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Research paper

Elderly polypharmacy patients' needs and concerns regarding medication assessed using the structured patient-pharmacist consultation model

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ABSTRACT

Objective: To evaluate elderly polypharmacy patients' needs and concerns regarding medication through the Structured Patient-Pharmacist Consultation (SPPC).

Methods: Older patients on chronic treatment with ≥ 5 medications were asked to fill in the SPPC form at home. A consultation with the community pharmacist, structured according to patient's answers, followed within 2–4 weeks. Logistic regression associated patients' individual treatment with care issues and consultation outcomes.

Results: Out of 440 patients, 39.5% experienced problems, and 46.1% had concerns about medication use. 122 patients reported reasons for discontinuing treatment. The main outcome of the consultation was a better understanding of medication use (75.5%). Side effects and/or non-adherence were identified in 50% of patients, and 26.6% were referred to the doctor. Atrial fibrillation, COPD, anticoagulants, benzodiazepines, and beta agonists/corticosteroids were associated with problems during medication use. Patients with diabetes improved their understanding of medication use significantly.

Conclusion: Patients on benzodiazepines, anticoagulants, and beta agonists/corticosteroids, with atrial fibrillation and/or COPD, may have a higher potential for non-adherence. Counseling patients based on the SPPC model may be particularly useful for patients with diabetes.

Practice Implications: The SPPC model is a useful tool for counseling based on patient needs.

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1. Introduction

Over the past decades, studies have confirmed the effectiveness of pharmaceutical care services in improving medication use [1]. Lack of adherence is a significant problem in medication use, especially in elderly patients on chronic treatment in primary care [2,3]. Non-adherence does not only severely compromise therapeutic outcomes and patients' safety, but it also results in additional healthcare costs [4–6]. Unintentional non-adherence is related to patients' skills or their ability to take their medication, whereas intentional non-adherence is associated with motivation and patients' beliefs and concerns towards medication use [7]. In order to address the problem of non-adherence, practitioners need

to gain a deeper insight into patients' individual perception and attitude towards medication therapy [8]. Hence, a number of instruments for improvement of patients' involvement in the consultation through written or verbal prompts and guidance have been developed, evaluated and tested. Tools which encourage patients to consider and write agenda issues prior to the appointment with healthcare practitioner can lead to longer consultations, increased number of questions asked and problems discussed [9–14]. Geurts et al. developed the self-completion concordance form (SCCF) for patients with a prescription for new chronic treatment, consisting of eleven open-ended questions. Patients' drug-related expectations, concerns, information needs, possible reasons for discontinuation as well as practically experienced problems during the first two weeks of the therapy, prior to a consultation in the pharmacy were addressed [15]. The questionnaire was slightly modified and used in a research program coordinated by the European Directorate for the Quality of Medicines & HealthCare (EDQM, Council of Europe) for the assessment of patients' involvement in pharmaceutical care. The

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aim of the present research was to assess the needs and concerns of elderly polypharmacy patients regarding medication through the Structured Patient-Pharmacist Consultation (SPPC) model in Serbia.

2. Methods

2.1. Study design and patients

Between March and June 2014, a prospective study was conducted, in Serbia. After obtaining a local Ethical Committee permission, the recruitment process was launched. The research was carried out in accordance with The Code of Ethics of the World Medical Association (Declaration of Helsinki). The study was announced on the website and in the official journal of the Pharmaceutical Chamber of Serbia. Pharmacists who applied for participation were asked to fill in, sign and send an agreement form to the national coordinator. After that, they were provided with all study materials. Instructions suggesting procedures for recruiting patients and delivering consultations were also at pharmacists' disposal. All material was originally developed in English and later on translated into the local language. Translations were then evaluated by a small group (8–10) of native speakers to ensure that the resulting translations are correct, clear and understandable. Back-translation into English was then performed and the resulting forms sent to the project leader for final approval.

The procedure required the recruitment of 10 consecutive patients meeting the following criteria: age ≥ 65 years and five or more medications for conditions that have been present at least six months. Medications of interest were: cardiovascular (ATC: C01–C10), alimentary tract and metabolism (ATC: A1–A16), musculo-skeletal system (ATC: M01–M09) and respiratory system (ATC: R01–R07). Patients with at least one medication of interest were included in the study. Exclusion criteria were: no possibility for personal contact with the patient (e.g. patients who cannot leave their home), physically frail elderly, and patients receiving palliative care, patients with cognitive impairment and illiterate patients. Patients with cognitive impairment had a diagnosis of diseases such as Alzheimer's disease and dementia, whereas frailty was assessed by the pharmacist.

The pharmacist briefly informed patients about the project and invited them to participate. A self-completion concordance form called "My CheckList" was handed out to participants and a consultation appointment was scheduled, usually for the date of next visit or within 2–4 weeks. "My CheckList" consisted of seven

questions covering five subjects: knowledge, expectations, problems, concerns and reasons to stop treatment (Table 1). If patients' needs in pharmaceutical care process remained unmet, the patient could ask additional questions. The pharmacist structured the consultation according to patient's answers and documented the care issues in the Consultation Form for Pharmacists. Moreover, the patients were asked about the usefulness of the consultation and whether it was helpful for better understanding of medicine use. Pharmacists documented the outcome of the consultation by filling in one or more of following issues: Patient agreed that he/she understood better the use of his/her medication; possible side effects were identified during the consultation; patient's non-adherence to therapy was identified; patient was referred to the doctor due to side effects of prescribed medication; patient was referred to the doctor due to patient's non-adherence to therapy; no major outcome to be reported due to the fact that the "My CheckList" form was not completed meaningfully (i.e. the patient's answers were not appropriate for this type of consultation); other.

If participating community pharmacists had uncertainties of any kind, they referred to a senior academic pharmacist and six teacher-practitioner pharmacists at the Faculty of Pharmacy, University of Belgrade. During the study period, two meetings with community pharmacists were organized. Additionally, regular correspondence between teaching pharmacists and community pharmacists was maintained. The online platform Moodle was used as a forum for discussions, support, and sharing of experience.

2.2. Statistical analysis

Descriptive statistics was performed to analyze the overall use of the SPPC model within the settings of the community pharmacies. Due to the heterogeneity of the data, the development of a coding system was necessary. Patients' answers were summarized and replaced by keywords, which were further grouped into categories. Statistical analysis was performed using binary logistic regression. Drug or disease/condition; gender; age; the number of prescribed drugs; and the number of indications; were entered in the logistic regression analysis and a model was built using the backward conditional method which excluded variables at a selection threshold of 0.1. The results of the analysis and predictive factors are presented with odds ratios (OR) and their 95% confident intervals (CI). A probability value of <0.05 was considered to be statistically significant.

Table 1
My "CheckList".

Questions That You, The Patient, May Have Concerning Medication Use
1. What medication were you prescribed? Please write down the name of the medications.
2. What would you like to know about medications?
3. What are your expectations of the effects of medications?
4. Have you experienced problems using medications during the first weeks of treatment (i.e. practical problems and/or unwanted effects)?
<ul style="list-style-type: none"> • Yes • No • I do not know
4a. If yes, please list practical problems that you experienced (e.g. problems in taking the medication at the time indicated by the prescriber). If you did not experience any practical problems, please write "None."
4b. If yes, please list unwanted effects that you experienced. If you did not experience any unwanted effects, please write "None."
5. Do you have concerns about taking medications for long term (e.g. afraid of experiencing side effects; afraid that the medication will affect my normal daily routine; etc.)? If yes, please write your concerns down.
6. What would be a reason for you to stop using medications?
7. Please note here any questions or issues that you think will be important to discuss with your pharmacist as you continue to receive the treatment

Italic values are a subcategory to the category above. I.e. within the category Problems, practical problems are the subcategory of problems and Regimen issues and Administration problems are the subcategory of practical problems. Gastrointestinal system, Nervous system and Cardiovascular system are subcategories of Side effects.

3. Results

73 pharmacists applied for participation in the study, out of whom 44 (60.3%) completed recruitment of 10 patients. The response rate of patients was 93%. The main reasons for unwillingness to participate in the study were lack of time and lack of interest in the topic. The average age of the recruited 440 patients was 72.0 ± 6.3 years, and 54.1% were female. The results of the “My CheckList” questionnaire are presented in Table 2.

3.1. Knowledge

More than 50% of the patients raised questions for discussion. The most common questions were about side effects, followed by regimen issues, which included: should drugs be taken on a daily

basis or just as needed, what are the appropriate intake times and dosages (54 patients). 12 patients were afraid that their regimen included too many drugs. Twenty-six patients asked whether the combination of their medications was appropriate for their condition or potentially harmful. Patients wanted to know about the duration of therapy (23 patients, including three patients who asked if medication discontinuation is appropriate since they have recently achieved control of their condition). Another 5.2% of the participants needed an explanation of the indications of their drugs or did not understand why a medicine was prescribed given the fact that they eat healthily or have only slightly elevated laboratory results (5 patients).

3.2. Expectations

The majority of patients stated that their expectations from therapy have been absolutely (53.4%) or partially (23.4%) met. 64.5% of patients expected control of the condition and quality of life improvement.

3.3. Problems

Almost 40% of the patients had experienced problems in their chronic therapy. 117 patients reported having practical problems with their drug intake related mainly to regimen issues and administration difficulties. Patients did not remember the instructions how to take the medicines (because of lack of written information), were not able to split tablets and/or forget to take the medicines despite adequate knowledge about medication use (70 patients). Adverse drug reactions were also identified as a problem by 30.7% of patients. Most prevalent categories were gastrointestinal side effects (nausea, stomach pain, and constipation), nervous system side effects (drowsiness, dizziness, insomnia, depression, anxiety) and cardiovascular side effects (tremor, bradycardia, and cough).

3.4. Concerns

Almost half of the population was concerned about the therapy. The most prevalent categories were the fear of side effects, followed by polypharmacy issues such as complexity of their regimen and the fear of harm due to a number of drugs. Addiction concerns were reported by 6.8%. Moreover, lifelong duration of treatment was of concern for 6.1% patients with chronic illnesses, and 4.5% reported ineffectiveness of drugs as a reason for concern.

3.5. Reasons to stop therapy

27.7% of patients admitted that they had thought of discontinuing their treatment. The most common reason was the occurrence of adverse reactions (7.5%) followed by treatment cost (6.8%). Achieved control of the condition, disturbed daily routine, administration difficulties, allergies and alternative medicine were also reported as reasons for potential discontinuing actual treatment.

3.6. Additional comments

More than a half of patients wanted to discuss additional issues. The questions were very heterogeneous, and the most prevalent categories were regimen issues (how and when to take the medicines), again the occurrence of side effects, need for additional therapy, how can the patient take better care of her/himself, which lifestyle modifications would be recommended and how long should the medicines be administered.

Table 2
Most common answers within the “My CheckList” categories.

Category	Nr of patients	%
Knowledge	260	59.1
Side effects	67	15.2
Regimen	62	14.1
Drug combination	27	6.1
Mechanism of action and general information	26	5.9
Duration of therapy	23	5.2
Indications	23	5.2
Expectations	400	90.9
Control of the condition	159	36.1
Quality of life improvement	125	28.4
Effectiveness	69	15.7
Maintain current condition	31	7.0
Curation	20	4.5
Problems	174	39.5
Practical problems	117	26.6
Regimen issues	72	16.4
Administration problems	25	5.7
Side effects	135	30.7
Gastrointestinal system	51	11.6
Nervous system	30	6.8
Cardiovascular system	20	4.5
Concerns	203	46.1
Side effects	87	19.8
Poly-pharmacy issues	32	7.3
Addiction	30	6.8
Duration of therapy	27	6.1
Ineffectiveness	20	4.5
Reasons to stop treatment	122	27.7
Adverse reactions	33	7.5
Financial reasons	30	6.8
Ineffectiveness	17	3.9
Additional questions	247	56.1
Regimen issues	50	11.4
Side effects	45	10.2
Additional therapy	37	8.4
Self-care and lifestyle modifications	23	5.2
Duration of therapy	21	4.8
Outcomes of the consultation	426	96.8
Better use of medication	332	75.5
Identification of possible side effects	128	29.1
Identification of patient's non-adherence to therapy	92	20.9
Patient referred to the doctor (side effects)	73	16.6
Patient referred to the doctor (non-adherence)	44	10.0
No major outcome	13	3.0

Italic values are a subcategory to the category above. I.e. within the category Problems, practical problems are the subcategory of problems and Regimen issues and Administration problems are the subcategory of practical problems. Gastrointestinal system, Nervous system and Cardiovascular system are subcategories of Side effects.

3.7. Outcomes of the consultation

The majority of patients agreed (when asked by the pharmacist) that the consultation received following the completion of the “My CheckList” form was useful and that they understood better the use of their medicines (75.5%). Moreover, side effects and non-adherence were identified in 50% of the patients, and 26.6% were referred to a doctor for these reasons. 6.2% of patients had no major outcome, or the form was not filled in (Table 2).

3.8. Statistical analysis

In 388 patients (88.2%), complete medical records with indication and prescribed drugs were available and presented elsewhere [16]. Patients' individual treatment was associated with the answers in “My CheckList” and consultation outcomes, using binary logistic regression and the results are presented in Table 3.

Atrial fibrillation was associated with higher proportion of patients' expectations being met, and patients reporting the presence of practical problems. Anticoagulants, benzodiazepines and chronic obstructive pulmonary disease (COPD) increased the risk of treatment discontinuation, and benzodiazepines increased the risk of adverse reactions. Patients with dyslipidemia or on long-acting nitrates were less likely to be concerned about their medications. However, patients on long-acting nitrates, as well as patients with previous myocardial infarction (post-MI), also reported a lack of better understanding the use of medicines following the consultation. Diabetes was associated with better understanding of the use of medications and a lower rate of patients being referred to the doctor because of non-adherence. The use of benzodiazepines and beta agonists/corticosteroids increased the risk of patients being referred to the doctor.

Table 3
Indications/medications predictive of “My CheckList” categories.

Care issue/indication/medication	Odds ratio	95%CI	p-value
Expectations met			
Atrial fibrillation	4.09	1.53–10.96	0.003
Practical problems			
Atrial fibrillation	2.92	1.24–6.87	0.011
Adverse reactions			
Benzodiazepines	1.82	1.15–2.87	0.010
Concerns			
Long-acting nitrates	0.56	0.34–0.90	0.017
Dyslipidemia	0.62	0.39–0.98	0.039
Reasons to stop therapy			
Anticoagulants	2.16	1.04–4.46	0.035
Benzodiazepines	2.09	1.30–3.36	0.002
Chronic obstructive pulmonary disease	2.11	1.07–4.19	0.029
Consultation outcomes			
Better use of medication			
Diabetes	1.61	1.01–2.59	0.046
Long-acting nitrates	0.59	0.36–0.97	0.036
Post myocardial infarction	0.49	0.26–0.92	0.025
Identification of possible side effects			
Sartans	0.34	0.82–0.95	0.013
Patient referred to the doctor (side effects)			
Benzodiazepines	1.76	1.03–3.03	0.037
Patient referred to the doctor (non-adherence)			
Beta agonists + corticosteroids	2.66	1.01–7.03	0.041
Diabetes	0.34	0.16–0.72	0.004

CI-confidence interval.

4. Discussion and conclusion

4.1. Discussion

The results of the SPPC model seem to suggest meaningful patient involvement in the pharmaceutical care services as provided by community pharmacists. The heterogeneity of the data illustrates the variety of patient information needs that remain unaddressed during long-term medication therapy. All these arguments, along with the extremely high percentage of consultation outcomes, seem to suggest a successful intervention. Moreover, we were able to associate patient's medications and/or indications with particular pharmaceutical care issues as well as consultation outcomes.

The SPPC model contained five categories of possible care issues related to medication use: knowledge, expectations, problems, concerns and reasons to discontinue treatment. Moreover, patients were able to ask additional questions. Compared to patients newly started on chronic treatment, our patients showed more interest in additional questions and less interest in all other categories [15,17]. Nevertheless, we identified adverse reactions as a topic related to need for more information (knowledge and additional questions), concerns and reasons to stop treatment in overall 57.7% of patients. The outcome of the consultation resulted in the identification and/or referral to the doctor because of possible side effects in 33.6% of patients. This is in accordance with other studies which reported unmet needs of patients regarding medication information [18,19]. Moreover, patients are usually provided with verbal information about medication use by their prescribers and pharmacists in our practice. Written information in any form is rare and this could have contributed to the lack of medication information. If worries about long-term effects of the medication, addiction, and cost of medication are added, 73.6% of our population revealed concerns about their treatment. Horne et al. showed that increase in patients' concerns about medication use decreased the odds of adherence [5]. In our study, 26.6% of patients reported practical problems, which have been associated with unintentional non-adherence and should be addressed in order to improve adherence [5,7]. A total of 27.7% of patients were identified as non-adherent, which is lower compared to the estimated non-adherence of 50% in elderly polypharmacy patients [20].

We identified predictive medications/indications for particular categories of care issues. Atrial fibrillation was associated with the increased probability of expectations being met and occurrence of practical problems. Moreover, anticoagulants were related to reasons to stop treatment. Possible explanation for such results is that in Serbia warfarin is commonly used in atrial fibrillation but is available only in the dose of 5 mg. Therefore, many patients require splitting of the tablet to achieve adequate doses, which explains the association with practical problems and possible reasons to stop treatment. Other results imply adverse reactions, commonly occurring with warfarin, complex dosing regimens, and frequent INR monitoring, as a reason for discontinuation of therapy [21–24].

The use of benzodiazepines was associated with adverse reactions and potential reasons to stop treatment as well as the outcome of patients being referred to the doctor because of side effects. Patients' attitudes towards benzodiazepines seem to be conflicting. While some authors reported patients denying or minimizing side effects, other authors reported that patients on benzodiazepines were affected by health concerns and the feeling of being addicted which influenced the decision of stopping the treatment [25–27].

Patients with COPD were also more likely to have reasons for treatment discontinuation, and the presence of beta agonists and corticosteroids was associated with referral to the doctor because of non-adherence. Among COPD patients, poor adherence is

common and related to perceived ineffectiveness of medication, the presence of co-morbid illness, the perception of the disease, type of treatment or medication, the quality of patient-provider communication, the social environment and depressed mood [28,29].

Long-acting nitrates and dyslipidemia were associated with a lower probability of patients being concerned about their treatment. Whereas patients were reported to persist to nitrates [30], the result was surprising given the recognized poor adherence of patients with dyslipidemia [31,32].

We identified patients with diabetes as more likely to have a better understanding of the medication use following the SPCC model utilized by the pharmacist and less liable to be referred to the doctor because of non-adherence. Adherence to diabetes treatment has been studied extensively. Higher adherence was associated with improved glycemic control, use of phone interventions, integrative health coaching, case managers, pharmacists, education, and point-of-care testing improve adherence [33,34]. In contrast, diabetic patients with high concerns about adverse consequences of anti-diabetic medications were more likely to be non-adherent [35,36].

Long-acting nitrates and post-MI were associated with less probability of the consultation outcome being a better understanding of the use of medicines. Post-MI patients have been associated with poor longitudinal adherence [37,38]. Moreover, Gujral et al. showed that pharmacists did not improve medication adherence by discussing patients' beliefs about medicines for their MI [39]. Regarding long-acting nitrates, it has been demonstrated that patients with twice daily regimens, as was the case in our group, have lower adherence rates compared to once daily regimens [40]. To avoid medication tolerance to long-term therapy, patients were counseled to use long-acting nitrates in the morning and the noon. However, this may have been confusing for the elderly patients in our group and resulted in fewer odds for the patient to understand the medication use.

Patients on sartans had less probability of adverse effects being identified. This was not surprising, considering the fact that sartans were usually prescribed following treatment with ACE inhibitors, because of less adverse effects, particularly cough [41].

The number of medications or indications was not predictive of any My Checklist category or outcome. This observation was somewhat surprising since the number of medications/indications have been associated with increased number of drug-related problems. It could be expected that patients with more medications would have more challenges and concerns about their treatment [42–44]. Nevertheless, adverse effects were a major issue in our study and other authors reported that a number of medications were not predictive of self-reporting of adverse events in elderly patients [45].

The study shows a practical approach of involving patients in expressing their needs, expectations, and concerns regarding their medication use to their pharmacists in a structured consultation. The analyzed study materials were filled adequately, which implies that the developed instruments are acceptable and understandable for both pharmacists and patients. Nevertheless, certain limitations should be taken into account. All participants were recruited solely on a voluntary basis. Therefore, it is possible that patients included in the study had a higher interest in healthcare services, thus creating a selection bias. For this reason, it is hard to evaluate the generalizability of the gathered data. Another limitation is the fact that patients' opinions about the usefulness of the MyCheckList form could have been biased since these were collected by the pharmacist during the consultation. Nevertheless, the usefulness of a similar approach at the start of chronic treatment was evaluated as very positive using the self-completion forms in a previous study [15,17].

4.2. Conclusion

The SPCC model used in the study was found to be a useful tool to start a patient consultation based on patient needs. Subgroups of patients with higher risk of potential non-adherence were identified such as patients on benzodiazepines, anticoagulants and beta agonists/corticosteroids, patients with atrial fibrillation and/or COPD. Patients with diabetes showed a better understanding of medication use following the consultation, indicating the possible usefulness of the model for this patient population. In contrast, patients on long-acting nitrates or patients with post-MI seemed to be less satisfied with their understanding of medication use and the reasons for that should be further investigated.

4.3. Practice implications

Patients concerns about side effects and practical problems during the administration of medicines may lead to non-adherence. Counseling elderly polypharmacy patients based on their needs may improve the appropriate use of medications. This may be particularly useful in some patient populations such as patients with diabetes.

Conflict of interest

The authors declared that there is no conflict of interest.

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