



Drug-related problems and pharmacist interventions in a cohort of patients with asthma and chronic obstructive pulmonary disease



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ABSTRACT

Background: Asthma and chronic obstructive pulmonary disease are preventable and treatable chronic airway diseases with high incidence and prevalence. Pharmacists and clinical pharmacy based pharmaceutical care services have positive impact on therapy outcomes.

Objective: The aim of this study is to describe drug related problems in a cohort of patients with asthma and chronic obstructive pulmonary disease and to assess interventions provided by the pharmacist to address these problems in a community pharmacy. **Method:** Study population consisted of patients with asthma and chronic obstructive pulmonary disease older than 18 years who visited the study pharmacy during the pre-determined six-month period. The patients whose disease control states were “not fully controlled” were included in our study for further steps. On the first interview, present and potential drug related problems were addressed, interventions were provided. Follow-up interviews were held one month and two months later than the first interview. **Results:** For the 44 patients with asthma, 59 drug-related problems and 134 causes for these problems were identified. Eighty-four interventions were made to resolve the problems; and 54.2% of the problems were resolved. For the 37 patients with chronic obstructive pulmonary disease, 60 drug-related problems and 128 causes for these problems were identified. Ninety-five interventions were made to resolve the problems; and 63.3% of the problems were resolved.

Conclusion: Pharmacists taking part in therapy and management of asthma and chronic obstructive pulmonary disease can help patients be more educated about their disease and medications; and improve disease control and therapy outcomes.

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1. Introduction

Asthma and chronic obstructive pulmonary disease (COPD) cases are of growing concern worldwide and have become a substantial burden for healthcare systems [1]. Although effective drugs and evidence-based guidelines have been developed, many factors affect the success of therapy, such as the route of administration, skill in using inhaler devices and medication adherence [2]. Patients with asthma and COPD are mainly treated with inhalers [3,4]. For many patients, proper use of inhalers is difficult. Several studies

have demonstrated that 50–80% of patients fail to use their inhaler devices correctly [2,5–10]. Patients are often not aware that they use their inhalers inadequately, and often overestimate their own abilities [11]. Incorrect use of inhalers may lead to uncontrolled disease states, unwanted side effects and higher treatment costs. According to Fink and Rubin, \$5–7 million are wasted annually in the United States of America (USA) because of inhaler misuse [8]. National and international guidelines for asthma and COPD management state that inhalation technique should be assessed regularly, and corrected if inadequate [3,4]. In light of these recommendations, there is a need for studies exploring the effectiveness and frequency of patient education, with appropriate consideration for improving inhalation technique. The pharmacist's role in asthma and COPD treatment includes evaluating therapy results and benefits, referring to a physician when there are worsening signs, giving patient education on disease and medications, evaluating all drugs used by patients, checking drug

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interactions, providing interventions, monitoring inhaler use technique, interviewing patients regarding medication adherence, advising regular exercising, immunization and smoking cessation. Recent studies demonstrated that pharmaceutical care services improve drug adherence and health outcomes by focusing on inhalation technique and patient education [11–24]. This may also lead to enhanced disease awareness, changes in patients' beliefs and attitudes towards treatment and improved self-efficacy and control [25].

The aim of this study was to describe drug-related problems in a cohort of Turkish patients with asthma and COPD who were not fully controlled and assess the interventions provided by pharmacists to address these problems.

2. Material and methods

2.1. Ethical approval

Ethical approval was obtained from the Ethics Committee of Marmara University, Institute of Health Sciences, prior to commencement of this study.

2.2. Study population

All adult patients with asthma and COPD who visited the study pharmacy (Hastaneler Pharmacy in Sivas, Turkey) for their prescribed medicines during the pre-determined 6-month period (5th September 2011 – 5th March 2012) were informed of the study. The study population consisted of the patients who accepted to be involved in the study and signed the informed consent form. The exclusion criteria were being unable to communicate, being illiterate, having cognitive impairment and serious psychiatric conditions. Also, participants who could not be contacted at 1 and 2 months following the first intervention visit were excluded from the study.

2.3. Tools

Disease states were assessed by the Asthma Control Test (ACT) [26] or the Clinical COPD Questionnaire (CCQ) [27]. Patients with asthma with an ACT score <20 and patients with COPD with a CCQ score ≥ 3 were considered to be “not fully controlled” and were included in the further stages of the study.

Medications used by the patients were accessed through the Social Security Institution Medula® Pharmacy Provision system and/or from the prescription records of the patients. The medications already being used by the patients, as well as the duration between the refills, were investigated.

The Morisky Medication Adherence Scale (MMAS) [28] was used to assess the medication adherence of the patients at the initial visit. The four-item MMAS consisted of the following questions: “Do you ever forget to take your medicine?; Are you careless at times about taking your medicine?; When you feel better do you sometimes stop taking your medicine?; Sometimes if you feel worse when you take the medicine, do you stop taking it?”. Each question was scored as 0 for ‘yes’ and 1 for ‘no’. The total score ranged from 0 (low adherence) to 4 (high adherence). A total score of 4 indicated ‘high adherence with medication regimen’.

Drug-related problems (DRPs) were identified at the initial visit using the Turkish version of the PCNE Classification scheme for Drug-Related Problems v6.2. (http://www.pcne.org/upload/files/11_PCNE_classification_V6-2.pdf). This instrument has four areas: problems; causes; interventions; and outcome of intervention. With its hierarchical design each area has its domains: problems (4 domains: treatment effectiveness; adverse reactions; treatment

costs; others); causes (8 domains: drug selection; drug form; dose selection; treatment duration; drug use/administration process; logistics; patient; other); interventions (5 domains: no intervention; at prescriber level; at patient (or carer) level; at drug level; other); and outcome of intervention (4 domains: outcome intervention unknown; problem totally solved; problem partially solved; problem not solved). For each problem identified, 1–3 causes can be applied, 1–3 interventions proposed and one outcome is chosen during follow-up.

The following data were collected on the DRP-Registration Form: demographic features (age, gender); number of drugs taken; duration of the first visit; whether the problem is potential or manifested; who identified the problem (patient, physician, pharmacist); the type and cause(s) of the problem; interventions provided to resolve the problem; and the outcomes of the interventions.

Participants were requested to fill in the patient satisfaction questionnaires to evaluate the service given by the pharmacist at the end of the second month. This self-administered questionnaire was developed by the authors for this study and was not piloted. It consisted of seven questions on items listed in Table 7. The response options for the Questions 1–6 were “Yes; No; or Uncertain”. The seventh question had response options as “Physician; Pharmacist; or Nurse”; this question might have more than one answer.

Other tools employed included smoking cessation leaflets for patients with asthma and COPD, and written instructions for the use of inhaler devices and inhaler demonstration aids.

2.4. Interventions

The reasons for non-adherence in participants with low medication adherence scores were further investigated. They were asked detailed questions regarding their opinions and attitudes toward the medications, and when and how they used the inhaler devices. They were requested to demonstrate the application of the inhaler device and the incorrect and/or missing steps were recorded. The possibility or presence of drug–drug interactions and smoking status were reviewed and recorded.

Interventions provided included those aimed at improvement of adherence and inhaler use, ameliorating adverse effects, counseling on medications and disease conditions as well as smoking cessation. Written and oral information was supplied to the patients and the interventions were recorded.

The pharmacist contacted the patients face-to-face at the pharmacy at 1 and 2 months following the first intervention visit to assess the outcome of the intervention. The initial visit, and the subsequent visits took place at a private counseling area in the pharmacy. The intervention was considered successful if the DRP was totally solved. When there were several factors affecting the outcome, and only some of them could be addressed, the problem was considered partially solved. The problem was considered not solved if the problem still existed.

2.5. Statistics

SPSS was used for all statistical analyses (v.11.5 SPSS Inc., Chicago, IL, USA). Continuous variables were expressed as mean $\pm$ standard deviation (SD), while the nominal and ordinal variables were expressed as median (25–75 percentile), numbers (n) and percentages (%), when appropriate.

3. Results

Seventy-two patients with asthma were interviewed at the beginning of the study. Sixty (83.3%) patients were not fully

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