QUALITY OF PHARMACEUTICAL CARE AT THE STAGE OF PATIENTS’ NEEDS IDENTIFICATION UNDER CONDITIONS OF COMMUNITY PHARMACIES AS A TRANSBORDER PROBLEM

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Abstract: The results of the study of the real pharmaceutical practice in relation to the patient’s needs identification defined that the problem of not always high pharmaceutical care quality at this stage is equally up-to-date for the community pharmacies of Lviv (Ukraine) and Lublin (Poland). It was found that the quantity and amount of questions set by a pharmacist are not related to the conversation duration with a pharmacy visitor, and the communication duration does not have the statistically confirmed dependence on the queue availability, therefore in the context of pharmaceutical care quality, these criteria are of no high importance. Instead, drug-related problems (n = 209) verified by the authors of this article, that have been distributed into the groups according to the criterion of the information amount received by a pharmacist studying the needs of the patient (visitor of a pharmacy), were determined as a quantitative indicator of potential pharmaceutical care quality increase.

Keywords: patients’ needs identification, drug-related problems (DRP), pharmaceutical care

The concept of pharmaceutical care (PC) has started its active development, probably after the key publication of Hepler and Strand in 1990 (1). In our opinion, it continues to evolve further. Nowadays, there exist quite a few interpretations of this term, which frequently differ a lot from one another (2). Due to the activity organized by Pharmaceutical Care Network Europe (PCNE) the consensus interpretation of PC as “the pharmacist’s contribution to the care of individuals in order to optimize medicines use and improve health outcomes” appeared in 2013 (3). In such a way, under contemporary conditions PC is considered not only as a theory but also as the philosophy of practice where the main beneficiary of pharmacist’s actions is a patient (3, 4). Certainly, it is possible to ensure such contribution only under estimation of health condition and patient’s need identification which are ultimately provided by the good pharmacy practice (5). Although, with the availability of the appropriate theoretical base, the success of the defined concept, in our opinion, correlates with its implementation into the practice of health care, which defined the aim, strategy, and design of our research.

The aim of the research was the study of the real pharmaceutical practice in relation to the patient’s needs identification in community pharmacies of Lviv (Ukraine) in comparison with the results of the same research received in community pharmacies of Lublin (Poland) and the establishment of the interconnection between this pharmacist’s activity and PC.

EXPERIMENTAL

Methods and materials
The second stage of already conducted research in 129 community pharmacies of Lublin (Poland) from February till March 2009 (6) was undertaken in 139 randomly selected community pharmacies of Lviv (Ukraine) from November till December 2014 (Fig. 1).
Figure 1. The structure of the conducted research

- **Implementation of the research**
- **phase I**
  - Lublin (Poland)
  - February – March 2009
- **phase II**
  - Lviv (Ukraine)
  - November – December 2014
- **Deadlines**
- **Model of the research**
  - Appeal of the interviewer to the pharmacies according to the model of the "disguised visitor"
  - Appeals to 150 pharmacists from 129 community pharmacies
  - Appeals to 150 pharmacists from 139 community pharmacies
- **Appeal of the interviewer to the pharmacists**
  - Question of the interviewer: "advise something against coughing"
- **Clinical situation according to which the interviewer answered the questions of the pharmacists**
  - Age: 2-years-old child
  - Symptoms: dry cough, poor appetite
  - Duration of symptoms: 3-weeks
  - The used drugs: the Althaea syrup – the cough continues
  - Symptoms have not been previously observed
  - Body temperature is normal
- **Form of protocol (4 blocks):**
  A. General information about the pharmaceutical specialist
     (3 criteria of evaluation: gender, age, education)
  B. Interview: at the stage of assessment of the patient’s health condition and detection of patient's needs
     (documentation of the questions set by a pharmaceutical specialist)
  C. Pharmaceutical specialist’s recommendations
     (2 criteria of evaluation: non-medication, medication)
  D. Additional information
     (3 criteria of evaluation: queue availability, duration of the pharmaceutical care(s), referral to a doctor)
- **The documentation of interviewer's visits to a community pharmacy**
- **phase III**
  - The comparison of the results of the first and second phases and establishment of the interrelation with the pharmaceutical care
The interviewer (whose role was performed by a researcher) referred to the pharmacists of community pharmacy according to the model of the “disguised visitor”. 150 appeals were conducted to 139 community pharmacies of Lviv (Ukraine) and the same number of appeals was conducted to 129 community pharmacies of Lublin (Poland). According to the conditions of the research, a visitor (interviewer) asked: “to advise something against coughing”. The interviewer answered a question of pharmacists according to the modeled clinical situation. According to its conditions, dry cough, which lasted for 3 weeks, disturbs a 2-years-old child. Before that, the child has not been observed to have similar symptoms, the body’s temperature is normal, the appetite is bad. A cough will not disappear despite the use of the Althaea syrup.

The documentation of the interviewer’s visits to a community pharmacy, in particular questions set by a pharmacist, has been done with the help of specially developed for this protocol form, which first has been approbated and applied in community pharmacies of Lublin, and eventually adapted (i.e., translated from Polish into Ukrainian) and used for the research in the community pharmacies of Lviv.

The duration of the pharmaceutical care was measured by the interviewer (researcher) during the visits to the community pharmacies with a help of stopwatch and was written down to the protocol in seconds.

We used the modified by Eichenberger et al. PCNE V 5.01 classification system, the amendment with a technical DRP category, which adapted by us to Ukrainian pharmaceutical practice (7).

Applied methods: system approach, modeling, interviewing (the method of “disguised visitor”), analytical-comparative, clinical-pharmaceutical, standardization and mathematical-statistical. The processing of the received results has been conducted in the environment for statistical computing R 3.1.1. The chi-squared test with the Yates’s correction for continuity has been applied for the research of the statistical significance of the differences by their nominal features, the Student’s t-test in the Welch’s modification has been applied in the case of relative features. The Pearson double product moment correlation coefficient has been calculated in order to detect the strength and significance of relations between two relative magnitudes.

The significant discrepancies among the employees of Lviv and Lublin community pharmacies under the research on age (according to the interviewer’s estimation) and gender distribution have not been revealed (Table 1).

The identification of the education level has been conducted regarding the information on badges, although 63.4% and 57.3% of employees from community pharmacies in Lviv and Lublin have not indicated this data. Among the other employees with badges, a part of individuals with a master’s degree in Lviv, has turned out to be smaller (23.3%) than in pharmacies in Lublin (36.0%), and pharmacists with undergraduate degree in Lviv (13.3%), correspondingly, bigger than in Lublin.

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<th>Table 1. Characteristics of the pharmacies employees engaged into the research</th>
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(6.7%). The discrepancy of the samples of pharmacists under the research by the education level reaches statistical significance by the chi-squared test, $\chi^2 = 5.69$, $p = 0.017$.

RESULTS AND DISCUSSION

The health state estimation and patient’s needs identification belong to the tasks which emerge in front of a community pharmacy employee when the visitor appeals (5). The appropriate fulfillment of these tasks includes finding out: who has got a problem, when malaise appeared, for how long it lasts, what measures have been taken before asking for help and what drugs have been used for the state relief (8). These questions also allow revealing threatening symptoms. According to the modeled clinical case, with which the visitor (interviewer) came to the community pharmacies, the three-weeks lasting cough was a threatening symptom. Thus, according to the appropriate algorithm of actions, the pharmacist had to ask the visitor on how long the cough had lasted, and once he receives the information — immediately refer him to a physician (5, 8). However, the question about a cough was set by pharmacists of community pharmacies in Lviv and Lublin not frequently enough, only in 12.0% and 12.7% of the cases correspondingly ($p = 1$).

The general information about the age of a patient (adult or child) has been asked by a lot many pharmacists. In Lviv this question has been mentioned statistically significantly more often (73.3%), than in Lublin (30.0%), $p$-magnitude $p = 1.42 \times 10^{-13}$. However, the possibility of the appropriate PC provision toward a specific over the counter drug use was available only for pharmacists who have learned the accurate age of a child, because contraindication, one-time dose, frequency of drugs use by children of different ages differ. Therefore, if to consider that setting the accurate age of a child by pharmacy employees is an obligatory condition, then it is possible to discuss patient’s needs detection in Lviv not in 73.3%, but only in 56.0% of the cases. It decreases the difference among the results received in community pharmacies of Lviv and Lublin, but the disparities are still preserved — 56.0% vs. 30.0% ($p = 9.36 \times 10^{-6}$). However, despite the better indications in community pharmacies of Lviv regarding this aspect, in our opinion, the situation according to this criterion should be estimated as unsatisfactory. In more than 1/3 of appeals to Lviv pharmacies and 2/3 appeals to Lublin community pharmacies there existed a potential hazard of the limitations ignorance of drugs use among the children by a pharmacy employee due to disregard of this question.

The question about the measures taken before asking for the help has almost not been raised, only in relation to the drugs used for the health state relief in 18.7% of community pharmacies in Lviv and

Figure 2. The distribution of questions asked by pharmacy employees on complaints about a cough (in both Lviv and Lublin)
2.0% of community pharmacies in Lublin (although the difference is statistically significant, $\rho = 5.31 \times 10^{-6}$).

The availability of patient’s additional symptoms, such as fever, sore throat, difficult breathing, running nose, was paid insufficient attention. Moreover, this question was asked less frequently (6.7%) in community pharmacies of Lviv than in community pharmacies of Lublin (17.3%) (the corresponding magnitude is $\rho = 0.0077$) while this question allows a pharmacist to find out the reason of coughing. The pharmacy employees of the community pharmacy in Lublin asked a visitor in more details about an earlier infection, allergy etc. (14.0%), while in Lviv these questions almost had not been asked (1.3%), the difference reaches the statistical significance ($\chi^2 = 15.3, \rho = 9.39 \times 10^{-5}$).

In community pharmacies of both Lviv (86.0%) and Lublin (87.3%), the most frequently asked question was about the type of coughing (dry or wet). The questions whether similar symptoms have been observed earlier and whether a patient uses some drugs now have not been asked neither in Lviv (0.7% and 0.7%) nor in Lublin (1.3% and 0%). The distribution of questions set by pharmacies employees on a visitor’s (interviewer) request “to advise something against coughing” is shown in Figure 2.

Except for already mentioned, the question about the form of medication chosen by the patient (syrup, drops, tablets, lozenges etc.) in our opinion has appeared to be reasonable and widespread in Lviv community pharmacies (34.7%). The other questions asked by pharmacy employees have not been so frequently asked and have not influenced the general picture of the research: the choice of a medication of synthetic or herbal origin; whether a patient is allergic, in particular to medications; whether there is blood-tinged sputum, which is a threatening symptom; whether the use of the Althaea syrup has helped a child etc.
The usage of non-medication approaches, such as consuming a lot of liquid, foodstuffs rich in vitamin C, putting a warming patch on chest and back areas, has been recommended only in 3 cases (2.0%) in Lviv community pharmacies. Among the employees of Lublin community pharmacies, such recommendations have not been widely spread as well, although, have been provided more often (8.7%) with statistical significance $p = 0.021$.

Regarding the recommendations about the proper use of drugs, they have been provided by 99.3% of pharmacy employees in Lviv, and in Lublin this part accounted for 91.3%, the difference has reached statistical significance ($p = 0.0026$). The list of recommended drugs has been quite wide in community pharmacies of Lviv (Fig. 3), considering that all recommendations were regarding the same clinical case, eventually, as in community pharmacies of Lublin [6]. Medications with incomplete information have been referred to the category “Other”, for example, Herbion syrup without mentioning its basis – Iceland moss, Primula, Hedera helix or Folium Plantaginis lanceolate, since it has been recommended not as the basic medicine, but as an alternative.

Overall, in our opinion, the discrepancies in the results of the quantitative estimation of recommendations provided regarding the drugs use among the community pharmacies of Lviv and Lublin are considered to be less essential, than the results of the qualitative estimation which turned out to be different. Pharmacy employees in Lviv chose drugs of herbal origin based on Hedera most frequently, while homeopathic medications were recommended in Lublin community pharmacies [6]. Thus, upon the availability of the comparative situation in relation to patient’s needs study performed by the pharmacists, there exist differences in the choice of criteria of certain medicine in Lviv and Lublin that require further research.

In our opinion, it should be mentioned that there is a tendency to recommend a number of drugs which can be pharmaceutically equivalent or the representatives of various pharmacotherapeutic groups. We believe that this situation creates certain problems for a pharmacy visitor, for whom it is difficult to make a justified and rational choice of a medication without correspondent professional education. It is reasonable that a pharmacist should estimate a situation, take a decision and offer a choice of 1-2 drugs among analogues to a pharmacy visitor. Nowadays, in the philosophy of PC the management of drug-related problems (DRP) [9, 10] is considered to be a key issue. Correctly provided PC is based on the deep understanding of the DRP nature and the process related to their identification, finding a solution, and most crucially, prevention [9]. That is why, protocols filled out by an interviewer, in particular, recommendations on the use of drugs, have been used by us as an object of the research for the identification of the DRP. Thus, DRP (n = 209) verified by us have been distributed into the groups according to the criterion of the information amount received by the pharmacist during the study of the patient’s (visitor of a pharmacy) needs (Fig. 4).

It turned out that the causes of more than 25% of identified DRP (n = 53; category I) were related to the interviews, which were inappropriately conducted with a community pharmacy visitor. For instance, a pharmacist did not specify the age of a patient and recommended a contraindicated by age medication. In another case, a patient who had already used Althaea syrup was recommended a medication based on the same medicinal herbs,
without ensuring whether the patient used any drugs. In such a way, all these DRP could have been prevented under the condition of the proper patient’s needs study with the help of the interview. Thus, since PC is continuous, systematic and professional care provided with the aim of not an only correction, but also DRP prevention (9, 10), and the proper study of patient’s needs allows preventing DRP, the latest is considered by us to be a stage of PC.

Almost 75% of DRP (n = 156; category II) discovered by us emerged despite the sufficient amount of information of a pharmacy employee about patient’s needs and their health condition. For example, a pharmacist found out the age of a child, although still recommended to use drugs contraindicated in this age, or asked a patient about the previous usage of the medication based on Althaea, however, recommended pharmaceutically equivalent drugs. In our opinion, causes for these DRP belong to another area of research and are not related to patient’s needs identification.

In our opinion, the verified DRP are reasonable to be considered as a quantitative indicator of potential PC quality increase, in particular under the conditions of the community pharmacies at the stage of patient’s needs identification.

Having raised the question of quality we have decided to study the influence of the queue availability on the average duration of the PC provision in a community pharmacy using the Student t-test, which took place in 48.0% of the cases as a result of the research conducted in Lviv. Thus, with the queue availability the average time of conversation with a visitor accounted for 58.7 ± 44.5 s, and under conditions of its absence the conversation duration was even a bit less – 49.3 ± 23.5 s. In such a way, the duration of provided PC does not depend on the queue availability in the community pharmacy, although this difference is not statistically significant (p = 0.12). It turned out that undergraduate degree pharmacists provided consultations only 6.5 ± 8.6 s shorter on average than master’s degree pharmacists in pharmacy, this discrepancy is not statistically significant as well (p = 46). The statistically confirmed differences have been discovered only during the study of the dependence of PC duration on the age of a pharmacist. It has been found out that older employees provide PC a bit longer, than their younger colleagues, moreover, the basic increase of duration is relevant for the employees of the age over 50 (the Pearson correlation coefficient between the age and time of conversation accounts for r = 0.19 with the

![Figure 5. The increase of the referral probability to a physician with the consultation duration of a community pharmacy visitor](image)
The detection of cases which require physician’s consultation and the referral of a community pharmacy visitor to this medical specialist belongs to the duties of a pharmacist (5), although in 93.3% of the cases such recommendations were not provided in Lviv. Sometimes in Lviv community pharmacies a patient was asked whether he had previously visited a physician (8.0%), though receiving the negative response, only 2.0% of pharmacy employees insisted on the visit, in 6.0% of the cases the answer was left without any comments. Probably it is partially related to inappropriately conducted interview with a visitor. The pharmacy employee was not aware of the whole situation, therefore, underestimated the complexity of the modeled case. Although, despite the problem of not always a proper study of patient’s needs for community pharmacies in Lviv and Lublin, in Lublin only 5.0% of pharmacy visitors did not receive the referral to a physician. In such a way, we consider this problem to be specific for Lviv community pharmacies. It is necessary to mention that on average the conversation with a visitor lasted for less than 1 minute (53.8 ± 35.3 s), that is evidently insufficient, in comparison, such conversation in community pharmacies of Lublin lasted 3 minutes (6). The hypothesis about the fact the longer the conversation duration of a pharmacy employee with a visitor is, the higher is the probability of patient’s referral to a physician, has been checked with the help of the construction of the logistic regression model. As a result, it has been discovered that in spite of the low base probability of such occasion, every 50 s of conversation increase the chance of the referral to a physician by 2.1 times, and the hypothesis is confirmed with ρ = 0.019. In particular, 1/2 of all recommendations to refer to a doctor belongs to the period from 50 till 100 s of conversation in Lviv community pharmacies (Fig. 5). Guided by the research findings on the importance of longer time interval of PC provision in a community pharmacy, we consider the further study of this issue to be efficient and up-to-date.

CONCLUSIONS

1. According to the received results, the appropriate interview with a community pharmacy visitor would allow preventing 25% of all DRP identified in community pharmacies of Lviv (n = 53). Since pharmaceutical care is a continuous, systematic and professional care provided with the aim of prevention or correction of DRP we consider the study of the patient’s needs with the help of interview to be a certain stage of pharmaceutical care.

2. The findings of the conducted research testify to the fact that the quantity and scope of questions asked by a pharmacist are not related to the conversation duration with a pharmacy visitor, and the communication duration does not have the statistically confirmed dependence on the queue availability. Therefore, in the context of pharmaceutical care quality, these criteria are of no high importance. However, in our opinion, it is efficient to consider the verified DRP as a quantitative indicator of the potential pharmaceutical care quality increase.

3. The findings of the conducted international trans-border comparative research testify to the fact that the defined problem of not always high pharmaceutical care quality, in particular at the stage of patient’s needs identification, is equally up-to-date for the community pharmacies of Lviv (Ukraine) and Lublin (Poland), despite some statistical discrepancies in the obtained results.

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REFERENCES


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