



Cooperation Between Pharmacists and Physicians – Whether It Was Before and is It Still Ongoing During the Pandemic?

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Abstract: Nowadays, it is very important to put an emphasis on widely understood teamwork. This is of great importance for achieving and maintaining success in all areas, especially in medicine. This kind of unity has many advantages, including unique ideas that are very helpful in a competitive environment, improve performance and knowledge, and create stronger supportive work relationships. Patient's health can be improved by using comprehensive treatment. This provides an urgent need for multidisciplinary partnership in the medical community. Optimal pharmacological treatment is crucial to achieving treatment goals. To ensure excellent quality of medical care, interprofessional cooperation between physicians and pharmacists and/or other medical professionals is necessary. Their complementary knowledge and experience can lead to improved health outcomes and can also reduce treatment costs. There are also many barriers and difficulties in legal systems that would allow for more effective inter-professional cooperation. The COVID-19 pandemic contributed to emphasizing the role of the pharmacist, increasing powers, and at the same time to teamwork, sometimes forced by the situation. The purpose of this publication is to view the literature on the cooperation of physicians and pharmacists in the provision of medical services for patients. Professional cooperation has been well known in many countries for years, as it is a key medium supporting optimized patient care. Analyzing the challenges and approaches can lead to better and improved health care.

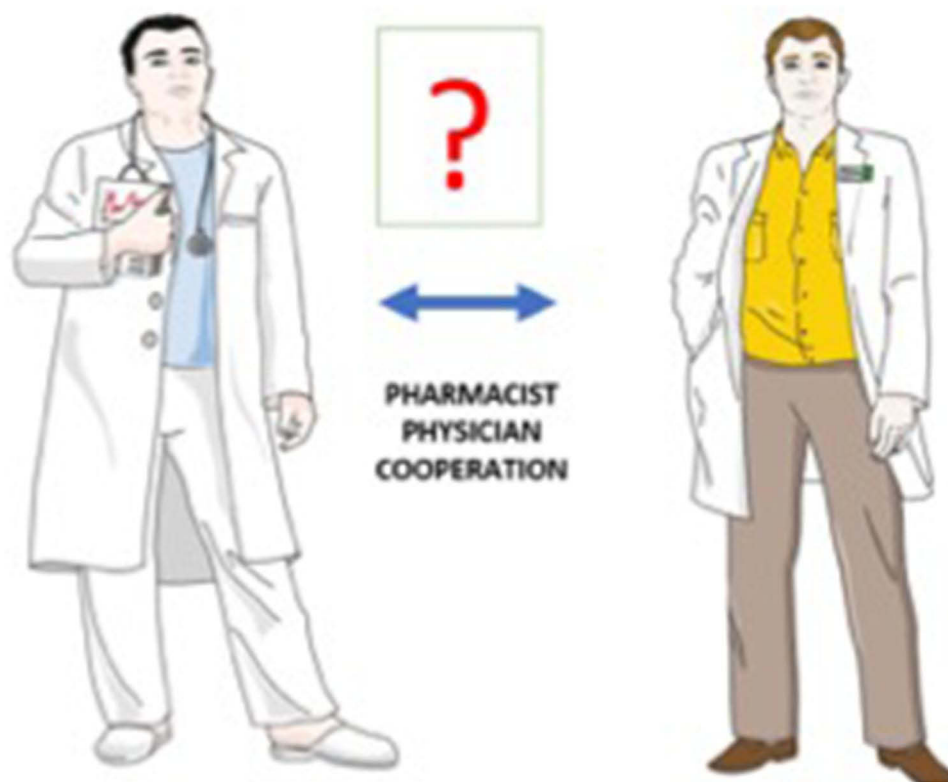
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Introduction

Over the past few years, the topic of collaboration between physicians and pharmacists, in the aspect of primary health care, has often been discussed as one of the ways to implement the interdisciplinary model. Looking at literature studies, it can be seen that there is evidence that indicates the effectiveness of this multidisciplinary primary care team. Pharmacists who are part of such a team are responsible, in addition to dispensing medicines, for obtaining a complete history of medications, identifying and minimizing barriers to compliance, and adapting treatment regimens to individual patient needs.^{1,2} Moreover, the times of the pandemic emphasized the importance of cooperation between doctors and pharmacists in improving the effectiveness of therapy and its streamlining. Pharmacists have proven to be indispensable partners for doctors during the COVID-19 epidemic, and their contribution not only improves primary care for patients but also reduces the burden on the healthcare system.³ Cooperation between human individuals has been observed

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Graphical Abstract



for 20,000 years. This extraordinary skill contributed to the excellent development of our species because history provides numerous evidences of the importance of interacting with others – those who joined into larger groups almost always won.⁴ Collaboration between medical professions has been defined as a common process of communication and decision-making to meet the patient's health and disease needs while respecting the unique characteristics and skills of each employee.⁵ This term may refer to the relationship between physicians and pharmacists, as numerous studies indicate that such coordinated care helps to improve patient outcomes.^{2,6,7} Sharing responsibilities and working together have a positive impact on the quality of drug therapy, avoid adverse drug-related incidents, and are economically efficient as they reduce the number of patient visits to doctors.⁸ The implication of solid communication between physicians and pharmacists is an important foundation on which to build cross-industry trust. The degree of collaboration between professions varies widely and depends on many influencing factors such as shared values, relationships, role definition, and trust.^{3,12} For patients, effective

collaboration between the healthcare team can lead to better coordination with healthcare professionals and more effective treatment.⁹ With this in mind, one may wonder why the topic of cooperation between physician and pharmacist, although so often discussed, has never been fully solved and systematized. Unfortunately, there are also many obstacles to cooperation – pharmacists and doctors have different views on the respective roles of pharmacists, no division of competences, and no salary arrangements. Collaboration can improve patient outcomes, but time and financial constraints limit the scope for physicians and pharmacists to interact to deliver care. Pharmacists and physicians agree that the greatest barriers to collaborative practice are the lack of compensation, insufficient time and the need to collaborate with many specialists.¹⁰ More and more countries and communities are implementing or improving the cooperation model, which is why the purpose of the work is to look into the literature on the collaboration of physicians and pharmacists in the provision of medical services for patients, as this analysis can lead to better healthcare focused on the patient.

Materials and Methods

Using online databases, mainly MEDLINE, a systematic literature review was carried out on pharmacist-doctor cooperation, also in terms of the impact of the COVID-19 pandemic. For the purposes of the study, a literature review was performed mainly using PubMed and Google Scholar databases to identify full-text articles published in English and Polish on mutual cooperation between pharmacists and physicians, with particular emphasis on the Sars-Cov-2 pandemic. Key articles were retrieved using the terms “physician”, “pharmacist”, “cooperation”, “collaboration”, “community pharmacy”, ‘COVID-19’, ‘2019-nCoV’, ‘coronavirus’, and ‘SARS-CoV-2’ as keywords for our search. We have included scientific publications on the coronavirus from January 1, 2020 to March 30, 2021 and others from 2004. In the first stage of the review, the titles of the articles were carefully checked. If the title clearly indicated that the article was outside the scope of our review, the reference was rejected. If the title suggested the presence of data consistent with our interests, the publication was subject to further analysis. In the next step, the abstract was assessed and, if still possible, the full text was analyzed.

Results

Cooperation between physicians and pharmacists is essential to ensure high-quality treatment. Most physicians confirm great sense in extended pharmaceutical care, in which the pharmacist acts as a qualified expert in the field of pharmacological therapy. They emphasize that during the patient’s visit they have limited time, so they are not able to carry out education on the safe use of medicines, to make a comprehensive analysis of possible interactions.¹¹ Physicians encourage patients to talk to pharmacists who are more available to them when purchasing medicines, and also believe that pharmacists should review their medications to detect potential interactions. This translates into an increase in the overall effectiveness of pharmacotherapy and compliance by patients.^{12,13} Some physicians are also positive about the possibility of prolonging regularly taken drugs in pharmacies.¹⁴ The pharmacist’s professional advice in the field of OTC (over the counter) preparations is invaluable because professional advice translates into reducing queues to doctors and improves the functioning of the already heavily burdened healthcare system.^{15–19}

Chronic diseases, which increasingly accompany people, are an example of the possibility of controlling the progress of the disease in the community pharmacy, eg spirometry in the treatment of asthma or pressure measurement.²⁰ In some countries, eg Great Britain, pharmacists in community pharmacies have the opportunity to carry out seasonal vaccinations, which allows them to relieve clinics during periods of intensive prevention or illness.²¹ What is more, systematization of cooperation will be more and more often introduced, eg in Germany, software has been developed for keeping records and exchanging information between a physician and a pharmacist. The participating physicians and pharmacists confirmed the definition of responsibilities and a clear understanding of roles, which, through close communication, has increased confidence. Just such organized physician-pharmacist cooperation can improve the effectiveness of drug therapy. Both professions saw a personal benefit in professional exchange and quality of care. The development of new technical structures requires considerable effort and close coordination between all involved, and only simple and user-friendly software solutions are accepted. After all, this is definitely a worthy process.²²

A positive impact of cooperation was noted in relation to a patient who, by increasing medical care, is easier to maintain discipline in regular drug use and to follow medical recommendations, which translates into improved pharmacotherapy. The patient also usually has easier access to the pharmacist to inform about problems.^{15,23–26} Defining and classifying drug-related problems is an important part of drug review. The patient may experience various types of ailments or side effects that may cause the drug therapy to fail to achieve the goal and even become harmful. In the case of drug review, it is also necessary to resolve the conflict of competence between pharmacist and family doctor. Recent research indicates that more than half of drug-related problems can be resolved by a pharmacist through education or the exchange of a patient’s drug with an OTC drug. Therefore, the development of regular relationships is of great importance in this area.^{3,16,27,28}

There is also cooperation between doctors and pharmacists working in the hospital. Clinical pharmacists provide unique expertise in the drugs that are the cornerstone of treatment. The administration and dosage of drugs can have a big impact on patient outcomes, and doctors may not have all of this information right away. Data indicate that the presence of a clinical pharmacist is associated with

fewer drug-related adverse events and better treatment outcomes.²⁹ Based on the example of a study in which the role of a pharmacist in a hospital treating HIV patients was tested, it was concluded that the presence of a pharmacist and cooperation with doctors definitely have enormous benefits, especially for the correctness of patients' therapy. It has been shown that the active involvement of pharmacists in HIV treatment improves the number of patients with CD4-positive lymphocytes, which is a key indicator of the therapeutic efficacy of outpatient treatment.³⁰ A pharmacist can quickly catch medical errors, pay attention to the systematic administration of drugs, and, after appropriate training, in cooperation with doctors, conduct interviews with patients. The doctor-pharmacist team contributes to the improvement of the effectiveness and safety of treatment, and also reduces the burden on doctors. These interventions also reduce the delay in therapeutic decisions, as each profession has slightly different scopes of competences and perceptions of therapy.³¹

Data from many studies brought new light to the pharmacist's role in cooperation with physicians (Table 1). Although there are many positive opinions about the cooperation of pharmacists from community pharmacies and general practitioners, not all specialists share enthusiasm. Family doctors are often not sure what role pharmacists play; they are opposed to extending their role because they would prefer to work under their authority.³² Some physicians believe that the participation of pharmacists in cooperation with the patient may be an excessive challenge for them, for which time and extra remuneration are needed. In addition, they believe that pharmacists could carry out drug reviews in their offices, but there is also a financial aspect here. Furthermore, physicians who have had bad experience with pharmacists in the past have doubts about future cooperation.¹² Moreover, physicians are concerned about possible disputes between professions. Pharmacists often overload family doctors with too much less information, eg, clinically insignificant interactions. Sometimes the recommendations of pharmacists interfere with the recommendations of family doctors. In their view, such misunderstandings may also result in a lack of readiness to cooperate with other professions. Interestingly, this opinion was the most popular among physicians who have never cooperated with pharmacists.³³ Doctors who have an established relationship with a particular pharmacist have a positive perception of the role of the pharmacist, but this does not necessarily translate into seeing other pharmacists

as specialists. On the other hand, physicians without prior interprofessional interaction are not enthusiastic and are unlikely to deepen these relationships. Doctors who did not work directly with pharmacists in facilities located in the same area argued that although they did contact pharmacists, in most cases these interactions were limited to explanations. These examples of cooperation between doctors and pharmacists only occurred in situations where there was an established relationship in which they either knew each other personally or worked together in a common health environment.⁹ In the opinion of some family doctors, pharmacists do not have enough knowledge to diagnose patients.^{14,17} In addition, highly developed pharmaceutical care can contribute to reducing the number of medical visits. The decrease in medical consultation may also affect the effectiveness of treatment. Therefore, some physicians are not conducive to the pharmacist's involvement in screening, providing information on diseases or monitoring the course of the disease. However, they support advice on checking drug interactions, dosing and treating minor ailments.^{34,35} Nevertheless, it all boils down to the lack of explicit systematization of cooperation and the appointment of specific tasks belonging to the doctor and pharmacist.¹²

The outbreak of the COVID-19 pandemic highlights the importance of pharmacists' work. At one point, people were deprived of the possibility of leaving the house purposeless, contacts with other people were limited, and the world slowed down its daily running. Many medical centers were closed, and the operations of hospitals and clinics were limited to emergency departments. During this extraordinary time, community pharmacies have become the only place to provide the public with necessary health care. Searching for health care, society went to pharmacies, counting on the advice of a pharmacist, who in this difficult time became an unsung hero standing at the first table – on the first front.^{12,15,16,36–40}

Pharmacists as primary healthcare providers help them not only with primary health problems but also share reliable information on SARS-CoV-2.^{15,37,40–44} The National Community Pharmacists Association, which represents 21,000 pharmacies in the US, is launching a campaign with the intention of drawing people's attention to unknown heroes. The founders want to make people aware that the community can rely on local pharmacists to gain excellent knowledge, consultation and commitment appropriate for neighbors. Pharmacy teams with enthusiasm and professionalism carry out

Table I Role of the Pharmacists in Cooperation with Physicians

No	Publication	Pharmacists' Role	Country
1	Meng et al (2020) ¹⁶	<p>Collaboration with physicians, creating safety and treatment protocols for COVID-19</p> <p>Collecting and providing COVID-19 based information about drugs for physicians</p> <p>Managing drug interactions and relieving physicians, by providing basic health care</p> <p>Providing education for patient and remote clinical pharmacy services</p>	China
2	Zaidan et al (2011) ¹⁷	<p>Physicians expect pharmacists to educate patients about appropriate and safe use of drugs.</p> <p>Physicians do not have a high index of experience when it comes to cooperation with pharmacists, however they are interested in improving relations in multidisciplinary teams.</p>	Qatar
3	Hess et al (2020) ¹⁹	<p>Taking into consideration vast importance of community pharmacist as most common vaccine providers and therefore helping other health care workers in stabilization of pandemic situation</p> <p>Helping health care providers in education, prevention and managing basic health problems and this way allow physicians concentrate on their tasks.</p>	USA
4	Kucukarslan et al (2011) ²³	<p>Collaboration between pharmacists and physicians in ambulatory care clinics improves patients' outcomes.</p> <p>Physicians believe that cooperation can result in better and enhanced prescribing.</p> <p>The strongest predictor of attitude toward multidisciplinary collaboration was the belief that interaction with community pharmacists would result in improved medication adherence.</p>	USA
5	Tannenbaum, Tsuyuki (2013) ²⁸	<p>Bringing together undergraduate and graduate students in the fields of pharmacy and medicine for training in interdisciplinary care, in example exposing them to complex patient cases for interdisciplinary functioning.</p> <p>Performing medication reviews for patients with complex illnesses and acknowledging useful suggestions and improving patients' outcomes by expanding the scope of pharmacists' services.</p> <p>Collaboration with pharmacists has the potential to reduce outpatient visits related to drugs and emergency department visits and in the end taking the burden off from doctors.</p> <p>Pharmacists can play a crucial role with substituting inappropriate prescriptions, minimizing the risk of adverse outcomes in pharmacotherapy.</p>	Canada
6	Bidwell, Thompson (2015) ³²	<p>Pharmacists and physicians were supportive when it comes to collaborative forms of working. However GPs preferred the type of collaboration where pharmacists were under the supervision of the general practice.</p> <p>There is a need to improve contact with physicians over minor prescribing mistakes.</p> <p>Encouraging the expansion of one professionals' group practice can be perceived as a danger to the other group of professionals. Mitigation strategies require confirmation that it takes time to build interprofessional trust and involves clear communication.</p>	USA
7	Mallhi et al. (2020) ³⁴	<p>Assisting drug regulatory authorities in identifying the unusual practices such as irrational use, stocking, and misconception among the general public related to the repurposed drugs.</p> <p>Working with public health officials to ensure that the population is complying with the preventive measures and to neutralize the myths about COVID-19.</p> <p>Creating an emergency preparedness plan in order to mitigate the disturbance in supply, which could lead to drug shortages that are arising from COVID-19.</p> <p>Pharmacists can effectively arrange the follow-up of COVID-19 patients which could provide greater insight into the recovery pattern of such patients.</p> <p>The integration of pharmacists into core healthcare teams during the current pandemic would facilitate positive patient outcomes, improved patient safety and continuity of care, better decisions about pharmacotherapy in healthcare teams.</p>	Pakistan, Saudi Arabia
8	Cadogan and Hughes (2021) ³⁷	<p>Pharmacists were taking part in prevention, preparedness, response and recovery chain.</p> <p>Providing reliable, scientific information about disease, prevention, hygiene and procedures.</p> <p>Establishing rational drug supplies, creating balance between demand and storage</p> <p>Management of minor illnesses or abrasions and relieving burden of other parts of health care system</p>	China, United Kingdom, Canada

(Continued)

Table I (Continued).

No	Publication	Pharmacists' Role	Country
9	Bragazzi et al (2020) ³⁹	Expanding collaboration between clinical pharmacist and medicians or nurses Providing staff training Establishing proper drug management Providing health care beyond hospital stay Tele-health and online counseling Reporting COVID-19 cases Stopping of misleading facts and myths about pandemic	USA, China, Italy, Canada, Israel
10	Zheng et al (2021) ⁴⁰	Pharmacists were providing and managing of COVID-19 related drugs Patient education and consulting about COVID-19 Ensuring compliance and proper medication intake Providing information about COVID-19 and following established pandemic rules	China
11	Kretchy, Asiedu-Danso, Kretchy (2021) ⁴⁶	Triaging at the community level for suspected COVID-19 cases. Conducting medication reviews, follow-ups and supporting rational medication use. Promoting medication adherence in community. Improving chronic diseases medication availability amongst patients with chronic diseases.	Ghana
12	Pickworth et al (2020) ⁵⁶	Tightening collaboration between cardiology pharmacist and physicians for more effective medical care for patient with cardiovascular diseases Providing information for new drug usage indications Preventing cardiovascular drugs shortages, by finding alternative products, eradicating drug interactions or beneficial, synergistic drug merging Providing education for patients with cardiovascular disease	USA

tests and vaccinate patients in order to return to the pre-pandemic reality. Living in the same neighborhoods, local pharmacists have personal relationships with patients, struggling with the same problems in the community.^{38,45}

In many countries as the first wave of pandemic was constantly progressing, medical clinics and physicians' offices have started to go for virtual contact with patients in order to alleviate the spread of infection. Pharmacists within a short period of time became one of the very few health care professionals who had regular contact with the public.⁴⁶ Pharmacists play a crucial role; in most cases, they are the first touch point of patient engagement with the healthcare system. Day by day, they are shifting the burden from GP practices by tackling with patients who suffer from other ailments to fulfill their healthcare needs, while access to the GPs is highly restrained. These actions are preventing patients from making unnecessary visits to healthcare facilities. As a consequence, collaboration between physicians, pharmacists and patients is crucial to escalate patient care. Pharmacists, which gives medication management recommendation to physician and suggests proper OTC medication to patients, may relieve the number of virtual visits. Community pharmacists are the most

accessible and qualified help for society during pandemic, as pharmacies are one of the few places that are permanently open for the communities.⁴⁷⁻⁴⁹ As studies show, pharmacists have solid knowledge about the current pandemic. Awareness is a key factor in society's response in protective behaviors. Thanks to their disease knowledge, pharmacists can influence patients about prevention and communicate about treatment of this respiratory disease.⁴⁸

The major role of the pharmacist in management with SARS-CoV-2 is well described worldwide. Community pharmacists at the very center of pandemic in China are considered to be a crucial link in the public health care chain. They are responsible for drug management, providing patients with basic health care, instructions of pandemic regulations and professional information for patients. Collaboration with physicians was also much highlighted during the outbreak of the COVID-19. Pharmacist actively co-worked with doctors with establishing COVID-19 regulations, treatment standards and ensuring supplies of disinfectants and efficient drug delivery. All their initiative work let take some burden off struggling health care system.⁴⁹⁻⁵¹ The constant work of community pharmacists is not only providing regular

supplies of medicine but also gives assistance to governments by spreading regulations and guidelines. Collaboration with local communities is a common phenomenon. Examination from Pakistan shows that many organizations are supporting doctors, nurses and paramedics, but little is known about pharmacy teams' protection.⁴⁸ Pharmacist importance during pandemic has been shown clearly in rural areas, where patient's contact with other medical professions was limited. There were very often also long distances between the patient's place of living and medical facilities. Only a pharmacist was available as a source of information and refuge, caring for the increased needs of patients. The situation has also resulted in increased potential exposure to the coronavirus, making pharmacists work even harder and, like other medical professions, putting them at risk of losing their own health.^{52,53}

Collaboration between pharmacists, nurses and physicians does not include only providing specialistic care or sharing reliable information with society. Relaxing law regulations has been shown, to let pharmacists use their full knowledge and abilities, making them more available to patients and first of all letting them share responsibilities with other medical professions. It includes not only checking for drug interactions, rewriting prescription for prolonging therapies but also allowing pharmacists to make tests for COVID-19.^{54,55}

Looking further, it appears that community pharmacists can contribute to the fight against pandemic. Clinical pharmacy has great share, taking the action necessary for efficient health care. It includes instructing nurses and physicians about drug interactions, management and working on patient's treatment in particular in area greatly overloaded during pandemic. This applies, for example, to cardiology wards. The key role of pharmacists in preventing these negative health outcomes is to help establish the best treatment plan, ensure drug availability and monitor side effects. Achieving this point is executable, but requires even tighter, than so far, cooperation between medical professions – especially physicians and pharmacists.⁵⁶ Pharmacists with specialty training in critical care perspective are considered vital, as comprehensive knowledge of therapeutic options is necessary to care for patients requiring mechanical ventilation. Therapeutic and drug knowledge is crucial not only for including patient wellbeing but also preventing of spreading COVID-19. Some institutions faced problems with implementing recommendations regarding sedative and analgesic agents

at the same time to prevent adverse events and also reduce hospital staff entry into the patient rooms. All these new responsibilities did not exempt pharmacists from their previous duties such as drug management, detecting and reducing medication errors. On the contrary, they had to use possessed knowledge and skills, learn even more and tighten cooperation with other members of the health care team as inter-professional approach was acquired.⁵⁷

The role of the physician is to create a care plan for the patient, his diagnosis, and the selection of appropriate medications. Collaboration with a pharmacist can complement and contribute to strengthening patient care. Pharmacists apply drug education, monitor therapy for its safety, effective use of drugs, and improvement in adherence. Due to the increasing number of medications taken by patients, the number of possible interactions increases, which only proves that the cooperation of a doctor with a pharmacist is necessary to increase the safety and effectiveness of therapy. However, this translates into better health outcomes for patients. In the long term, a decrease in state expenditure on the health of the population can be noticed.⁵⁸ Pharmaceutical care should be an integral part of the health-care system. It is very developed in the age of countries, but a large number of societies still cannot benefit from collaboration between the profession of a physician and a pharmacist. In Poland, for example, the topic of pharmaceutical care was raised as early as 2007.⁵⁹ Some aspects, such as the possibility of pharmacists prescribing medicines for themselves or their immediate family, were introduced only during the COVID-19 pandemic in 2020.⁶⁰ Additionally, pharmacists obtained the right to vaccinate and qualify patients after they underwent specially prepared training.⁶¹ Changes and further updates are needed as much as possible. Let us hope we do not have to wait for the next pandemic. After all, somehow pharmaceutical care depends not only on the development of the rights of pharmacists but also on proper communication between general practitioners and pharmacists.⁶² Physicians confirm that relying on each other is essential. Professional knowledge and the same approach to functions and responsibilities provide a good prospect for further cooperation. Despite minor misunderstandings regarding the duties and competences of both professions, mutual communication and trust are the keys to success.^{38,42,63} Both professions believe that the most important barriers in doctor-pharmacist cooperation are: lack of time, no fixed salary, no direct communication and agreement, and no clear division and definition of responsibilities.⁶⁴ It is worth noting that doctors who have

previously cooperated with a pharmacist are more supportive of further collaboration. This is an undeniably positive signal that there is a chance to expand these relationships in the near future.⁶⁵

Discussion and Conclusions

Pharmacists and physicians confirm that multidisciplinary collaboration brings many opportunities and has a significant influence on complex treatment. Pharmaceutical care, which is based on this kind of partnership, can be very supportive in maintaining positive health outcomes. Pharmacists may not only take part in primary health problems but also deal with compound issues to make the most of their excellent pharmacological knowledge and potential, which supports physicians, nurses and other medical professions. Integration between pharmacists and physicians is extremely important to improve patient care and treatment efficacy by complementing each other to make correct decisions about drugs, continuity of care, and patient safety. Unfortunately, there are some barriers to this collaborative practice. So as to make this partnership more efficient and beneficial, there is a need to modify infrastructure, negotiate, agree upon goals and educate young healthcare workers about this system. Furthermore, tough pandemic times, more than ever, have emphasized the importance of cooperation between physicians and pharmacists, regarding providing medical services for patients.

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