ASSESSMENT OF SERVICE QUALITY AT COMMUNITY PHARMACIES IN THE CITY OF BELGRADE, REPUBLIC OF SERBIA

Andjelka Prokic[1], Mirjana Davidovic[2], Nenad Gunjic[3]

[1]Faculty of Medical Sciences, University of Kragujevac, Kragujevac
[2]Faculty of Pharmacy, University of Belgrade, Belgrade
[3]University of Kragujevac, Kragujevac

PROCENA KVALITETA USLUGE U APOTEKAMA U GRADU BEOGRADU, REPUBLIKA SRBIJA

Anđelka Prokić[1], Mirjana Davidović[2], Nenad Gunjić[3]

[1]Fakultet medicinskih nauka, Univerzitet u Kragujevcu, Kragujevac
[2]Farmaceutski fakultet, Univerzitet u Beogradu, Beograd
[3]Univerzitet u Kragujevcu, Kragujevac

ABSTRACT

One of the principles of rational drug use is informing patients about their prescribed drug and its effects. A pharmacist has to contribute to safe and appropriate drug use and give patients adequate drug information. Service quality in pharmacies is examined by measuring drug use indicators provided by the World Health Organisation. Indicators relevant for pharmacies include patient care indicators and health facility indicators.

The goal of this paper is to measure indicators of drug use in both private and state-owned pharmacies.

Drug use indicators were measured prospectively in private and state-owned-owned pharmacies in Belgrade, Serbia. The study is designed as a cross-sectional study. The research was conducted withon 100 patients at each of 14 pharmacies, 7 of which were state-owned and 7 of which were private. Pharmacies were selected randomly.

Drug use indicators were not significantly different between private and state-owned pharmacies, except for their essential drugs lists. To improve pharmaceutical health care and achieve rational pharmacotherapy, all pharmacists should dedicate more time to patients.

Key words: *community pharmacies, drug use indicators, WHO/INRUD, essential drugs list*

SAŽETAK

Jedan od principa racionalne upotrebe lekova je informisanje pacijenta o leku i njegovim efektima. Farmaceut je dužan da obezbedi sigurno i primereno korišćenje lekova, pružajući pacijentu adekvatne informacije o leku. Način da se ispita kvalitet usluge u apotekama je merenje pokazatelja upotrebe lekova koje je dala Svetska zdravstvena organizacija. Pokazatelji, relevantni za apoteke su: pokazatelji zaštite pacijenta i pokazatelji zdravstvenih ustanova.

Cilj ovog rada je da izmeri pokazatelje upotrebe lekova u privatnim i državnim apotekama.

Pokazatelji korišćenja lekova mereni su prospektivno u privatnim i državnim apotekama u Beogradu. Studija je dizajnirana kao studija preseka. Istraživanje je sprovedeno u 14 apoteka, 7 državnih, 7 privatnih i u svakoj je ispitano 100 pacijenata. Apoteke su izabrane po principu slučanosti.

Pokazatelji korišćenja lekova nisu se značajno razlikovali u privatnim i državnim apotekama, izuzev liste esencijalnih lekova. U cilju poboljšanja farmaceutske zdravstvene zaštite i postizanja racionalne farmakoterapije svi farmaceuti bi trebali više vremena da posvete pacijentu.

Ključne reči: *apoteke, pokazatelji korišćenja lekova, INRUD*

ABBREVIATIONS

SPSS - Service Provisioning System Software   **WHO** - World Health Organisation

217

INTRODUCTION

Rational drug use refers to patients receiving drugs that correspond to their clinical needs in appropriate doses, for adequate durations and at the lowest prices for them and the society they live in (1). One of the principles of rational drug use is informing patients about each drug and its effects (2).

A pharmacist has to provide safe and appropriate drug use by giving patients adequate information about their prescribed drugs (3, 4). The quality of pharmaceutical services depends on pharmacists' training, knowledge, communication skills, and time spent consulting with patients (4).

The optimal drug dispensing time is 60 seconds (5). In the eastern part of Saudi Arabia, the average drug dispensing time is 100 (58-180) seconds (6) and in Egypt (Alexandria) it is less than 60 (47.4) seconds (7). In Kragujevac, the average drug dispensing time was between 20.4 and 48.2 seconds, and times were longer in private pharmacies (8). In contrast, in Jagodina, the drug dispensing times were similar in state-owned (54.4 seconds) and private (53.3 seconds) pharmacies (9).

Since January 2013, private pharmacies in Serbia have been able to accept prescriptions as well, which can influence the quality of pharmacy services.

The goal of this paper is to measure the values of drug use indicators in private and state-owned pharmacies using the methodology recommended by the WHO. Service quality data from pharmacies can be useful for the planning and implementation o f corrective measures for improving health outcomes and patient welfare.

MATERIALS AND METHODS

The best way to examine service quality in pharmacies is by measuring the values of drug use indicators provided by the World Health Organisation/International Network for the Rational Use of Drugs (INRUD). The indicators relevant for pharmacies are patient care indicators (of which there are four) and health facility indicators (of which there are two)[5].

The study was designed as a cross-sectional study. Drug use indicators were measured prospectively in private and state-owned community pharmacies in Belgrade, Serbia, from December 28, 2013 to February 19, 2014. Belgrade has 89 state-owned and 95 private pharmacies. This study included 7 (7.86%) state-owned and 7 (7.36%) private pharmacies. Pharmacies were selected consecutively. Because the present study dealt with the current practice of drug supplies in community and private pharmacies, the WHO recommended that at least 30 patients from each of 20 health institutions be enrolled. If a smaller number of health institutions are considered, more patients (at least 600) should be included in the study. This study was conducted in a total of 14 pharmacies, and each pharmacy enrolled 100 patients[5].

All private pharmacies included in the study have a contract with the NHIF (National Health Insurance Fund) and dispense prescription drugs. Private pharmacies that do not dispense prescription drugs were not considered in the study. The study was conducted by three researchers; in each pharmacy, one researcher measured the drug dispensing time, another researcher controlled the number of drugs actually dispensed and the dosage regimen labelling on the prescription forms. The third researcher questioned the patients in front of the pharmacy about their drugs. The patients were asked whether they could report the dosage regimen. Once the data were collected for 100 patients at each pharmacy, the pharmacists were questioned about the availability of key and A-list drugs. Because Serbia has no essential drugs list, the A-list was used as a substitution. This is a list of drugs that are prescribed and supplied on prescription forms.

Observed variables

Patient care indicators: a) average drug dispensing time describes how much time a pharmacist devotes, on average, to a patient while dispensing drugs (5). This is calculated as: the average drug dispensing time = total time spent dispensing drugs to a series of patients divided by the number of patient encounters. *b)* Percentage of drugs actually dispensed describes the ability of the health facility to provide drugs that patients need (5). This parameter is calculated as the: percentage of drugs actually dispensed = (the number of drugs actually dispensed / total number of drugs prescribed) × 100. *c)* To ensure that patients have the correct understanding of the dosage regimen, labelling must be legible and understandable. According to WHO recommendations, labels should contain the drug name, patient name and dosage regimen (5). This parameter is calculated in the following way: percentage of adequately labelled drugs = (percentage of drug adequately labelled / total number of drugs dispensed) × 100. *d)* Measurement th e effectiveness of information given to patients was performed in the following way: percentage of patients familiar with the way their drug is dosed = (number of patients who responded correctly to a question about the dosage regimen (schedule) of each drug correctly / total number of patients interviewed) × 100.

Health facility indicators: *a)* key drugs availability is a parameter for measuring available drugs used for the treatment of the most common diseases in the region under examination. The Pharmacology Department at the Faculty of Medical Sciences in Kragujevac established a list of essential drugs in Serbia based on their clinical significance and the frequency of their use. This list includes the following medicines: epinephrine, hydrocortisone, aspirin, morphine, penicillin, diazepam, aminophylline, furosemide, insulin, diclofenac, captopril, aminoglycosides, digoxin, glyceryl trinitrate and intravenous solutions (NaCl 0.9% or 5% glucose). (5,8) The essential drugs list, which was used in previous studies conducted in Serbia, was also used in this study. This parameter was calculated as the: key drugs availability = (the number of key drugs available in stock / total number of key drugs on the essential drugs list) × 100.

b) According to World Health Organisation regulations, all pharmacies should own a copy of the list of essential drugs. This paper used a positive list of drugs (drugs supplied based on health insurance requirements). Availability of a copy of the list of essential drugs was set as a dichotomous variable: yes or no for each health unit.(5,8)

Statistics

Continuous variables are summed as arithmetic means, medians and standard deviations, and categorical variables as proportions (percentages of categories). Student's t-test for independent samples was used to determine statistical significance in continuous variables values between the compared groups with normal distributions. If the data were not normally distributed, a nonparametric alternative (the Mann-Whitney U test) was used. The Kolmogorov-Smirnov test was used to determine if whether the data were normally distributed. A two-factorial analysis of variance allowed for the assessment of the individual influence of two categorical independent variables on the observed outcome, in this case the influence of each state-owned and private pharmacy on drug dispensing times and the interactions between them. Values of *p*<0.05 were considered statistically significant.

All statistical analyses were performed using SPSS software, version 21.

RESULTS

This study included 1395 patients. Of those, 697 were from state-owned pharmacies and 698 were from private pharmacies. The average drug dispensing time for patients in state-owned pharmacies was 15.58 seconds, whileand the average dispensing time in private pharmacies was 18.5 seconds. On average, state-owned pharmacies dispensed 92.7% of the drugs that patients needed, and private pharmacies dispensed 91.9% of the needed medicines. On average, 58.71% of the patients could correctly repeat their dosage regimen after picking up their medicines in state-owned pharmacies, whereas in private pharmacies, this percentage was 56.2%. The availability of key drugs was 77.14% on average in state-owned pharmacies and 80.95% in private pharmacies (Table 1).

Using a two-factor analysis of the variance of different groups, the influences on drug dispensing times of state-owned pharmacies, private pharmacies and each pharmacy separately were examined. It was determined that there is a statistically significant difference in drug dispensing times when each pharmacy is observed separately (F=52.595; p<0.001). However, the partial eta-square is 0.314, which means that the influence is of moderate strength.

Additional comparisons performed using Tukey's HSD test showed that the mean value of drug dispensing was statistically significantly different for the fourth state-owned pharmacy (M=33.64; SD=36.557; p=0,000; HSD= -18,20) and the seventh state-owned pharmacy (M=3.44; SD=1.166; p<0.001; HSD=12). For private pharmacies, statistical significance was noted in the cases of the fourth (M=43.81; SD=24.972; p<0.001; HSD=-28,37), sixth (M=25.33; SD=14.607; p=0,002; HSD=-9,89) and seventh (M=4.89; SD=4.452; p<.001; HSD =10,57) pharmacies.

Neither private nor state-owned pharmacies did labelled drugs adequately. None of the pharmacies marked the patients' names on the drug packaging. Dosage regimens were written illegibly and indistinctly on the original drug package.

Table 1. Drug use indicators in private and state-owned pharmacies in Belgrade

Pharmacy	Average drug dispensing time in seconds per patient (SD)	Actually dispensed drugs (%)	Patients familiar with drug use (%)	Key drugs availability (%)
State-owned				
1.	15.44 (15.574)	193 (95.5)	81	12 (80)
2.	7.67 (7.171)	162 (92.5)	67	12 (80)
3.	9.06 (9.630)	232 (95.0)	54	11 (73.3)
4.	33.64 (36.557)	200 (96.1)	51	13 (86.6)
5.	23.18 (14.739)	146 (91.8)	57	10 (66.6)
6.	16.58 (10.518)	189 (91.7)	47	12 (80)
7.	3.44 (1.166)	158 (84.9)	54	11 (73.3)
Total	**15.58 (19.565)**	**1280 (92.7)**	**58.71**	**81 (77.14)**
Private				
1.	13.79 (12.117)	162 (94.1)	51	12 (80)
2.	8.43 (10.783)	137 (90.7)	52	10 (66.6)
3.	11.16 (16.951)	154 (97.4)	51	14 (93.3)
4.	43.81 (24.972)	163 (92.0)	68	11 (73.3)
5.	19.47 (16.450)	159 (92.4)	53	12 (80)
6.	25.33 (14.607)	164 (86.3)	63	13 (86.6)
7.	4,89(4.452)	159 (91.3)	56	13 (86.6)
Total	**18.15 (19.701)**	**1098 (91.9)**	**56.2**	**85 (80.95)**
Compared state-owned and private pharmacies	U=231686.500; p=0.122	U=13.500; p=0.159	U=22.00; p=0.748.	t (14)= -0.910; p=0.381

All state-owned pharmacies possessed an essential drugs list, which was not observed at all of the private pharmacies (42.8% of private pharmacies possessed an essential drugs list).

DISCUSSION

This paper showed that there is no statistically significant difference in drug dispensing times between state-owned and private pharmacies in Belgrade, Serbia. These results are in accordance with previous observations in Jagodina (6). In the city of Kragujevac, it was noted that private pharmacies took significantly longer to dispense drugs (8), but, this time is not long enough to explain all of the necessary information about the drugs to patients (5). The average drug dispensing time in pharmacies in this study is 16.87 seconds. The optimal drug dispensing time is 60 seconds (5), so pharmacists in both private and state-owned pharmacies should extend drug dispensing times and provide patients with at least basic information about their drugs. Serbia is a country undergoing a socio-economic transition. Thus, material and other health system resources are limited, the drug supply system is not efficient enough, and there is a lack of an list essential drugs for treating diseases that are generally a burden to the health system and society in general. Good pharmacy practice standards still have not been implemented despite the fact that they were established and adopted by The Pharmaceutical Chamber. The personal incomes of pharmacists employed in state sectors are usually insufficient and there is lack of adequate communication and cooperation between doctors and pharmacists in everyday practice, all of which can influence both pharmacists' motivation and the quality of pharmaceutical services.

Written information about drugs in Australia is given in the form of *Medical Information for the Patient* and printed for the patient or given as flyers (12). The same study showed that patients want to read and discuss this information, especially if they received it from a doctor or pharmacist (12). This paper showed that even basic drug labelling was not in line with the recommendations established by the WHO (5), in that it was illegible and indistinct and in that none of the pharmacists wrote patient names on the packaging, which is consistent with the behaviour of pharmacists observed in previous studies in Serbia (8, 9).

Forty to eighty percent of patients can correctly repeat their dosage regimen, with results varying from pharmacy to pharmacy, but there is no statistically significant difference in this result between private and state-owned pharmacies. In developing countries, the results vary from 18% to 82% (6, 10, 11, 13, 15). All patients who pick up drugs in a pharmacy should know how to use them. Extending drug dispensing times order toto providegive necessary information to the patient about using their drugs, as well as improving the quality of drug labelling, would most likely improve the status of this important issue.

A statistically significant difference in the number of drugs actually dispensed between private and state-owned pharmacies was not observed.

This paper demonstrates that pharmacies in Serbia are currently better supplied with medicines than in the past (8, 9).

The 79% average availability of key drugs from the essential drugs list did not differ significantly between state-owned and private pharmacies. In the previous study conducted in Kragujevac, the availability of drugs from the key list was 77.5%[8] on average.

In Brazil (Brasilia) (15) and Egypt (Alexandria) (7), 83.2% and 78.3% of key list drugs, respectively, were available, respectivelywhich are both lower than the results found in our study. Drugs used for treating the most common health problems are not available in appropriate quantities (the value of this parameter should be 100%[5]).

The essential drugs list was present in all of the state-owned pharmacies, and the pharmacists were familiar with this WHO concept. Only two private pharmacies possessed essential drugs lists, but the pharmacists were familiar with the conceptit. In the future, it will be necessary to provide equal educational conditions for all pharmacists. Serbia has no essential drugs list. Its role is performed by the drugs list created by the NHIF (a so-called 'positive list') , which may be the reason for the differences noted between the private and state-owned pharmacies.

Drug use indicators were not significantly different between private and state-owned pharmacies, except for the essential drugs list. To improve the rational use of medicines and pharmaceutical health care in general, pharmacists should dedicate more time to patients. Continuing education of students and pharmacists and the implementation of standards of good apothecary practice adopted by the Ministry of Health to harmonise pharmacists' work in everyday practice are measures that would improve the current conditions.

REFERENCES:

1. World Health Organisation. How to develop and implement a national drug policy (Guidelines for Developing National Drug Policies). Geneva: WHO; 2001.
2. Akici A, Kalaça S, Uğurlu MU, Toklu HZ, Iskender E, Oktay S. Patient knowledge about drugs prescribed at primary healthcare facilities. Pharmacoepidemiol Drug Saf. 2004; 13(12): 871-6.
3. International Pharmaceutical Federation. Standard for Quality of Pharmacy Services (Good Pharmacy Practice). Hague: FIP; 1997.

4. Toklu HZ, Akici A, Oktay S, Cali S, Sezen SF, Keyer-Uysal M. The pharmacy practice of community pharmacists in Turkey. Marmara Pharm J 2010; 14(1): 53-60.

5. World Health Organisation. How to investigate drug use in health facilities (Selected drug use indicators). Action program on essential drugs. Geneva: WHO; 1995.

6. El Mahalli AA, Akl OA, Al-Dawood SF, et al. WHO/INRUD patient care and facility-specific drug use indicators at primary health care centres in Eastern province, Saudi Arabia. East Mediterr Health J. 2012; 18(11): 1086-90.

7. Akl OA, El Mahalli AA, Elkahky AA, Salem AM. WHO/INRUD drug use indicators at primary healthcare centres in Alexandria, Egypt. J Taibah Univ Med Sci 2013; 9(11): 54-64.

8. Jankovic SM, Maksimovic MR, Vusanovic A et al. Quality of work in state-owned and private pharmacies in city of Kragujevac. CMJ 2001; 42(1): 88-91.

9. Stojanovic BB, Jankovic SM.An analysis of drug use indicators within primary care health facilities in Jagodina. Medicus. 2002; 3(2): 30-6.

10. Otoom S, Batieha A, Hadidi H, Hasan M, Al-Saudi K. Evaluation of drug use in Jordan using WHO patient care and health facility indicators. East Mediterr Health J. 2002; 8(4-5): 544-9.

11. Dahal P, Bhattarai B, Adhikari D, Shrestha R, Baral SR, Shrestha N. Drug use pattern in Primary Health Care facilities of Kaski District, Western Nepal. Sunsari Technical College Journal. 2012; 1(1): 1-8.

12. Hamrosi KK, Raynor DK, Aslani P. Pharmacist, general practitioner and consumer use of written medicine information in Australia: Are they on the same page? Res Social Adm Pharm. 2013; pii:S1551-7411(13): 00186-10doi:1016.

13. Chedi BAZ, Abdu-Aguye I, Kwanashie HO. Analysis of Patient Care and Facility Indicators in Public Health Institutions in Kano State-owned, Nigeria. NJPS 2009; 8(2): 72-8.

14. Hogerzeil HV, Ross-Degnan D, Laing RO, et al. Field tests for rational drug use in twelve developing countries. Lancet. 1993; 342(8884): 1408-10.

15. Naves Jde O, Silver LD. Evaluation of pharmaceutical assistance in public primary care in Brasilia, Brazil. Rev Saude Publica. 2005; 39(2): 223-30.