Available online at www.sciencedirect.com

SciVerse ScienceDirect

journal homepage: www.elsevier.com/locate/vhri

HEALTH POLICY ANALYSIS

Drug Utilization Reviews by Community Pharmacists in Japan: Identification of Potential Safety Concerns through the Brown Bag Program

Manabu Akazawa, PhD, MPH[1,], Kaori Nomura, MPH[2], Makiko Kusama, PhD[3], Ataru Igarashi, PhD[3]*

[1]Meiji Pharmaceutical University, Tokyo, Japan; [2]Jikei University School of Medicine, Tokyo, Japan; [3]Graduate School of Pharmaceutical Sciences, The University of Tokyo, Tokyo, Japan

ABSTRACT

Objectives: Pharmacy-based drug utilization reviews were conducted through the Brown Bag program to understand drug-use patterns, identify potential safety concerns, and provide appropriate consultation for elderly individuals. **Methods:** Community pharmacists in Hiroshima, Japan, participated in this review program from October to December 2009. Elderly individuals, 65 years or older, were recruited from community events or at pharmacies and were asked to bring all their prescription and nonprescription drugs including over-the-counter drugs and dietary supplements to the program. Pharmacists reviewed the medications and their usages and gave appropriate feedback if medications were used incorrectly, had potential interactions, or had safety concerns. The relationships among medication usage, participant responses, and potential safety concerns were analyzed by using logistic regression models. In addition, contraindications, duplicate medications, and potentially inappropriate medications were descriptively analyzed. **Results:** Drug utilization reviews were conducted on 508 elderly participants at 177 community pharmacies. Of the 508 participants, 53% were 75 years old or older and 34% were men. Twenty-four percent of the elderly participants used prescription drugs only, and 73% used both prescription and nonprescription drugs. Pharmacists offered feedback to 250 participants (49%) concerning the risk of duplication/interaction, possible adverse drug reaction that can be averted, inappropriate/unnecessary medication, nonadherence, and overdose. Two cases of contraindicated drugs, 3 cases of duplicate medications, and 327 cases of potentially inappropriate medications were identified. **Conclusions:** The drug-use patterns among elderly individuals were identified. This medication review program conducted at community pharmacies was a useful approach to reduce concerns among users and prevent safety problems.

Keywords: community pharmacist, drug utilization review, elderly, potentially inappropriate medication.

Introduction

Many patients, particularly the elderly, take multiple medications concurrently for the treatment of a variety of acute and chronic conditions. Taking multiple medications is associated with potential drug-related safety problems [1,2]. A drug utilization review revealed that among elderly Americans, 29% used at least five prescription drugs concurrently, 46% used over-the-counter (OTC) drugs, and 52% used dietary supplements in addition to prescription drugs [3]. Among the multiple medication users, approximately 1 in 25 had a concern about potential major drug interactions. A similar tendency of overlapping medication usage was reported through a telephone survey expressing a potential concern for unintended interactions [4]. In Japan, potential safety concerns related to drug utilization have been analyzed by using large databases [5,6]. Patient-oriented information, including usage of nonprescription drugs such as OTC drugs and dietary supplements, however, is limited.

A medication review provided at a community pharmacy is a great method to reach the elderly population in the community to evaluate the usage of both prescription and nonprescription drugs [7,8]. Elderly patients were asked to bring all their medications to a participating pharmacy for review. The pharmacist then systematically checked the medications to identify the potential safety concerns, such as contraindications, interactions, compliance, inappropriate usage, or adverse drug reactions, and educated the patients about their diseases and medications in a face-to-face interview. This pharmacy-based medication review program is often referred to as Brown Bag because of an earlier program conducted in the United States in which pharmacists instructed patients to bring their medications in a brown paper bag [9], and currently, it has become a key component of the medication therapy management program for Medicare beneficiaries [10,11].

The Hiroshima Pharmaceutical Association conducted the Brown Bag program as a part of health promotion activities in the community. The Hiroshima prefecture is located in the western

Conflicts of interest: The authors have indicated that they have no conflicts of interest with regard to the content of this article.

* *Address correspondence to:* Manabu Akazawa, Meiji Pharmaceutical University, 2-522-1 Noshio, Kiyose, Tokyo 204-8588, Japan.
E-mail: makazawa@my-pharm.ac.jp.

2212-1099/$36.00 – see front matter

doi:10.1016/j.vhri.2012.03.001

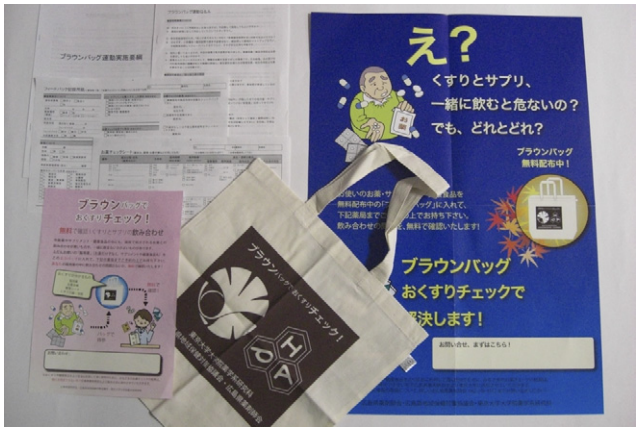

Fig. 1 – Brown Bag program promotion kit.

part of Japan, and of its population of 2.9 million (2.25% of the total Japanese population), 21% were 65 years or older according to the 2005 census [12]. The majority of the elderly living in this area were survivors of the atomic bomb tragedy, and in 2007, their annual medical expenditure was 15% higher than the national average [13]. The regional health care council, which consisted of the Hiroshima prefecture, Hiroshima city, Hiroshima University, and the Hiroshima Medical Association, supported the community program to understand drug-use patterns among citizens and to achieve appropriate use of medical resources [14].

As a research team from the University of Tokyo, we collaborated with the Hiroshima prefecture to support the medication review program, develop data collection procedures, and conduct data analyses. In this study, we described the drug-use patterns and potential safety concerns among the elderly population in Hiroshima. We also evaluated the views of the recipients on the pharmacy-based services.

Methods

Data collection

Community pharmacists, as members of the Hiroshima Pharmaceutical Association, recruited elderly individuals aged 65 years or older to participate in the review program at their pharmacies or community health events from October to December 2009. In addition, advertisements through news releases, poster displays in the community, and local government and professional organization Web sites were used to increase the program awareness among individuals who did not visit pharmacies regularly. We distributed an originally developed promotion kit to the pharmacists; this kit contained a participant brochure, a poster, and a shopping bag with the program logo (Fig. 1). We also prepared standardized data collection sheets for conducting a systematic medication review and for maintaining the necessary records (see Appendix 1: Participant background and feedback sheet, and Appendix 2: Medication review sheet, in Supplemental Materials found at doi: 10.1016/j.vhri.2012.03.001).

Elderly individuals were asked to contact their neighborhood pharmacy, possibly by appointment, and bring all their medications that were regularly used at home including prescription and nonprescription drugs (i.e., OTC drugs and dietary supplements). Pharmacists checked and recorded drug information (brand name, pharmaceutical company name, and active ingredients), from where the medication was obtained, duration of use, reason for choosing nonprescription drugs, and usage during the last week (such as storage, frequency, and adherence) for each medication. If contents of the drug were unidentifiable, detailed drug information or a picture of the package was collected for further investigations. All records were maintained in the medication review sheet.

When the pharmacists found any potential safety concerns regarding the medications and their usage, they were categorized into any of the following five potential concerns: 1) potential duplication/interaction, 2) overdose, 3) potentially inappropriate/unnecessary medication use, 4) complicated medication use/risk of nonadherence, or 5) potential risk of adverse drug reaction. The pharmacists then discussed potential safety concerns with participants and provided appropriate feedback. This feedback session was given immediately after the review (recommended) or at the next visit. Additional information such as age, sex, insurance program details, number of medical institutions regularly visited, and self-reported health conditions (16 specific conditions or others) was collected because it could influence the drug-use patterns. The insurance program was classified into the following four types: 1) insurance program for 75 years or older individuals (co-payment rate for medications is generally 10%), 2) local government-run insurance program (called “National Health Insurance” and its co-payment rate is 30%), 3) employee-based insurance program (called “Social Health Insurance” and its co-payment rate is 30%), and 4) others [15].

To analyze the effectiveness of the pharmacy-based services, the time spent by the pharmacist for the medication reviews and participant’s experience receiving them were recorded. Pharmacists checked any of the specified four positive (better understand instructions for drug use, get confirmation of appropriate medications, ease concerns about interactions and adverse drug reaction, and ease concerns about duplication) and three negative responses (tiresome to bring all medications from home, takes too much time, and insufficient advice), if applicable, or commented in detail. Multiple responses from participants were allowed. A positive responder was defined as a participant who expressed at least one positive response, and a negative responder was defined as a participant who expressed at least one negative response. The reasons why participants made particular responses were also recorded. All records were maintained by using the participant background and feedback sheet.

Participants received the one-time medication review at pharmacies free of charge and were asked for their permission to use the data for our analyses. Information entered in the data collection sheets was deidentified at pharmacies (no individual name and address was included) and sent to the University of Tokyo by the Hiroshima Pharmaceutical Association. Researchers at the university conducted data entry and maintained the database. All drug names were converted to individual drug codes called the YJ codes that could be transformed into ingredient data and accordingly classified in compliance with the Japan Standard Commodity Classification system [16]. A combination prescription drug has its own YJ code, whereas we assigned YJ codes to each component of OTC drugs (e.g., an OTC drug that included six active ingredients was represented by six drug codes). This study was approved by the Institutional Review Board at the researcher’s institution and was conducted in compliance with the Japanese Ethical Guidelines for Epidemiological Research updated in November 2007 [17].

Data analyses

We analyzed the data in two steps. First, we descriptively summarized the data reported by the community pharmacists. For each participant, the number of medications, prescription drugs, OTC drugs, and dietary supplements was counted. Drug-use patterns of participants were classified into prescription drugs only, prescription and nonprescription drugs, and nonprescription drugs only. Participant characteristics, potential safety concerns identified by pharmacists, and positive and negative responses reported