

## ORIGINAL ARTICLE

# Identifying the interprofessional agreement between community pharmacist's and general practitioner's views on collaborative practice in Slovakia

## Určenie zhody v názoroch lekárov a lekárníkov na ich interprofesionálnu spoluprácu na Slovensku

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### Summary

**Background:** The collaboration of community pharmacists (CPs) and general practitioners (GPs) has a positive effect on healthcare outcomes. There are still many countries, where no efforts have been made to enhance this type of teamwork. There is no evidence of how GPs and CPs collaborate in Slovakia. The objective of this study is to identify the current level of GPs and CPs teamwork in Slovakia and to identify the key factors, where these professions agree.

**Methods:** Two parallel electronic surveys were prepared and sent out by e-mail to CPs and GPs in Slovakia. The questions in the multi-choice questionnaires were divided into 6 sections: teamwork experience, attitudes to collaborative practice, preferred method of communication, preferred tasks done by CPs, anticipated areas of future collaboration and perceived barriers to collaborative practice. The results were analyzed separately by the proportion of agreements within each group.

**Results:** From the total of 670 questionnaires, which were sent out (434 to GPs and 236 to CPs) 347 were completed and returned by GPs (79.95%) and 181 by CPs (76.7%). The overall response rate was 78.33%. The perfect match of agreements between the CPs and the

GPs answers was identified in:

1. their preference to collaborate *face-to-face* ( $p = 0.0001$ )
2. perception of the role of the community pharmacist ( $p < 0.0001$ )
3. barriers to collaboration ( $p < 0.0001$ )
4. areas for future collaboration ( $p = 0.0468$ )

The majority of respondents confirmed (without proportional agreement) that their collaboration improves patient outcomes (71.3% of CPs, 60.5% of GPs), however, only 15.5% CPs and 17.6% GPs indicated, that they would consider team-working in the future.

**Conclusion:** The responding health professionals agreed about the current role of CPs in Slovakia. Both professions reported their willingness to collaborate in the following areas: 1. patient counselling and 2. patient adherence improvement. Face-to-face communication was preferred by both groups of respondents, as a potential key factor to improve their relationships (general trust). However, in order to create a sustainable collaborative environment, the identified barriers need to be taken into account.

**Key words:** agreement • barriers • collaboration • community pharmacist • general practitioner

### Súhrn

**Úvod:** Spolupráca všeobecných lekárov pre dospelých (ďalej len lekárov) a lekárníkov verejných lekární (ďalej len lekárníkov) má priaznivý vplyv na výsledky liečby pacientov. Napriek globálnym snahám o podporu a rozšírenie tejto spolupráce je stále veľa krajín, kde ešte k takýmto aktivitám nedošlo. O stave a spôsoboch spolupráce lekárov a lekárníkov na Slovensku zatiaľ nemáme žiadne dôkazy. Cieľom tejto práce je určenie stavu spolupráce lekárov a lekárníkov na Slovensku a identifikácia kľúčových faktorov, ktoré túto spoluprácu ovplyvňujú. Na základe týchto údajov určit' zhodu medzi týmito profesiami v otázkach ich vzájomnej spolupráce.

**Metódy:** Dva paralelné dotazníky boli zostavené a elektronicky odoslané lekárom a lekárníkom na

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Slovensku. Otázky dotazníkov boli rozdelené do šiestich tém: skúsenosti so spolupracou, postoje k tímovej práci, preferované metódy komunikácie, preferovaná náplň práce lekárníkov, očakávania od budúcej spolupráce a vnímané úskalia, brániace možnej spolupráci. Výsledky boli analyzované najskôr samostatne podľa proporcionálnych súhlasov jednotlivých profesií, následne hľadaním proporcionálnej zhody medzi profesiami.

**Výsledky:** Z celkového množstva 670 rozoslaných dotazníkov (434 lekárom a 236 lekárnikom); lekári vyplnili a odoslali 347 (79,95 %) a lekárnici 181 (76,7 %). Úspešnosť odozvy dotazníkov bola 78,33 %. Ideálna zhoda v súhlasných názoroch lekárov a lekárnikov bola identifikovaná v(o):

1. preferencii spolupracovať *osobne* ( $p = 0,0001$ )
2. vnímaní pracovného zaradenia lekárnikov ( $p < 0,0001$ )
3. úskalí v vzájomnej spolupráci ( $p < 0,0001$ )
4. oblastiach ich vzájomnej spolupráce ( $p = 0,0468$ )

Väčšina respondentov potvrdila (bez proporcionálneho súhlasu) vyjadrenie, že spolupráca lekárov a lekárnikov prináša zlepšenie výsledkov liečby (71,3 % lekárnikov, 60,5 % lekárov); aj keď iba 15,5 % lekárnici a 17,6 % lekárov indikovalo, že by zväžili vzájomnú spoluprácu v budúcnosti.

**Záver:** Participujúci lekári a lekárnici vzájomne uznali súčasné postavenie lekárnikov v systéme zdravotnej starostlivosti na Slovensku. Obidve profesie indikovali vzájomnú ochotu spolupracovať v nasledovných oblastiach:

1. konzultácie pacientom lekárnikmi a 2. zlepšovanie adherencie pacientov. Osobná forma komunikácie bola preferovaná obidvoma skupinami respondentov, čo

je vnímané ako kľúčový faktor v snahe zlepšiť ich vzťahy (dôvera). Napriek tomu je v záujme vytvárania udržateľného tímového prostredia medzi týmito profesiami, potrebné brať do úvahy aj identifikované úskalia.

**Kľúčové slová:** preferencie • vnímanie • bariéry • interprofesionálne • spolupráca • všeobecný lekár pre dospelých • lekárnik

## Background

The Slovak healthcare system shows a very low degree of effectiveness and efficiency when compared to many other EU countries<sup>1</sup>. One of the causes of this situation is the poor integration of primary health care providers<sup>2</sup>. Even the “Integrative health care” has become a common term to describe teams of health care providers working together to provide patient care. However, this term has not been well-defined and likely means many different things to different people<sup>3</sup>. In order to provide strategies to solve these problems, many countries worldwide started to intensify collaboration between general practitioners and community pharmacists<sup>4–6</sup>. Despite the global growing support to extend their (CPs) role within the primary health care sector<sup>7–13</sup>, CPs in Slovakia still perform technical roles such as dispensing and compounding. The GPs are responsible for traditional medical competencies, such as diagnosing patients and prescribing medication. The majority of interactions between CPs and GPs in Slovakia is based only on solving administrative issues.

Tab. 1. Sample characteristics

Sample characteristics	Pharmacist respondents (n = 181), n (%)	Pharmacist respondents (n = 347), n (%)
Male	43 (23.8)	120 (34.6)
Female	138 (76.2)	227 (65.4)
Age, y		
20–29	37 (20.4)	–
30–39	51 (28.2)	40 (11.5)
40–49 <sup>[11]</sup> <sub>SEP</sub>	48 (26.5)	86 (24.8)
≥ 50 <sup>[11]</sup> <sub>SEP</sub>	45 (24.9)	220 (63.4)
Number of years since graduation		
< 10 <sup>[11]</sup> <sub>SEP</sub>	60 (33.1)	14 (4.0)
10–19 <sup>[11]</sup> <sub>SEP</sub>	59 (32.6)	69 (19.9)
20–29 <sup>[11]</sup> <sub>SEP</sub>	38 (21.0)	107 (30.8)
≥ 30 <sup>[11]</sup> <sub>SEP</sub>	24 (13.3)	156 (45.0)
Community size		
Rural area (< 5,000) <sup>[11]</sup> <sub>SEP</sub>	18 (9.9)	54 (15.6)
Small town (5,000–20,000) <sup>[11]</sup> <sub>SEP</sub>	69 (38.1)	122 (35.2)
Town (20,000–100,000) <sup>[11]</sup> <sub>SEP</sub>	68 (37.6)	123 (35.4)
City (> 100,000) <sup>[11]</sup> <sub>SEP</sub>	24 (13.3)	52 (13.8)

\*Not all respondents answered each question.

The communication between healthcare professionals has been generally valued as “unethical” for many years, however the “unethicality” isn’t defined as anything more than “bad relationships”<sup>14</sup>. Each attendee classifies his or her perception as right and the perception of the other side as “wrong” or “unreliable”. In order to achieve any kind of pharmaceutical integration into the primary health care, development of caring and collaborative relationships with other health care providers is essential<sup>15–16</sup>. According to D’Amour, collaboration consists from two key elements: the construction of a collective action that addresses the complexity of client needs, and the construction of a team dynamic that integrates each professional’s perspective<sup>17</sup>. Vachon, in his research identified another 5 important themes of how to achieve these goals<sup>18</sup>. In other words, to gain knowledge about the future team members’ opinions is one of the key elements for building a sustainable collaborative environment. Information about the importance of GPs and CPs attitudes to extended collaboration was confirmed in many other studies<sup>19–26</sup>. Different perceptions by pharmacists and general practitioners concerning the pharmacist’s role could reduce the quality of their cooperation. Additionally, lack of communication and misunderstanding of roles by general medical practitioners and other members of the primary health care team has been reported to undermine the potential of the primary health care team<sup>27</sup>. Understanding local specific attitudes and barriers to collaboration, which can naturally differ from international studies or guidelines, may further optimize the delivery of primary health care services<sup>22, 23, 26</sup>. This data is essential, because attitudes (tendencies to respond in a particular way toward certain issues) affect not just the way, how our respondents think, but also, how those attitudes relate to the way the respondents will behave<sup>27</sup>. The acquired interprofessional agreements between GPs with CPs have the potential to act as cornerstones for a future collaborative working relationship<sup>28, 29</sup>. The objective of this study is to identify the current level of teamwork between GPs and CPs in Slovakia and to identify the key factors, where these professions agree. The “agreements” between CPs and GPs opinions, attitudes and perception about their future teamwork are the required essentials for collaborative practice assessment or (re)-construction. This research is based on theoretical assumption, that effective teamwork requires both “agreements”: from each profession’s as well, defined as an “interprofessional agreement” between them. However, the potential of these findings needs to be verified in clinical practice and/or patient outcomes.

## Methods

### Questionnaire choice

Literature research has been conducted to find the best suitable and validated method to use in Slovakian health care settings. The search strategy was based on research and comparison of various measuring tools for GPs and CPs attitudes testing to interprofessional collaboration. Relevant information was gained from the international databases

ScienceDirect & PubMed Central with the following keywords: “pharmacist & GP ‘collaboration’, ‘preferences’, ‘barriers’, ‘interprofessional’ and ‘teamwork’”. The ideal testing method had to fulfil the aim of the study (to map the experience, attitudes, perception, CPs competencies and perceived barriers of CPs and GPs), matching the level of the current Slovakian settings. The chosen questionnaire was prepared by *Best Practices Program, Health Canada and the Office of VP (Research), Memorial University of Newfoundland*<sup>20</sup>.

### Questionnaire adaptation

Standardized method of intercultural adaptation was applied to obtain a semantic, idiomatic, experiential and conceptual equivalence in translation to Slovak<sup>30</sup>. The adaptation consisted of three independent translations, back-translations, committee review, followed by pre-testing and examining in clinical practice. This was based on theoretical research of published work on cross-cultural adaptation<sup>31, 32</sup>. The pre-testing was conducted by 20 GPs and 20 CPs. The aim of this testing was to verify the intelligibility and proper understanding of the questions by random GPs and CPs. The issues were re-checked, amended and reviewed by the academics committee. The committee consisted of 3 academic researchers, 3 clinical GPs and 3 clinical CPs.

### Settings and participants

The final questionnaire was sent by e-mail to 670 random respondents (434 for GPs and 236 for CPs) to all regions of Slovakia on 1<sup>st</sup> of July 2015 and the results were collected by the end of August 2015. The low participation of CPs in comparison with GPs was due the fact, that the invitation mail, which was sent out before the release of this the survey been responded by twice so many GPs than CPs. The inclusion criteria to participate in this study was the active practice of GPs in general surgeries and the active practice of CPs in community pharmacies in Slovakia during the release of the survey. The completed questionnaire was returned by 347 GPs (79.95%) and 181 CPs (76.7%), which equals an overall response rate of 78.33%. The participants were repeatedly contacted by mail and by phone, until the total number of questionnaires was collected. Each participant could only fill the questionnaire once.

### Questionnaire assembly

In a constructivist approach of the physician and CP collaboration, to initiate collaborative practices, it is necessary to initially describe the current settings: the perceptions of healthcare professionals have of each other, of the skills of each other, their expectations for the patient and their interest for collaborative practice. Then the contribution of each healthcare professional should be defined in consensus to create a trustful environment<sup>33</sup>. Demographical data about sex, age, length of practice, years after graduation of the respondents were collected as well. The questionnaire was constructed with multiple choice answers with the option to mark one or more answers.

**Questionnaire sections**

The majority of the questions given to GPs and CPs were identical, focusing on:

1. The attitudes of GPs and CPs towards their collaborative practice.
2. The personal experience in teamwork.
3. Preferences in communication method.
4. Perception of the CPs role.
5. The anticipated areas of future collaboration.
6. Perceived barriers to teamwork.

**Statistical method**

The primary valuation of the answers was accomplished by descriptive statistics for each question separately and using chi-square test, followed by a pair to pair post-hoc test in order to find the equality of similar answers from both groups (reconciliation). Inter rater agreement, between individual raters and rater groups, was analysed only on the level of average responses, by means of simple linear relationship between proportions of answers<sup>34</sup>. The multitude of answers was assessed within each question using a linear fit. The validity of the overall linear model and its parameters was tested by the ANOVA method. In the case of an “ideal” agreement, non-significant (zero) linear contrast and a unit slope is expected. All statistical tests of parameters of the linear model were provided on the level of significance 0.05. The data analysis for this paper was generated using SAS Education Analytical Suite software, Version 9.3. Copyright © 2013. SAS Institute Inc. SAS and all other SAS Institute Inc. product or service names are registered trademarks or trademarks of SAS Institute Inc., Cary, NC, USA.

**Results**

**Sample characteristics**

A total of 528 respondents returned the completed questionnaire, which gives a 78.33% overall response rate. Table 1 shows the demographical data about the total number of returned questionnaires. Both groups reported similar community distribution of their practice. These results were similar to Slovakian settings, according to the Territorial breakdown of the Slovak Republic

in 2015<sup>35</sup>), which makes the results independent from the demographical point of view. Differences between the GPs and the CPs group were identified in the age distribution. The group of CPs was more homogenously spread in all age categories. The difference was confirmed in number of years since graduation as a parameter, as well. The participating CPs were more proactive in all sections of the survey than the GPs (+35.9% answers).

**Overall agreement between CP and GP groups**

The proportional agreement between answers of respondents in the CPs and GPs group was evaluated and exhibited as a good quality consensus ( $p < 0.0001$ ). The magnitude of affirmative answers regardless to the asked question was practically the same (Fig. 1).

**Attitudes of GPs and CPs towards their collaborative practice**

The majority of respondents preferred the answer that “Collaboration between pharmacists and doctors improves patient outcomes”, however the analysis of variance proved the insignificance of the model (Prob

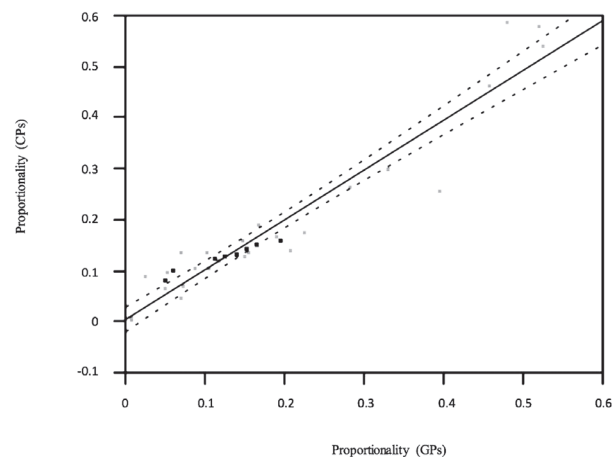


Fig. 1. Overall proportional agreement between GPs and CPs answers. Proportionality of CPs =  $-0.00012$ , Proportionality of GPs =  $+1.0006191$ ; Intercept  $p < 0.0001^*$ ; ANOVA test with  $p < 0.0001^*$  ( $n = 347$  GPs, 181 CPs)

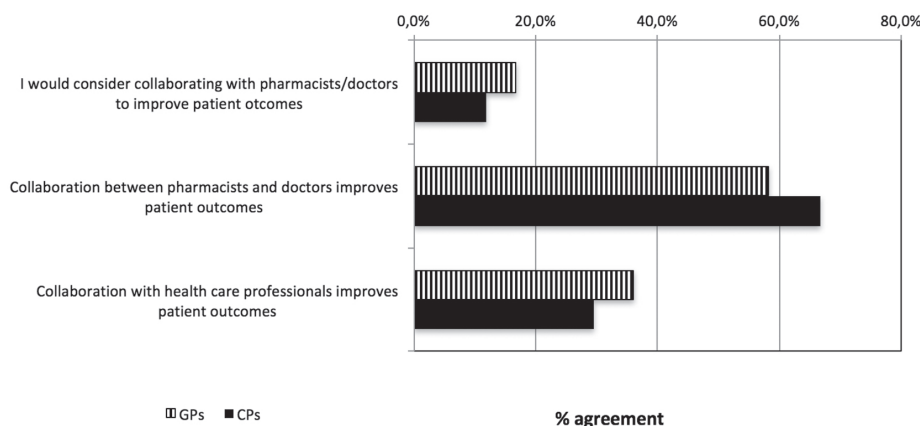


Fig. 2. Assessment of GPs and CPs attitudes of towards their collaborative practice. Proportionality of CPs =  $-0.07696$ ; Proportionality of GPs =  $+1.2309796$ ; Intercept with  $p = 0.3975$ ; ANOVA test with  $p = 0.0780$  ( $n = 347$  GPs, 181 CPs)

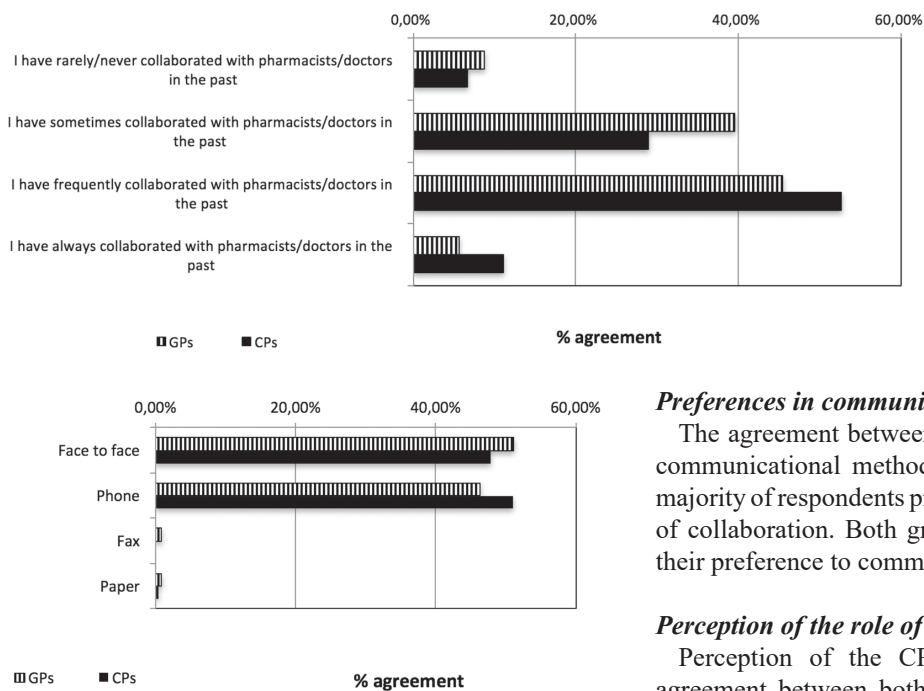


Fig. 3. Assessment of GPs and CPs experience with collaborative practice. Proportionality of CPs =  $-0.0054947$ ; Proportionality of GPs =  $+0.9778235$ . Intercept with  $p = 0.9630$ ; ANOVA test with  $p = 0.0993$

Fig. 4. Assessment of GPs and CPs preferred methods of communication for collaborative practice. Proportionality of CPs =  $-0.006485$ ; Proportionality of GPs =  $+1.0259409$ ; Intercept with  $p = 0.2294$ ; ANOVA test with  $p = 0.0001$  ( $n = 347$  GPs, 181 CPs)

$> 0.0780$ ). The proportional agreement between CPs and GPs answers was not met (Fig. 2).

### Experience with collaborative practice

No significant agreement between CPs and GPs ( $p = 0.0993$ ) was identified in their answers about teamwork experience. Even the majority of both professions declared, that they collaborate “often”, or “sometimes”. The minority of respondents indicated, that they collaborate “always” or “never” (Fig. 3).

### Preferences in communication method.

The agreement between CPs and GPs about preferred communicational method was perfect ( $p=0.0001$ ). The majority of respondents preferred the face-to-face method of collaboration. Both groups of respondents agreed in their preference to communicate over telephone (Fig. 4).

### Perception of the role of the community pharmacist

Perception of the CPs role confirmed an “ideal” agreement between both groups of respondents in the whole model ( $p < 0.0001$ ). This section had a (zero) linear contrast and an ideal unit slope with the level of significance ( $p < 0.001$ ). The majority of respondents acknowledged the importance of the current CPs roles in Slovakia. Both professions in the first line acknowledged the importance of *Assisting patients to select over-the-counter medication*. The perception of the CPs role in *Dispensing prescriptions* was identified by 62.8% GPs and 75.7% CPs. The next CPs roles acknowledged by both groups were: patient counselling and patient adherence improvement (Fig. 5).

### Areas for future teamwork improvement

Not perfect, but still significant agreement ( $p = 0.0468$ ) was detected in the areas for further collaboration between CPs and GPs. The majority of respondents would

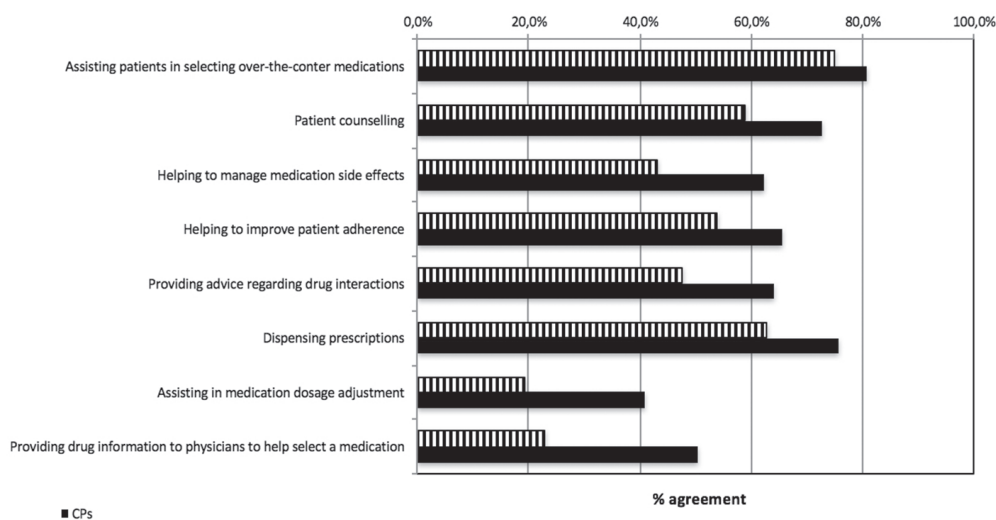


Fig. 5. Assessment of GPs and CPs perception about the role of the community pharmacist. Proportionality of CPs =  $-0.0617549$ ; Proportionality of GPs =  $+0.5058101$ ; Intercept with  $p < 0.0001$ ; ANOVA test with  $p < 0.0001$  ( $n = 347$  GPs, 181 CPs)



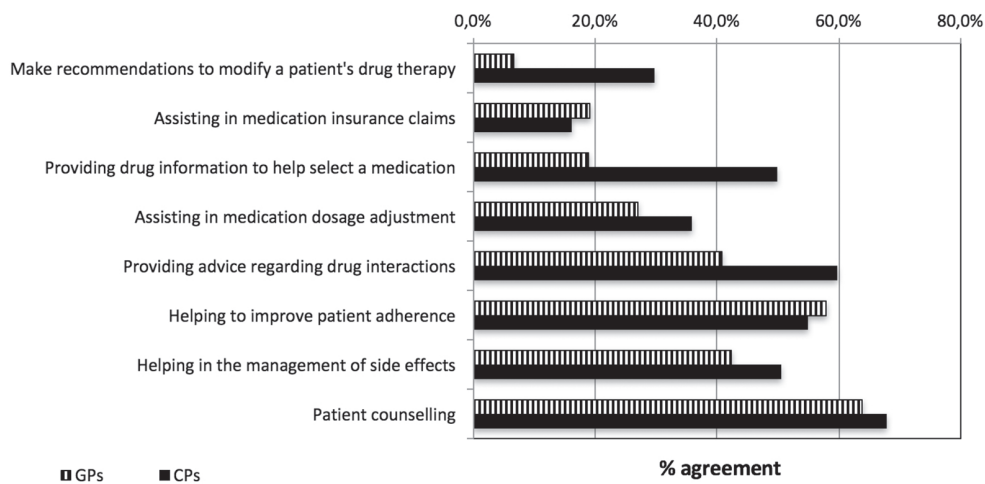


Fig. 6. Assessment of GPs and CPs perception about areas for future teamwork improvement. Proportionality of CPs =  $-0.0742356$ ; Proportionality of GPs =  $+0.4060344$ ; Intercept with  $p = 0.0180$ ; ANOVA test with  $p = 0.0468$  ( $n = 347$  GPs,  $181$  CPs)

prefer to extend their further collaboration in patient counselling and in patient adherence improvement. The highest disagreements between the CPs and GPs group was identified in traditional “doctors” responsibilities. Assisting the GPs in decisions about medication choice or medication dosage by CPs were not acknowledged by the GPs group. The highest proportional disagreement from the view of GPs, is to “make recommendations to modify the patients’ drug therapy” on behalf of the CPs (Fig. 6).

**Barriers to collaboration**

We can confirm a perfect match between answers from the GPs and CPs group in 6 out of 7 barriers to collaboration ( $p < 0.0001$ ). The only identified insignificant barrier was *Lack of face-to-face communication*. A total match in perceived barriers was declared in the following 6 out of 7 issues: 1. *fragmentation of care*, 2. *responsibility in information sharing*, 3. *patient confidentiality issues*,

4. *lack of compensation*, 5. *need to deal with multiple health care professionals* and 6. *concerns about time consumption* (Fig. 7).

**Discussion**

Several conceptual models have been developed to describe and aid understanding of the stages and characteristics of collaboration and integration between health and/or social care professionals and services<sup>36, 37</sup>, however, little attention has been given so far to compare the perceptions of the collaborative professionals, or to identify the matching points between their collaborative preferences or barriers<sup>38</sup>. The aim of this study was to identify these “agreements” in perceptions and preferences about collaborative practice between GPs and CPs. The asked questions reflect the key factors, such as *Trustworthiness* (attitudes), *Perception of usefulness* (experience) and *Role specification* (preferences and

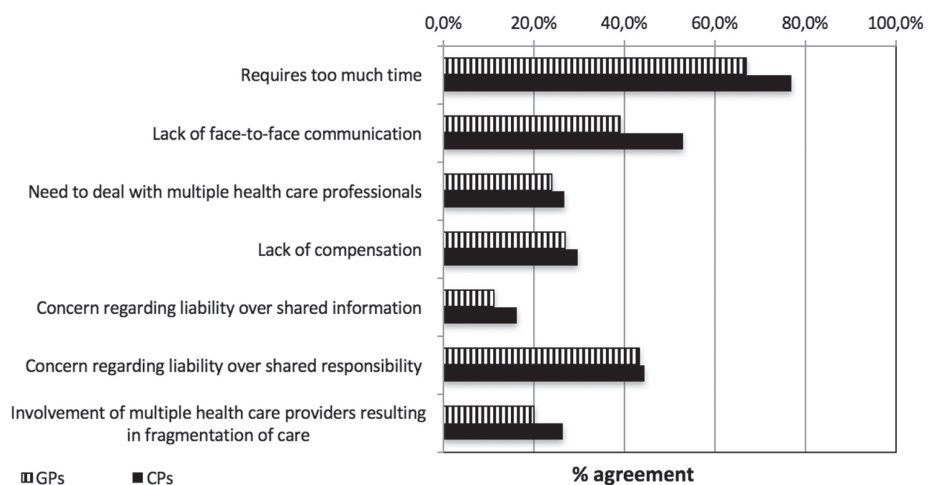


Fig. 7. Assessment of GPs and CPs perception about barriers to collaborative practice. Proportionality of CPs =  $-0.0212914$ ; Proportionality of GPs =  $+0.8511451$ ; Intercept with  $p = 0.1282$ ; ANOVA test with  $p < 0.0001$  ( $n = 347$  GPs,  $181$  Cps)

barriers), identified in previous studies<sup>8, 9, 20, 33, 39–42</sup>). The intention of our study was to identify these attributes by higher number of CPs than GPs (to reflect their representation in the clinical practice in Slovakia), but the invitation letter, which has been sent prior this survey has been returned by twice so many GPs in comparison with CPs. On the other side, we can confirm the benefit of using this invitation letter by higher response rate (78.33%) to the final survey of the participating respondents, than usual in this type of surveys. The positive attitude of CPs in this study was declared by significantly higher number of their responses in contrast with the participating GPs. The results testify an overall agreement between CPs and GPs via proportionality of affirmative answers independently on the asked question (significance of the model). More detailed outcomes showed a good interprofessional agreement at ‘Preferred methods of communication’, ‘Perception of the CPs role’, ‘Areas for further collaboration’ and in ‘Perceived barriers’. Personal form of communication was absolutely preferred by both groups. The face-to-face mechanism has been described to have a positive impact on developing a “personal” relationship between CPs and GPs. Along with an enhanced professional role for pharmacists, this was the only expectation that either professional had for collaborating<sup>43</sup>). The results in our study identified, that CPs in Slovakia are more interested in their future competences and development of collaborative practice than GPs. One of the influencing factors is their age and the time of their graduation. Younger health care professionals tend to have a proactive and open approach towards interprofessional teamwork<sup>44</sup>). It is important that pharmacists act proactively to expand their own role at the frontline of patient care, by making the medical profession aware of their distinct competencies<sup>45</sup>). Patient medication education and improvement of patient adherence were in this study jointly recognized by CPs, as abilities expected of pharmacists<sup>8, 20, 23, 25, 28</sup>). Preferred consultative roles by CPs, (assisting in creation or amendments of the drug regimen), were less acknowledged by GPs, what copies the same preference, as in many other studies from abroad<sup>3, 22, 25, 26</sup>). Both groups of respondents agreed in all questions about possible barriers. International studies indicate, that the barriers are linked to the structure of the health care system. The largest barrier identified by both groups in Australia is the lack of appropriate or sustainable remuneration<sup>8</sup>). The lack of time and remuneration were identified as prohibitive factors to collaboration in the Canadian environment<sup>20</sup>). CPs in Slovakia recently do not provide any systematic pharmacy professional services. They are still being reimbursed for dispensing prescriptions. Recent analysis of remuneration models for pharmacy professional services indicate, that the method of remuneration does appear to influence the provision of such services, noting that in countries where pharmacists are paid a flat fee to cover all services provided, there is a lack of incentive to provide more or higher-quality service<sup>46</sup>).

## Conclusion

This study unveiled the match between the CPs and GPs perceptions, preferences and barriers to interprofessional collaboration in Slovakia. Interprofessional agreement was identified in: 1. Preferred methods of communication, 2. Perception of the role of the community pharmacist, 3. Areas for further collaboration between CPs and GPs and 4. Perceived barriers to collaborative practice. Dispensing medication, assisting in over-the-counter treatment were accepted as primary roles of CPs. Patient counselling and patient adherence improvement were identified as further preferable roles of pharmacists. CPs and GPs in this study accordingly agreed in their willingness to collaborate in these areas. Face-to-face communication, identified as equally preferable in both groups, proves the general willingness to collaborate. However, the future teamwork should satisfy the identified criteria of time-effectiveness, confidentiality and remuneration. The preference of face-to-face meetings between the CPs and GPs could be achieved by organising joint conferences and interdisciplinary meetings between these professions. These meetings should be organised on a local as well as on global level. The other findings of this study can be used for (re)construction of the GPs and CPs teamwork in the clinical practice. Implementation of individual, as well as interprofessional agreements from this study can help to create a healthy and sustainable teamwork with a higher possibility of acceptance from representatives of both professions. The limitations of this study are represented by a relatively small number of participants. The statistical results in sections analysing the *Experience and Attitudes* of GPs and CPs prove the essential need to test the model with the higher number of participants. The next limitation is the online form of the survey. These limitations need to be verified with a larger group of respondents, using a personal method.

## Abbreviations

CPs – Community pharmacists  
GPs – General practitioners

## Ethics approval

Ethical approval (reference No: 5/2016) was granted by the Ethics Committee for biomedical research, Faculty of Pharmacy, Comenius University in Bratislava, Slovakia.

## Consent to participate

Not applicable.

## Availability of data and materials

The data supporting the findings can be found on: <https://dx.doi.org/10.6084/m9.figshare.3847494.v1>; doi: 10.6084/m9.figshare.3847494.

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## Authors' contributions

The study formed part of LD's PhD. MF and MK were LD's academic supervisors. The statistical part was prepared by TF. All authors contributed to the design of the study and analysis of the data. LD drafted the manuscript and AO and MS carried out the fieldwork. All authors read and approved the final manuscript.

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**Conflicts of interest:** none.

**References**

- World Health Organization.** Evaluation of the Structure and Provision of Primary Care in Slovakia. Copenhagen 2012. [http://www.euro.who.int/\\_data/assets/pdf\\_file/0003/175242/Evaluation-of-the-structure-and-provision-of-primary-care-in-slovakia.pdf](http://www.euro.who.int/_data/assets/pdf_file/0003/175242/Evaluation-of-the-structure-and-provision-of-primary-care-in-slovakia.pdf).
- Ministry of Health of the Slovak Republic.** Implementation strategy – integrated health care system. Bratislava 2014. <http://www.health.gov.sk/Zdroje/?Sources/Sekcie/IZP/Strategic-framework-for-health-2014-2030.pdf>
- Boon H., Verhoef M., O'Hara D., Findlay B.** From parallel practice to integrative health care: a conceptual framework. *BMC Health Serv. Res.* 2004; 4, 15–20.
- World Health Organization.** The Role of the Pharmacist in the Health-Care System – Preparing the Future Pharmacist: Curricular Development. Report of a Third WHO Consultative Group on the Role of the Pharmacist. Vancouver 1997. <http://apps.who.int/medicinedocs/pdf/s2214e/s2214e.pdf>
- World Health Organization.** Framework for Action on Interprofessional Education Collaborative Practice. Geneva 2010. [http://apps.who.int/iris/bitstream/10665/70185/1/WHO\\_HRH\\_HPN\\_10.3\\_eng.pdf](http://apps.who.int/iris/bitstream/10665/70185/1/WHO_HRH_HPN_10.3_eng.pdf)
- Geurts M. M., Talsma J., Brouwers J. R., de Gier J. J.** Medication review and reconciliation with cooperation between pharmacist and general practitioner and the benefit for the patient: a systematic review. *Br. J. Clin. Pharmacol.* 2012; 74, 16–33.
- Edmunds J., Calnan M. W.** The reprofessionalisation of community pharmacy? An exploration of attitudes to extended roles for community pharmacists amongst pharmacists and General Practitioners in the United Kingdom. *Soc. Sci. Med.* 2001; 53, 943–955.
- Freeman C., Cottrell N., Kyle G., Williams I., Nissen L.** Integrating a pharmacist into the general practice environment: opinions of pharmacist's, general practitioner's, health care consumer's, and practice manager's. *BMC Health Serv. Res.* 2012; 12, 229–237.
- Rubio-Valera M., Jové A. M., Hughes C. M., Guillen-Solà M., Rovira M., Fernández A.** Factors affecting collaboration between general practitioners and community pharmacists: a qualitative study. *BMC Health Serv. Res.* 2012; 12, 188–198.
- Rigby D., Hill C.** Collaboration between doctors and pharmacists in the community. *Aust. Prescr.* 2010; 33, 191–193.
- Foltán V.** Social pharmacy and healthcare (in Slovak). Martin: Osveta 2010.
- Blenkinsopp A., Bond C.** Pharmacist must learn to play their part in multidisciplinary health teams. *Pharm. J.* 2007; 279, 330–332.
- Stringer K., Curran V., Asghari S.** Pharmacists and family physicians improving interprofessional collaboration through joint understanding of our competencies. *Front. Pharmacol.* 2013; 4, 151, 1–3.
- Ptáček R., Bartuněk P., et al.** Ethics and communication in medicine (in Czech). Praha: Grada Publishing 2011.
- Dey R. M., de Vries M. J., Bosnic-Anticevich S.** Collaboration in chronic care: unpacking the relationship of pharmacists and general medical practitioners in primary care. *Int. J. Pharm. Pract.* 2011; 19, 21–29.
- Rosenthal M., Tsao N. W., Tsuyuki R. T., Marra C. A.** Identifying relationships between the professional culture of pharmacy, pharmacists' personality traits, and the provision of advanced pharmacy services. *Res. Soc. Adm. Pharm.* 2016; 12, 56–57.
- D'Amour D., et al.** The conceptual basis for interprofessional collaboration: Core concepts and theoretical frameworks. *J. Interprof. Care* 2005; 19, 116–131.
- Vachon B., et al.** Engaging primary care practitioners in quality improvement: making explicit the program theory of an interprofessional education intervention. *BMC Health Serv. Res.* 2013; 13, 106–118.
- Holland R. W., Nimmo C. M.** Transitions, part 1: beyond pharmaceutical care. *Am. J. Health Syst. Pharm.* 1999; 56, 1758–1764.
- Kelly D. V., Bishop L., Young S., Hawboldt J., Philips L., Keough M. T.** Pharmacist and physician views on collaborative practice. *Can. Pharm. J. (Ott)* 2013; 146, 218–226.
- Lalonde L., et al.** Physician-pharmacist collaborative care in dyslipidemia management: The perception of clinicians and patients. *Res. Soc. Adm. Pharm.* 2011; 7, 233–245.
- Matowe L., et al.** Physicians' Perception and Expectations of Pharmacists' Professional Duties in Government Hospitals in Kuwait. *Med. Princ. Pract.* 2006; 15, 185–189.
- Wüstmann A. F., Haase-Strey C., Kubiak T., Ritter C. A.** Cooperation between Community Pharmacists and General Practitioners in Eastern Germany: Attitudes and Needs. *Int. J. Clin. Pharm.* 2013; 35, 584–592.
- Pojškie N., Mackeigan L., Boon H., Ellison P., Breslin C.** Ontario family physician readiness to collaborate with community pharmacists on drug therapy management. *Res Social Adm Pharm.* 2011; 7, 39–50.
- Wilbur K., Beniles A., Hammuda A.** Physician perceptions of pharmacist roles in a primary care setting in Qatar. *Globalization and Health.* 2012; 8, 12–15.
- Awalom M. T., Kidane M. E., Abraha B. W.** Physicians' views on the professional roles of pharmacists in patient care in Eritrea. *Int J Clin Pharm.* 2013; 35, 841–846.
- Seamon J. G., Kenrick D. T.** Psychology. New Jersey: Prentice-Hall, Inc. 1992.
- Kucukarslan S., Lai S., Dong Y., Al-Bassam N., Kim K.** Physician beliefs and attitudes toward collaboration with community pharmacists. *Res. Soc. Adm. Pharm.* 2011; 7, 224–232.
- Leggat S.** Effective healthcare teams require effective team members: defining teamwork competencies. *BMC Health Serv. Res.* 2007; 7, 17.
- Brislin R. W., Lonner W. J., Thorndike R. M.** Questionnaire wording and translation. *Cross-cultural Research Methods.* New York: John Wiley 1973; 32–58.
- Brislin R. W.** Back-translation for cross-cultural research. *J. Cross-cultural Psychol.* 1970; 1, 185–216.
- Deutscher I.** Asking questions cross-culturally: some problems of linguistic comparability. *Comparative research methods.* New Jersey: Prentice-Hall, Inc. 1973; 163–185.
- Bardet J. D., et al.** Physicians and community pharmacists collaboration in primary care: A review of specific models. *Res. Social. Adm. Pharm.* 2015; 11, 602–622.
- Vanbelle S., Albert A.** Agreement between Two Independent Groups of Raters. *Psychometrika* 2009; 74, 477–491.
- Statistical Office of the Slovak Republic.** Statistical Yearbook of the Slovak Republic 2015. Bratislava: VEDA 2015. <https://slovak.statistics.sk/PortalTraffic/fileServlet?Dokument=508d85bc-716d-41cd-a232-476fc9f2e47a>
- Bradley F., Ashcroft D. M., Novce P. R.** Integration and differentiation: a conceptual model of general practitioner and community pharmacist collaboration. *Res. Social. Adm. Pharm.* 2012; 8, 36–46.
- Liu Y., Doucette W. R., Farris K. B.** Examining the development of pharmacist-physician collaboration over 3 months. *Res. Social. Adm. Pharm.* 2010; 6, 324–333.
- McDonough R. P., Doucette W. R.** Dynamics of pharmaceutical care: developing collaborative working relationships between pharmacists and physicians. *J. Am. Pharm. Assoc.* 2001; 41, 682–692.
- Sellappans R., Ng C. J., Lai P. S.** Validation of the Physician-Pharmacist Collaborative Index for physicians in Malaysia. *Int. J. Clin. Pharm.* 2015; 37, 1242–1249.
- Van C., Costa D., Mitchell B., Abbott P., Krass I.** Development and initial validation of the Pharmacist Frequency of Interprofessional Collaboration Instrument (FICI-P) in primary care. *Res. Social. Adm. Pharm.* 2012; 8, 397–407.



41. **Van C., Costa D., Mitchell B., Abbott P., Krass I.** Development and validation of a measure and a model of general practitioner attitudes toward collaboration with pharmacists. *Res. Social. Adm. Pharm.* 2013; 9, 688–699.
42. **Zillich A. J., Doucette W. R., Carter B. L., Kreiter C. D.** Development and initial validation of an instrument to measure physician-pharmacist collaboration from the physician perspective. *Value Health* 2005; 8, 59–66.
43. **Doucette W. R., Nevins J., McDonough R. P.** Factors Affecting Collaborative Care Between Pharmacists and Physicians. *Res. Soc. Adm. Pharm.* 2005; 1, 565–578.
44. **Haxby D. G., Weart C. W., Goodman B. W.** Family practice physicians' perceptions of the usefulness of drug therapy recommendations from clinical pharmacists. *Am. J. Hosp. Pharm.* 1988; 45, 824–827.
45. **Gallagher R. M., Gallagher H. C.** Improving the working relationship between doctors and pharmacists: is inter-professional education the answer? *Adv. Health Sci. Educ. Theory Pract.* 2012; 17, 247–257.
46. **Bernsten C., Andersson K., Gariepy Y., Simoens S.** A comparative analysis of remuneration models for pharmaceutical professional services. *Health Policy* 2010; 95, 1–9.