



Research article

Implementation of a personal health planning program and health promotion in the community pharmacies

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ARTICLE INFO

Keywords:

Prevention
Health planning
Health promotion
Community pharmacy
Pharmacists' competencies

ABSTRACT

It is well known that one of the most accessible health providers are community pharmacists; hence, their role in sanitarium programs should not be neglected. Although they were not present in the first pilot trial of the Hungarian Health Planning Application (HHPA) made by the National Healthcare Services Center, they were involved in the latter phases of the personal health planning program. The aim was the detailed assessment of the HHPA, with regard to the newly introduced online form. The HHPA is a software designed to identify health risks and help in the health planning and management of the risks. The present study was started in the 2016/2017 academic year, and the enrollment of citizens was carried out by resident pharmacists, who had received additional training on the software and primary (and tertiary) prevention. The resident pharmacists also filled two opinion survey questionnaires, one at the beginning of the study and one after the study period. Seventy-five pharmacists enrolled 594 citizens. At the 190 participants who enrolled by online application, the drop-out rate was similar to the personal way. The main four risks that were identified in the study were the risk of an inactive lifestyle (47.8%), weight problems (38.7%), risk of diabetes mellitus (26.9%), and cardiovascular risks (25.3%). About the project, the majority of the pharmacists thought that it was a useful project. Highlighted supporting factors were colleges in the pharmacies that were very encouraging; however, factors such as long risk-assessment or the non-cooperation of the other healthcare providers were discouraging. The personal health planning program is a favorable initiative for identifying health risks and determining health plans. Furthermore, the used software seems to be same effective as personal way, but more suitable in the present pandemic situation.

1. Introduction

As is well known, a healthy lifestyle leads to a better quality of life. Hence, numerous national and international programs have been published to date [1, 2]. As community pharmacies are one of the main health providers where patients can meet professionals, it is rational to utilize them far more than just for compounding of drugs, dispensing medicines, and management of drug therapies. Interventions in public health can include topics such as smoking cessation, health promotion, disease screening, and so on [3]. Moreover, these programs need time and employment; hence, to alleviate the pressure on pharmacists, well-trained assistants may participate in these programs [4].

Although numerous studies have emphasized the role of pharmacists and thereby the role of community pharmacists in public health, the

further studies are required to assess the feasibility of such programs [5, 6, 7]. For this reason, in Australia, the background of a community pharmacy-based weight management program was already examined in 2013 [8]. Barriers and gaps were also specified in the studies of the United Kingdom [3, 9].

One of the most important factors that need improvement is knowledge and skills. These barriers were identified in 2011 as well as in 2018 [3, 9]. On the other hand, the real spectrum of barriers may have theme and country specificity. For example, in a Malaysian study, the main problematic point in the expansion of public health services was inappropriate training, while factors such as financial support and the infrastructure of the computing technology were not emphasized [10]. On the contrary, in Australia, financial problems also emerged [8].

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All in all, a general agreement can be observed in the role of community pharmacies in public health, but the barriers may need national and international considerations.

To launch a national intervention with the involvement of community pharmacists, it is necessary to see through the national epidemiology of risk factors or morbidity — as low prevalence of a disease may not need a country-wide sanitarian program. For this, it should be highlighted that in Hungary, the aggregate frequency of overweight and obese people was more than 50% for both males and females [11]. Wrong dietary habits and passive lifestyle should be mentioned as two main causes of this. Furthermore, in Hungary, only 11% of adults engage in 150 min of physical activity per week, as recommended by the World Health Organization [12]. Also, the high prevalence of smoking is worrisome, because since 2015, this number has been growing despite the several programs and laws [13].

While personal health planning can be filled at home, a healthcare specialist’s contribution is not negligible for the true effectivity. It has also been demonstrated in a project funded by the European Union (TÁMOP-6.2.5-B-13/1-2014-0001). A main outcome of the funding was the Hungarian Health Planning Application (HHPA), which is a software tool for personal health planning. The application has been introduced with healthcare specialists because people frequently needed detailed

explanations regarding their questions about the health planning program or the risks. The software is available on the Internet for every Hungarian citizen who is older than 18 years. Although anyone can use it, a particular part is implemented for healthcare providers (professional module) for the management of their patients [14].

The first pilot program was launched between 30th April 2015 and 15th October 2015, with 952 medical doctors and 110 health advisors, such as nurses, dietitians, psychologists, and so on, but without the involvement of community pharmacists. In the next year, the program was expanded with pharmacists. It was incorporated to the resident training program (specialization: pharmacy management) of Semmelweis University. This means that the 68 participants were qualified pharmacists who had higher education training. After this first pilot period, the feasibility and reliability of the project were demonstrated. The quality of the coordinated personal health planning of the pharmacists was not inferior to that of the other healthcare professionals [14].

Therefore, our aim was the further assessment of the implemented personal health planning with a second, more detailed project in the community pharmacies. Accordingly, attention was paid on the ways of communication (online methods, personal speech) and the barriers and supporting factors. Namely, the study was expanded to an online form of personal health planning, which may be more exciting for the younger

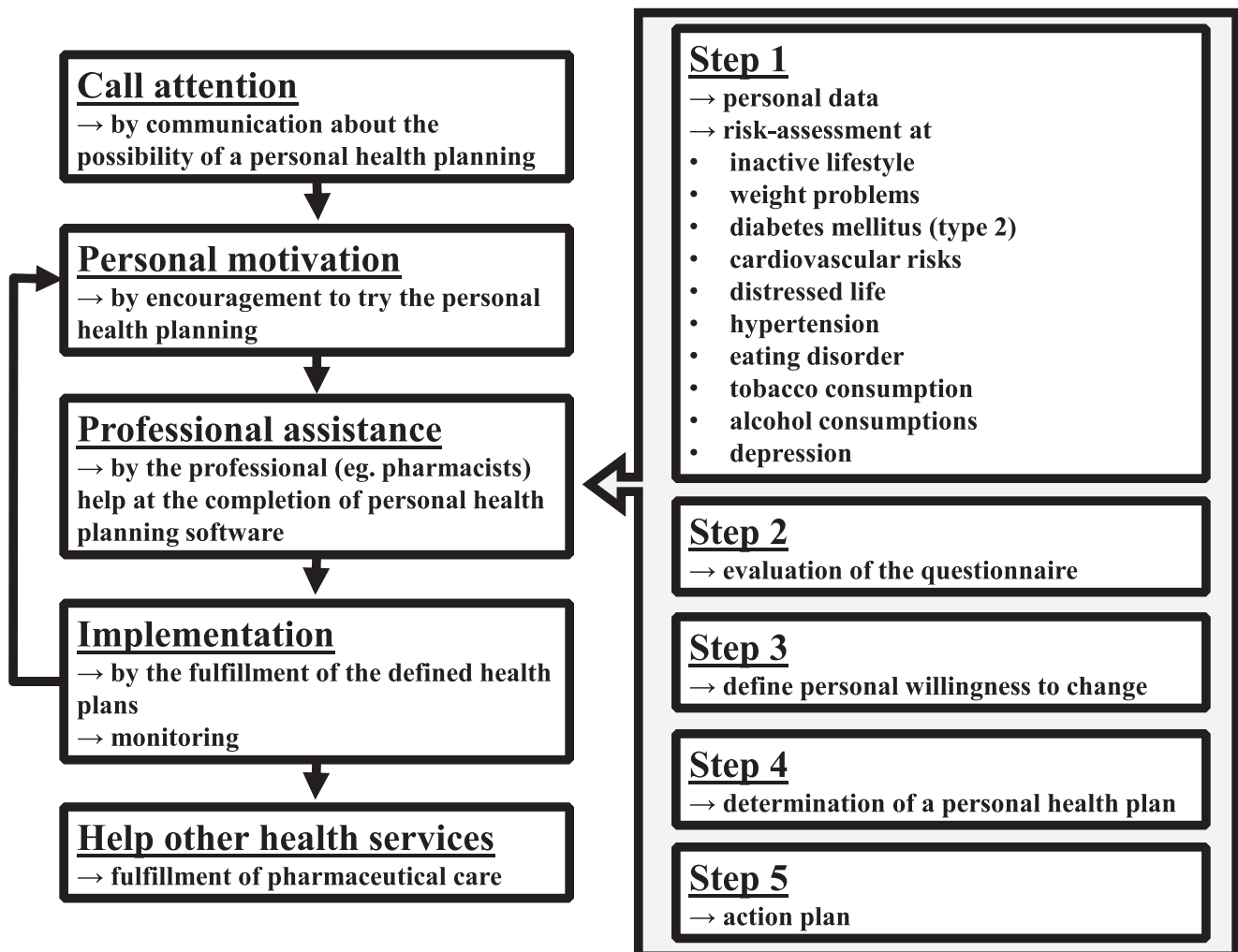


Figure 1. The protocol and schematic structure of the personal health planning. The personal health planning consists of verbal acts and steps in the software. Verbal acts are in the left-hand side oblongs. After the implementation of a health plan, there may be two further steps, as a new health plan can be made in the future or other health services are needed. In the right-hand side oblongs can be seen the schematic steps of the Hungarian Health Planning Application (HHPA). It should be mentioned that the risk category of distressed life was accumulated from risk of anxiety disorders and stressful life, because at the citizens with these problems there was a high rate of overlap, while the given advices and health plans had many similarities.

generation and more helpful in the mitigation of infections and epidemics or pandemics.

2. Material and methods

2.1. The personal health planning software

The software for personal health planning is called the Hungarian Health Planning Application (HHPA) (accessible from: <https://egterv.aek.hu/>). This program does not make a diagnosis, it only locates risks. The reason for this was that the project was designed for healthy people and was secondary to patients with well-controlled chronic diseases such as hypertension and diabetes. In these latter cases, tertiary prevention was the main goal instead of primary prevention. The protocol and risk assessment system are provided in [Figure 1](#).

In the case of our study period, the personal health planning could be made individually at home or with pharmacists in the community pharmacies. The pharmacists, like every healthcare provider, had a professional user interface, where they could track the activity of a person.

2.2. Study design

Our study was started in the 2016/2017 academic year by sending official requests to the chief of the pharmacy of every resident pharmacist to authorize the implementation of the project. Meanwhile, the National Healthcare Services Center (NHSC) provided a 6 × 45 min-long special training to supplement the residency program's regular higher education training about primary (or tertiary) prevention. Furthermore, other printed professional materials, brochures, posters, and so on were given to the pharmacists too. The age limit for participation in the personal health planning was 18 years. The goal for every pharmacist was to enroll at least five people in the pharmacies and a minimum of two more citizens in this program through an online procedure. Firstly, the assessment of a patient could be made in the community pharmacy, or online, but the monitoring of a patient was always done by the pharmacists. In the second one, people carried out their own personal health planning individually or with their pharmacist. In the online procedure, the applied devices for the connection between participants and pharmacists varied in a wide range.

Maintenance and monitoring of the health planning project could be visualized by further consultations, which were also recorded. When enrollment was started in the pharmacy, anyone's health plan project was fulfilled after at least three different consultations except the first one, when the health assessment and/or the defining of health plan were made. (This means, that in this case, minimum four meetings were the requirement.) When the enrollment was made online, personal meetings were not required, but at least two more consultations were needed after the first one to consider that someone's risks are under control (All in all, three separate meetings were needed in any platform to regard a personal health plan as fulfilled.) These requirements were expected for those people who had no health risk, as they could also define the health plans.

The NHSC, as well as the university, provided coordinators for the project. The pharmacists were obligated to report regularly about the progression and barriers to these coordinators. The last version of these reports had to contain the basic demographic data about the citizens, their defined risk factors, and information about the follow-up in a pre-determined form. An evaluation of the project was also required.

Furthermore, two opinion surveys with only close-ended questions were asked from the resident pharmacists to assess the feasibility of the project. The first one was about the early evaluation of the project. At the beginning, as it can be seen in the questionnaire in [Table 1](#), questions were about cooperation with the other workers of the pharmacy. We used a cumulative number called the early cooperative index to describe whether it was easy or difficult to implement the practice to the life of the

Table 1. Early evaluation of the project.

Question number	Questions	Answers
S1	Have you managed to cooperate with the chief pharmacist at the starting of the project?	YES/NO
S2	Have you managed to cooperate with the colleges at the starting of the project?	YES/NO
S3	Have you get enough help from the project coordinators to the starting of the project?	YES/NO
S4	Have you managed to create an appropriate environment for the pharmaceutical counseling?	YES/NO
S5	Have you received any further support from the chief pharmacist to help you start the project (eg. help with sub-processes, financial support, use of equipment, etc.)?	YES/NO

pharmacy. In the range from 0 to 5, high values meant better cooperation with coworkers.

At the end of the study period, a more general information was available about the implementation of the project ([Table 2](#)). For that, in this case, only four questions were concerned with cooperation in the pharmacy (E1, E2, E3, and E4), which means that 4 was the maximum of the final cooperative index. As the same kind of cooperation was measured in the starting questionnaires S1 and S2 and the final questionnaires E2 and E3, respectively, we statistically analyzed the relationship. Details of mathematical analysis are written down latter at "Statistical analysis". Otherwise, we also asked about the cooperation with other healthcare providers. Questions were concerned with citizens who also needed further medical, pharmaceutical, or other professional care.

Although the HHPA tool does not need measured parameters, it can direct one's attention to them. Therefore, we asked whether the pharmacist needed to measure blood pressure or blood glucose because of the risk assessment. Another cumulative number, namely the index of pharmaceutical care, was used to measure whether the risk assessment needed further pharmaceutical care (E7, E8, and E9).

Table 2. Final evaluation of the project.

Number of question	Question	Answer
E1	Did you usually have enough time to complete the project within the opening hours of the pharmacy?	YES/NO
E2	Did you manage to cooperate with the chief pharmacist during the implementation of the project?	YES/NO
E3	Did you manage to cooperate with the colleges during the implementation of the project?	YES/NO
E4	Did you manage to cooperate with the other healthcare providers (eg.: family doctor, dietitian, personal trainer, etc.) during the implementation of the project?	YES/NO
E5	Had you ever had to refer a participant to a medic because of the risks you recognized during counseling (during the implementation of the project)?	YES/NO
E6	Had you ever had to refer a participant to another healthcare provider (not medic) because of the risks you recognized during counseling (during the implementation of the project)?	YES/NO
E7	During the consultations, did you have any questions specifically related to pharmaceutical care (eg. dietary supplements, OTC-s or even prescription drugs)?	YES/NO
E8	Had you measured blood pressure to a participant during the implementation of the project?	YES/NO
E9	Had you measured blood sugar to a participant during the implementation of the project?	YES/NO
E10	All in all, do you think, the project is useful?	YES/NO

At the end of the questionnaire, we paid attention to what was the overall opinion about the project.

Furthermore, we wanted to study whether there were differences between the features of the enrolled citizens that could be explained by the attitudes of the pharmacists. For these analyses, we used pooled values of the main outcomes, namely the health goals and the number of consultations organized between 1st March 2017 and 31st August 2017. Pooling was carried out by pharmacists.

The survey complied with the Hungarian legal requirements (the pharmacy service was completely free and non-invasive). It was also carried out with the assistance and professional supervision of the NHSC. As GDPR decree was not yet enacted, verbal informed consents were obtained in each case from all participants in the pharmacies. Written consents were not required according to the Act CLIV of 1997 (non-invasive pharmacy service and questionnaire survey). 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. For the processing of the results, the collected data were forwarded to the authors without any personal data. The personal and health records of the patients included in the study were kept anonymous. The study was in accordance with the Declaration of Helsinki, informed consent was always obtained from participants [15, 16, 17, 18, 19].

2.3. Statistical analysis

Statistical analysis was performed using Microsoft Office Excel 2003 (Microsoft Corp, Redmond, USA) and SPSS version 25 (IBM, Armonk, USA) programs.

As our main task was to assess the properties of persons, who can be enrolled to such sanitarian programs, we generally used descriptive statistics, like numbers of participants with corresponding percentages, and 95% confidence intervals.

On the other hand, in a few cases we wanted to assess whether there are marked differences in the people who may participate in such sanitarian program.

It is noteworthy that the starting and ending parameters may highly differ from each others, so in the cooperative indices which measure equivalent questions (S1 vs. E2 and S2 vs. E3) we performed Fisher's Exact test.

At the end we wanted to see, if there is any sign of difference by the cooperative parameters of a pharmacy in the participants' willingness to change. Therefore, health goals and the number of consultations were assessed by the cumulative cooperative parameters. We used Kruskal-Wallis ANOVA for the assessment.

As we mentioned before, the core aim was rather an objective description about the characteristics of enrollable participants to further improve health-planning programs, hence we needed high sensitivity, therefore we used the conventional significance level of 0.05.

3. Results

3.1. Results from the personal health planning program

In this study, 75 resident pharmacists participated, who enrolled 594 citizens. The mean age of these citizens (\pm standard deviation) was 35.97 (\pm 11.55) years. Predominantly women were enrolled into the project; the number of females assessed was almost two-fold higher than that of men, as it can be observed from Table 3. Citizens were also categorized based on education. Basic education meant that a person had fulfilled only the elementary school or less. Among those who started the personal health planning program, only 1% had basic education. Fulfillment of a technical school or grammar school was medium and an academic degree meant higher-level education. More than half of the citizens (54%) had

Table 3. Basic demographic data about the participants.

	Internet-based enrollment	Enrollment in the pharmacy	Total
age	(mean \pm SD; year)		
missing (N (%))	34.0 \pm 9.7	36.8 \pm 12.7	36.0 \pm 11,6
	23 (92.0)	2 (8.0)	25 (4.2)
sex	(N%)		
females	123 (32.5)	256 (67,5)	379 (63.8)
males	62 (30.0)	145 (70.0)	207 (34.8)
missing	0 (0)	1 (12.5)	8 (1.3)
education	(N (%))		
basic	0 (0)	6 (100)	6 (1.0)
medium	56 (24.7)	171 (75.3)	227 (38.2)
higher	106 (33.1)	214 (66.9)	320 (53.9)
missing	2 (4,9)	5 (12.2)	41 (6.9)

higher-level education, while 38% had medium-level education in our study.

Two types of enrollment, described in the study design, were performed. As the minimum objective was to involve 5 people in the pharmacy and 2 more in an online way, it is not surprising that from the 594 citizens who were advised to take part in the study, 404 persons (68%) were enrolled in the pharmacies and 190 persons (32%) were registered online.

From the group of 404 individuals, 265 (66%) were assessed in the pharmacy (evaluation of the questionnaire of the HHPA) and 122 (30%) were evaluated online (evaluation of the questionnaire of the HHPA). Furthermore, a person made one part of the assessment in the pharmacy and the other part online. In 16 (4%) cases, the pharmacists were not given exact information about the manner of health assessment, but all further consultations took place in person in the pharmacies.

By the 190 people who enrolled and made their assessment online completely in the study, 10 types of connection were listed that were used to communicate with their pharmacists (Table 4). One participant may name more ways of communication. It follows that generally every fifth person used more than one way of communication. The most important manner of consultation was through e-mail, but softwares with

Table 4. Communication forms.

	Communication forms	N (%)
Internet-based (or Internet-based cellphone application)	Email	67 (28.5)
	Messenger™	49 (20.9)
	Facebook™	30 (12.8)
	Skype™	10 (4.3)
	Viber™	5 (2.1)
	Unspecified chat surface	2 (0.9)
	Unspecified online surface	2 (0.9)
Telephone based	cellphone/phone	21 (8.9)
	sms	1 (0.4)
Other	personal contact	2 (0.9)
No data		46 (19.6)
Total		235 (100.0)

Caption: The table shows the utilized types of communication between participants and pharmacists when participants were enrolled online (190 persons). Some participants used more than one way of communication.

chat functions were also highly utilized. However, it is hard to distinguish whether people preferred talking with their pharmacist or use only the chat function. Nevertheless, the only telephone-based communication was less than 10%. As expected, only a few individuals used personal contact.

In the characteristics of enrollment, we have seen, that remarkable younger generation people were retracted by the online way. Namely, in the online enrollment mean age was 34.0 (95% CI.: 32.5; 35.5) while in the group of those, who enrolled in the pharmacy was 36.8 (95% CI.: 35.6; 38.0).

After the risk assessment (questionnaire of the HHPA), the HHPA software determined the health risks. All in all, 1331 risks were identified in the 594 citizens (Table 5). Therefore, at least two problematic points could have been identified in one participant.

Although a high prevalence of risks was detected, only 539 health goals were identified, which indicates that in less than half of them a health plan was identified to tackle the problem. We found it favorable that people who had more risks defined visibly more health goals, what can be seen in Table 6. On the other hand, as has been mentioned, there is a discrepancy between the number of health risks and the number of health goals. For instance, while the maximum of risks was 7, none of these individuals described more than 3 goals during the whole project period. Meanwhile, some of those people, who had no health risks, also defined a few health plans to maintain their healthy status.

However, declaring health goals are the first step to a healthier life, and the second is the undertaking and maintenance of the change. In our study, 1570 consultations were organized in the period between 1st March 2017 and 31st August 2017 and in 426 out of 594 citizens, whose health assessment reports fulfilled the minimum requirements of the follow-up. In the context of age, it seems that those who have fulfilled the requirements may be younger (mean (95% CI): 35.5 (34.4; 36.6)) versus the non-compliant participants seem to be a bit older (mean (95% CI): 37.4 (35.4; 39.3)). There was no remarkable difference between the type of enrollment, as the drop-out rate was 29% in the online way and 28% in the personal way. However, differences between sexes can have critical role on the drop-out rate. Although the number of women enrolled in the study was two times that of men, their drop-out rate had similar distribution. The percentage of women who did not achieve the minimum meeting numbers was 34%, while this percentage was only 18% in men.

3.2. Results of the questionnaires about the implementation

For the early cooperative index, the lowest value was two, and it has been indicated by only 2 of the 72 participants who filled this part of the questionnaire. The highest value was 5, which has been indicated by 37 pharmacists. The mean value was 4.34, which means that the coworkers and the chief pharmacists were mainly tried to help in the implementation of the personal health planning program.

Table 5. Identified risk factors.

Measured risks	N (%)
risk of inactive lifestyle	284 (47.8)
weight problems	230 (38.7)
risk of diabetes mellitus (type 2)	160 (26.9)
cardiovascular risks	150 (25.3)
risk of distressed life	137 (23.1)
risk of hypertension	99 (16.7)
risk of an eating disorder	82 (13.8)
problems with tobacco consumption	78 (13.1)
problems with alcohol consumptions	60 (10.1)
risk of depression	51 (8.6)
no risk	28 (4.7)

Table 6. Number of health risks versus defined health goals and the distribution of the participants.

Risks (N)	Health goals (N)				
	0	1	2	3	4
0	1	6	8	13	0
1	0	53	26	25	4
2	1	15	75	51	0
3	0	19	38	95	1
4	1	5	14	54	0
5	0	2	4	22	0
6	1	0	1	0	0
7	0	0	1	3	0

Captions: The table shows the number of participants in the view of the health goals and health risks. The highest number of patients defined 3 health goals because of 3 health risks. Obviously, patients who had fewer health risks defined fewer health goals. Patients, who had more health risks typically not defined as much goals as many risks they had.

At the end, the lowest value of the final cooperative index was 1, and it has been indicated in 4 pharmacies. The highest value achieved was again the maximum (highest value was 4), but among the 51 pharmacists who filled this part of the questionnaire, only 12 pharmacists have indicated it. The mean of the final cooperative index was 3.02, which indicates a more pronounced decrease in the marker of the cooperation than was expected because of the lower number of questions. On the other hand, the 21 missing data are also suggestive of the problems that arise in the implementation of this program.

For the same kind of questions in the two questionnaires, no significant difference has been detected ($p_{S1 \text{ vs } E2} = 1.00$; $p_{S2 \text{ vs } E3} = 1.00$). On the other hand, the time that pharmacists could spend on the assessment of a citizen in the pharmacy (question E1) was negative in 34% and the cooperation with other healthcare providers (question E4) was negative in 61%.

We studied whether pharmacists advised people to see a doctor or other healthcare providers, because of the risks, which was revealed at the personal health planning assay. We observed that 39% of the participants who filled these parts of the questionnaire noticed symptoms that needed medical attention, and 48% of the participants met at least one individual who needed other kinds of healthcare services.

The index of pharmaceutical care was used to determine whether the risks assessment needed further pharmaceutical care (E7, E8, and E9). The maximum value was 3 and the mean value was 2.38; hence, in most cases, at least two more pharmaceutical services were utilized.

The usefulness of the program was also questioned. Only 2 out of the 52 pharmacists believed that it was useless, whereas the other 50 (96%) thought that the implementation of the program was beneficial. This indicates that the vast majority of the pharmacists believed that the personal health planning program was valuable.

In the assessment of the features of the enrolled citizens and the attitudes of the pharmacists, no significant differences were found ($p_{\text{mean}} \text{ health goals by early cooperative index} = 0.426$; $p_{\text{mean}} \text{ number of consultations by early cooperative index} = 0.194$; $p_{\text{mean}} \text{ health goals by final cooperative index} = 0.845$; $p_{\text{mean}} \text{ number of consultations by final cooperative index} = 0.534$). As only two pharmacists believed that the project was not useful, further mathematical assessment could not be carried out. Otherwise, it should be mentioned that 2.23 (± 0.68) was the mean (\pm standard deviation) of the pooled number of goals for those who believed that the project was not useful, and 2.30 (± 0.51) was the same value for those who believed it was useful. The difference was also negligible for the pooled number of consultations, and the mean (\pm standard deviation) values were 2.50 (± 0.71) and 2.82 (± 0.78) in the two above-mentioned groups, respectively.

4. Discussion

In our study we performed a national sanitarian program that main purpose was to prevent noncommunicable diseases. The applied HHPA program is a risk assessment tool, which can be used by healthcare professionals and other citizens too. While the online software is freely available for every Hungarian adult (age >18 years), healthcare providers' help might be required for risk assessment and health planning. Furthermore, the monitoring may be also beneficial in the maintenance of these changes by an independent healthcare provider. For this, our observations can guide many other nations regarding the barriers and supporting factors for a risk lowering program.

Although it is well known that one of the most utilized healthcare providers are pharmacies, their role in medical programs had been underestimated previously. Not to mention, during the first pilot period of the HHPA program, pharmacists were not enrolled. However, in later periods, pharmacists did not have negligible role. For example, in the second pilot period, graduate pharmacists, who had a higher education, also participated.

In this study, we wanted to show the results from another study period, in the same design but with more attention to barriers and encouraging factors. On the other hand, some limitations should be highlighted. First, the enrolled citizens were mainly from the younger generation; their mean age did not exceed 35 years (against the typical age of patients in the community pharmacies). Another important limitation was the unknown health status, as the software was designed originally for healthy people and was not useful for making a diagnosis. Meanwhile, some people needed further medical assessment or some already had well-controlled diseases and so the healthier way of life was not only defined with the HHPA software, but with other healthcare providers. Not to mention the relatively long time needed for the health assessment, with additional documentation, which was highlighted by more than one-third of the participating pharmacists.

Despite the limitations, the results obtained are intriguing. Most importantly, it was observed that pharmacists are capable of such sanitarian projects, especially if it is a part of a residency program, when they can earn a special license. Unsurprisingly, these programs need further training too, for instance, about the software, the assessed risks, and communication skills. On the other hand, a supportive environment can be developed in pharmacies, which may encourage the participants from the beginning as well as in the maintaining period. As the data show, the attitude of the coworkers and chief pharmacist was similar, while the time that pharmacists could spend on the assessment of people was more problematic. Sadly, more than half of the pharmacists reported that other healthcare providers were not much cooperative. This is in good agreement with the results reported by Kelly et al. (2013) [20]. In our case, the problematic point could be the higher proactivity in the search for health risks, but this should not be confused with making diagnoses. So, it must be emphasized that while healthy people were the target population, a significant percentage of pharmacists had to send the citizens to a medic or another healthcare professional, because of the known differences between the competencies.

It should also be highlighted that pharmaceutical knowledge can be demonstrated for non-professionals too. In our case, utilization of further pharmaceutical advice and measurement of blood pressure and blood glucose were reported in many cases.

As can be observed from the results, the majority of the pharmacists believed that the personal health planning program was valuable. Since pharmacists thought it was a useful project, some refinement would be necessary. The most important point is the noticeably long assessment, which can be a burden for both the pharmacist and the citizen. This may be alleviated by the shortening of the survey. Our research team concluded that only the four most important risk factors should be assessed, while the other factors could be omitted. In this study, the risk of an inactive lifestyle, weight problems, risk of diabetes, and risk of cardiovascular disease had the greatest prevalence. It should also be

mentioned that at least a quarter of the participants in this study and in the pilot study conducted in 2016 were affected by these factors. This can shift the attention to another bias factor that although another national survey found that more than 20% of the Hungarian adults smoke, in our study, only 13% had problems due to tobacco use. It can be explained that those who are enrolled for such an assessment may have another attributions than the national features. For instance, in our case, the first four risks were the same in 2017 as in 2016.

Although only 594 patients were enrolled by 75 pharmacists, by considering the further consultations, it is obvious that more than two thousand meetings occurred. Most of them took place in the pharmacies, but with 190 individuals, an online-based health assessment and health planning was carried out, which seems more feasible for the younger generation. It may have further significance in the current pandemic case, not to mention that COVID-19 appears have increased negative clinical outcomes with obese patients [21, 22].

The follow-up was also resolvable, but pharmacists needed a wide spectrum of devices and software (with accounts) for this. For these citizens, the most important way of communication was the e-mail, but many programs with chat functions were also highly utilized. Implicitly, for online health planning, a widespread background of software can be suggested.

Differences between sexes should be also mentioned. Although the number of women enrolled was almost two times that of men, the dropout rate was also remarkably higher in women. This means that females may be more likely to choose a healthier lifestyle, but they may need special attention and more encouragement in the maintaining period.

The personal health assessment is truly just the beginning of a healthier life. For this, as Lonie et al. (2017) described, people may need "health coaches", who can be their pharmacist [23]. On the other hand, monitoring of health plans, encouragement, and additional assistance are needed for achieving the health goals, which requires a significant amount of time, organized background, and trained health professionals. We believe that in our study, pharmacists received a good training for the project, and so, further factors could have been revealed, which may provide a basis for national and international sanitarian programs.

5. Conclusion

The personal health planning program is a favorable initiative for identifying risks and determining health plans. It has been revealed that health coaching by this tool after a detailed training is feasible. On the other hand, the barriers and supporting factors were revealed. Some of the pharmacists identified that the personal health planning program is time consuming. To overcome this concern, the program should be shortened to include the most important four risks: risk of an inactive lifestyle, diabetes, cardiovascular disease, and weight problems. Another important problem could be non-cooperation of other healthcare providers. The enrollment of citizens to the personal health plan could have been made by an online procedure, which was non-inferior to the personal way. In this case, the widely used tools for communication should be mentioned. All in all, this study presents a risk-lowering sanitarian program, which seems to provide a good platform for developing pharmaceutical care services.

Declarations

Author contribution statement

Dénes Kleiner; Orsolya Somogyi; Fruzsina Hedvig Petlickij; Attiláné Meskó; András Szilvay; Romána Zelkó; Balázs Hankó: Conceived and designed the experiments; Performed the experiments; Analyzed and interpreted the data; Contributed reagents, materials, analysis tools or data; Wrote the paper.

Funding statement

This work was supported by National Healthcare Services Center (TÁMOP-6.2.5-B-13/1-2014-0001).

Data availability statement

Data included in article/supp. material/referenced in article.

Declaration of interests statement

The authors declare the following conflict of interests:

Dr. Romána Zelko is an associate editor at Heliyon (in Pharmaceutical Science, Pharmacology and Toxicology).

Petlickij Fruzsina Hedvig works at the National Healthcare Services Center.

Additional information

No additional information is available for this paper.

Acknowledgements

We would like to express our gratitude to all community pharmacies and pharmacists who assisted us with our research.

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