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Establishment of a communication environment supporting low health literacy in the Hungarian community pharmacies – the introduction of a methodological recommendation – a before-after study

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Establishment of a communication environment supporting low health literacy in the Hungarian community pharmacies – the introduction of a methodological recommendation – a before-after study

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Abstract

Objectives

Patient-centered community pharmacy services such as medication review, adherence improvement, or health promotion require pharmacists to have strong communication skills. The research aimed to improve these abilities of professionals working in community pharmacies through a communications training system and methodology linked to postgraduate education to create a pharmacy environment that supports low health literacy.

Design

Two cross-sectional questionnaire surveys before and after the introduction of a methodological recommendation.

Setting

69 Hungarian community pharmacies.

Participants

The study involved 333 pharmacists and pharmacy technicians from community pharmacies, 890 and 847 patients (over 18 who bought their prescribed medication) at the beginning and the end of the project, respectively.

Interventions

A three-day postgraduate health literacy-focused communication training followed by "train the trainer" teaching method at pharmacies, then the introduction of the learned methodology using uniform information materials and a communication checklist.

Primary and secondary outcome measures

Primary: total score of the employee and patient questionnaires and the change in score due to the intervention, total and for each question. Secondary: the differences between sexes, age groups, marital statuses, educational attainments and types of settlement.

Results

The mean score of the input patient group was 64.07% which increased to 72.72% by the end of the project ($p<0.001$). For staff, the mean score of the initial questionnaires was 74.47%, and that of the final questionnaires was 85.21% ($p<0.001$). According to both groups, professionals made the most progress in encouraging patients to ask questions.

Conclusions

It can be stated that the techniques used in this study can be easily mastered and effectively introduced into community pharmacy practice with the methodology presented.

Strengths and limitation of this study

- The project had almost nationwide coverage, involving many professionals and patients.
- The success of the intervention was confirmed by two different questionnaires (patients and employees)

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- Evaluation of knowledge 3 months after the training may be too short of reflecting long-term effects.
- Lack of control groups (other professionals who do not receive education and do not apply the methodology and their patients).

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Competing Interest

None declared.

Introduction

Pharmacy and pharmacy practices have evolved around the world in response to changes in the environment around the profession and the needs of patients. The emphasis on drug distribution and preparation is shifting towards patient-centered care and counseling, where pharmacists assess the necessity, efficiency, and safety of patients' medications and ensure that patients understand their therapies and monitor changes in their condition.[1-6] This is facilitated by several factors. In the current healthcare setting, community pharmacies are the most accessible healthcare providers for patients,[7] which is complemented by the fact that patients often want to talk to their pharmacists rather than doctors about their illness,[8] make pharmacists the "the first port of call" of the health care.[7, 9, 10] These types of pharmacy services can have many benefits: they can improve the health of patients through drug therapy and patient adherence management,[11] contribute to reducing morbidity, mortality and health costs.[12]

Patient-centered and consultative community pharmacy services such as medication review, adherence improvement, or health promotion require pharmacists to have strong communication skills,[13] thus ensuring the optimal exchange of information and that patients are fully involved in their care.[14-17]

Pharmacists' communication needs to adapt to different patients' needs to achieve patient-centricity,[18] with particular regard to the different levels of their health literacy.

Health literacy „refers to those personal, cognitive, and social skills that determine the ability of individuals to obtain, understand, and use basic health information and all services aimed at promoting and maintaining a healthy lifestyle."[6, 19, 20] According to a survey, 47% of patients have poor health literacy,[21] this proportion is 52% in Hungary.[22] On this basis, it is essential that pharmacists provide clear and easily understandable information on the correct use of medicines to prevent, protect and improve patient health so that patients can make the most of it.[23] In its 1997 report, the World Health Organization made it clear that the future pharmacists should be effective communicators, focusing on open information exchange and patient involvement in treatment decision-making.[14, 16, 23, 24] Pharmacist counseling rates vary worldwide from 8% to 100%,[25] moreover, according to a survey, 40-80% of the information provided by health professionals is immediately forgotten by patients, while nearly half of them are poorly remembered.[26] Inadequate and inaccurate communication, self-medication, and poor health literacy can easily lead to misunderstanding of medical recommendations and deviations from the prescribed treatment regimen.[23] Also, it can have a negative effect on pharmacists, as poor communication can lead to a deterioration in their judgment and a loss of confidence in

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pharmacists' knowledge.[6, 27] In contrast, a pharmacist who is capable of effective patient-centered communication can work to improve patient adherence and health outcomes,[28] and can also increase patient satisfaction.[4, 6, 29] However, to achieve all these goals, it is essential that both graduate and postgraduate training of pharmacists be adapted to changing needs. Various international pharmacist competence frameworks emphasize communication as the core competency of pharmacists.[30-34] However, these requirements are not always met in practice.[17, 18, 35, 36] Education and training can improve the communication skills of pharmacists,[16, 37-39] which are needed by both pharmacy students and graduated pharmacists.[40]

The research aimed to improve the communication skills of professionals working in community pharmacies through a communication training system and methodology linked to postgraduate education to create a pharmacy environment that supports low health literacy.

Methods

The research in general

The research was conducted as part of the Semmelweis University postgraduate specialist training (3-year specialization training for graduated pharmacists) between January 2017 and June 2017. The implementation was carried out under the guidance of the pharmacists participating in the training, with the participation of pharmacists and pharmacy technicians they involved (no financial compensation was granted) from their workplace (Hungarian community pharmacies accredited at Semmelweis University).

The description of the project

The flowchart of the project is shown in *Figure 1*. At the beginning of the project, graduated pharmacists participating in the postgraduate specialist training took part in a three-day training course at Semmelweis University. They received training on health literacy, appropriate pharmacist-patient communication techniques, domestic conditions, factors behind poor health literacy, and its consequences, they also learned about the potential of pharmacies to improve health literacy. Project requirements, methodology, and questionnaires were described *(see "Communication tools in the pharmacies").*

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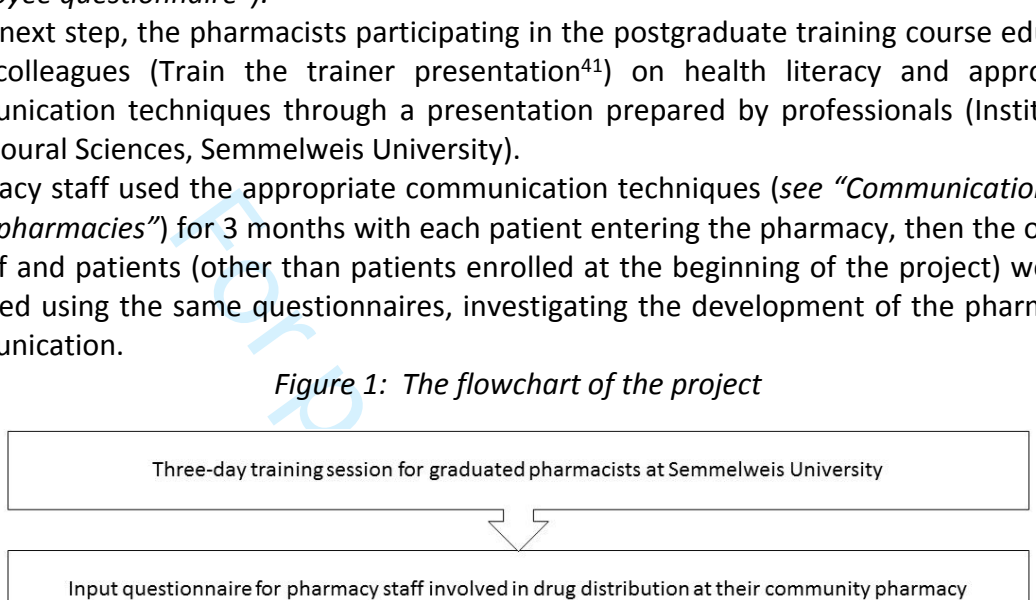
In the next step, pharmacists used a questionnaire to assess the opinions of technicians and pharmacists at their workplace about how well they think they communicate with patients in a manner appropriate to the level of patients' health literacy *(see "Patient questionnaire").* At the same time, patients over 18 who bought their prescribed medication were enrolled. All patients involved were fully informed and volunteered to participate in the survey, and then completed a questionnaire on the quality of the pharmacy staff's communication *(see "Employee questionnaire").*

In the next step, the pharmacists participating in the postgraduate training course educated their colleagues (Train the trainer presentation[41]) on health literacy and appropriate communication techniques through a presentation prepared by professionals (Institute of Behavioural Sciences, Semmelweis University).

Pharmacy staff used the appropriate communication techniques (*see "Communication tools in the pharmacies"*) for 3 months with each patient entering the pharmacy, then the opinion of staff and patients (other than patients enrolled at the beginning of the project) were re-surveyed using the same questionnaires, investigating the development of the pharmacies' communication.

Figure 1: The flowchart of the project



Communication tools in the pharmacies

The participating pharmacies received a self-developed communication package, which included a "Communication checklist" *(Annex 1)*, with eight basic communication tips for good consultation practice, and an "Ask your pharmacist!" poster *(Annex 2),* which was displayed in the participating pharmacies. Also, the participating pharmacies received written patient information leaflets, which were given to patients in the framework of the project *("Ask your pharmacist" – patient information leaflet-Annex 3).*

Patient questionnaire

The patient questionnaire is included in *Annex 4*. The questionnaires were completed on paper, either in interviews or individually, and were conducted each time by an employee other than the person conducting the consultation. The questionnaire and scoring system were self-developed by communication experts from MSD Pharma Hungary Ltd., Institute of

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Behavioural Sciences (Semmelweis University) and pharmacists, based on previous experience (Crystal Clear Pharmacy Program, Ireland[42]).

The questionnaires were completed anonymously and voluntarily. In addition to sex, age, marital status, and educational attainment, patients receive 6 questions, including 3 simple choice questions (Question 1-3; yes / no / don't know), and 3 scaling questions (Question 4-6; 5-point scale). To find out what patients think about pharmacists' communications overall, the responses were converted into scores (see *Annex 4).* In the case of simple choice questions (Questions 1-3), positive answers for health literacy were 4 points, negative answers 1, and neutral ("don't know") answers 0 points. In the case of questions 4-6, patients were able to choose from 5 options, of which the neutral and “don’t know” answers were 0 points, the other answers were 1-4 points, where 4 were the most positive answers. A total of 24 points were thus obtained.

Employee questionnaire

The employee questionnaire is included in *Annex 5*. The questionnaires were completed on paper and were filled independently, anonymously. The employees only had to indicate the type of settlement where the pharmacy was located, and then they had to answer 5 questions, each of them was rated 1-5 according to how typical the given statement was (1- not at all, 5- very characteristic). A total of 25 points were thus obtained. The scoring system used for evaluation *(see Annex 5*) was self-developed, thanks to the collaborations described above (Crystal Clear Pharmacy Programme[42]).

Characteristics of involved pharmacies and patients

Post-graduate education was attended by 73 pharmacists from 69 pharmacies. A total of 333 employees participated in the whole project. The survey was close to national coverage, 14 out of 20 counties in the country (including the capital city, Budapest) had a participating pharmacy. Of the staff working in pharmacies, most took part in the project in “other cities” (44.7%) and in the capital (43.5%), while a smaller proportion worked in pharmacies located in county towns (8.4%) or village (3.3%). *Table 1* shows the patients enrolled. 890 and 847 patients participated at the beginning and end of the project, respectively.

Table 1: Characteristics of patients involved in the project (data numbers (n) other than "number of patients involved" are due to occasional deficiencies in data collection)

	INPUT	OUTPUT		INPUT	OUTPUT
Number of patients involved:	**890**	**847**	**Marital status:**	**n=876**	**n=835**
			Other	2.4%	1.8%
			Single	23.7%	22.8%
			Widowed	19.5%	18.8%
			Married/long-term relationship	54.4%	56.6%
Sex:	**n=871**	**n=830**	**Educational attainment:**	**n=876**	**n=817**
Male	42.3%	43.6%	Primary school	7.0%	8.6%
Female	57.7%	56.4%	Vocational school	24.0%	23.1%
			Baccalaureate	34.3%	35.7%

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			University	34.7%	32.6%
Age:	**n=887**	**n=839**	**Type of settlement:**	**n=889**	**n=846**
18-25 years	12.0%	12.5%	Villages	3.4%	3.6%
26-40 years	25.8%	25.4%	Other cities	40.8%	40.5%
41-65 years	37.4%	38.0%	County towns	9.7%	10.4%
65- years	24.8%	24.1%	Capital city	46.1%	45.5%

Ethics approval

The survey complied with Hungarian legal requirements (the pharmacy service was completely free and non-invasive).[43-46] Verbal informed consent was obtained from all participants in the pharmacies (GDPR decree not yet enacted); no written consent was required according to the Act CLIV of 1997 on (non-invasive pharmacy service and questionnaire survey).[43,47] The study was conducted as a free service of licensed pharmacies, with the voluntary and fully informed participation of patients. The services were provided by graduated pharmacists with licensed pharmacy technicians. The processing of the data was carried out in accordance with the Hungarian legal requirements at that time.[43] The collected data were forwarded to the authors without any personal data for processing the results. The personal and health records of the patients included in the study were kept anonymous.

Statistical analysis

After descriptive statistical analysis, data composition, employee and patient questionnaires were examined for each question, total scores, and degree of change in normal distribution by variance analysis and t-tests. The normality was checked by the Kolmogorov-Smirnov test. The Chi-square test and the Kruskal-Wallis test were used to compare participants' total scores for each gender, age group, educational attainment, marital status, and settlement type. The significance level was set at 5%. Statistical calculations were performed using SPSS 20.0 (SPSS Inc., Chicago, IL, USA).

Patient and Public Involvement

Patients or the public were not involved in the design, or conduct, or reporting, or dissemination plans of this research.

Results

Results of the patient questionnaire

The mean score of the input patient group was 15.38 (SD=4.89) points, which corresponds to 64.07%. At the end of the project, patients other than this patient population completed the questionnaire, their mean score was 17.45 (SD=4.07) points, which is 72.72% of the total score, showing a significant ($p<0.001$) improvement of 8.65% (+2.07 points) between the two questionnaires. The improvement in the score of each question during the project has been examined, and these results are included in *Table 2* (maximum of 4 points per question). There was a significant improvement in all questions: the greatest was found in Question 2 (+17.58%). Questions 1 and 3 showed an improvement of 9.09% and 9.77% respectively, while the mean score of Questions 4-6 improved by 4-5% *(Table 2).*

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	Questions	Values of points available for the question	Mean input score *(point)* n=889	Mean output score *(point)* n=846	Mean change *(point)*	Mean change *(%)*	*p*
1.	Did the pharmacist or pharmacy technician use complicated terms or expressions during the consultation?	0/1/4 point(s)	2.94	3.31	+0.37	+9.09	<0.001
2.	Did the pharmacist or pharmacy technician encourage you to ask questions during the consultation?		2.35	3.05	+0.70	+17.58	<0.001
3.	Did your pharmacist or pharmacy technician emphasize the important information orally, with written help or graphics?		3.13	3.52	+0.39	+9.77	<0.001
4.	How easy or difficult was it for you to understand the instructions given by your pharmacist or pharmacy technician on how to take/use the prescribed medication?	0-4 point(s)	3.06	3.29	+0.23	+5.75	<0.001
5.	How much do you feel you know all the important information about your medicines?		2.04	2.26	+0.22	+5.58	0.002
6.	How do you see your state of health?		1.86	2.02	+0.16	+4.16	0.027
TOTAL		**24 points**	**15.38**	**17.45**	**+2.07**	**+8.65**	**<0.001**

Table 2: Results of patient questionnaires (data numbers (n) other than "number of patients involved" (see Table 1) are due to occasional deficiencies in data collection; p values were determined using variance analysis and t-tests)

To find out if there is a difference between the individual subpopulations, to identify a group of patients more or less affected by the project their improvement of the overall score has been analyzed *(Table 3)*. The results show that there was no significant difference between the sexes (p>0.05). Among the age groups, the score of patients older than 40 years developed significantly more (p<0.001). Among patients with different educational attainment, patients with university degrees significantly less improved (p=0,02).Widows improved most in terms of marital status (p<0.02), finally, among the settlement types, those living in county towns developed the most (p<0.02).

Sex	Mean change *(point)*	Mean change *(%)*			
Male *n(input)=368 n(output)=362*	+2.02	+8.42			
Female *n(input)=502 n(output)=467*	+2.10	+8.75			

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p>0.05					
Age	**Mean change *(point)***	**Mean change *(%)***	**Marital status**	**Mean change (point)**	**Mean change (%)**
18-25 years *n(input)=106* *n(output)=105*	+1.39	+5.79	Other *n(input)=21* *n(output)=15*	+1.93	+8.04
26-40 years *n(input)=228* *n(output)=213*	+1.26	+5.25	Single *n(input)=208* *n(output)=190*	+1.71	+7.13
41-65 years *n(input)=332* *n(output)=318*	**+2.43**	**+10.13**	Married/long-term relationship *n(input)=475* *n(output)=473*	+1.86	+7.75
65- years *n(input)=220* *n(output)=202*	**+2.59**	**+10.79**	**Widowed** *n(input)=171* *n(output)=156*	**+2.84**	**+11.83**
p<0.001			*p<0.02*		
Educational attainment	**Mean change *(point)***	**Mean change *(%)***	**Type of settlement**	**Mean change *(point)***	**Mean change *(%)***
Primary school *n(input)=61* *n(output)=69*	**+2.43**	**+10.13**	Villages *n(input)=30* *n(output)=30*	+0.97	+4.04
Vocational school *n(input)=210* *n(output)=189*	**+2.49**	**+10.38**	Other cities *n(input)=363* *n(output)=343*	+2.50	+10.42
Baccalaureate *n(input)=301* *n(output)=292*	**+2.39**	**+9.96**	**County towns** *n(input)=86* *n(output)=88*	**+3.33**	**+13.88**
University *n(input)=303* *n(output)=266*	+1.67	+6.96	Capital city *n(input)=410* *n(output)=385*	+1.67	+6.96
p=0.02			*p<0.02*		

Table 3: Change in the score for each patient subpopulation

*(**Bold**: **Subpopulation with significantly higher improvement**; n(input): input questionnaire data number; n(output): output questionnaire data number; data numbers (n) other than "number of patients involved" (see Table 1) are due to occasional deficiencies in data collection; p values were determined using Chi-square test and the Kruskal-Wallis test)*

Results of the employee questionnaire

The mean total score of the input questionnaires was 18.61 points (SD=2.97; 74.47%) out of 25, with an average of 3.72 points per question. The results of the repeated questionnaires at the end of the project were 21.30 points (SD=2.32; 85.21%), which is 2.69 points (0.54 points per question), 10.74%, significant increase (p<0.001). Examining the individual questions, it can be stated that the mean score of all questions increased significantly by the

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end of the project (p<0.001), the greatest improvement was in the case of Question 4 and the least in the case of Question 1 *(Table 4).*

	Questions	Mean input score *(point)* n=889	Mean output score *(point)* n=846	Mean change *(point)*	Mean change *(%)*	*p*
1.	How typical are you to recognize patients with low levels of health literacy?	3.96	4.35	+0.39	+7.80	<0.001
2.	How typical are you to know what communication techniques you can use to help the patient's health literacy?	3.69	4.26	+0.57	+11.40	<0.001
3.	How typical are you of communicating with your patients in plain, everyday terms (e.g. not using technical terms)?	4.02	4.50	+0.48	+9.60	<0.001
4.	How typical are you of encouraging your patients to ask questions?	3.29	4.04	+0.75	+15.00	<0.001
5.	How typical are you to visually help your patient understand the information?	3.65	4.16	+0.51	+10.20	<0.001
TOTAL		**18.61**	**21.30**	**+2.69**	**+10.74**	**<0.001**

Table 4: Employee questionnaire results per question and total (n(input): input questionnaire data number; n(output): output questionnaire data number; data numbers (n) other than the number of employees involved in the project are due to occasional deficiencies in data collection; p values were determined using variance analysis and t-tests)

In results of the statistical analysis show that the results of professionals working in the county towns or the capital improved significantly more (p<0.02; *Table 5*).

Type of settlement	Mean change *(point)*	Mean change *(%)*
Villages *n(input)=13 n(output)=14*	+2.29	+9.16
Other cities *n (input)=145 n(output)=148*	+2.71	+10.84
County towns *n(input)=30 n(output)=30*	**+3.23**	**+12.92**
Capital	**+3.43**	**+13.72**

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n(input)=143 *n(output)=135*		
p<0.02		

Table 5: Results of employee questionnaires by settlement type
(Bold: Subpopulation with significantly higher improvement; *n(input): input questionnaire data number; n(output): output questionnaire data number; data numbers (n) other than the number of employees involved in the project are due to occasional deficiencies in data collection; p values were determined using Chi-square test and the Kruskal-Wallis test)*

Discussion

By the postgraduate training methodology discussed in this article, an improvement has been achieved in the communication skills of a further 260 pharmacists (pharmacists and pharmacy technicians) through 73 pharmacists. The success of this method is supported by the opinion of more than 1700 patients surveyed.

The results of the input patient questionnaire show that pharmacies' communications were not perfect at the beginning of the project. However, this was improved by the method described in the project. The patients in the input and output groups differed, so the development is clearly due to the methodology implemented. Examining the patient questionnaire, the results of the questions directly related to communication skills (Questions 1-4) show that the methodology introduced can make real progress in the professional application of communication techniques in a short time. Pharmacy workers have made the most progress encourage the patients to ask questions, avoiding technical terms, and adequately emphasizing information, the first of these was a technique that was rarely used at the beginning of the project. For Questions 5 and 6, the indirect effect of the communication techniques (on drug knowledge and sense of health) has been examined. Here, in addition to improving communication, the score is also affected by changes in the patient's condition. As the patients completing the input and output questionnaires differed, we could not detect the change of the latter factor with this methodology, which is why these changes were smaller. However, thanks to the methodology implemented, significant progress in these questions has been achieved as well. To make greater improvement on these issues longer-term and broader adoption is needed. The results show that pharmacy workers have to pay particular attention to the quality of communication with patients over 40 (this includes most of the widows) and/or lower qualification.

The relatively high 74.47% mean input score from employee questionnaires indicate that pharmacy staff does not consider their communication skills to be poor, which does not fully coincide with the results of the patient questionnaires discussed above. After the project, the employees saw their abilities even better, which are reflected in the patients' opinions. Looking at the input and output responses to each question it can be stated that these also agree with the patients' views: initially, the pharmacy staff rarely encouraged the patients to ask questions (Question 4), but by the end of the project, the employees had been able to progress in this, and the knowledge and application of communication techniques. This is one of the most essential steps for the patient to be actively involved in his/her therapy, which is the basis for collaboration and proper patient adherence. In contrast, training has barely improved the recognition of patients with poor health literacy. The higher development of colleagues working in the capital or county towns may be due to that professionals were trying to spend more time with patients than they did before the project,

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as pharmacies at these types of settlements generally meet many patients daily, which can make it challenging to provide all the important information due to the lack of time.

Conclusions

All in all, it can be stated that the techniques used to develop appropriate communication during pharmacist-patient consultations can be easily mastered and effectively introduced into community pharmacy practice with the training and methodology presented. However, to measure the long-term and more indirect effects of the methodology implemented, such as better knowledge of medicines and a better sense of health, further studies are needed.

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Author Contributions

ASz: formal analysis, investigation, writing - original draft, visualization. OS: conceptualization, methodology, validation, writing - review & editing, project administration. AM: formal analysis. RZ: writing - review & editing, supervision. BH: conceptualization, supervision.

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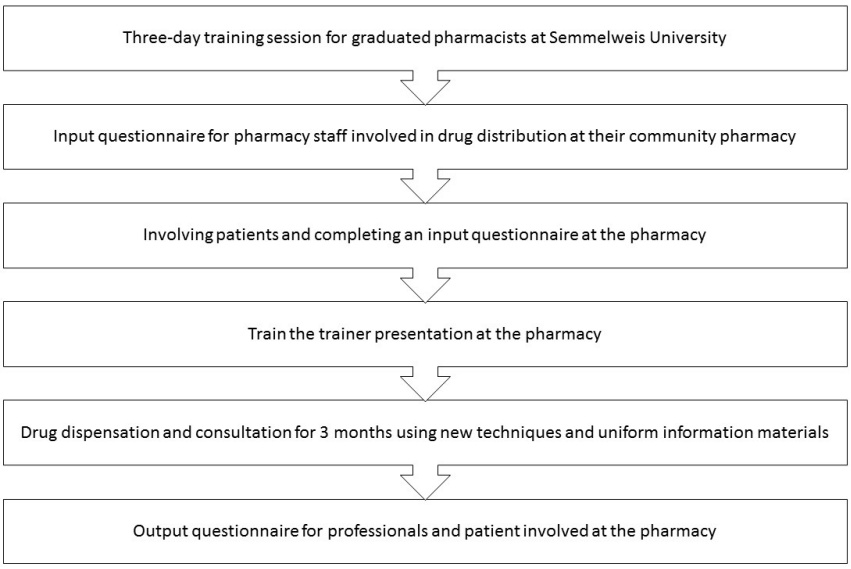

Figure 1: The flowchart of the project

338x190mm (96 x 96 DPI)

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Annex 1: Communication checklist – text summary

HEALTH LITERACY COMMUNICATION - CHECKLIST

Use simple language.

- Avoid technical terms, use their common synonyms.
- If you still need to use a term, explain the meaning.

Highlight the most important information.

- *Verbally: use emotional accentuation (e.g. "It's very important to know that ...").*
- *Writing: use underlining or colored text in the medication box or in the patient leaflet.*

When describing the dosage of medications, give the total daily amount divided into periods of the day.

- For example: "Take two pills daily: one in the morning and one in the evening."
  Avoid the wording: "This medicine should be taken in 2x1 doses."

Give only the most necessary information verbally.

- The capacity of short-term memory is limited, so you should not have more than four verbal messages in one conversation.

Recommend a written leaflet or website.

- Provide a leaflet with more information about the disease and the therapy.
- Ask if the patient has internet access and if so, give them a list of professionally credible websites that can be recommended to them.

Offer your help in the preparation of the medicine.

- If the medicine (e.g. a suspension) is to be prepared by the patient him/herself, offer your help and prepare it prepared in the pharmacy.

Show the patient how to use the purchased equipment.

- If the patient buys a device (e.g. blood pressure monitor, blood glucose meter, inhaler, etc.), offer to show their use.

Encourage the patient to ask questions.

- For example: "If you have any questions about this medicine, I would be happy to answer them."
  Avoid the "Do you have a question?" wording, because the answer is usually denial.

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Annex 2: „ Ask your pharmacist!" *poster – text summary*

ASK YOUR PHARMACIST!

To use your medication successfully, it is important that you know the answers to the following questions:

- What is the name of the medicine and what does it do?
- How often and how much should I take?
- When, how, and under what circumstances should I take it? Do I have to take it with or without food?
- Are there any foods or beverages (alcoholic beverages) to avoid while taking?
- How do I feel if the drug works and how if not?
- How long should I take? Can I quit earlier if I am better?
- What are the most common side effects? What should I do if I experience side effects?
- What should I do if I forget to take it once or more?
- Can I take other medicines at the same time?
- Is there an over-the-counter medicine that I cannot take with this medicine?
- Can I drive a car? Can I sunbathe while taking medication?
- Does the effect of my medicine change if I use it constantly?
- What happens if I do not use the medicine?
- How should I store my medicine?

Always tell your doctor or pharmacist:

- About prescription and over-the-counter medicines, you take.
- Allergies, side effects associated with your medication.
- If you are pregnant or breast-feeding.

If you have any problems with your current medication (cannot take your medication properly).

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Annex 3: „Ask your pharmacist!"- patient information leaflet – text summary

Ask your pharmacist!

In some cases, even the simplest medication can be more complicated than you think, since you need a lot of knowledge to use your medicines safely and effectively. For example, there are some drugs that you should take with food while others before or after a meal. Some of them may make us sleepy, while others may make us very lively. Drinking coffee, alcohol and certain foods or even smoking can affect the way medicines work. Some medications have certain side effects, which may be troublesome but not a problem, while in other cases it is important to inform health care professionals.

We need medications in many cases. Based on a medical recommendation, we buy a prescription or non-prescription product at a pharmacy. In order for drugs to achieve their desired effect, we need to be informed about them. The following detailed information applies to all prescription and over-the-counter drugs. However, they do not replace the essential individual guides for each medicine. To know these, **ask your pharmacist** (who has the appropriate knowledge and electronic database) with confidence.

What you need to know about medicines…

Before you start to take your medicine, always tell your doctor or pharmacist about:

- Your prescription and over-the-counter medicines.
- Allergies and side effects associated with medications.
- If you are pregnant or breast-feeding.
- If you have any problems with your current medication (cannot take your medications properly)

If you are not able to answer the following questions about your medications, ask your pharmacist for help, as this knowledge is needed in order for your therapy to work best.

- What is the name of the medicine and what does it do?
- How often and how much should I take?
- When, how, and under what circumstances should I take it? Do I have to take it with or without food?
- Are there any foods or beverages (alcoholic beverages) to avoid while taking?
- How do I feel if the drug works and how if not?
- How long should I take? Can I quit earlier if I am better?
- What are the most common side effects? What should I do if I experience side effects?
- What should I do if I forget to take it once or more?
- Can I take other medicines at the same time?
- Is there an over-the-counter medicine that I cannot take with this medicine?
- Can I drive a car? Can I sunbathe while taking medication?
- Does the effect of my medicine change if I use it constantly?
- What happens if I do not use the medicine?
- How should I store my medicine?

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Always keep an up-to-date list of your prescription and over-the-counter medications, strengths and doses. Indicate your drug allergies, if you have any. Always show this card to your doctor or pharmacist to help prevent potential interactions and medication with the same active ingredient.

Always keep the following in mind when storing your medication:

- Keep your medication in one place.
- Keep your drugs out of the reach and sight of children.
- Keep your medicine in its original packaging. Except for the daily dose boxes, do not put more than one medicine in one container.
- Store your medication in a dry room at room temperature (15-25 ° C) unless otherwise stated. The kitchen or bathroom is not a good place because of the high humidity.
- Keep your medication away from heat and direct sunlight.
- Never leave your medication in the car.
- If you need to keep your medicine in the refrigerator, always keep it away from food and keep liquids from freezing.
- Keep an eye on the expiry date of your medicines. Deliver the expired product to the pharmacy.

What should you know about side effects?

Some medicines can have unwanted effects, called side effects In case of side effects, consult a health care professional. Therefore, it is important for you to know what side effects your medications may have and what to do if you notice them. If you notice any unexpected side effects, tell your doctor or pharmacist.

Further important information about medication…

- To take your medicine safely, never take it in places where your eyesight is poor. Always read the name of the medicine and check the expiry date.
- If you are having trouble unpacking your drug, please inform your pharmacist.
- Tell your pharmacist if you have a problem taking your medicine or using the medication delivery device.
- Never give your prescribed medicine to anyone else, because they are assigned to your health problem that is not necessarily the same as the other person's therapy.
- Never take any medicine that you cannot identify or may not have the correct quality (cloudy solution, discolored tablets, etc.). Ask your pharmacist for help.
- Never wait until the last piece of medication has been used. Ask your doctor for an appointment on time.

Remember, to get the best results from your medicines, you need to use them correctly.

Feel free to ask your pharmacist.

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Annex 4: Patient questionnaire (the number next to each answer represents the point value of the given answer; this was not indicated in the patient questionnaire)

	PHARMACY QUESTIONNAIRE FOR PATIENTS				Date: (day) (month) 2017.	
	The purpose of completing this questionnaire is to survey all pharmacy services that help patients achieve more effective and safer drug therapy.					
	Please circle your answer!					
	Sex	Male	Female			
	Age	18-25	26-40	41-65	65 -	
	Marital status	Single	Married/long-term relationship	Widowed	Other	
	Education attainment	Primary school	Vocational school	Baccalaureate	University	
	Type of settlement	Village	Other city	County town	Capital	
1	**Did the pharmacist or pharmacy technician use complicated terms or expressions during the consultation?**	Yes (1)	No (4)	I don't know (0)		
2	**Did the pharmacist or pharmacy technician encourage you to ask questions during the consultation?**	Yes (4)	No (1)	I don't know (0)		
3	**Did your pharmacist or pharmacy technician emphasize the important information orally, with written help or graphics?**	Yes (4)	No (1)	I don't know (0)		
4	**How easy or difficult was it for you to understand the instructions given by your pharmacist or pharmacy technician on how to take/use the prescribed medication?**	Very difficult (1)	Rather difficult (2)	Rather easy (3)	Very easy (4)	I don't know (0)
5	**How much do you feel you know all the important information about your medicines?**	Not at all (1)	I have a lack of knowledge (2)	I have medium knowledge (0)	I have sufficient knowledge (3)	I have all the knowledge I need (4)
6	**How do you see your state of health?**	Very good (4)	Good (3)	Acceptable (0)	Bad (2)	Very bad (1)

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Annex 5: Employee questionnaire (the number above the answers denotes the score for that answer)

PHARMACY QUESTIONNAIRE FOR EMPLOYEES						Date: (day) (month) 2017.
Type of settlement		Village	Other city	County town	Capital	
The purpose of completing this questionnaire is to survey all pharmacy services that help patients achieve more effective and safer drug therapy.						
	Please mark the most relevant answer with an X in the appropriate box, rate it from 1 to 5.	**1** Not at all	**2** Not typical	**3** Moderately	**4** Typical	**5** Very typical
1	**How typical are you to recognize patients with low levels of health literacy?**					For example, you know which patient group has a lower level of health literacy.
2	**How typical are you to know what communication techniques you can use to help the patient's health literacy?**					For example, what questions to ask, what words, examples to use.
3	**How typical are you of communicating with your patients in plain, everyday terms (e.g. not using technical terms)?**					For example, instead of oral anticoagulant: "blood thinner"; instead of photosensitizing: "as long as you take the medicine, do not go to the sun" etc.
4	**How typical are you of encouraging your patients to ask questions?**					For example: "a lot of things have been discussed right now, is there anything we need to take over again?"
5	**How typical are you to visually help your patient understand the information?**					For example: circling or underlining the relevant information on the package (e.g. name of the active substance, the type of formulation, etc.), writing down the dosage on the box, or showing the use of a device.

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Establishment of a communication environment supporting low health literacy in the Hungarian community pharmacies – the introduction of a methodological recommendation – a before-after study

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Establishment of a communication environment supporting low health literacy in the Hungarian community pharmacies – the introduction of a methodological recommendation – a before-after study

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Abstract

Objectives

The research aimed to support the effectiveness and necessity of the communication training and methodology introduced in the postgraduate pharmacy training and community pharmacy practice in Hungary.

Design

Two cross-sectional questionnaire surveys before and after the introduction of a methodological recommendation.

Setting

69 Hungarian community pharmacies.

Participants

The study included 333 pharmacists and pharmacy technicians from community pharmacies, 890 and 847 patients (over 18 who bought their prescribed medication) at the beginning and the end of the project, respectively.

Interventions

A three-day postgraduate health literacy-focused communication training followed by the "Train the trainer" teaching method at pharmacies, then the introduction of the learned methodology using uniform information materials and a communication checklist.

Primary and secondary outcome measures

Primary: total score of the staff and patient questionnaires and the change in score due to the intervention, total, and for each question. Secondary: the differences between sexes, age groups, marital statuses, educational attainments, and types of settlement.

Results

The mean score of the pre-intervention patient group was 64.07% which increased to 72.72% by the end of the project ($p<0.001$). For staff, the mean score of the initial questionnaires was 74.47%, and that of the final questionnaires was 85.21% ($p<0.001$). According to both groups, professionals made the most progress in encouraging patients to ask questions.

Conclusions

It can be stated that the presented methodology can be used to develop the communication skills of a large number of professionals in a short time, using a small number of instructors, so it is worthwhile to introduce this methodology as part of compulsory postgraduate training.

Strengths and limitation of this study

- The project had almost nationwide coverage, including many professionals and patients.
- The success of the intervention was confirmed by two different questionnaires (patients and staff)

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- Lack of control groups (other professionals who did not receive education and did not apply the methodology, and their patients).
- Selection bias: no randomization was used in the professional, pharmacy, and patient enrollment method.
- The questionnaires used were self-developed, based on experience from previous projects.

Funding

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Competing Interest

None declared.

Introduction

Pharmacy and pharmacy practices have evolved around the world in response to changes in the environment around the profession and the needs of patients. The emphasis on drug distribution and preparation is shifting towards patient-centered care and counseling, where pharmacists assess the necessity, efficiency, and safety of patients' medications and ensure that patients understand their therapies and monitor changes in their condition.[1-6] This is facilitated by several factors. In the current healthcare setting, community pharmacies are the most accessible healthcare providers for patients.[7] It has been stated that patients are more willing to talk to their pharmacist than to doctors about their illness,[8] which make the pharmacists the "the first port of call" of the health care system.[7, 9, 10] These types of pharmacy services can have many benefits: they can improve the health of patients through drug therapy and patient adherence management,[11] contribute to reducing morbidity, mortality and health costs.[12]

Patient-centered and consultative community pharmacy services such as medication review, adherence improvement, or health promotion require pharmacists to have strong communication skills,[13] thus ensuring the optimal exchange of information and that patients are fully participating in their care.[14-17]

Pharmacists' communication has to adapt to different patients' needs to achieve patient-centricity,[18] with particular regard to the different levels of their health literacy.

Health literacy "refers to those personal, cognitive, and social skills that determine the ability of individuals to obtain, understand, and use basic health information and all services aimed at promoting and maintaining a healthy lifestyle."[6, 19, 20] According to a survey, 47% of the patients have poor health literacy,[21] this proportion is 52% in Hungary.[22] On this basis, pharmacists must provide clear and easily understandable information on the correct use of medicines to prevent, protect, and improve patient health so that patients can make the most of it.[23] In its 1997 report, the World Health Organization made it clear that the future pharmacists should be effective communicators, focusing on open information exchange and patient involvement in treatment decision-making.[14, 16, 23, 24] Pharmacist counseling rates vary worldwide from 8% to 100%,[25] moreover, according to a survey, 40-80% of the information provided by health professionals is immediately forgotten by patients, while nearly half of the

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information are poorly remembered.[26] Inadequate and inaccurate communication, self-medication, and poor health literacy can easily lead to misunderstanding of medical recommendations and deviations from the prescribed treatment regimen.[23] Also, it can have a negative effect on pharmacists, as poor communication can lead to a deterioration in their judgment and a loss of confidence in pharmacists' knowledge.[6, 27] In contrast, a pharmacist who is capable of effective patient-centered communication can work to improve patient adherence and health outcomes,[28] and can also increase patient satisfaction.[4, 6, 29] However, to achieve all these goals, it is essential that both graduate and postgraduate training of pharmacists be adapted to changing needs. Various international pharmacist competence frameworks emphasize communication as the core competency of pharmacists.[30-34] However, these requirements are not always met in practice.[17, 18, 35, 36] Education and training can improve the communication skills of pharmacists,[16, 37-39] which are needed by both pharmacy students and graduated pharmacists.[40]

In Hungary, two types of professional works exist in the community pharmacies: pharmacists and pharmacy technicians. Pharmacists receive a degree after five years at university, while the training of pharmacy assistants lasts for 2 years. Pharmacy technicians may perform everything only under the supervision of a pharmacist. They also play a significant role in communication with the patient and drug dispensing. Only a pharmacist can dispense the medicine in some special cases (e.g. interaction, side effect) regulated by law.

The health care institutions that cover the country most evenly are the community pharmacies operating as part of the primary care. There are about 2,900 community pharmacies in Hungary, where more than 60 million pharmacist-patient meetings take place every year. The majority of patients visit pharmacies for two reasons: 1) to get a drug prescribed by a general practitioner or a specialist; 2) to seek advice on relieving their mild symptoms. During a consultation, pharmacists or pharmacy technicians dispense the prescribed drug or recommend an over-the-counter (OTC) medication for the patient's symptoms. In both cases, they have to properly describe the use of medicines, for which the use of appropriate communication techniques is essential. However, during their normal program of education, pharmacy technicians currently receive no, while pharmacists receive minimal communication training (a 3-hour lesson in the last year), so the effective and wide-ranging postgraduate training for professionals who have already graduated is crucial.

The research aimed to support the effectiveness and necessity of the communication training and methodology introduced in the postgraduate pharmacy training and community pharmacy practice in Hungary.

Methods

The research in general

The research was conducted between January 2017 and June 2017. The implementation was carried out under the guidance of the pharmacists participating in Semmelweis University postgraduate specialist training (3-year specialization training for graduated pharmacists), with the participation of pharmacists and pharmacy technicians they included (no financial compensation was granted) from their workplace (Hungarian community pharmacies accredited at Semmelweis University (the largest of the four universities training pharmacists in Hungary, located in Budapest, offering both graduate and postgraduate training)). No randomization was used in the selection of pharmacists, pharmacy technicians, and community pharmacies included: 73 pharmacists took place in the postgraduate training, all the other participating professionals were the colleagues, while the pharmacies where the research took place were the workplaces of these pharmacists.

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The description of the project

The flowchart of the project is shown in *Figure 1*. At the beginning of the project, graduated pharmacists participating in the postgraduate specialist training took part in a three-day training course at Semmelweis University. They received training on health literacy, appropriate pharmacist-patient communication techniques, domestic conditions, factors behind poor health literacy, and its consequences, they also learned about the potential of pharmacies to improve health literacy. Project requirements, methodology, and questionnaires were described *(see "Communication tools in the pharmacies").*

In the next step, pharmacists used a questionnaire to assess the opinions of technicians and pharmacists at their workplace about how well they think they communicate with patients in a manner appropriate to the level of patients' health literacy *(see "Staff questionnaire").*

At the same time, patients over 18 who bought their prescribed medication were enrolled. After the consultation, patients were asked by a professional other than the dispensing technicians or pharmacists, and the patients could voluntarily decide whether or not to participate in the survey. Randomization was not used, the staff of the pharmacy had to involve about 15 patients in overall at the beginning and the end of the project. All patients surveyed were fully informed and then completed a questionnaire on the quality of the pharmacy staff's communication *(see "Patient questionnaire").* The language of the questionnaires was Hungarian, which is the only official language in Hungary. The Hungarian language of the questionnaire was written with the help of communication experts (MSD Pharma Hungary Ltd., Institute of Behavioural Sciences (Semmelweis University) to fit the comprehension skills of the Hungarian society. In the next step, the pharmacists participating in the postgraduate training course educated their colleagues (Train the trainer presentation[41]) on health literacy and appropriate communication techniques through a 30-minute presentation prepared by professionals (Institute of Behavioural Sciences, Semmelweis University). All pharmacy colleagues who voluntarily participated in the research were required to attend the lecture. Pharmacy staff used the appropriate communication techniques (*see "Communication tools in the pharmacies"*) for 3 months with each patient entering the pharmacy, then the opinion of staff and patients (other than patients enrolled at the beginning of the project) were re-surveyed using the same questionnaires, investigating the development of the pharmacies' communication.

Communication tools in the pharmacies

The participating pharmacies received a self-developed communication package, which included a "Communication checklist" *(Annex 1)*, with eight basic communication tips for good consultation practice, and an "Ask your pharmacist!" poster *(Annex 2),* which was displayed in the participating pharmacies. Also, the participating pharmacies received written patient information leaflets, which were given to patients in the framework of the project *("Ask your pharmacist" – patient information leaflet-Annex 3).*

Patient questionnaire

The English transcription of the patient questionnaire is included in *Annex 4*. The questionnaires were completed on paper, either in interviews or individually, and were conducted each time by a professional other than the person conducting the consultation. The questionnaire and scoring system were self-developed by communication experts from MSD Pharma Hungary Ltd., Institute of Behavioural Sciences (Semmelweis University), and pharmacists, based on previous experience (Crystal Clear Pharmacy Program, Ireland[42]).

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The questionnaires were completed anonymously and voluntarily. In addition to sex, age, marital status, and educational attainment, patients receive 6 questions, including 3 simple choice questions (Question 1-3; yes / no / don't know), and 3 scaling questions (Question 4-6; 5-point scale). To find out what patients think about pharmacists' communications overall, the responses were converted into scores (see *Annex 4).* The scoring system was self-developed developed to measure the development of the participants' communication skills in each targeted question and overall. The value of the points and the decisive nature of the examination questions determining the total score were decided based on professional considerations. In the case of simple choice questions (Questions 1-3), positive answers for health literacy were 4 points, negative answers 1, and neutral ("don't know") answers 0 points. In the case of questions 4-6, patients were able to choose from 5 options, of which the neutral and "don't know" answers were 0 points, the other answers were 1-4 points, where 4 were the most positive answers. A total of 24 points were thus obtained.

Staff questionnaire

The staff questionnaire is included in *Annex 5*. The questionnaires were completed on paper and were filled independently, anonymously. The professionals only had to indicate the type of settlement where the pharmacy was located, and then they had to answer 5 questions, each of them was rated 1-5 according to how typical the given statement was (1-not at all, 5-very characteristic). A total of 25 points were thus obtained. The scoring system used for evaluation *(see Annex 5*) was self-developed, thanks to the collaborations described above (Crystal Clear Pharmacy Programme[42]).

Ethics approval

The survey complied with Hungarian legal requirements (the pharmacy service was completely free and non-invasive).[43-46] Verbal informed consent was obtained from all participants in the pharmacies (GDPR decree not yet enacted); no written consent was required according to the Act CLIV of 1997 on (non-invasive pharmacy service and questionnaire survey).[43,47] Informed consent was taken from the community pharmacies. The study was conducted as a free service of licensed pharmacies, with the voluntary and fully informed participation of patients. The services were provided by graduated pharmacists with licensed pharmacy technicians. The processing of the data was carried out in accordance with the Hungarian legal requirements at that time.[43] The collected data were forwarded to the authors without any personal data for processing the results. The personal and health records of the patients included in the study were kept anonymous.

Statistical analysis

After descriptive statistical analysis, data composition, staff and patient questionnaires were examined for each question, total scores, and degree of change in normal distribution by variance analysis and t-tests. The normality was checked by the Kolmogorov-Smirnov test. Subgroups of the two different populations were compared using the Chi-square test. The Chi-square test and the Kruskal-Wallis test were used to compare participants' total scores for each gender, age group, educational attainment, marital status, and settlement type. Bonferroni and Scheffe tests were used to determine which group mean was significantly different from others. The significance level was set at 5%. Statistical calculations were performed using SPSS 20.0 (SPSS Inc., Chicago, IL, USA).

Patient and Public Involvement

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Patients or the public were not involved in the design, or conduct, or reporting, or dissemination plans of this research.

Results

Characteristics of surveyed pharmacies and patients

Postgraduate education was attended by 73 pharmacists from 69 pharmacies. A total of 333 professionals participated in the whole project. The survey was close to national coverage, 14 out of 20 counties in the country (including the capital city, Budapest) had a participating pharmacy. Of the staff working in pharmacies, most took part in the project in "other cities" (44.7%) and in the capital (43.5%), while a smaller proportion worked in pharmacies located in county towns (8.4%) or village (3.3%). *Table 1* shows the patients enrolled: 890 and 847 patients participated at the beginning and end of the project, respectively.

	PRE-INTERVENTION	**POST-INTERVENTION**
The number of patients surveyed:	**890**	**847**
Sex:	**n=871**	**n=830**
Male	42.3%	43.6%
Female	57.7%	56.4%
Age:	**n=887**	**n=839**
18-25 years	12.0%	12.5%
26-40 years	25.8%	25.4%
41-65 years	37.4%	38.0%
65- years	24.8%	24.1%
Marital status:	**n=876**	**n=835**
Other	2.4%	1.8%
Single	23.7%	22.8%
Widowed	19.5%	18.8%
Married/long-term relationship	54.4%	56.6%
Educational attainment:	**n=876**	**n=817**
Primary school	7.0%	8.6%
Vocational school	24.0%	23.1%
Baccalaureate	34.3%	35.7%
University	34.7%	32.6%
Type of settlement:	**n=889**	**n=846**
Villages	3.4%	3.6%

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Other cities	40.8%	40.5%
County towns	9.7%	10.4%
Capital city	46.1%	45.5%

Table 1: Characteristics of patients surveyed in the project (data numbers (n) other than "the number of patients surveyed" are due to occasional deficiencies in data collection; "Other" marital status: divorced, short-term relationship or the patient cannot define it)

Results of the patient questionnaire

The pre-intervention and post-intervention groups consisted of two different patient populations. Subgroups of these two different populations were compared using the Chi-square test and they were statistically significantly equal (p>0.05; Sex: p=0.569; Age: p=0.962; Marital status: p=0.676; Educational attainment: p=0.555; Type of settlement: p=0.958). The mean score of the pre-intervention patient group was 15.38 (SD=4.89) points, which corresponds to 64.07%. At the end of the project, patients other than this patient population completed the questionnaire, their mean score was 17.45 (SD=4.07) points, which is 72.72% of the total score, showing a significant (p<0.001) improvement of 8.65% (+2.07 points) between the two questionnaires. The improvement in the score of each question during the project has been examined, and these results are included in *Table 2* (maximum of 4 points per question). There was a significant improvement in all questions: the greatest was found in Question 2 (+17.58%). Questions 1 and 3 showed an improvement of 9.09% and 9.77% respectively, while the mean score of Questions 4-6 improved by 4-5% *(Table 2).*

	Questions	**Values of points available for the question**	**Mean pre-intervention score (point) n=889**	**Mean post-intervention score *(point)* n=846**	**Mean change *(point)***	**Mean change *(%)***	***p***
1.	Did the pharmacist or pharmacy technician use complicated terms or expressions during the consultation?	0/1/4 point(s)	2.94	3.31	+0.37	+9.09	<0.001
2.	Did the pharmacist or pharmacy technician encourage you to ask questions during the consultation?		2.35	3.05	+0.70	+17.58	<0.001
3.	Did your pharmacist or pharmacy technician emphasize the important information orally, with written help or graphics?		3.13	3.52	+0.39	+9.77	<0.001
4.	How easy or difficult was it for you to understand the instructions given by your pharmacist or pharmacy technician on how to take/use the prescribed medication?	0-4 point(s)	3.06	3.29	+0.23	+5.75	<0.001
5.	How much do you feel you know all the important information about your medicines?		2.04	2.26	+0.22	+5.58	0.002

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6.	How do you see your state of health?		1.86	2.02	+0.16	+4.16	0.027
TOTAL		**24 points**	**15.38**	**17.45**	**+2.07**	**+8.65**	**<0.001**

Table 2: Results of patient questionnaires (data numbers (n) other than "the number of patients surveyed" (see Table 1) are due to occasional deficiencies in data collection; p values were determined using variance analysis and t-tests)

The improvement of the total score of each subpopulation has been analyzed to identify the groups of patients more or less affected by the project *(Table 3)*. The results showed that there was no significant difference between women and men (p>0.05). The total score of patients older than 40 years developed significantly more than those under 40 years (p<0.001). Also, the development of widows (p<0.02) and residents of county seats (p<0.02) was significantly higher. In contrast patients with university degrees improved less (p=0,02).

Sex	**Mean change *(point)***	**Mean change *(%)***			
Male *n(pre)=368* *n(post-intervention)=362*	+2.02	+8.42			
Female *n(pre-intervention)=502* *n(post-intervention)=467*	+2.10	+8.75			
p>0.05					
Age	**Mean change *(point)***	**Mean change *(%)***	**Marital status**	**Mean change (point)**	**Mean change (%)**
18-25 years *n(pre-intervention)=106* *n(post-intervention)=105*	+1.39	+5.79	Other *n(pre-intervention)=21* *n(post-intervention)=15*	+1.93	+8.04
26-40 years *n(pre-intervention)=228* *n(post-intervention)=213*	+1.26	+5.25	Single *n(pre-intervention)=208* *n(post-intervention)=190*	+1.71	+7.13
41-65 years *n(pre-intervention)=332* *n(post-intervention)=318*	**+2.43**	**+10.13**	Married/long-term relationship *n(pre-intervention)=475* *n(post-intervention)=473*	+1.86	+7.75
65- years *n(pre-intervention)=220* *n(post-intervention)=202*	**+2.59**	**+10.79**	**Widowed** *n(pre-intervention)=171* *n(post-intervention)=156*	**+2.84**	**+11.83**
p<0.001			*p<0.02*		
Educational attainment	**Mean change *(point)***	**Mean change *(%)***	**Type of settlement**	**Mean change *(point)***	**Mean change *(%)***

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Primary school *n(pre-intervention)=61 n(post-intervention)=69*	**+2.43**	**+10.13**	Villages *n(pre-intervention)=30 n(post-intervention)=30*	+0.97	+4.04
Vocational school *n(pre-intervention)=210 n(post-intervention)=189*	**+2.49**	**+10.38**	Other cities *n(pre-intervention)=363 n(post-intervention)=343*	+2.50	+10.42
Baccalaureate *n(pre-intervention)=301 n(post-intervention)=292*	**+2.39**	**+9.96**	**County towns** *n(pre-intervention)=86 n(post-intervention)=88*	**+3.33**	**+13.88**
University *n(pre-intervention)=303 n(post-intervention)=266*	+1.67	+6.96	Capital city *n(pre-intervention)=410 n(post-intervention)=385*	+1.67	+6.96
p=0.02			*p<0.02*		

Table 3: Change in the score for each patient subpopulation
*(**Bold**: **Subpopulation with significantly higher improvement**; n(pre-intervention): pre-intervention questionnaire data number; n(post-intervention): post-intervention questionnaire data number; data numbers (n) other than "number of patients surveyed" (see Table 1) are due to occasional deficiencies in data collection; p values were determined using Chi-square test and the Kruskal-Wallis test)*

Results of the staff questionnaire

The mean total score of the pre-intervention questionnaires was 18.61 points (SD=2.97; 74.47%) out of 25, with an average of 3.72 points per question. The results of the repeated questionnaires at the end of the project were 21.30 points (SD=2.32; 85.21%), which is 2.69 points (0.54 points per question), 10.74%, significant increase (p<0.001). Examining the individual questions, it can be stated that the mean score of all questions increased significantly by the end of the project (p<0.001), the greatest improvement was in the case of Question 4 and the least in the case of Question 1 *(Table 4).*

	Questions	Mean pre-intervention score *(point)* n=889	Mean post-intervention score *(point)* n=846	Mean change *(point)*	Mean change *(%)*	*p*
1.	How typical are you to recognize patients with low levels of health literacy?	3.96	4.35	+0.39	+7.80	<0.001
2.	How typical are you to know what communication techniques you can use to help the patient's health literacy?	3.69	4.26	+0.57	+11.40	<0.001
3.	How typical are you of communicating with your patients in plain, everyday terms (e.g. not using technical terms)?	4.02	4.50	+0.48	+9.60	<0.001

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4.	How typical are you of encouraging your patients to ask questions?	3.29	4.04	+0.75	+15.00	<0.001
5.	How typical are you to visually help your patient understand the information?	3.65	4.16	+0.51	+10.20	<0.001
TOTAL		**18.61**	**21.30**	**+2.69**	**+10.74**	**<0.001**

Table 4: Staff questionnaire results per question and total (n(pre-intervention): pre-intervention questionnaire data number; n(post-intervention): post-intervention questionnaire data number; data numbers (n) other than "the number of professionals surveyed" in the project are due to occasional deficiencies in data collection; p values were determined using variance analysis and t-tests)

In results of the statistical analysis show that the results of professionals working in the county towns or the capital improved significantly more (p<0.02; *Table 5*).

Type of settlement	Mean change *(point)*	Mean change *(%)*
Villages *n(pre-intervention)=13* *n(post-intervention)=14*	+2.29	+9.16
Other cities *n(pre-intervention)=145* *n(post-intervention)=148*	+2.71	+10.84
County towns *n(pre-intervention)=30* *n(post-intervention)=30*	**+3.23**	**+12.92**
Capital *n(pre-intervention)=143* *n(post-intervention)=135*	**+3.43**	**+13.72**
p<0.02		

Table 5: Results of staff questionnaires by settlement type ***(Bold: Subpopulation with significantly higher improvement;*** *n(pre-intervention): pre-intervention questionnaire data number; n(post-intervention): post-intervention questionnaire data number; data numbers (n) other than "the number of professionals surveyed" in the project are due to occasional deficiencies in data collection; p values were determined using Chi-square test and the Kruskal-Wallis test)*

Discussion

Nowadays, in Hungary, neither pharmacy students nor pharmacy technician students receive adequate communication training. As a result, the communication skills of drug dispensing staff working in community pharmacies do not meet the current international requirements of the field.

This phenomenon is also supported by the results of the pre-intervention questionnaires. The relatively high 74.47% mean pre-intervention score from staff questionnaires indicate that pharmacy staff does not consider their communication skills to be poor, which does not fully coincide with the results of the patient questionnaires. These results show that the communication of the staff was not that good at the beginning of the project (64.07%). There

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were gaps in all questions, especially in Question 2 (“Did the pharmacist or pharmacy technician encourage you to ask questions during the consultation?”).

This problem has already been recognized by the leadership of the Faculty of Pharmacy at Semmelweis University, which will lead to the introduction of extensive teaching in communication in the undergraduate training of pharmacists from the 2020/2021 academic year. However, the communication training of professionals currently working in community pharmacies is unresolved.

There are several methods for teaching oral communication techniques between professionals and patients in the literature,[16, 48-54] but due to the limited time and the lack of available teaching staff, a new methodology had to be introduced to effectively train a large number of professionals in a short time. With the postgraduate training methodology discussed in the article, the communication skills of 333 pharmacists and pharmacy technicians were developed in 6 months, with only 76 pharmacists participating in direct training, thanks to the presented “Train the trainer” methodology, which is an ideal solution for the communication training of a large number of professional with few available trained instructors.

The success of this method is supported by the opinion of more than 1700 patients surveyed. Examining the patient questionnaire, the results of the questions directly related to communication skills (Questions 1-4) show that the methodology introduced can make real progress in the professional application of communication techniques in a short time. By the end of the project, the staff has made the most progress in encouraging the patients to ask questions, in avoiding technical terms, and in adequately emphasizing information. The patients in the pre-intervention and post-intervention groups differed, so the development is clearly due to the methodology implemented. For Questions 5 and 6, the indirect effect of the communication techniques (on drug knowledge and sense of health) has been examined. Here, in addition to improving communication, the score is also affected by changes in the patients’ condition. As the patients completing the pre-intervention and post-intervention questionnaires differed, we could not detect the change of the latter factor with this methodology, which is why these changes were smaller. To make greater improvement on these issues longer-term and broader adoption is needed. The results show that pharmacy workers have to pay particular attention to the quality of communication with patients over 40 (this includes most of the widows) and/or lower qualification.

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These results are consistent with the results of the staff questionnaire. As mentioned earlier, pharmacists and pharmacy technicians did not consider their communication skills to be poor. However, after the project, the professionals saw their abilities even better. Looking at the pre-intervention and post-intervention responses to each question it can be stated that initially, the pharmacy staff rarely encouraged the patients to ask questions (Question 4), but by the end of the project, the staff had been able to improve in this, the knowledge and application of communication techniques. This is one of the most essential steps for the patient to actively participate in his/her therapy, which is the basis for collaboration and proper patient adherence. In contrast, training has barely improved the recognition of patients with poor health literacy. The higher development of colleagues working in the capital or county towns may be due to that professionals were trying to spend more time with patients than they did before the project, as pharmacies at these types of settlements generally meet many patients daily, which can make it challenging to provide all the important information due to the lack of time.

The results of the methodology introduced and examined by this study are unique in Hungary. The design and implementation of the project was not an easy task, as it had to adapt to the overload of pharmacists and pharmacy technicians. The aim was to make the methodology compatible with everyday work, due to which there are methodological limitations and shortcomings of the presented study (no randomization was used, self-developed questionnaires, lack of differentiation between pharmacists and pharmacy technicians), which will be eliminated in the future based on experience. The results and conclusions drawn in the present study provide a comprehensive picture of the necessary introduction of the development of pharmacist communication training in Hungary and the importance and usefulness of the wide-ranging introduction of the pharmacy communication methodology.

Conclusions

It can be stated that the presented methodology can be used to develop the communication skills of a large number of professionals in a short time, using a small number of instructors, so it is worthwhile to introduce this methodology as part of compulsory postgraduate training. However, it is even more important to introduce the teaching of communication skills in undergraduate pharmacy training to meet the challenges posed by international trends.

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Author Contributions

ASz: formal analysis, investigation, writing - original draft, visualization. OS: conceptualization, methodology, validation, writing - review & editing, project administration. AM: formal analysis. KSZP: investigation, project administration. RZ: writing - review & editing, supervision. BH: conceptualization, supervision.

Data sharing statement

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Data are available upon reasonable request from the corresponding author.

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Figures

Figure 1: The flowchart of the project

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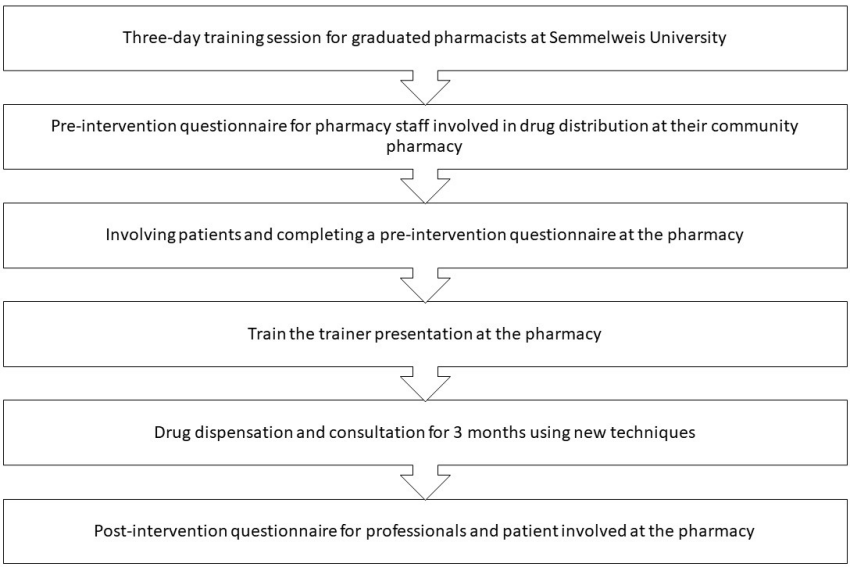

Figure 1: The flowchart of the project

338x190mm (96 x 96 DPI)

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Annex 1: Communication checklist – text summary (English transcription)

HEALTH LITERACY COMMUNICATION - CHECKLIST

Use simple language.

- Avoid technical terms, use their common synonyms.
- If you still need to use a term, explain the meaning.

Highlight the most important information.

- *Verbally: use emotional accentuation (e.g. "It's very important to know that ...").*
- *Writing: use underlining or colored text in the medication box or the patient leaflet.*

When describing the dosage of medications, give the total daily amount divided into periods of the day.

- For example: "Take two pills daily: one in the morning and one in the evening."
  Avoid the wording: "This medicine should be taken in 2x1 doses."

Give only the most necessary information verbally.

- The capacity of short-term memory is limited, so you should not have more than four verbal messages in one conversation.

Recommend a written leaflet or website.

- Provide a leaflet with more information about the disease and the therapy.
- Ask if the patient has internet access and if so, give them a list of professionally credible websites that can be recommended to them.

Offer your help in the preparation of the medicine.

- If the medicine (e.g. a suspension) is to be prepared by the patient him/herself, offer your help, and prepare it prepared in the pharmacy.

Show the patient how to use the purchased equipment.

- If the patient buys a device (e.g. blood pressure monitor, blood glucose meter, inhaler, etc.), offer to show their use.

Encourage the patient to ask questions.

- For example: "If you have any questions about this medicine, I would be happy to answer them."
  Avoid the "Do you have a question?" wording, because the answer is usually denial.

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Annex 2: „ Ask your pharmacist!" *poster – text summary (English transcription)*

ASK YOUR PHARMACIST!

To use your medication successfully, it is important that you know the answers to the following questions:

- What is the name of the medicine and what does it do?
- How often and how much should I take?
- When, how, and under what circumstances should I take it? Do I have to take it with or without food?
- Are there any foods or beverages (alcoholic beverages) to avoid while taking?
- How do I feel if the drug works and how if not?
- How long should I take? Can I quit earlier if I am better?
- What are the most common side effects? What should I do if I experience side effects?
- What should I do if I forget to take it once or more?
- Can I take other medicines at the same time?
- Is there an over-the-counter medicine that I cannot take with this medicine?
- Can I drive a car? Can I sunbathe while taking medication?
- Does the effect of my medicine change if I use it constantly?
- What happens if I do not use the medicine?
- How should I store my medicine?

Always tell your doctor or pharmacist:

- About prescription and over-the-counter medicines, you take.
- Allergies, side effects associated with your medication.
- If you are pregnant or breast-feeding.

If you have any problems with your current medication (cannot take your medication properly).

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Annex 3: „Ask your pharmacist!"- patient information leaflet – text summary (English transcription)

Ask your pharmacist!

In some cases, even the simplest medication can be more complicated than you think, since you need a lot of knowledge to use your medicines safely and effectively. For example, there are some drugs that you should take with food while others before or after a meal. Some of them may make us sleepy, while others may make us very lively. Drinking coffee, alcohol and certain foods or even smoking can affect the way medicines work. Some medications have certain side effects, which may be troublesome but not a problem, while in other cases it is important to inform health care professionals.

We need medications in many cases. Based on a medical recommendation, we buy a prescription or non-prescription product at a pharmacy. In order for drugs to achieve their desired effect, we need to be informed about them. The following detailed information applies to all prescription and over-the-counter drugs. However, they do not replace the essential individual guides for each medicine. To know these, **ask your pharmacist** (who has the appropriate knowledge and electronic database) with confidence.

What you need to know about medicines…

Before you start to take your medicine, always tell your doctor or pharmacist about:

- Your prescription and over-the-counter medicines.
- Allergies and side effects associated with medications.
- If you are pregnant or breast-feeding.
- If you have any problems with your current medication (cannot take your medications properly)

If you are not able to answer the following questions about your medications, ask your pharmacist for help, as this knowledge is needed in order for your therapy to work best.

- What is the name of the medicine and what does it do?
- How often and how much should I take?
- When, how, and under what circumstances should I take it? Do I have to take it with or without food?
- Are there any foods or beverages (alcoholic beverages) to avoid while taking?
- How do I feel if the drug works and how if not?
- How long should I take? Can I quit earlier if I am better?
- What are the most common side effects? What should I do if I experience side effects?
- What should I do if I forget to take it once or more?
- Can I take other medicines at the same time?
- Is there an over-the-counter medicine that I cannot take with this medicine?
- Can I drive a car? Can I sunbathe while taking medication?
- Does the effect of my medicine change if I use it constantly?
- What happens if I do not use the medicine?
- How should I store my medicine?

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Always keep an up-to-date list of your prescription and over-the-counter medications, strengths, and doses. Indicate your drug allergies, if you have any. Always show this card to your doctor or pharmacist to help prevent potential interactions and medication with the same active ingredient.

Always keep the following in mind when storing your medication:

- Keep your medication in one place.
- Keep your drugs out of the reach and sight of children.
- Keep your medicine in its original packaging. Except for the daily dose boxes, do not put more than one medicine in one container.
- Store your medication in a dry room at room temperature (15-25 ° C) unless otherwise stated. The kitchen or bathroom is not a good place because of the high humidity.
- Keep your medication away from heat and direct sunlight.
- Never leave your medication in the car.
- If you need to keep your medicine in the refrigerator, always keep it away from food and keep liquids from freezing.
- Keep an eye on the expiry date of your medicines. Deliver the expired product to the pharmacy.

What should you know about side effects?

Some medicines can have unwanted effects, called side effects In case of side effects, consult a health care professional. Therefore, it is important for you to know what side effects your medications may have and what to do if you notice them. If you notice any unexpected side effects, tell your doctor or pharmacist.

Further important information about medication…

- To take your medicine safely, never take it in places where your eyesight is poor. Always read the name of the medicine and check the expiry date.
- If you are having trouble unpacking your drug, please inform your pharmacist.
- Tell your pharmacist if you have a problem taking your medicine or using the medication delivery device.
- Never give your prescribed medicine to anyone else, because they are assigned to your health problem that is not necessarily the same as the other person's therapy.
- Never take any medicine that you cannot identify or may not have the correct quality (cloudy solution, discolored tablets, etc.). Ask your pharmacist for help.
- Never wait until the last piece of medication has been used. Ask your doctor for an appointment on time.

Remember, to get the best results from your medicines, you need to use them correctly.

Feel free to ask your pharmacist.

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Annex 4: Patient questionnaire (the number next to each answer represents the point value of the given answer; this was not indicated in the patient questionnaire) (English transcription)

	PHARMACY QUESTIONNAIRE FOR PATIENTS				Date: (day) (month) 2017.	
	The purpose of completing this questionnaire is to survey all pharmacy services that help patients achieve more effective and safer drug therapy.					
	Please circle your answer!					
	Sex	Male	Female			
	Age	18-25	26-40	41-65	65 -	
	Marital status	Single	Married/long-term relationship	Widowed	Other	
	Education attainment	Primary school	Vocational school	Baccalaureate	University	
	Type of settlement	Village	Other city	County town	Capital	
1	**Did the pharmacist or pharmacy technician use complicated terms or expressions during the consultation?**	Yes (1)	No (4)	I don't know (0)		
2	**Did the pharmacist or pharmacy technician encourage you to ask questions during the consultation?**	Yes (4)	No (1)	I don't know (0)		
3	**Did your pharmacist or pharmacy technician emphasize the important information orally, with written help or graphics?**	Yes (4)	No (1)	I don't know (0)		
4	**How easy or difficult was it for you to understand the instructions given by your pharmacist or pharmacy technician on how to take/use the prescribed medication?**	Very difficult (1)	Rather difficult (2)	Rather easy (3)	Very easy (4)	I don't know (0)
5	**How much do you feel you know all the important information about your medicines?**	Not at all (1)	I have a lack of knowledge (2)	I have medium knowledge (0)	I have sufficient knowledge (3)	I have all the knowledge I need (4)
6	**How do you see your state of health?**	Very good (4)	Good (3)	Acceptable (0)	Bad (2)	Very bad (1)

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Annex 5: Staff questionnaire (the number above the answers denotes the score for that answer) (English transcription)

PHARMACY QUESTIONNAIRE FOR EMPLOYEES						Date: (day) (month) 2017.
Type of settlement		Village	Other city	County town	Capital	
The purpose of completing this questionnaire is to survey all pharmacy services that help patients achieve more effective and safer drug therapy.						
	Please mark the most relevant answer with an X in the appropriate box, rate it from 1 to 5.	**1** Not at all	**2** Not typical	**3** Moderately	**4** Typical	**5** Very typical
1	**How typical are you to recognize patients with low levels of health literacy?**					For example, you know which patient group has a lower level of health literacy.
2	**How typical are you to know what communication techniques you can use to help the patient's health literacy?**					For example, what questions to ask, what words, examples to use.
3	**How typical are you of communicating with your patients in plain, everyday terms (e.g. not using technical terms)?**					For example, instead of an oral anticoagulant: "blood thinner"; instead of photosensitizing: "as long as you take the medicine, do not go to the sun" etc.
4	**How typical are you of encouraging your patients to ask questions?**					For example: "a lot of things have been discussed right now, is there anything we need to take over again?"
5	**How typical are you to visually help your patient understand the information?**					For example: circling or underlining the relevant information on the package (e.g. name of the active substance, the type of formulation, etc.), writing down the dosage on the box, or showing the use of a device.

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STROBE Statement - Establishment of a communication environment supporting low health literacy in the Hungarian community pharmacies – the introduction of a methodological recommendation – a before-after study

	Item No	Recommendation	Line No
Title and abstract	1	(*a*) Indicate the study's design with a commonly used term in the title or the abstract	24
		(*b*) Provide in the abstract an informative and balanced summary of what was done and what was found	19
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	69
Objectives	3	State specific objectives, including any prespecified hypotheses	130
Methods			
Study design	4	Present key elements of study design early in the paper	146
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	134
Participants	6	(*a*) Give the eligibility criteria, and the sources and methods of selection of participants	157
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	146
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	184/204
Bias	9	Describe any efforts to address potential sources of bias	142
Study size	10	Explain how the study size was arrived at	161
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	225
Statistical methods	12	(*a*) Describe all statistical methods, including those used to control for confounding	225
		(*b*) Describe any methods used to examine subgroups and interactions	225
		(*c*) Explain how missing data were addressed	225
		(*d*) If applicable, describe analytical methods taking account of sampling strategy	-
		(*e*) Describe any sensitivity analyses	225
Results			
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	234
		(b) Give reasons for non-participation at each stage	155
		(c) Consider use of a flow diagram	-
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	239
		(b) Indicate number of participants with missing data for each variable of	239

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		interest	
Outcome data	15*	Report numbers of outcome events or summary measures	250/280
Main results	16	(*a*) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	239
		(*b*) Report category boundaries when continuous variables were categorized	247
		(*c*) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	-
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	274/298
Discussion			
Key results	18	Summarise key results with reference to study objectives	304
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	361
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	371
Generalisability	21	Discuss the generalisability (external validity) of the study results	371
Other information			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	64

*Give information separately for exposed and unexposed groups.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at www.strobe-statement.org.

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