A Preliminary Study about the Relationship between Workload and the Outcomes of Community Pharmacists’ Home Visiting Service

Mitsuko Onda¹, Hirohisa Imai², Yuta Kataoka¹, Makoto Takamatsu¹, Masako Tanaka¹, Hidekazu Tanaka¹, Yoko Nanaumi³, Yukio Arakawa¹

¹ Clinical Laboratory of Practical Pharmacy, Osaka University of Pharmaceutical Sciences,
² National Institute of Public Health, ³ Advanced Pharma Research Office

Abstract : Aim: To examine any relations of workload and outcomes of pharmacists’ home visiting service for medication management and guidance. Survey Target: Managing pharmacists and home-visiting pharmacists from community pharmacies of the Osaka Pharmaceutical Association’s Yao and Toyonaka branches as of March, 2012. Methods: Survey forms regarding drug management and guidance at patients’ homes were mailed, requesting mail or online response. Workload indexes were visit frequency and work time on site. The relation of workload and its outcomes was examined using univariate analysis regarding three items: change in unused medication amount, detection of side effects during visits, and change in prescription. SPSS ver. 20 for Windows was used for statistical analysis. Results: 90 of 201 pharmacies responded (collection rate 44.8%), and 110 home patients’ data were analyzed. 5-to-15-minute actual work time scored highest (57.4%), followed by less than 5 minutes and 15 to 30 minutes, both at 21.3%. Visit frequency of twice a month scored highest (70.4%), followed by once a week (19.4%), once a month (7.4%), and once in more than one month (2.8%). 5-minute or longer patient visits had a tendency of higher percentage of patients whose unused medication decreased after visits started than less-than-5-minute visits (P=0.072). “Once a week” visits had a tendency of higher percentage of pharmacists detecting side effects than less frequent visits (P=0.061) and changing in prescription (P=0.085). Conclusion: The results above implied the relationship between workload and outcomes incurred by pharmacists’ home visits for medication safety management and guidance.

Key words : home-visiting service, community pharmacy, pharmacist, workload, outcomes

1. Introduction

Before the enforcement of the Long-Term Care Insurance Act in April 2000, main pharmacy services included filling prescriptions and supplying non-prescription drugs and other products. The implementation rate of the “drug management and guidance for home-visiting service,” which had already been made compensable under the national health insurance system, was not too high.¹⁻³ Nevertheless, users of home care services were hoping that pharmacists would check side effects, explain and instruct dose regimens, assist in drug storage management, and consult them.³

Later in 2005, the authors conducted a survey again with the purpose of examining the changes in the structural features of pharmacy functions as a result of the implementation of Long-term Care Insurance program (hereinafter “the program”).¹ The results revealed that the implementation of services such as “provision of nursing care products,” “management of community residents and engagement in educational activities on proper drug usage,” “proper management and use of medication record ("YAKUREKI),” “management and guidance on drugs involved in home visits,” “coordination with community healthcare institutions,” and “coordination with nursing, caregiving, and other professions” had improved significantly, while about 30% of the pharmacies surveyed were actually visiting the homes of their patients.

The revised Long-Term Care Insurance Act enforced in April, 2012, positioned as the most important issues the strengthening of the foundation for building an “integrative community care system,” which would seamlessly provide medical, nursing care, preventive, residential and life-related assistance services, and promotion of at-home healthcare under the integrative community care system. The revised Act stipulates that a review be conducted about the occupations that will provide these services and evaluations by residence location for management and guidance for in-home treatment, which is one of the home-visiting
services for home-bound patients. Therefore, a need will arise to clarify the relationship between the workload and the content of a pharmacist’s home visiting and the outcomes.

Multiple case reviews have been reported on the involvement of pharmacists in home care and its results, including involvement with in-home rehabilitation, 6) intervention in drug administration issues, 6) support for HPN (Home Parenteral Nutrition) patients, 7,8) and support for pain control in home terminal care. Multiple reports have also been published on the current status of pharmacists’ home-visiting service in the home care arena. 9~11) However, there are no reports that have examined the workload in relation to its outcomes. In this study, a survey was conducted with the purpose of examining the relation of workload and its outcomes in terms of safety management and guidance of medication involved in home visits by community pharmacists. This study was conducted with the approval of the Research Ethics Review Board of Osaka University of Pharmaceutical Sciences.

2. Survey Target and Method

The survey forms were sent to managing and home-visit pharmacists who worked for pharmacies belonging to the Yao and Toyonaka branches of the Osaka Pharmaceutical Association. The pharmacists were requested to respond to questions regarding pharmacy attributes and the patients visited. We asked for only one response from each pharmacy regarding pharmacy attributes, and requested the managing pharmacist to enter these attributes. In addition, we requested those pharmacies that were conducting home visits to provide responses for each patient’s case. Home-visiting pharmacists were asked to select up to five patients (any feasible number of patients for pharmacies that had less than five home-visit patients) out of those they visited for medication safety management and guidance, and to respond to questions on each case. We did not establish any specific criteria for selecting home-visit patients. Instead, we asked the pharmacists to select at their own discretion patients for whom pharmaceutical care was relatively frequent. Survey forms were mailed and response was requested either via mail or online. The survey was conducted for a 10-day period from March 12 to 21, 2012.

The main survey items were:

- pharmacy attributes (actual number of prescriptions filled per day, actual number of employee pharmacists, actual number of pharmacists registered as "home visitor", and actual number of patients visited over the past month),
- workload indicators (frequency of visits to patients’ homes (hereinafter “visit frequency”), and work time at a patient’s home per visit (hereinafter "work time"),
- patient attributes (sex, age, actual number of prescribed drugs (a total of oral drugs, single-dose drug packages, and injection drugs that were prescribed last),
- indicators of outcomes from home visits (change in the amounts of unused drugs (hereinafter "amount change in unused drugs"), detection of side effects during visits (hereinafter "detection of side effects"), and change in prescription (hereinafter "change in prescription")

The data on pharmacy attributes were used to examine the relationship between the presence of a home visiting service and pharmacy attributes by implementation of Mann-Whitney U test. Also, to test the relation of pharmacy attributes and workload, Kruskal Wallis test was conducted.

Then, to test the relation of workload and its outcomes, Kruskal Wallis test was conducted for the visit frequency and its outcome indicators, as well as for the actual work time and its outcome indicators, respectively. SPSS version 20 for Windows was used for statistical analysis, and a significance level of 5% was adopted for determining significant differences.

3. Results

(1) Collection Status

90 pharmacies (35 from Yao and 55 from Toyonaka) out of 201 pharmacies (80 in Yao and 121 in Toyonaka) responded, with the collection rate of 44.8% (43.8% for Yao and 45.5% for Toyonaka). 44 of the pharmacies that responded, or 48.9%, had the home-visit drug management and guidance program in place, and data from 110 homebound patients were obtained. The following is the distribution of patient data per pharmacy:

- 5 patients: 11 pharmacies
- 4 patients: 3 pharmacies
- 3 patients: 4 pharmacies
- 2 patients: 5 pharmacies
- 1 patient: 21 pharmacies

As far as patient attributes, there were 46 males (41.8%) and 57 females (51.8%). The sex of 7 patients (6.4%) was unknown. The average age was 79.7 years.
(S.D. 13.0). Actual number of prescribed drugs was 8.5 (S.D. 3.3), with the highest number being 8.

(2) Pharmacy Attributes

Table 1 shows the relationship between the presence of a home visiting service and pharmacy attributes. The factor related to the presence of a home visiting service was actual number of pharmacists registered as “home visitor.”

(3) Workload Indicator

1) Visit Frequency (Choices : once a week, twice a month, once a month, once in more than a month)

69.1% of visiting pharmacists visited twice a month, followed by once a week (19.1%), once a month (7.3%), and once in more than a month (2.7%). 1.8% was unknown.

2) Actual Work Time (Choices : <5 min, 5-15 min, 15-30 min, >30 min)

The highest number of pharmacists visited patients for 5 to 15 minutes (56.4%), followed by less than 5 minutes (20.9%), 15 to 30 minutes (19.1%), and more than 30 minutes (1.8%). 1.8% was unknown.

(4) Relationship between Pharmacy Attributes and Workload (Examination by Kruskal Wallis test)

1) Visit Frequency

Between the group of patients who received visits once a week and the group that received visits less frequently, there was a significant difference in number of patients visited for the last month. Also, the group of patients who received “Once a week” visits had a tendency of fewer staff members than the group of patients who received less frequent visits (Table 2).

2) Actual Work Time

Between the group of patients for whom the actual work time during pharmacists’ home visits was 5 or more minutes and the group for whom the actual work time was less than 5 minutes, there was a significant difference in the average number of pharmacists registered as “home visitor” and staff pharmacists compared to the shorter-period group (Table 2). It was confirmed that the longer-period groups had more pharmacists registered as “home visitor” and fewer...
staff members compared to shorter-period group.

(5) Distribution of Outcome Indicators

The amount of unused drugs decreased for 40.0% of the patients since the start of home visits, while the amount either did not change or increased for 54.5% of them. Furthermore, pharmacists detected signs of side effects or other adverse events arising from drugs during home visits for 23.6% of the patients. Decreases in the administration amounts, changes in dose regimens, and changes in types of prescribed drugs occurred after pharmacists contacted or discussed with the physicians for 17.3%, 14.5%, and 25.5% of the patients, respectively (Table 3).

(6) Relationship between Workload and Outcome Indicators (Examination by Kruskal Wallis test)

1) Relation of Visit Frequency and Outcome Indicators

For patients who received home visiting service once a week, pharmacists tended to detect signs of side effects or other adverse events arising from medication during home visits and change in prescription more frequently than for the less-frequency groups (Table 4).

2) Relation of Actual Work Time and Outcome Indicators

The amount of unused drugs tended to decrease more for patients who received 5 or more minutes of visitor

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### Table 3 Distribution of outcome indicators

<table>
<thead>
<tr>
<th>Outcome Indicator</th>
<th>Ans.</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Change in the amounts of unused drugs (Has the amount of unused medication changed since the start of visits?)</td>
<td>1. Decreased</td>
<td>44</td>
<td>40.0</td>
</tr>
<tr>
<td></td>
<td>2. No Change</td>
<td>55</td>
<td>50.0</td>
</tr>
<tr>
<td></td>
<td>3. Increased</td>
<td>5</td>
<td>4.5</td>
</tr>
<tr>
<td></td>
<td>4. No Response</td>
<td>6</td>
<td>5.5</td>
</tr>
<tr>
<td>Side effects detected (Have signs of side effects or other adverse events arising from drugs been detected?)</td>
<td>1. Yes</td>
<td>26</td>
<td>23.6</td>
</tr>
<tr>
<td></td>
<td>2. No</td>
<td>73</td>
<td>66.4</td>
</tr>
<tr>
<td></td>
<td>3. No Response</td>
<td>11</td>
<td>10.0</td>
</tr>
<tr>
<td>Change in prescription (Has the prescription changed after contact or discussion with the doctor?): Multiple choice</td>
<td>1. Decreased</td>
<td>19</td>
<td>17.3</td>
</tr>
<tr>
<td></td>
<td>2. Increased</td>
<td>13</td>
<td>11.8</td>
</tr>
<tr>
<td></td>
<td>3. Change in Use Regimen</td>
<td>16</td>
<td>14.5</td>
</tr>
<tr>
<td></td>
<td>4. Change in Medication</td>
<td>28</td>
<td>25.5</td>
</tr>
<tr>
<td></td>
<td>5. No Change</td>
<td>47</td>
<td>42.7</td>
</tr>
</tbody>
</table>

### Table 4 Relationship between workload and outcome indicators

<table>
<thead>
<tr>
<th>Outcome Indicators</th>
<th>Ans.</th>
<th>Visit Frequency</th>
<th>Actual Work Time</th>
<th>P</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Once a week</td>
<td>Twice a month</td>
<td>Once a month, or once in more than a month</td>
<td></td>
</tr>
</tbody>
</table>
| Change in the amount of unused medication (Has the amount of unused medication changed since the start of visits?) | Yes | 4 (9.1%) | 35 (79.5%) | 5 (11.4%) | 0.168 | 4 (9.1%) | 28 (63.6%) | 12 (27.3%) | 0.072
| | No | 14 (23.3%) | 40 (66.7%) | 6 (10.0%) | 0.168 | 16 (26.7%) | 33 (55.0%) | 11 (18.3%) |
| Side effects detected (Have signs of side effects or other adverse events arising from medication been detected?) | Yes | 9 (34.7%) | 14 (53.8%) | 3 (11.5%) | 0.061 | 7 (26.9%) | 11 (42.3%) | 8 (30.8%) | 0.142
| | No | 10 (13.7%) | 55 (75.3%) | 8 (11.0%) | 0.061 | 11 (15.1%) | 47 (64.4%) | 15 (20.5%) |
| Change in prescription (Has the prescription changed after contact or discussion with the doctor?) | Yes | 14 (26.4%) | 32 (60.4%) | 7 (13.2%) | 0.085 | 9 (17.0%) | 28 (52.8%) | 16 (30.2%) | 0.187
| | No | 6 (12.8%) | 38 (80.9%) | 3 (6.3%) | 0.085 | 11 (23.4%) | 29 (61.7%) | 7 (14.9%) |

1) Decreased=Yes ; No change/increased=No. No response is treated as a missing value.
2) No response is treated as a missing value.
3) No change=No ; Other responses=Yes. No response is treated as a missing value.
pharmacists’ actual work than for the shorter period (less than 5 minute visits) group (Table 4).

4. Discussion

This survey was implemented in order to secure a certain amount of data on home-visit patients. The authors requested cooperation of the local pharmaceutical association to which authors belong, and received recommendation of two branches where their pharmacies are actively visiting patients’ homes. We received data from the two branches at approximately the same level of collection rate, and thus we do not expect that the regional differences between the two branches will have a serious effect on the results. We also believe that this survey afforded us a general idea of the attributes of the patients who receive home visiting service from community pharmacists, and the current situation on the home visits for individual patients.

Of the pharmacy attributes used in this survey, the number of pharmacists registered as “home visitor” was the factor that showed relation with the presence of a home visiting service. This led to the confirmation that it is essential to ensure at least two pharmacists who can visit patients’ homes.

Home visits of twice a month for 5 to 15 minutes of actual work time each session was the average situation for pharmacists’ home visits. Elderly, living alone or with the spouse, and using multiple drugs were typical attributes of patients who received home visits. We also found that approximately 10% of these patients were suffering complications from brain infarction and dementia.

The workload involved in a pharmacist’s home visit is related to the number of patients to visit, and the number of staff members. It was indicated that pharmacists whose workload for prescription filling was relatively light and who visited homes of more patients tended to provide more frequent home visits.

In the area of relation of workload and its outcomes, it was indicated that the workload indicators “visit frequency” and “actual work time” had relation with different outcome indicators. Specifically, it was implied that higher visit frequencies allowed for easier detection of signs of side effects or other adverse events and change in prescription. In addition, ensuring a certain minimum actual work time proved to be effective in resolving the unused drug issues.

A limitation of this study may be that it was difficult to closely compare workload using patients’ attributes. This is because, in addition to the limitation of the number of patients, visit frequencies and actual work time were collected as categorical data instead of actual numbers. Another limitation of this study may be that the sampling cannot really be random because: (1) the visit lengths and frequencies were obtained from the pharmacists’ visit records, and not from the measurements that researchers actually obtained in the field, and (2) selection of patients to be studied was left to the pharmacists. We will continue to prepare for our nationwide survey in a fashion that will enable us to obtain high-accuracy data that can survive statistical analysis by conducting detailed examination of the survey forms based on the knowledge acquired from the current study, and by carefully examining the investigation method.

5. Conclusion

This study examined the relations of the workload and its outcomes involved in the safety management and guidance on medication for community pharmacists’ visits to patients’ homes. The results implied that ensuring 5 or more minutes of actual work time at a patient’s home resolves the unused drug issues more effectively, and ensuring the visit frequency of once a week increases the chance of detecting side effects or other adverse events arising from medication, securing safety by change in prescription. Therefore, it is imperative that the workload of the safety management and guidance on medication for home visits be properly ensured in order to alleviate patients’ financial burden involved in medication and to improve the safety of drug therapy.

6. Acknowledgments

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References


