for support from family members. Medication- and/or lifestyle-related issues as determined by the care managers were found in thirty-three of the sixty-four home-care patients, and thirty-one of the sixty-four patients

were found to have no medication- or lifestyle-related issues by the care managers (Fig. 5A). The pharmacists gave advice/feedback to the care managers in seventeen of the thirty-three patients with issues (Fig. 5B). In thirteen of the seventeen cases, the care managers were able to gain insights from the pharmacists' advice/feedback and included them in the care plan (Fig. 6A). Moreover, six of the twelve care managers expressed their desire for a joint patient visit with a pharmacist or participation in the medication support collaboration conference (Fig. 6B).

As a result of pharmacist intervention in the disposal of unused medication, the amount paid for unused medication by each patient significantly decreased from $28,818.5 \pm 9,183.1$ yen to 679.4 ± 498.3 yen (Fig. 7). The grand total of the amount paid for unused medication by the patients in the study decreased from 432,276.8 yen to 10,191.0 yen, and the reduction rate was 97.6%. Similarly, the number of unused medication was reduced significantly from 6.5 ± 0.9 to 0.7 ± 0.4 as a result of pharmacist intervention in the disposal of unused medication (Fig. 8).

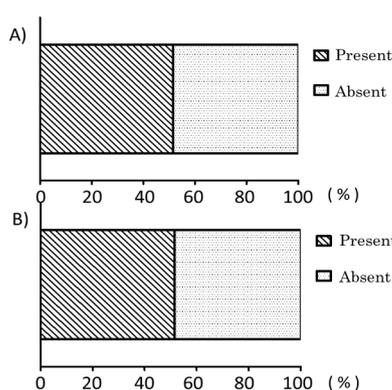


Fig.5 Presence or absence of issues as judged by care manager and of advice and feedback from pharmacist

A) Presence or absence of issues related to medication and/or lifestyle as judged by care manager

B) Presence or absence of advice/feedback from pharmacist to care manager

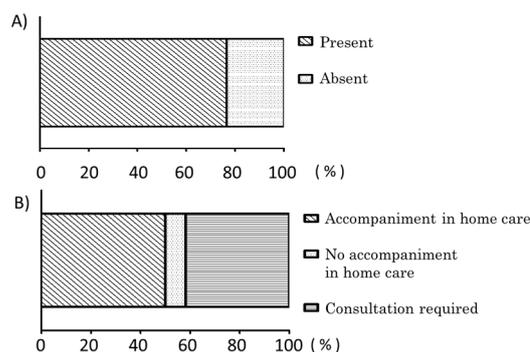


Fig.6 Presence or absence of care manager's insights and their inclusion in care plan, and desire for accompaniment by pharmacist in home-care visit

A) Presence or absence of care manager's insights and their inclusion in care plan

B) Desire for accompaniment by pharmacist in home-care visit or participation in medical support collaboration conferences

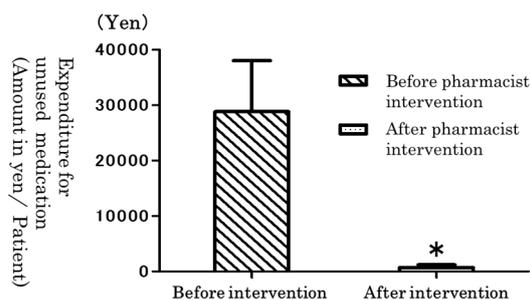


Fig.7 Changes in expenditure for unused medication (medical expenses) before and after pharmacist intervention (Mean±S.E. n=15)

* : P < 0.05 Wilcoxon's signed-rank test

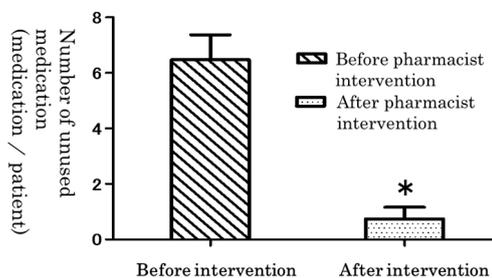


Fig.8 Changes in the number of unused medication before and after pharmacist intervention (Mean±S.E. n=15)

* : P < 0.05 Wilcoxon's signed-rank test

The findings of the questionnaire survey for thirteen pharmacists are as follows (Table 3A): twelve pharmacists responded 'Yes' and one responded 'No' to the question of whether any medication-related issues were found through collaboration with the care manager, and eleven pharmacists responded 'Yes' and two responded 'No' to the question of whether information provided led to the adjustment and/or decrease of unused medication. The questionnaire survey of the twelve

care managers yielded the following findings: eight care managers responded 'Yes' and four responded 'No' to the question of whether any new issues were identified on the basis of the pharmacist's advice/feedback, and five care managers responded 'Yes' and seven responded 'No' to the question of whether collaboration with the pharmacist led to resolution of issues. Other survey results indicated that the collaboration between pharmacists and care managers yielded very productive outcomes.

Table 3 Questionnaire results for pharmacist and care manager (%)

A) Questionnaire results for pharmacist		
Item	Yes	No
Medication-related issues were found through collaboration with care manager.	92.3	7.7
Information provided led to adjustment and/or decrease of unused medication.	84.6	15.4
Collaboration with care manager enabled pharmacist to give more precise advice on medication.	100	0
The importance of pharmacist intervention in medication assessment was recognized.	100	0
Cases that led to periodic monitoring were identified.	69.2	30.8
Maintenance and/or improvement of patient's ADL was observed.	91.7	8.3
Collaboration with care manager was enhanced through the project.	100	0
B) Questionnaire results for care manager		
Item	Yes	No
New issues were identified on the basis of pharmacist's advice/feedback.	66.7	33.3
Collaboration with pharmacist led to resolution of issues.	41.7	58.3
Awareness of the importance of medication assessment was enhanced.	75.0	25.0
Care plan that includes monitored items was available.	33.3	66.7
Medication-related issues were found through collaboration with pharmacist.	66.7	33.3
Collaboration with pharmacist was enhanced through the project.	66.7	33.3

3. Discussion

A report¹⁾ by a discussion group on the promotion of team-based health care published by the Ministry of Health, Labour and Welfare in 2010 stated the importance of active involvement in pharmacotherapy by pharmacists, who are considered medicinal drug experts. It also reported that pharmacists had not been utilized sufficiently in community health care, of which home care was a part^{2, 3)}.

Therefore, in this study, we developed a system in which pharmacists collaborate with care managers to identify and resolve medication- and lifestyle-related issues of patients.

We found that approximately 19% of the patients were unable follow the instructions for use of medication. This value was consistent with that reported by Spector, Closson, Wagner, and others⁴⁻⁶⁾. In addition, approximately 47% of the patients had unused medication in their possession, and 70% of those patients wished to receive assistance from

a pharmacist. An understanding of the necessity of medication is crucial to medication compliance by patients. Rather than leaving the task of explaining to medical doctors, pharmacists should explain carefully according to the level of knowledge of each patient. As the next step, understanding patient's habits, listening to patient's wishes, and streamlining medication regimen will be required. In any case, the results strongly indicate that pharmacists have to support patients' medication compliance. The reasons why the patients cannot comply with the medication regimen include difficulty swallowing, refusal to be medicated, and forgetfulness. All of these issues may be addressed by a pharmacist. There were twelve patients who were unable to take their medication. Eight of them received assistance from a pharmacist, including the creation of a medication calendar, repackaging of medication into single-dose packets, and request for support from patient's family. As a result, two became able to take their medication.

These findings suggest that patients cared for at home in the community health care setting desire assistance from a pharmacist, and that pharmacists can manage patients' medication by contacting them. Itoh et al.⁷⁾ reported that the involvement of pharmacists in the inhalation therapy of COPD patients contributed to not only the appropriate use of medication but also improvement in pulmonary function of the patients. We conclude that pharmacists can enhance the therapeutic effects of medication by ensuring patients' medication compliance.

From the perspective of a care manager, it was found that approximately half of the patients had medication- or lifestyle-related issues. This suggested that collaboration between care managers

and pharmacists was important. In almost 50% of the cases, the pharmacists offered advice/feedback on the basis of the Medication Assessment Preliminary Check Sheet for Care Manager. This suggested that the pharmacists in Tokai Village had a proactive attitude toward community health care.

During the study, pharmacist intervention in the disposal of unused medication significantly reduced the number of and amount paid by patients for unused medication. In the Asheville Project conducted in the U.S., pharmacist support for patients' self-management contributed to the improvement of patients' physiological indices, reducing annual therapy cost per capita by more than 30% over a five-year period. In the said project⁸⁻¹⁰⁾, both improvement in therapeutic effect and reduction in medical care cost were achieved; however, prescription drug expenditure was not reduced. In our study, prescription drug expenditure was reduced. This difference may be due to the way pharmacists assisted patients, as our study has confirmed that pharmacist intervention resulted in the reduction of prescription drug expenditure. It has been reported that prescription drug expenditure could be reduced by reusing unused medication¹¹⁻¹³⁾. Those findings highlighted the urgent need for specific actions by pharmacists of local pharmacies.

The questionnaire survey of the care managers revealed that almost 70% of the care managers were able to identify new issues on the basis of advice/feedback from the pharmacists. In addition, 75% of the care managers responded that their awareness of the importance of medication assessment had been enhanced. The questionnaire survey of the pharmacists indicated that approximately 92% of the pharmacists were able to

observe maintenance and/or improvement of patient's ADL.

Pharmacist intervention in home health care resulted in improvement of medication-related ADL and QOL of patients. The close collaboration between care managers and pharmacists enabled identification and resolution of patients' medication- and lifestyle-related issues. We believe that the results of this study would contribute significantly to the enhancement of community-based health care.

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