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Original Research

Pharmaceutical Care provision from the pharmacist's perspective: A qualitative study in Belgian and Cuban contexts

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Abstract

Background: Over the past decades, the qualitative research approach has played a crucial role in supporting the adoption of Pharmaceutical Care (PhC) and offers a valuable approach to explore health issues from a social and cultural perspective. It delves into attitudes, perceptions, behaviours, beliefs, and social representations related to health phenomena. **Objective:** To explore the experiences, insights and outlook of pharmacists regarding the development of PhC in daily practice in Belgium and Cuba. **Methods:** A qualitative study was conducted using a semi-structured interview guide. Thematic content analysis was used. Themes emerged by examining key phrases in the interviewees' responses. **Results:** Fifteen interviews with 18 professionals in Belgium and 10 interviews from Cuba were conducted. In total, 18 themes emerged from the Belgian and Cubans interviewees, 12 common themes and six non-overlapping themes. Common issues addressed in both countries include: access to patient records, lack of time, pharmacy staff and private spaces, legal framework, and non-systematic practice of PhC, pharmacists' attitudes, interaction with physicians, the need for collaborative practice, insufficient recording of PhC activity, continuity of care between levels of care. Themes specific to Belgium include the need for remuneration, patient loyalty to a single pharmacy, and quality control of PhC services. Meanwhile, Cuba faces particular challenges such as a lack of materials and technological resources, shortages of medicines, and inadequate administrative support. **Conclusion:** Both Belgium and Cuba face challenges in implementing pharmaceutical care (PhC). Despite their differences, both countries need to enhance PhC by improving resources, tools, and monitoring. Belgium has made progress in PhC, while Cuba faces resource limitations. The holistic approach to pharmacists' professional perception and practice is still limited.

Keywords: qualitative research; pharmaceutical care; cuba; belgium; implementation

INTRODUCTION

The annual global cost attributed to medication errors has been estimated in 2017 at $42 billion USD.[1] Unsafe medication practices significantly contribute to these injuries and much of it should be preventable. In order to address the societal imperative of reducing this drug-related morbidity and mortality, it is crucial to considerably strengthen the provision of Pharmaceutical Care (PhC).[2]

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Several reports have documented the barriers identified during the PhC implementation process, such as limited time, inadequate compensation and inadequate infrastructure.[3-6] Moreover, there is a scarcity of skilled professionals capable of delivering PhC, coupled with a lack of protocols and regulations to support pharmacists' practice.[3-6]

The provision of integrated, person-centered health services should be comprehensive and holistic.[7] These principles may be based on the philosophy and practice of the PhC, even if they were not explicitly stated during its inception.[8] However, the provision of pharmacy services still lacks this patient-centered approach. Therefore, it has been essential to gain a deeper understanding of the practice's reality from the practitioners' and beneficiaries' own perspective. In this regards, it would be interesting to know the current usefulness of a holistic approach by pharmacists in interacting with the patient to prevent or resolve Drug Related Problems (DRPs).

Qualitative research methodology offers a valuable tool to explore health issues from a social and cultural perspective. It delves into attitudes, perceptions, behaviors, beliefs, and social representations related to health phenomena, capturing insights from professionals and patients alike.[9,10] Over the last two decades, the qualitative research approach has played a crucial role in supporting the adoption of PhC.[11] Several studies in countries including United States, Brazil, Singapore, Malaysia, and the Netherlands looked at the barriers and facilitators for providing PhC.[12-16]

Recent surveys conducted by the Pan-American Conference on Pharmacy Education,[17] have shown that all participating countries have regulations governing the professional practice in pharmacy services. Pharmacists were less likely to participate in activities that directly affect patients, their families, and the community, such as medication therapy management, pharmacotherapy follow-up, and maintaining patient records. However, participants were most positive about pharmacovigilance, dispensing, and promoting rational use of medicines, suggesting that pharmacists are spending less time on patient-centered activities that require more holistic patient care.

In Cuba, pharmacy services are regulated at different levels of care through manuals,[18,19] procedures and established regulations.[20,21] Valuable research was conducted about the provision and enhanced implantation of PhC.[22-24] Some of these studies describe DRPs in patients,[25-30] while others focus on the validation of tools for clinical services and decision-making.[31,32] For instance, Ortega contributed by validating and applying a Geriatric Functional Evaluation scale in a Standard Operating Procedure for Cuban elderly care, aiming to improve patient assessment.[33] Rojas proposed tools to capture patient's medication experiences and social determinants of health (SDOH)[32] to facilitate a more holistic approach. Fegadolli and Dupotey conducted in-depth interviews to investigate the chronic use of benzodiazepines in primary care patients.[34] Cuba's health system still needs to make significant progress in improving its PhC.

Certain pharmacy services in European countries may be exclusive to a single country or region and not implemented in neighboring countries. Nevertheless, these services indirectly contribute to the progress of pharmacy practice. Out of 34 European countries surveyed on the implementation of pharmacy services, participants from 15 countries chose the PhC option in the survey, including Belgium. In this research, Medication review (MR) was the most disseminated among advanced services and was the service more often mentioned as having high implementation rate.[35-38]

In Belgium, the use of qualitative methodology in the study of the use of medicines and the implementation of MR services has progressed.[39-41] In Cuba, however, there is a lack of published studies that use a qualitative approach and that accurately reflect the reality of clinical pharmacy services.[42]

The primary goal is to explore the experiences, insights and outlook of pharmacists regarding the development of PhC in daily practice in Belgium and Cuba, while the secondary goal is to understand how pharmacists approach patient care holistically.

METHODS

Study design

This qualitative study utilized a semi-structured interview guide[9,43] provided in Appendix 1, with 15 questions that were designed to be open-ended, neutral, and non-leading.[44,45] This guide was developed through a collaborative iterative process involving three of the researchers (EIR, NMD, HDL). The same domains were consistently addressed when the interview guide was used in both Belgium and Cuba.

Sample and recruitment

The study was conducted in Belgium from October 3rd to December 20th, 2021, and in Cuba from July 3rd to October 20th, 2022. The research was approved by the Doctoral Program of Basic Sciences at the Natural and Exact Sciences Faculty, Universidad de Oriente. The participants provided verbal consent, with the assurance that their information would be treated with confidentiality and anonymity. The study used purposive sampling to select pharmacists who met specific criteria, including having at least two years of experience in pharmacy services activities such as management, research or patient care.[9,41] Before the interviews, all pharmacists were provided with the interview guide by email. Details such as the participant's gender, age, work setting, geographical location, professional activities, and academic training were recorded at the beginning of each interview.

Data collection

In Belgium, the interviews were conducted by the principal researcher (EIR) and supervised by NMD and HDL. The interviews took place either face-to-face or through video conversations using the Blackboard Collaborative online platform. In Cuba, a final-year Bachelor of Pharmaceutical Sciences student (KMB) conducted the interviews. The student received prior training and preparation for the field study. The interviews in Cuba were conducted face-to-face or through WhatsApp. The interviews were recorded and transcribed verbatim, followed by a comprehensive analysis.

Data analysis

Thematic content analysis was applied, using an inductive approach as proposed by Caulfield.J[46,47] and data processing involved both interpretative and descriptive levels. Themes emerged through examining key phrases in the interviewees' responses in relation to the guiding questions. They were identified based on the frequency, relevance, and potential significance of the codes within the data.In Belgium, the interviews were continued until apparent data saturation was achieved. The pharmacists' interviews were labeled with the country acronym and interview number (e.g., B-01, C-01).

RESULTS

The study included a sample of 29 professionals, with 19 participants from Belgium and 10 from Cuba. In Belgium, all professionals invited to participate in the research agreed to be interviewed. In Cuba, 14 pharmacists were invited to participate; three agreed to be interviewed, but confirmation was not received, and one pharmacist did not respond to the invitation.

In Belgium, a total of 16 interviews were conducted with the participation of 18 pharmacists and one nurse who

had experience in pharmacy service management. Three interviews were conducted with pairs of participants, and each pair's interview was treated as a single entity for the purpose of analysis. Two face-to-face interviews were conducted in community pharmacies in Antwerp, while the remaining interviews were conducted via video conversation. The majority of interviews took place face-to-face in community and hospital pharmacies in the city of Santiago de Cuba. The average duration of the interviews was 40 minutes. In Belgium, due to connection issues that affected the quality of the audio recording, one interview had to be excluded from the analysis.

Only women pharmacists were interviewed in Cuba, with participants having a higher average age range. In contrast, in Belgium, both men and women were interviewed, and the age range was lower. Belgium had a more diverse group of professionals in terms of geographical origin and main workplace. Many levels of education and occupations were represented in both countries. Participant demographic and professional characteristics are summarized in Table 1.

In totally, 18 themes emerged from the Belgian and Cubans interviewees. The analysis of key terms in each interview uncovered common topics in both countries and distinct themes were identified in Cuba and Belgium. The common and non-overlapping themes identified through thematic analysis are presented in Tables 2 and 3. The interviewees' responses can be found in the supplementary material for more detailed information of the themes (Appendixes 2 and 3).

Table 1. Characteristics of the participants from Belgium and Cuba

Characteristics	Belgium	Cuba
Sex		
Male/Female	10/8	-/10
Age		
Average	45	55
Observed ranges	23-68	45-77
Main workplace		
Community pharmacy	7	2
Hospital pharmacy	1	5
University	3	1
Pharmacist association	4	-
Government organizations	3	-
Professional activities*		
Patient care	10	6
Manager	10	2
Research	7	4
Teaching	7	5
Logistic and dispensing service	5	3
Cities		
Antwerpen	9	-
Lokeren	2	-
Ghent	1	-
Leuven	1	-
Brussels	5	-
Santiago de Cuba	-	8
Holguin	-	1
Havana	-	1
Postgraduate education		
Pharmacist	8	2
Master degree	7	7
Doctoral degree	3	1

*Some pharmacists have more than one pharmacy activity

Common themes from Belgium and Cuba interviews

1.Education and training

In both countries, pharmacists expressed the view that better postgraduate preparation and training are essential for delivering PhC. In Belgium, they recognized that academic institutions provide excellent education, but emphasized the need for specific training in resolving DRPs and effectively collaborating with healthcare team. Insufficient knowledge was considered a potential obstacle. Pharmacists in Cuba underlined that when engaging with physicians, it is crucial to possess a solid expertise and effective communication skills. They also suggested the need for pharmacists to have better skills in relation to searching information on the Internet.

- "*We may not know enough to fix everything. We have a lot of information, but we need to figure out what's important and share it with the patient. It's not easy". (B-03)*

- *"When interacting with other healthcare professionals, it is crucial for us to substantiate our opinions with scientific and up-to-date knowledge. I recommend that professionals engaged in this practice pursue specialized training in this field, enabling them to carry out their role with greater proficiency and confidence, without feeling vulnerable in the presence of other healthcare professionals". (C-02)*

2. Legal framework of Pharmaceutical Care services

In Belgium, the implementation of government policies and the authorization for pharmacists to perform specific clinical tests (e.g. blood glucose) were seen as both a potential obstacle for the future and a barrier to preventing or resolving DRPs. Some pharmacists said that not all the activities of PhC and the procedure for paying for them have been legislated. Several respondents expressed concerns about the prescription system for certain medications that can be addictive, such as benzodiazepines.

- *"We weren't allowed as pharmacist to take a drop of blood. And that's really a barrier, because it can really be good for the patient. The role of the pharmacist in pharmaceutical care is recognized also by the government and it is improving, but very slowly … Pharmaceutical care activities have been officially legislated and approved by the government"... We go in the good direction, but there is still a long way to go". (B-05)*

Table 2. Common themes from Belgium and Cuba interviews
1. Education and training
2. Legal framework of Pharmaceutical Care services
3. Staffing problems for pharmacists to participate in clinical pharmacy activities
4. Lack of systematic practice of Pharmaceutical Care
5. More time to provide Pharmaceutical Care
6. Need for privacy
7. Pharmacists attitude and commitment to the patient
8. Limited access to patient's clinical information in community pharmacies versus hospitals
9. Concerns and good experiences interacting with physicians
10. Need of collaborative practice
11. Pharmaceutical care is not fully recorded
12. Challengues in continuity of care

- *"I stated a little bit early, there is no context to do these kinds of things, it's not reimbursed and there is no real procedure for it".(B-14)*

- "*The regulation can be a bit stricter, for example... doctors prescribe a lot of benzodiazepines". (B-09/10)*

In Cuba, respondents focused on the need to manage and evaluate the provision of clinical pharmacy services at a national level. Participants emphasized the significance of revising the manuals of standards and procedures, particularly the information pertaining to the operation of PhC.

- *"Pharmaceutical Care should be advocated for at the highest level... There needs to be a consistent and standardized methodology implemented at the national level". (C-01)*

- *"In relation to Pharmaceutical Care, I feel that there is still a need for more precise regulation of this practice. ... Currently, there are numerous circulars, legislations, and standardized processes for drug control. However, when it comes to Pharmaceutical Care, there seems to be lack of regulations that need to be addressed in order to enhance its implementation and effectiveness". (C-03)*

3. Staffing problems for pharmacists to participate in clinical pharmacy activities

The lack of pharmacists is a barrier to addressing or preventing DRPs in healthcare settings. For instance, in Cuba, pharmacy operations have shifted towards prioritizing dispensing since the onset of the pandemic.

- *"The main barrier is the financial problem. There aren't enough resources to keep the pharmacist the whole time in the specific department, ... sometimes it depends on the personal interests [motivation, research] of the pharmacist...". (B-14)*

- *"One of the barriers that, from my point of view, most affects this activity is related to staff, since the clinical pharmacist positions have not yet been approved". (C-08)*

Table 3. Non-overlapping themes from Belgium and Cuba interviews	
Belgium	1. Need of remuneration
	2. Patient loyalty to a single pharmacy
	3. Quality control of Pharmaceutical Care
Cuba	4. Lack of materials and technological resources
	5. Drug availability problems
	6. Inadequate administrative support

4. Lack of systematic practice of Pharmaceutical Care

In both Belgium and Cuba, it was noted that the identification of DRPs and collaboration with healthcare professionals to address them is not consistently implemented. A respondent from Belgium expressed the view that this pharmacy service should be accessible to a larger number of patients. During the interviews in Cuba, it was emphasized that the practice of PhC has been more closely associated with research interests.

- "*I think it should be extended ... I'm speaking about advanced pharmaceutical care. Now, it's only paid for specific groups of patients [patients with specific diseases and medications]. And we, as authorities, would like to extend it to a larger group of patients". (B-12/13)*

- *"We were relatively stable for a period, not excellent, but good. However, in the field of community pharmacy, our involvement in this activity has declined significantly. Personally, I used to work extensively with various at-risk groups, dedicating myself to this activity. As the country stabilizes, I believe there is potential for improvement in this activity [Pharmaceutical Care]". (C -03)*

- *"they may often provide drug information, but typically they do not document the service provided. In some cases, they also engage in passive pharmacovigilance... The topics discussed in commissions regarding pharmacies do not always focus on patient-oriented services; instead, issues related to drug availability and shortages are prioritized". (C-10)*

Three respondents from Belgium and two from Cuba suggested the idea of allocating specific days or times of the week exclusively for clinical activities. One Cuban pharmacist prompted that the working system would need to change to accommodate this idea.

- *"You could make it part of your structure's organization of the pharmacy. For instance, any Tuesday of the week, I have a pharmacist dedicated to working on medication". I think in the future we will make appointments with patients. .... a 15- or 20-minutes appointment and we will talk about the medication profile". (B-16)*

- *"One or two pharmacists should be assigned if the health institution is very large and exclusively dedicated to this activity. Another important aspect is that there should be changes in the work system". (C-04)*

5. More time to provide Pharmaceutical Care

Pharmacists have expressed the need for additional time to

deliver PhC. The interviews highlighted the multiple roles of pharmacists and the time necessary to ensure high-quality PhC. This emerged as a significant barrier. Allocating sufficient time to engage with patients and thoroughly research DRPs for pharmacist interventions are key areas for improvement in practice. Currently, there is limited emphasis on patient-centered services, with priority often given to medication supplies.

- "The opportunity to have more conversations with patients". (B-01)

- "I think one of the things is certainly time. If you have a patient in front of you and there are other patients, then you can look for the problems, but time is limited". (B-03)

- "To provide adequate PhC, you have to spend time with the patient and also add other functions... this causes the pharmacist to lose interest in this area". (C-01)

- "But then, I had to allocate my time to other services such as dispensing, where you find yourself occupied with different tasks....". (C -03)

- "The activities performed by the pharmacist are affected and make the pharmacist more involved in dispensing. In community pharmacy only very few professionals carry out clinical pharmacy activities because they have to perform other functions that take up a lot of time". (C-07)

- "The pharmacist performs several functions, which limits the time.... as a consequence of the lack of staff, pharmacists focus more on dispensing". (C-08)

6. Need for privacy

The pharmacist's need for a facility to offer PhC and ensure patient privacy was emphasized in both countries. In Cuba, four professionals mentioned that the majority of them lack a space to engage with patients or other professionals in the pharmacy. Only one respondent in Belgium stated of the need for pharmacists to have a private space for pharmacist-patient interaction.

- "It's the location, a confidential location. We always ask pharmacists to try to have a private place to do pharmacy activities. And it's also something that we're seeing more and more in the reports". (B-17/18)

- "Infrastructure is the main problem, because at the time of the follow-up visit, you don't even have a place to sit and talk comfortably with the patient". (C-01)

7. Pharmacists attitude and commitment to the patient

This study collected feedback on the impact of pharmacists' attitudes on their performance in clinical activities and interactions with healthcare professionals. Pharmacists are urged to play a more significant part in patient care by recognizing and dealing with DRPs. Despite facing difficult situations with limited resources, pharmacists are confident that with experience and effort, they can always help patients resolve health issues related to medication use. It was also recognized that the initial hesitation to interact with doctors, along with a lack of support and motivation among pharmacists themselves, are significant obstacles.

- "The potential of the pharmacist is underused... we can do much more than just delivering boxes,... because we are already doing more ...". (B-16)

- "...Through experience, dedication, and the use of therapeutic alternatives, pharmacists strive to help patients overcome their health issues". (C-07)

- "what's important for the patient and for me. Simple: if it's good for the patient and, obviously, if I'm capable of doing it... I will not perform acts that I'm not trained for or that I'm not capable. Simple things you can do as a pharmacist because it's important for the patient. And not because the law says that you can do it". (B-15)

- "Personally, I've spent many years working in the healthcare field. I've also held management positions. But I have always maintained an active role in patient care. I believe there are essential elements that characterize every professional's journey: an unwavering respect for our work, a commitment to continuing learning, and a humble attitude". (C-09)

- "I think with the pharmacist, there is a sort of fear of contacting a doctor and telling him that he has done something wrong or prescribed something that is not so good for the patient. I think that pharmacists are a little bit afraid to call the doctors about any kind of drug problem". (B-03)

- "Initially, I faced personal challenges, mainly due to the fear of interacting with doctors. The lack of support and interest from other pharmacists further compounded the difficulties". (C-02)

8. Limited access to patient's clinical information in community pharmacies versus hospitals

In Belgium, in contrast to hospital pharmacists, the medication's 'reason for use' is often unknown for community pharmacists who lack access to clinical patient information. It was a prevalent topic in the interviews conducted in Belgium. Only one respondent in Cuba reported difficulties in accessing patient medical records in hospitals.

- "When it comes to patient information, we are actually blind… And that's the problem". (B-01)

- "There's still a big gap between the pharmacist in Belgium and the doctors … we don't know the indication, why a certain drug is prescribed by the doctor. We don't know the lab results of a patient, and we are not allowed to see them. That makes it very difficult to give proper pharmaceutical care to the patient because there are certain things that we don't know". (B-05)

- "In the hospital, it's completely different because we have an overview of the patient. We have an electronic patient record in the hospital, so... you can really see every problem, including past problems. You can also, of course, see the reason for which the patient is hospitalized now. And you see the interventions of the physicians because they write them all on the computer, the interventions of the nurses, etc. In fact, you see everything. ... you need lab values.... We are quite well equipped in the

hospital to find our information. And that's more limited in the community pharmacy". (B-14)

- "In the hospital, you cannot easily access that patient's medical history". (C-04)

9. Concerns and good experiences interacting with physicians

Most pharmacists have observed from their practical experience that the majority of DRPs are initially resolved with the patient and nursing staff. Pharmacists less commonly reach out to prescribers to clarify information not obtained from patients. The most pressing issues to discuss with physicians are those related to indication, safety, and dosage.

Lack of time among physicians was identified as a barrier to the implementation of pharmacist interventions, particularly due to challenges in communicating with physicians or specialists. In both countries, interviewees expressed concerns about limited communication within the healthcare team. In Cuba, physicians who began collaborating with pharmacists either failed to acknowledge their mistakes or showed resistance. Conversely, pharmacists held positive views of physicians' attitudes towards recommendations for enhancing patients' drug therapy.

- "I must reach out to the doctor as they have more comprehensive knowledge about the patient's condition than I do. I can't make any changes; I'm not allowed to make changes to the treatment that a doctor prescribes…. or alter dosages". (B-01)

- "Communicating with other healthcare professionals presents a challenge. I think we have to improve that. And if that improves, I think a lot of things will go better, if we learn more to communicate with other healthcare workers…But also with the doctors, a kind of medication review, these are also things that if you do profoundly more often with them, I think we can also improve pharmaceutical care". (B-02)

- "I think we all have the same feeling that here the doctors are not yet open to it, or they don't have the time for it, or they don't think it could be useful. There is still a long way to go". (B-11)

- "With physicians? [limitations] Yes, because when new physicians arrive who are not accustomed to working with us, they tend to perceive us as just pharmacists and doubt our ability to make decisions regarding the patient's treatments". (C-06)

- "With respect to the indication, sometimes you have to intervene with the physician. Concerning safety, the same is done with the physician to find a safer medication, if possible. Dosages are easily resolved with the physician, as is duplication of medication or when the medication is not necessary...". (C-03)

- "Well, we had a very good experience. I never had a problem with the doctor, they always wanted the solution. Yes, most of the time I do make suggestions, but they also ask for suggestions". (B-04)

- "My relationship is good; there are always some staff who are reluctant to listen to and implement the pharmacist's advice, but overall, it is good". (C-04)

10. Need of collaborative practice

In both countries, different elements were identified to facilitate the integration of pharmacists into healthcare teams. Getting to know other healthcare providers personally makes establishing a professional link easier. Furthermore, the pharmacist needs to be able to empathize with the healthcare team. Specifically in Belgium, the first suggestion was to organize meetings and conferences on topics of interest to physicians, pharmacists and other members of the healthcare team. In Cuba, participants' main recommendation was that pharmacists should propose interventions with ethics, respect and scientific knowledge. They also stressed the significance of heeding health professionals and utilizing professional settings like rounds or the antimicrobial stewardship committee.

- "The first step is for people to get to know each other, sit down and talk about their patients". (B-05)

- "We're looking for spaces for dialogue and for proposing changes, for example in the daily organizations where pharmacists and physicians get to know each other better and then they have to communicate in a more respectful way... we refer to it as spaces for interaction: physicians-pharmacists where medical-pharmaceutical problems are discussed with several doctors and pharmacies, that's a nice way to get in touch with others... to have small dialogues in such an evening. And all these things will help to improve the work after the meeting of the antimicrobial subcommittee and also in the discussion of cases after each on-call delivery". (B-02)

- "Another aspect is that when a doctor goes to the pharmacist for advice, we should try to give a clear, objective answer as quickly as possible. The pharmacist must handle the issue with the utmost ethical consideration, the reason for the problem is explained and how it can be solved on a scientific basis". (C-05)

- "Opportunities for dialogue and suggestions for change are sought, for example in the daily antimicrobial subcommittee meeting and in case discussions after each on-call service". (C-09)

11. Pharmaceutical care is not fully recorded

Regarding patient follow-up, in Belgium, according to the participants, only patients with medication problems are followed up. A number of pharmacists have noted that while issues with a patient's medication are frequently resolved, the interventions made by the pharmacist are infrequently documented. In hospitals, the prescription is validated, the pharmacotherapy recommendations are recorded in the electronic medical record, but usually the results of the intervention are not evaluated. In Cuba, most professionals stated that contact is usually done in person, with only one pharmacist mentioning her experience with home visits to patients. The hospital pharmacists interviewed visit the ward to conduct a pharmacotherapeutic follow-up of the patient when given the opportunity. They also aim to join the medical

staff during their rounds to assess whether the therapeutic goals have been achieved and to determine if any DRPs have been resolved or prevented as a result of the pharmacist's interventions. All respondents know or have used the patient's therapeutic record to register the DRPs identified.

- *"...is with another prescription for another substance. ...because I see that there's no change, and still these interaction exists, I will go again to the doctor. And if there's no change and you communicate it change to someone, we just keep an eye on it..."... "Is difficult to see your patient while taking notes well. Not only the things that you see on paper, but also the behaviour of patient that sometimes tell you things like without saying things". (B-01)*

- *"I don't think it's easy. I think it's difficult to keep track of when you've changed something. And then, when the patient comes back, you ask them: What is the result of the change we made? It's difficult because there's no tool to help us remember that suggestion. I don't think we know about a good tool or how to follow up on these things". (B-03)*

- *"...we just call the patient if we see a problem ". (B-07)*

- *"During the hospital visit, I carry out this follow-up and check whether the patient has achieved the therapeutic goals with the interventions. This is the most difficult part for me. The patient's therapeutic record is very long and I have to summarize this information in a single page". (C-01)*

12. Challenges in continuity of care

Interviewees pointed out that there are still deficiencies in professional communication and coordination between different levels of healthcare in the continuity of patient care. This issue impacts the follow-up and documentation of the pharmacist's clinical involvement with the patient. In Belgium, there are existing options for patients to receive information about medications upon discharge from the hospital. In Cuba, there are established procedures for obtaining prescription drugs for chronic conditions or specific groups of medication when transitioning from the hospital to primary care.

- *"When they send them out of the hospital with very little information around them... There are two things I would change. The first one is a very simple one: make sure that every patient who leaves the hospital is given a little name card....a card that you give to link up with the patient's information.... The more complex solution that everybody is thinking about... very expensive, very complex and the connection is complete is the electronic file of the patient in the hospital and maybe we would access that file". (B- 15)*

- *"...Another initiative is the green envelope. When the patient leaves the hospital, the hospital pharmacist or nurse puts everything concerning the medication in a green envelope. The patient knows all the medication information in that envelope. And they try to encourage to take that envelope to the pharmacy. ... It's not really new, but it's not universally applied…". (B- 17/18)*

- *"From the cancer hospital .... when the patient is discharged, I receive information from the hospital pharmacist and then I follow up the patient who takes psychotropic and narcotic drugs". (C-03)*

- *"I have not had any experience [communication with community pharmacist]. Occasionally some patients from community pharmacies come asking for information about a specific medication". (C-05)*

Non-overlapping themes from Belgium and Cuba interviews

Belgium

1. Need of remuneration

In interviews conducted in Belgium, most professionals unanimously agreed that the current remuneration system should be revised to incentivize the provision of PhC, and pharmacists should be compensated for their clinical efforts in preventing or resolving DRPs in patients.

- *"They may spend half an hour dealing with a complex patient, but the profit they receive is only three dollars or three euros. However, selling cosmetics can yield a profit of 10 euros". (B-04)*

2. Patient loyalty to a single pharmacy

According to a significant minority of Belgian interviewees, a challenge in improving the delivery of PhC is when patients do not consistently return to the same pharmacy. This can especially impact the process of addressing DRPs and following up with patients who have chronic conditions.

- *"The patient can only be monitored if they return to you... The pharmacist won't know what has happened to them. Thus, this is also a significant problem. What happened with the patients after visiting me? Did the patient take any other medications after visiting me? We require more patient information". (B-04)*

3. Quality control of Pharmaceutical Care

Current quality initiatives of pharmacies are more of a technical nature and the PhC is not really monitored or measured. One professional considered that compliance with quality indicators could be a factor in the future remuneration of pharmacists. Others suggested that it is possible to assess the outcomes of pharmacists' efforts using quality indicators that are linked to the benefits experienced by patients.

- *"I just think that the control... is focused on details that are not important. Like the kind of equipment you have in the pharmacy, which is very technical, and not so much on the quality of your work in pharmaceutical care".*

(B-06)

- *"We measure what we do, but we cannot accurately quantify the amount of health we produce since healthcare's fundamental objective is to produce and maintain good health". (B-15)*

Cuba

1.Lack of materials and technological resources

The lack of material and technological resources, which hinders the provision of patient-centered services, was mentioned in the interviews as an obstacle that does not facilitate the work

of clinical pharmacists. The lack access up-to-date information through the internet was also mentioned.

- *"There are also infrastructure problems, along with a shortage of office supplies". (C-01)*

- *"Technology also influences the updating of the information we have. It is important to guarantee office material, at least the patient's therapeutic record sheets". (C-02)*

- *"Some pharmacists do not have smart phones to look for updated information referred to some treatment because the literature in paper format found in hospitals is outdated". (C-05)*

- *"Due to inadequate information available at the hospital, there is a scarcity of literature sources. The hospital has access to the internet, but it does not have any facilities. The existing facilities belong to me, not the hospital".*

(C-06)

2. Drug availability problems

The scarcity of medications has a detrimental effect on the pharmacist's ability to recommend medication changes, start new treatments or explore other therapeutic options. Clearly, the most challenging medication-related problem to address is the issue of drug shortages.

- *"The unavailability of drugs has a significant impact because when a DRP is identified and requires a change in treatment, the lack of an alternative drug becomes a problem. These are challenges that we have to try to improve". (C-03)*

3. Inadequate administrative support

In the sample of respondents, sizable minority felt that they did not receive adequate support and resources from health center managers compared to other professionals.

- *"It is necessary to give resources to the people who manage the activity; doctors and dentists have been given computers and business telephones. But sometimes even the managers of pharmacies are not given these resources. This work is fundamental because, for the vision of the managers, it is one more salary, but they do not see that this salary would be a reduction in the cost of medicines for their irrational and incorrect use". (C-02)*

DISCUSSION

The diversity of the sample enabled the research team to gain varied perspectives on the topics covered in the interview guide. However, in Cuba, the study failed to recruit pharmacists from various regions of the country, male pharmacists, or pharmacists from younger age groups.

Common themes from Belgium and Cuba interviews

There were 12 common themes identified as result of analyzing the interview data from Belgian and Cuban respondents.

Education and training of pharmacists was a topic discussed during the interviews. In both countries the pharmacists consider that graduates were excellently trained, but that it was imperative that this knowledge be put to use in the healthcare setting. In Cuba, researches are certain of that the lack of time and multiple activities have a negative impact on pharmacists' continuing education. Besides, the insufficient knowledge by community and hospital pharmacists hinders the progress of clinical activity and research.[48] Magedanz argued that training is essential as the usual pharmaceutical practice is more oriented towards technical and commercial activities.[49] Due to the variety of methodologies, pharmacy services and approaches used in the provision of PhC, it is recommended that the pharmacist receives frequent updates.

As regard *the legal framework of Pharmaceutical Care services*, in Belgium, pharmacists stated that the legalization of some clinical test, for example glycaemia, and the routine administration of injectable drugs should be under consideration by the government. In the context of the COVID-19 pandemic, pharmacists demonstrated their ability to diversify their role in the pharmacy. Interaction with patients was increased through various clinical services, including MR.[50,51] PhC was recognized as a fundamental responsibility of pharmacists by a law of 1 May 2006,[52] but this was only mentioned in one interview. Nonetheless, there is no legal requirement to remunerate pharmacists for providing PhC. Lack of regulation was a common barrier to the implementation of PhC, a finding confirmed the study by Lugo.[3] Furthermore, while positive comments were made about the prescribing system in several interviews, studies show that changes in prescribing for certain groups of medicines are needed.[53,54]

In Cuba, there is no specific law referring to the practice of PhC.[55] The standards of practice of pharmacies, regulated by the manuals of standards and procedures,[18-21] do not specify the actions that correspond to this clinical activity. This situation, identified in 2012 by Reyes,[56] is still valid in 2023.

The *staffing problems for pharmacists to participate in clinical pharmacy activities*, is hampering the implementation of the PhC.[5] In Belgium, there is a recognized shortage of pharmacists in community pharmacies and hospitals, which is worsened by financial challenges.[57,58] It is a challenge for hospital pharmacists to regularly visit wards and interview patients; for example, in a preliminary project in a hospital ward for elderly patients, the need of permanent presence of the pharmacist was identified as a barrier.[58] In Cuba, few professionals are involved in PhC activities. Their involvement has been primarily restricted to the management of pharmaceutical supplies. Their skills in resolving DRPs, patient health outcomes and community health promotion have received little recognition.[59] Reyes discussed a variety of factors: a large number of professionals do not practice after graduation, others go on international assignments and there has been an exodus of pharmacists to industry and marketing because of better remuneration.[56] These issues persist in causing staffing challenges in pharmacies and impede the expansion of patient-centered pharmacy services.

Addressing the *lack of systematic practice of PhC*, the provision of MR has been linked to pharmacist remuneration for groups of patients with specific diseases in programs or pilot projects.

However, poor implementation of some of these services in practice has been reported, as well as a lack of commitment on the part of pharmacists, health professionals and patients.[57]

In Cuba, although there are pharmacists who have successfully applied PhC, low amount in clinical activity and interaction with medical staff and patients continues to be identified in a recent study.[48] Previous studies have reported a lack of compliance with PhC-related functions, a lack of institutional control[56] and limited clinical pharmacy practice by pharmacists.[55] Particularly in the Santiago de Cuba province, the development of PhC in recent years has been associated with the implementation of research projects. Then, with the end of the researches, the provision of PhC decreased.

Although there is a lack of pharmacy staff in both countries, it was suggested by respondents to organize or schedule appointments exclusively for PhC. A published paper on pharmacist workload in pharmacies suggests setting a time limit for interaction with the patient and then making an appointment if more time is needed to resolve the problem with the patient. [60]

Pharmacists expressed *the need for more time* to deliver PhC, gather information, and communicate with the healthcare team. Current workload in non-clinical roles often hinders this, making lack of time a barrier to providing PhC.[61,62] In Cuba, time constraints were not explicitly mentioned as in Belgium. Instead, staff shortages and a focus on dispensing were cited as reasons for limited time, reducing the availability for clinical activities as previously noted.[48,55,63]

The pharmacist needs more space in the pharmacy to the provision of patient-centered services. It has been reported that there is *need for privacy* for patient consultations. It is difficult for pharmacists to perform PhC without a dedicated space to review patient information and other sources of information[64] and the protection of privacy is a prerequisite for all clinical activity and it is a legal requirement.[65] In Cuba, this situation in community pharmacies has been presented as a basic structural condition that affecting the implementation of the pharmacotherapeutic follow-up service.[63]

The interviews revealed the importance of the *pharmacists attitude and commitment to the patient* to the success of clinical pharmacy activities. The pharmacist should be aware that, besides dispensing medication, they also play a crucial role in improving the use of medicines and resolving DRPs, which is the primary goal of PhC. As a result, the pharmacist must be dedicated to the patient's well-being and work collaboratively with other healthcare professionals. Accordingly, one study reported the usefulness of the proactive attitude and that the interaction with the health care team depends on the personality of the pharmacist.[64] The implementation of clinical pharmacy in a hospital in Brazil found that the lack of confidence and clinical experience of pharmacists was overcome with the help of other professionals.[66] A lack of proactivity and collaboration on the part of pharmacists themselves has also been identified.[66]

The *limited access to patient's clinical information,* in the community pharmacy in Belgium, was previously also found in a qualitative study on the implementation of MR.[44] In Cuba's primary healthcare system, pharmacists can immediately access the medical records because most patients have a copy, including those with information on diseases treated by medical specialties. The pharmacist can deal with all the patient information with the family physician and nurse (primary care health system) and has the possibility to make a home visit. In the hospital ward, the pharmacist finds it challenging to review the patient's medical record due to it being a single paper document that is used by doctors, nurses, and medical students for the majority of the day. Post-discharge, the hospital pharmacist requires authorization to review it since it is promptly archived at the hospital. Sharing patient information between members of the healthcare team could help resolve DRPs and improve health outcomes, especially in cases where clinical data is not accessible.

Regarding *concerns and good experiences interacting with physicians,* preventing and resolving DRPs can be difficult due to the limited exchange of information between pharmacists and physicians.[41,44,67] Based on interprofessional interaction and clinical pharmacy experience in both countries, there is evidence of persistent negativity towards pharmacists' interventions, despite prevailing positive attitudes. Similar findings have been reported as factors facilitating the process of integrating pharmacists into healthcare teams.[64] Identifying negative provider attitudes should be seen as an opportunity for pharmacists to better integrate into the healthcare team rather than a setback. This is why the necessity for collaborative practice, as suggested by various methods from the interviewers, is crucial. In line with this, Sirimsi *et al*[68] have recently developed a toolkit consisting of eight sections to improve broad collaboration and professional integration in primary healthcare.

The Electronic Pharmaceutical Dossier in Belgium features multiple menus for logging medication details.[69] Nonetheless, *Pharmaceutical Care is not fully recorded*. In Cuba, a study published by Reyes in 2012 found that the clinical activities performed by pharmacists in hospitals were also not documented or recorded.[56] Elías in 2019,[63] also pinpointed the absence of documentation as a key issue in community pharmacy, which hampers the progression of services oriented towards patients. The pharmacist's clinical work with patients prescribed narcotics and psychotropic drugs closely resembles the practice of Pharmaceutical Care. At the very least, all activities carried out are documented and overseen by other professionals, which includes identifying DRPs. In this pharmacy service, a legal system-based approach is evident instead of a patient-centered approach.[18]

There are still *challenges in continuity of care.* The problem of lack of information at the transitions between hospital and community pharmacy was mentioned in Belgium. Experience and opportunities already exist for sharing information through medication lists and discharge letters aimed at community pharmacists. However, these practices have not yet been implemented universally. There was a positive response from

professionals to this initiative, who felt that it would facilitate PhC and avoid misinformation about medication.[58]

In Cuba, as noted in some of the interviews, very few pharmacists communicate with others from other levels of health care to ensure *continuity of care* for patients. This occurs in particular scenarios, such as when coordinating the distribution of psychotropic and narcotic medications to cancer patients in community pharmacies who are referred from oncology hospitals.

Non-overlapping themes from Belgium and Cuba interviews

Belgium

The *need of remuneration* has been identified as a major barrier to the implementation of PhC, as highlighted by a qualitative study conducted by Robberechts in Belgium in 2021.[44] Other studies in Europe and Asia have reported a lack of consistent financial remuneration for this patient-centred service.[61,70,71] It has been reported that pharmacists are remunerated through a combination of a fixed fee per medicine and a percentage of the purchase or supply price of medicaments, plus a small financial margin for certain forms of PhC.[72]

Pharmacists mentioned that dispensing chronic disease medication is reimbursed at a lower rate than the sale of other products. Caring for the chronically ill takes time, but there is no remuneration for this activity.[72] Payment should be based more on the pharmacist's service to patients than on the price of medicines.[72] All pharmacists agree that this activity requires a fixed payment to the person developing the clinical activity. Clearly, the remuneration system needs to change to better motivate the pharmacist.

In countries across Latin America, it has been noted that the compensation for clinical work is relatively low.[3,73] Remuneration was not discussed in the interviews in Cuba, however, prior studies have indicated that pharmacists lack motivation due to their salary. In addition, community and hospital pharmacists earn lower salaries than those in the industrial and commercial sectors.[56] Only community pharmacies are paid according to the profit made on the products dispensed.[63]

The fact that *patients sometimes do not remain loyal to the same pharmacy* in Belgium, was one of the main concerns expressed during the interviews. Not all patients are loyal to their pharmacists and in addition there is no easy way to monitor or enforce that. When the patient receives personalized attention from the pharmacist, it would allow for the follow-up of treatment.[74]

In Cuba, patients visit a designated pharmacy to get their medication for chronic clinical conditions based on the prescription and a medication list card, as outlined in the National Drug Program.[18,21] In primary care, a pharmacist should be involved in the pharmacotherapy committee, antimicrobial use subcommittee, adverse reaction reporting process, and other activities, just as they would in a hospital.[21] Thus, integrating pharmacy and its operations into the healthcare system allows for the inclusion of pharmacists in the healthcare team. However, this integration does not ensure that all pharmacies offer pharmacotherapeutic follow-up of patients or professional advice on medication.

The use of *quality indicators* for community pharmacy, as per respondents, does not currently prioritize patient-centered services. Some of them made comparisons with the Netherlands, which has introduced some quality indicators for PhC in community pharmacies.[75] Hence, some interviewees perceived the pharmacy service in that country to be more advanced than in Belgium. Initiatives have been undertaken to suggest quality metrics for assessing the level of clinical pharmacy practices in Belgian hospitals.[76] Although this topic was not addressed in the interviews in Cuba, results have been published on the behaviour of quality indicators in the pharmacotherapeutic follow-up of psychiatric inpatients. This has facilitated an in-house verification of the suggested indicator system and the setting up of benchmarks to evaluate the quality of service in the future.[77] Certainly, if the implementation of PhC is not routine and there is minimal patient supervision and documentation of the pharmacist's actions, it becomes unviable to gather data, compute quality indicators and standardise the operation.

Cuba

The *lack of materials and technological resources* (computers, printers, paper, updated bibliographies and other sources of information) prevent the pharmacist carry out the PhC activity. Similarly, a study carried out in Cuba identified the need for computer systems and tools in community pharmacies to allow systematic and complete documentation.[63] Computers have been primarily available in pharmacies for managing medication supplies; however, their use for the delivering of clinical pharmacy services has not yet been established. The situation in Belgium is very different; professionals mentioned a variety of source of information available in pharmacy.

The main cause of *drug availability problems* in Cuba is the lack of raw materials for their manufacture and the lack of financial resources resulting in a DRP in itself. In Belgium, this issue was not raised in the interviews, although it certainly is also a problem.[78,79]

Regarding *insufficient administrative support*, a Cuban participant expressed that health center managers and the Cuban Ministry of Public Health still lacked understanding about the benefits of pharmacists working directly with patients. Researchers reported a lack of guidance on the development of pharmaceutical patient care[64] and support of pharmacy administrators. [62]

In interviews, pharmacists mentioned the essential personal information they often collect from the patient to provide PhC. In this way, we were able to explore the extent to which a holistic approach has been integrated into Pharmaceutical Care and the relationship with some of the themes identified in the interviews. In Belgium, interviewees mentioned demographic data, medications, diseases, laboratory tests, among others. Although pharmacists must manage certain clinical data to prevent or resolve DRPs while respecting patient privacy, barriers to accessing clinical information

exist. In addition, the importance of knowing the psychosocial aspects and the patient's medication experience was reported by a few pharmacists. Respondents mentioned that they had referred patients to and communicated with social workers and psychologists in order to provide a more holistic PhC to patients. This is clearly not yet a widespread practice, and there is limited documentation of the connection between SDOH and the occurrence of DRPs. Although, in the recent article of Robberechts et al, about the key elements for assessing the quality of MR type 3 in Belgium, there was consensus to include the living situation and patient's expectations and concerns when developing the treatment plan.[80] In recent Belgian research, it was found that community pharmacists were able to recognize the psychosocial needs of patients and can direct them to appropriate social care institutions.[81]

Cuban pharmacists stressed the importance of conducting patient interviews in an atmosphere of trust and care. Although it is not common to interview the patient, professionals commented on the importance of knowing the patient's living situation. However, some psychosocial data and patient perspectives remain uncollected. This could be due to the design of tools that have been validated in a health care context. In particular, while regulations for personalized follow-up and care for patients who use psychotropic and narcotic drugs are important, this activity should be closely monitored, not only from a legal perspective but also in terms of the clinical and humanistic outcomes for the patient. In this regard, the Cuban authors considered that there is a lack of publications on the consumption of medicines in relation to the living conditions of the population in Cuba.[82]

The pharmacists' negative attitude towards providing PhC and the lack of education and training in both countries may also negatively impact the adoption of this holistic approach. The practitioner needs to take a more proactive approach and be better prepared, demonstrating more commitment to the patient, humanism, and communication skills in order to gather information on physical, mental, and psychosocial aspects, as well as on medication.

In Belgium, pharmacists reported having multiple tools and sources of information at their disposal to provide PhC. Positive feedback was received regarding the Shared Medication Register database, which includes information on both prescription and over-the-counter medication. This service is led by the Belgian professional associations for pharmacists in order to improve patient safety and provision of PhC.[69] In comparison with Cuba, the main sources of information consulted by pharmacists were pharmacology textbooks, drug formularies, clinical guidelines and standard operating procedures for pharmacotherapy follow-up. However, some of the literature may be outdated or inaccessible to pharmacists in community pharmacies, hospitals, or other health care settings.

In both countries, despite facing barriers and challenges, pharmacists are able to solve DRPs. Therefore, the primary focus should be on training pharmacists and promoting the humanistic aspects of the profession to better prepare them to provide patient care. Additionally, regulations are necessary to enhance the management and oversight of PhC activities and monitor patient-centered services.

The SDOH in relation to pharmacotherapy, or the application of this information in PhC, were only briefly addressed when inquiring about the information that the pharmacist considers important to gather. The research team has recognized the necessity for further investigation into the psychosocial aspects of the patient, alongside clinical data and medication records. This approach would allow for a more holistic understanding of the patient, which could potentially impact the use of medications.

This study confirmed the progress made and the ongoing challenges in implementing PhC. A comparative analysis of healthcare contexts in Cuba and Belgium was conducted, although Cuba had a smaller sample size for interviews. The qualitative approach enabled a deeper understanding of the topics discussed, based on the perspectives and experiences of the interviewees. Therefore, the findings can serve as a basis for identifying priorities to improve the delivery of PhC.

Limitations

In both health care contexts, the perspective of other health care providers and patients was not investigated. In Cuba, the lack of response from interviewers and the resulting smaller sample size may have impacted in the information obtained and the saturation of the data could not be achieved. The research carried out in Cuba occurred during an economic crisis that continues to affect the accessibility of medications in community pharmacies and hospitals. Consequently, prioritizing the management of medicine supply has an impact on clinical interactions with patients.

CONCLUSIONS

In both countries, according to those interviewed, PhC is not yet widely practiced. However, it is essential to harness pharmacists' positive experiences to further develop PhC practices. Despite the differences in economy, society, and politics, both healthcare systems face similar significant challenges and obstacles in implementing PhC. Regulatory, financial, and human resources are needed to enhance the provision of this activity. The holistic approach to pharmacists' professional perception and practice is still limited. Tools for pharmacists to engage with patients need to be more holistic. Improved access to clinical patient information and a more proactive pharmacist approach, coupled with better preparation, could help improve the delivery of clinical pharmacy services. In Belgium, there has been noteworthy progress in the field of PhC. The technological resources available facilitate the identification, prevention and resolution of DRPs. In spite of the lack of resources impacting the total amount of PhC we discern a continued interest in this kind of patient centered care in Cuba.

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CONSENT: I have read and agree to the privacy policy.

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Appendix 1 Guide interview for pharmacists

I. **General information**

Sex:

Age:

Setting:

Professional pharmacist's activities:

Patient care __

Manager __

Research __

Teaching__

Logistic and dispensing service __

Date of obtaining a professional degree __

Time dedicated to the patient care activity: __

Postgraduate degree: _____

II. Interview topics (T) and Questions (Q)

(I) Challenges to face by the pharmacist and application of regulatory policies

1. How do you suggest that pharmaceutical care to the patient in Belgium could be improved?
2. What challenges the pharmacist will have to face?
3. What is your opinion about the performance of clinical oriented services in the pharmacy in the daily professional practice?
4. Could you give your opinion on the regulations or policies that legislate and control the pharmacists' activities in your setting?

(II) Management of Drug-Related Problems (DRP) in clinical pharmacy practice

5. How do you handle any problem with the indication, effectiveness and side effects of medication in a particular patient? How do you identify those drug related problems?
6. What kind of problems do you solve immediately or take more time? Could you describe an example, please?
7. What elements and patient-specific information do you consider that the pharmacist should assess to identify, prevent and solve a problem associated with medication in the patient?
8. What tools or source of information you use most in order to support this? What tools are missing?

(III) Professional collaboration between the pharmacist and the health team

9. Could you describe your professional relationship with healthcare providers in order to resolve drug related problems?
10. Have you faced limitations during interaction with physicians or others healthcare providers to resolve drug related

problems?

11. How can this be improved?

(IV) Follow-up and documentation of clinical pharmacy activity with the patient

12. How do you follow up the patient once that you made suggestions to prevent or solve those identified problem?
13. How do you record the patient care activity? What kind of ways do you use for communication with the patient?
14. How do you follow a patient who is referred to another level of health care?

(V) Barriers to the resolution and prevention of DRP

15. What barriers have you faced in the development of pharmaceutical care to solve or prevent drug related problems in patients?

Themes	Interview Topics	Pharmacist Discourses
Common themes from Belgium and Cuba interviews		
1.Education and training	I. Challenges to face by the pharmacist and application of regulatory policies	- " That pharmacists need more education about pharmaceutical care and be well trained ". (B-14) - " There is a wide range of postgraduate education and numerous courses available for pharmacists to enhance their knowledge. Additionally, trans mural collaboration can present another challenge ". (B-12/13) - " At the university level, the education provided is quite satisfactory. However, there is room for improvement, especially in terms of implementing more focused information for new services ". (B-16) -" Training is highly beneficial for enhancing clinical activities ". (B-17/18)
	II. Management of DRPs in clinical pharmacy practice	- " There is a learning potential for community pharmacists, which is now being provided through education. Nowadays, more attention is being given to these aspects. However, not every pharmacist may know how and where to find the best resources ". (B-14)
	III. Professional collaboration between the pharmacist and the health team	- " You have clinical problems where pharmacists can play a significant role in specific topics... And they should also train themselves in specific domains". (B-07)
	V. Barriers to the resolution and prevention of DRPs	**- " We may not know enough to fix everything. We have a lot of information, but we need to figure out what's important and share it with the patient. It's not easy ". (B-03)** - " One of the barriers could be the lack of knowledge among pharmacy personnel, particularly the assistants. I believe their education could be improved to enhance the quality of pharmaceutical care they provide ". (B-04) - " At times, certain tasks could be delegated to technicians. However, the reason behiznd not doing so is that these technicians have a very low level of education ". (B-17/18)
2. Legal framework of Pharmaceutical Care services	I. Challenges to face by the pharmacist and application of regulatory policies	- " Many patients can go to any pharmacy to pick up the medicine… they can bring multiple prescriptions on the same day for the same drug. And that's like drug abuse, for example, sleeping pills...When it is known for certain patients that abuse or misuse of certain drugs, I guess should be like a message or whatever in the system that really shows this to the pharmacist: Whatch out! … ". (B-01) - " But the most pharmaceutical care we give is not legally arranged ". (B-02) - " I don't think there are legal regulations, there are some policies to get suggestions and to do that, but it's very little, not much regulations or policies for the moment ". (B-03) - " There are some organizations that do the controls. And that some organizations are working". "We needed on government level policy. …. I suggest that filtration of all those products ". (B-04) - " The role of the pharmacist in pharmaceutical care is recognized also by the government and we are improving, but it is very slowly …pharmaceutical care actions they are really legislated to approved by the government"... We go in the good direction, but is a long way to go ". (B-05) -" Pharmacists are underestimated by regulatory institutions, and we should more talk about what we do and the added value... I think it's changing a little bit. Due to the pandemic, we demonstrated that we were present for patients ". (B-07) **- " The regulation can be a bit stricter, for example... doctors prescribe a lot of benzodiazepines ". (B-09/10)** **- " I stated a little bit early, there is no context to do these kinds of things, it's not reimbursed and there is no real procedure for it ".(B-14)** -" We cannot legally do screening or prevention in a pharmacy ...I mean, those terms legally, except if you have the authorization of the authorities, ... in the context of a big program, an organized program. …we measure people blood pressure, is a good example ". (B-15) - " Laws and other rules had to be adapted. And when you convince the patients, more or less at the same time you convince politicians. The possibilities of the pharmacists are underused ". (B-16)
	II. Management of DRPs in clinical pharmacy practice	- " That is not yet officially existing, but it can become official by monitoring blood sugar levels ". (B-01)

	V. Barriers to the resolution and prevention of DRPs	- " We are now trained to administer injections to patients. However, our government has not included this in the law ". (B-01) **- " We weren't allowed as pharmacist to take a drop of blood. And that's really a barrier, because it can really be good for the patient. The role of the pharmacist in pharmaceutical care is recognized also by the government and it is improving, but very slowly … Pharmaceutical care activities have been officially legislated and approved by the government."... We go in the good direction, but there is still a long way to go ". (B-05)** - " It would be beneficial to have more support from the Pharmaceutical Association or the government. They could provide us with more tools and greater access to tools ". (B-11)
3. Staffing problems for pharmacists to participate in clinical pharmacy activities	II. Management of DRPs in clinical pharmacy practice	- "As pharmacists, we have a lot of responsibilities in the hospital. One of these is to follow up with specific patients. However, due to our small group size, we have a large workload and many patients to attend to. It is not feasible for us to screen every patient and medication individually due to financial constraints. Therefore, we prioritize high-risk medications such as antibiotics, anticoagulants, insulin, and oncology products that could be dangerous if given incorrectly ". (B-14)
	V. Barriers to the resolution and prevention of DRPs	**- "…The main barrier is the financial problem. There aren't enough resources to keep the pharmacist the whole time in the specific department, ... sometimes it depends on the personal interests [motivation, research] of the pharmacist...". (B-14)** - " One of the significant issues is the shortage of pharmacists, and it falls under the purview of Human Resources " . (B-17/18)
4. Lack of systematic practice of Pharmaceutical Care	I. Challenges to face by the pharmacist and application of regulatory policies	- " We don't do it systematically, but sometimes if it's a very important interaction, we take action to solve the problem. However, I believe that it may still not be enough ". (B-03) - " We should be more organized in our normal daily work ". (B-07) **- " I think it should be extended ... I'm speaking about advanced pharmaceutical care. Now, it's only paid for specific groups of patients [patients with specific diseases and medications]. And we, as authorities, would like to extend it to a larger group of patients ". (B-12/13)** - " It's not fully integrated into daily practice yet, at least not in Belgium. The pharmacist needs to have an agenda with appointments. This is not the regular care provided in Belgium at the moment. This is an organizational expectation that could be improved ". (B-14) **- " You could make it part of your structure's organization of the pharmacy. For instance, any Tuesday of the week, I have a pharmacist dedicated to working on medication". I think in the future we will make appointments with patients. .... a 15- or 20-minutes appointment and we will talk about the medication profile ". (B-16)**
	II. Management of DRPs in clinical pharmacy practice	- " This is also something that pharmacists are not yet doing in daily practice, sometimes for specific medications or on specific request maybe, but not on a regular basis ". (B-14) - " That's the function added, these are the responsibilities of the clinical pharmacist. Sometimes it goes smoothly, sometimes it's a bit less so, but it is increasing ". (B-17/18)
	III. Professional collaboration between the pharmacist and the health team	-" Maybe we should do that more often as well ". (B-07)
5. More time to provide Pharmaceutical Care	I. Challenges to face by the pharmacist and application of regulatory policies	**- " ... The opportunity to have more conversations with patients ". (B-01)** - "...we should also take a little bit more time to talk with the patients. Now, we have rather quick contact with the patient ..." (B-02)
	II. Management of DRPs in clinical pharmacy practice	- "...in most of the cases, the case takes more time and we will take our time to investigate it properly. Yeah, it's better to do our homework in a quiet moment and then to contact the patient again after we did some investigation about it ". (B-02) - " In daily situations we don't always have enough time, patients expect us to go fast… They come in, we give them their medicines, they pay and they go out. And everything has to go pretty fast in Belgium. And it's not good in our profession. Sometimes it's too quickly ". (B-06)

	V. Barriers to the resolution and prevention of DRPs	- " We need to adopt a more personalized approach with each patient, dedicating more time to discuss their medication ". (B-02) **- " I think one of the things is certainly time. If you have a patient in front of you and there are other patients, then you can look for the problems, but time is limited ". (B-03)** - " Another barrier we face is the lack of time. Most of the time, we are constrained by limited time. It would be beneficial if we had more time to spend with each patient ". (B-09/10) - " Sometimes, we don't have enough time to conduct thorough research in our job. Time constraints often hinder our ability to do so ". (B-11) - " Working with a limited amount of time, sometimes even less than 100% in certain departments, is also a barrier. Time is a significant factor that requires a considerable amount of our attention ". (B-14)
6. Need for privacy	V. Barriers to the resolution and prevention of DRPs	**-" It's the location, a confidential location. We always ask pharmacists to try to have a private place to do pharmacy activities. And it's also something that we're seeing more and more in the reports". (B-17/18)**
7. Pharmacists attitude and commitment to the patient	I. Challenges to face by the pharmacist and application of regulatory policies	- " I believe that pharmacists should take a more proactive approach in dealing with patients, particularly those with chronic care needs. We should not wait for patients to simply come into the pharmacy; instead, we should be more proactive ". (B-07) - " We are aware that it is crucial for patients to have access to this service. The importance of this service is not based on our own perception, but rather on the fact that patients themselves consider it important ". (B-16)
	III. Professional collaboration between the pharmacist and the health team	- " These individuals sometimes perform clinical tasks, not exclusively, but they can also engage with patients " . (B-14) **- "... what's important for the patient and for me. Simple: if it's good for the patient and, obviously, if I'm capable of doing it... I will not perform acts that I'm not trained for or that I'm not capable. Simple things you can do as a pharmacist because it's important for the patient. And not because the law says that you can do it ". (B-15)**
	I. Challenges to face by the pharmacist and application of regulatory policies	- " Maybe another challenge is the self-confidence of the pharmacist, who may not be used to providing this type of service or may not believe they can do it there ". (B-12/13) **-" ...The potential of the pharmacist is underused... we can do much more than just delivering boxes,... because we are already doing more ...". (B-16)**
	III. Professional collaboration between the pharmacist and the health team	**- " I think with the pharmacist, there is a sort of fear of contacting a doctor and telling him that he has done something wrong or prescribed something that is not so good for the patient. I think that pharmacists are a little bit afraid to call the doctors about any kind of drug problem ". (B-03)** - "Pharmacists should also take some responsibility. We should be more proactive and collaborate with general practitioners." (B-07) - " I believe that if you are correct and provide doctors in the hospital with important and well-supported information, they will respect you. So, it is something that needs to develop over time ". (B-12/13)

8. Limited access to patient's clinical information in community pharmacies versus hospitals	I. Challenges to face by the pharmacist and application of regulatory policies	- " We may require additional information about a patient in order to perform our job more effectively. This does not mean that we are unaware of any hidden information. By having more information shared with doctors, we can provide better pharmaceutical care for the patients ". (B-02) - "…One of the biggest problems in Belgium is the lack of information sharing between caregivers. As a pharmacist, we receive patients but we do not have access to any lab results. I believe that information sharing is essential. Without access to patient records or lab results, perhaps we can communicate with the doctor...". (B-04) **- " There's still a big gap between the pharmacist in Belgium and the doctors … we don't know the indication, why a certain drug is prescribed by the doctor. We don't know the lab results of a patient, and we are not allowed to see them. That makes it very difficult to give proper pharmaceutical care to the patient because there are certain things that we don't know ". (B-05)** - " I think we need more information about patients. When we have some more information, we can get to give specific, select better medication ". (B-09/10) - " We are often unaware of the patient's condition. We lack information about their illness and current state. Our only clue is the medication they are prescribed. Obtaining more details about the patient's situation would greatly aid us in our work. However, we are limited by the patient's pharmaceutical history, which may not always provide sufficient information. Additionally, we believe that accessing confidential patient information is prohibited by lab ". (B-11) - " We require more clinical data from the patients, particularly what is currently lacking. A good exchange of patient information should be implemented, and this responsibility likely falls on the regulatory authorities or policymakers. The community pharmacist does not have access to the medical patient file, unlike the pharmaceutical hospital file. As a result, they often lack knowledge about the indication of a medication. If you wish to monitor the patient and conduct a medication review based on this data, you need access to all the relevant information, including the lab values ". (B-14) -" In hospitals, practitioners and pharmacists are increasingly exchanging information electronically, which simplifies the process of providing pharmaceutical care ". (B-17/18)
	II. Management of DRPs in clinical pharmacy practice	**- "... When it comes to patient information, we are actually blind…And that's the problem ". (B-01)** - " I need the indication... It's crucial. However, it poses a problem for medical doctors who are concerned about privacy issues... I believe the first thing is the indication. The second thing is the lab result ". (B-04) - " We truly lack knowledge about the illness behind the indication, the reason for prescribing that medication. We don't have access to that information... Consequently, we are unable to provide better Pharmaceutical Care... Some doctors refuse to share it, fearing that it may jeopardize their job security." "A digital platform that is shared among the pharmacist, doctor, and hospital is missing ". (B-05) - " We don't have access to any additional information regarding the indication... If we could at least have some clinical parameters... For instance, if the patient has comorbidities like chronic kidney disease or similar conditions. The GP doesn't disclose indication ". (B-07) - " We are unable to review a file or medical history, we don't have that capability ". (B-09/10) - " The problem lies with the indication, it's challenging because... we are often unaware of the reason for which the doctor prescribes." "We lack knowledge about the patient's physical condition ". (B-11) **-"...In the hospital, it's completely different because we have an overview of the patient. We have an electronic patient record in the hospital, so... you can really see every problem, including past problems. You can also, of course, see the reason for which the patient is hospitalized now. And you see the interventions of the physicians because they write them all on the computer, the interventions of the nurses, etc. In fact, you see everything. ... you need lab values.... We are quite well equipped in the hospital to find our information. And that's more limited in the community pharmacy ". (B-14)** - " Regarding the highest level of access, it won't be type three because, as I mentioned earlier, we don't have access to clinical data ". (B-16) - " For the patient's chronic diseases, it would be beneficial to also have knowledge of their kidney function. I believe this is crucial information for every pharmacist, especially those working in primary care ". (B-19)

	IV. Follow-up and documentation of clinical pharmacy activity with the patient	- " His pharmacists, family pharmacist, GP, or even the nurse may accompany the patient. In my opinion, it is reasonable for these individuals to have access to the patient's data. However, ultimately, it is the patient who should be in control and decide who has access. Of course, we can assist them in making this decision ". (B-16) - " We cannot access the file where a doctor records the patient's medical problems. This lack of information hinders our ability to fully understand the patient's condition. As pharmacists, it is important for us to have access to the complete medical file, not just the pharmaceutical information. For instance, if there is an alcohol abuse problem that we are unaware of, it can significantly impact our treatment approach ". (B-01)
	V. Barriers to the resolution and prevention of DRPs	- " We can also improve by sharing all information about the patient ". (B-02) - " Sharing knowledge is what will be solved". (B-04) - " I believe that we require clinical data to a certain extent, particularly in public pharmacies, even when dispensing certain antibiotics. This is not only necessary for chronic medication delivery, but also in other situations where it could be crucial ". (B-16)
9. Concerns and good experiences interacting with physicians	I. Challenges to face by the pharmacist and application of regulatory policies	- " Better communication with other healthcare providers is necessary in order to improve the overall quality of care ". (B-09/10) - " Additionally, doctors may not be familiar with certain types of services, and sometimes these healthcare professionals are underutilized or not used appropriately by other individuals ". (B-12/13)
	II. Management of DRPs in clinical pharmacy practice	**- " I must reach out to the doctor as they have more comprehensive knowledge about the patient's condition than I do. I can't make any changes; I'm not allowed to make changes to the treatment that a doctor prescribes…. or alter dosages ". (B-01)** - " If the doctor is unavailable when the patient is present, or if the doctor is too busy or difficult to reach, it becomes challenging to establish contact ". (B-03) - " For instance, if the doctor is a specialist like a cardiologist, you would call their office, but sometimes the secretary at the hospital may hang up or make you wait for up to 15 minutes. Waiting for that long is not feasible for everyone, so often young patients, who have work commitments, would leave their contact number and go home. We would then handle everything over the phone, which is not the most convenient method. It is quite challenging for us to manage everything solely through phone communication ". (B-04) - " If we are unable to reach the physician, we try to contact them later in the day and then call the patient to discuss the matter with them. However, it is even more difficult to reach specialists ". (B-07)

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	III. Professional collaboration between the pharmacist and the health team	- " Most of the time, it's a discussion with the doctor, either the doctor or the specialist, or both. We try to contact them by telephone. It's not easy, but we make an effort to have a personal conversation with the doctor about these patients." Yes, there is a constant limitation, and contacting them is one of the bigger problems ". (B-02) - " When it comes to the family doctor, maybe the problem is not as significant. But I believe that with specialist doctors... we never tell them that they made a mistake, right? When we think something is not good, we leave it to the specialist"... "I'm certain there are limitations in that doctor-patient relationship, and they don't easily admit it. They prescribe medication that may not be ideal for the patient. And when we suggest something else, it's difficult for them to admit that they have made a mistake, or some sort of mistake. It's challenging for them to admit that they have made a mistake ". (B-03) **- " Well, we had a very good experience. I never had a problem with the doctor, they always wanted the solution. Yes, most of the time I do make suggestions, but they also ask for suggestions ". (B-04)** - " I believe most pharmacists have a good relationship with the physicians in their neighborhoods. It also depends on the individual themselves. The younger doctors are more willing to collaborate with pharmacists ". (B-05) - " In terms of communication, it feels like the specialists in hospitals are the kings, the house doctors are the princesses, and the nurses and pharmacists are like soldiers, the foot soldiers. This hierarchy is evident in the way we communicate ". (B-06) - " It can be time-consuming, especially if we have to wait. The challenging part is that healthcare professionals, especially pharmacists, are not always open to suggestions from others ". (B-07) - " Communication is not easy. When we call, doctors are often busy with other patients, which is normal, and we end up speaking to the secretary. We try to find a solution. It is more difficult to get in touch with specialists in hospitals because they are frequently unavailable. However, doctors are always appreciative when we call and make suggestions ". (B-09/10) **-" I think we all have the same feeling that here the doctors are not yet open to it, or they don't have the time for it, or they don't think it could be useful. There is still a long way to go ". (B-11)** - " It is also challenging to contact specialists in the hospital. However, I can say that the professional contacts are quite efficient. I haven't encountered many problems, and they are always grateful when we bring up an issue. There is a lot of respect, and we know we are working towards the same goal. Sometimes they may say they don't have enough time and ask us to call back later, which is okay. It probably depends on how we approach the physician. Personally, I haven't faced many difficulties, but the situation might be different for frontline workers ". (B-14) - " Sometimes nurses feel intimidated to ask questions to doctors, but they find it easier to ask the pharmacist. It is unclear why this is the case. Generally, there is a good relationship between nurses and pharmacists, and nurses appreciate the value that pharmacists bring to the committee ". (B-17/18) - " There are two groups of doctors: younger doctors who are willing to cooperate with pharmacists and respect their expertise in medication and drugs, and older doctors who tend to have a superiority complex and look down on pharmacists. Not all doctors fall into this category, but many are reluctant to cooperate and are highly critical of advice from pharmacists ". (B-19)
	V. Barriers to the resolution and prevention of DRPs	**- " Communicating with other healthcare professionals presents a challenge. I think we have to improve that. And if that improves, I think a lot of things will go better, if we learn more to communicate with other healthcare workers…But also with the doctors, a kind of medication review, these are also things that if you do profoundly more often with them, I think we can also improve pharmaceutical care ". (B-02)** - " Younger pharmacists and doctors are more willing to cooperate, and I feel a sense of urgency in fostering collaboration and obtaining more information in larger pharmacies ". (B-06) - " The lack of interaction with other health workers, such as doctors and nurses, is a challenge ". (B-11)

10. Need of collaborative practice	III. Professional collaboration between the pharmacist and the health team	**- " We're looking for spaces for dialogue and for proposing changes, for example in the daily organizations where pharmacists and physicians get to know each other better and then they have to communicate in a more respectful way... we refer to it as spaces for interaction: physicians-pharmacists where medical-pharmaceutical problems are discussed with several doctors and pharmacies, that's a nice way to get in touch with others... to have small dialogues in such an evening. And all these things will help to improve the work after the meeting of the antimicrobial subcommittee and also in the discussion of cases after each on-call delivery ". (B-02)** - " In some other cities, pharmacists and doctors organize joint scientific events, along with family doctors. This is highly beneficial for learning, building relationships, and fostering mutual appreciation. When such events take place, there is less hesitation in reaching out to doctors you have met before. As a result, familiarity grows, making it easier to establish contact ". (B-03) **- " The first step is for people to get to know each other, sit down and talk about their patients ". (B-05)** - " One advantage of living in our city, which has a small-town feel, is that you personally know these individuals, and that is significant. By having a personal connection, it becomes easier to call or email them. This is particularly true for the city I reside in. In larger cities, it may be more challenging. However, in general, everyone is motivated, and things are progressing well ". (B-06) - " I firmly believe that having a personal and positive relationship with the physician of the patients makes it easier to discuss matters, especially in urgent situations and topics that physicians may not be well-versed in ". (B-07) - " Sometimes, in the evenings, there are opportunities for house practitioners and doctors to meet and discuss specific subjects. These events allow doctors and pharmacists to get to know each other, making it easier to reach out for help when needed. It may be beneficial to organize dedicated hours for doctors to be available for healthcare providers, which could help address this problem ". (B-09/10) - " I attended a lecture where both pharmacists and doctors showed a lot of interest. However, none of the doctors from my town were present. This could have been a good opportunity to establish contact and take the first step in building relationships ". (B-11) - " We frequently hold joint meetings with doctors, pharmacists, physical therapists, and nutrition specialists in the Netherlands. It is important to organize similar meetings between doctors and pharmacists, as well as other healthcare providers, to emphasize the value of pharmaceutical integration ". (B-12/13) - "Building relationships makes the interaction much easier ". (B-14) - " In Belgium, we have a system called "info medicine, pharmacy, this overlay" which facilitates discussions on medical and pharmaceutical topics, allowing access to both pharmacists and doctors. However, these discussions tend to focus more on policy matters ". (B-16) - " Having weekly staff meetings with the doctor where they can have one-on-one discussions about their patients is crucial ". (B-19)

11. Pharmaceutical care is not fully recorded	IV. Follow-up and documentation of clinical pharmacy activity with the patient	**-" ...is with another prescription for another substance. ...because I see that there's no change, and still these interaction exists, I will go again to the doctor. And if there's no change and you communicate it change to someone, we just keep an eye on it..."... " Is difficult to see your patient while taking notes well. Not only the things that you see on paper, but also the behaviour of patient that sometimes tell you things like without saying things ". (B-01)** **- " I don't think it's easy. I think it's difficult to keep track of when you've changed something. And then, when the patient comes back, you ask them: What is the result of the change we made? It's difficult because there's no tool to help us remember that suggestion. I don't think we know about a good tool or how to follow up on these things ".** **(B-03)** - " I think if we want to monitor the patients in a more effective way, we need some tools or programs that we can share with other caregivers. I think that's very important, because the patient's medication record is not shared with the physicians ". (B-04) - " We have our pharmacy software, and there is a patient file. There we keep a record of everything that the patient purchases in a pharmacy...we can write notes in the software about the patient to monitor their progress. But that's a manual process. We don't have a website or platform to share it with the doctor or see what the doctor does, it's only accessible within the pharmacies ". (B-05) **- " ...we just call the patient if we see a problem ". (B-07)** - " We can accomplish this task using software or a program. By conducting a medication review and maintaining a schedule of all the medications a patient takes, we can effectively detect any potential interactions and also keep track of their previous purchases. This approach allows us to maintain comprehensive registries, as the software will always remember everything ". (B-09/10) - " In the hospital pharmacy, there should be sufficient space available to document patient information in their files ". (B-12/13) - " These problems are challenging to solve in practice, primarily due to the lack of advanced tools for convenient and effective follow-up. So, who should take responsibility? In my opinion, the individuals who are most familiar with the patients are best suited for this role. This includes general practitioners and community pharmacists ". (B-14) - " Furthermore, technology can assist us in this endeavor. Currently, we are facing difficulties in encouraging more patients to use an app. Ideally, there should be a single application that all pharmacists can recommend, allowing them to connect their patients to their pharmacy or other pharmacies through this tool. Australia serves as a fantastic example with their Met advisor app ". (B-15) - " I recall that one-third of pharmacists have their own pharmaceutical files. It would be beneficial to integrate these files into the patients' medical records. However, even if they remain separate, they should always be accessible to doctors and nurses. It should not be a closed file. Pharmacists should have the ability to document modifications or suggestions in the patients' medical records. This is also an area where hospitals need to invest ". (B-17/18)

12. Challenges in continuity of care	I. Challenges to face by the pharmacist and application of regulatory policies	- "...And also, there were communication problems when the patient leaves the hospital. We need to ensure that everyone speaks with each other ". (B-17/18)
	IV. Follow-up and documentation of clinical pharmacy activity with the patient	- " When a patient is admitted to the hospital, it is not always clear whether they have provided us with a complete list of their medications...". (B-04) - "... they provide patients with a paper medication scheme, which is also given to their general practitioner and community pharmacist. However, they are unsure if this information always reaches the intended parties ". (B-14) **- " When they send them out of the hospital with very little information around them... There are two things I would change. The first one is a very simple one: make sure that every patient who leaves the hospital is given a little name card....a card that you give to link up with the patient's information.... The more complex solution that everybody is thinking about... very expensive, very complex and the connection is complete is the electronic file of the patient in the hospital and maybe we would access that file ". (B- 15)** **-"...Another initiative is the green envelope. When the patient leaves the hospital, the hospital pharmacist or nurse puts everything concerning the medication in a green envelope. The patient knows all the medication information in that envelope. And they try to encourage to take that envelope to the pharmacy. ... It's not really new, but it's not universally applied…". (B- 17/18)** - " This relationship is growing, and there is frequent communication between hospital pharmacists and local pharmacists via telephone. However, this communication is often outdated, which poses a significant problem. Many projects and researchers are dedicated to addressing this issue ". (B-19)
Non-overlapping themes from Belgium and Cuba interviews		
1. Need of remuneration	I. Challenges to face by the pharmacist and application of regulatory policies	- " Pharmacists are motivated when they are paid for their services." (B-01) - "Although we provide a lot of pharmaceutical care services, we are not adequately compensated for them in most cases." (B-02) **- " They may spend half an hour dealing with a complex patient, but the profit they receive is only three dollars or three euros. However, selling cosmetics can yield a profit of 10 euros ". (B-04)** - " There should be a budget and financial compensation for pharmaceutical care services ". (B-07) - " Pharmacists need proper remuneration for their services. Currently, the focus is mainly on sales of medicines, and pharmacies are viewed as large stores with many unnecessary products. To be considered real professionals, pharmacists should behave more like healthcare providers and less like salespeople ". (B-12/13) - " The current model does not compensate pharmacists for the services they provide, which is problematic. Instead, pharmacists should be compensated for services such as monitoring blood pressure ". (B-15) - " It is logical to compensate pharmacists for new services they provide. For example, in 2017, we introduced the family pharmacist function, and there should be a corresponding remuneration ". (B-16) - " Providing advice is not effective pharmaceutical care when people order all their medicines online, especially when they have questions ". (B-19)
	V. Barriers to the resolution and prevention of DRPs	- " The payment system should be the first thing to tackle ". (B-04) - " A major concern is online selling. I believe we should focus more on prescription and other items available online and in supermarkets, but we should prioritize real medicines ". (B-06) - " The biggest barrier is that we still depend on selling a large quantity of medication in order to receive payment for pharmaceutical care. The amount we receive from selling medication for chronic diseases is less than what we should be compensated for ". (B-9/10) - " Pharmacists cannot dedicate all their time to providing pharmaceutical care when there is no fee. However, when you work in local pharmacies and have to conduct research in the evening when the pharmacy is closed, you don't have the means or a fee for it ". (B-19)

2. Patient loyalty to a single pharmacy	I. Challenges to face by the pharmacist and application of regulatory policies	- " Sometimes, you may never see certain individuals again because they choose not to take their medication. They might say, "Well, I don't feel sick, so I won't take my medication," and as a result, you won't see them anymore. Alternatively, they might take their medication for a while, but not consistently. Therefore, for those individuals who have only one chronic disease, the initiation of treatment is a crucial moment that requires more attention. We need to ensure that when they begin their treatment...". (B-15)
	II. Management of DRPs in clinical pharmacy practice	- " The patients must visit the same pharmacy in order to access this information, as they have the freedom to choose any pharmacy in Belgium when they leave the doctor's office. We encourage them to visit the same pharmacy to incentivize their participation. I will then contact the doctor based on the information shared during the encounter. However, it is ultimately up to the doctor and patients to evaluate the situation, and they no longer need to come to me ". (B-01) - " We strive to address this issue promptly, as patients may either return the next day or not at all when informed about it. While everyone has a family doctor, we have always envisioned the possibility of having a family pharmacist as well. The patient is required to sign a contract, and we aim to provide better assistance and dedicate more time to offering suggestions and monitoring their medication ". (B-03)
	IV. Follow-up and documentation of clinical pharmacy activity with the patient	**- " The patient can only be monitored if they return to you... The pharmacist won't know what has happened to them. Thus, this is also a significant problem. What happened with the patients after visiting me? Did the patient take any other medications after visiting me? We require more patient information ". (B-04)** - " And then we don't follow up. We see that patient come back with a prescription or something else. But I don't believe that we follow those patients. And then when the patient comes back, okay it's handled, or we should follow up with maybe a list at the end of the day or at the end of the week and call the patient and ask him about what he did with his problem. That could also be very helpful. But again, that's a proactive way of thinking and not waiting until the patient comes to the pharmacy ". (B-07) -"...when he returns to the pharmacy. When we see him again, we always try to ask if the problem is solved, if it's better, if he or he taken some other action, for example, by returning to the doctor. Mostly, we try to ask the patient when we return and give us feedback. But it depends on him." (B-11) - " Just wait until the patient comes back to the pharmacy and then they can ask the patients ". (B-19)
3. Quality control of Pharmaceutical Care	I. Challenges to face by the pharmacist and application of regulatory policies	**- " I just think that the control... is focused on details that are not important. Like the kind of equipment you have in the pharmacy, which is very technical, and not so much on the quality of your work in pharmaceutical care ".** **(B-06)** - " We lack effective quality measures for these practices, which are both monitored and paid for ". (B-07) **- " We measure what we do, but we cannot accurately quantify the amount of health we produce since healthcare's fundamental objective is to produce and maintain good health ". (B-15)**

Themes	Interview Topics	Pharmacist Discourses
Common themes from Belgium and Cuba interviews		
1.Education and training	I. Challenges to face by the pharmacist and application of regulatory policies	- " ... ensure that the personnel in charge are stable and properly trained to carry out this activity. The consensus used at the university and the one used in hospital pharmacies must be aligned. I personally had to quickly learn the American consensus, but I was not given a postgraduate course to explain it to me ". (C-01) - **" When interacting with other healthcare professionals, it is crucial for us to substantiate our opinions with scientific and up-to-date knowledge. I recommend that professionals engaged in this practice pursue specialized training in this field, enabling them to carry out their role with greater proficiency and confidence, without feeling vulnerable in the presence of other healthcare professionals ". (C-02)** -" The pharmacist in PhC should be highly skilled and well-prepared. They should acquire technological skills because often they need to search for updated information on the networks ". (C-03) - " In addition, they should be properly prepared when carrying out interventions ". (C-04) - " To overcome potential barriers in the practice of pharmaceutical care, the professional must have a thorough understanding of the pharmacodynamics and pharmacokinetics of the pharmacological groups being analysed ". (C-10)
	II. Management of Drug-Related Problems (DRP) in clinical pharmacy practice	-"... You can intervene to solve the problem and educate the staff. The key is to maintain communication within the team...". (C-01) - " ... the medical staff I work with knows me, knows my work and performance, making it easier for them to listen to me. Additionally, I possess communication skills and when addressing the medical staff, I assess the patient's situation and provide the physician with fundamental knowledge of pharmacology and pharmacokinetics. I usually succeed in my intervention...". (C-03) - "A specific example is with the dosage and duration of a treatment, particularly antimicrobials. This is when we must convince and apply pharmaceutical knowledge, along with the clinical method, and suggest complementary products that support our hypothesis for preventing or solving the detected DRP ". (C-09)
	IV. Professional collaboration between the pharmacist and the health team	- " When carrying out a pharmaceutical intervention, it is essential to justify it based on solid scientific grounds ". (C-01) - " Although it was not mentioned in the guide, I learned about it from a Spanish pharmacist who conducted a course. It was from that moment on that the doctor started listening to me ". (C-02) - " To address this situation, each pharmacist should strive to improve their work and assert themselves, while also working to convince others of their knowledge ". (C-04) - " Over the years, I have gained knowledge and communication techniques that allow me to achieve my goals without intruding on others' personal space. It is important to study extensively because there are new drugs and diseases every day, and each patient is a unique individual with distinct characteristics. (C-06) - " Mastering the subject of research is crucial ". (C-10)
2.Legal framework of Pharmaceutical Care services	I. Challenges to face by the pharmacist and application of regulatory policies	- **" Pharmaceutical Care should be advocated for at the highest level... There needs to be a consistent and standardized methodology implemented at the national level ". (C-01)** - " All pharmaceutical services activity is monitored. ... but in terms of PhC there is still a lot of room for improvement. In the rules and procedures manual, the elements that are included are insufficient; there are many ambiguous element ". (C-02) - **" In relation to Pharmaceutical Care, I feel that there is still a need for more precise regulation of this practice. ... Currently, there are numerous circulars, legislations, and standardized processes for drug control. However, when it comes to Pharmaceutical Care, there seems to be lack of regulations that need to be addressed in order to enhance its implementation and effectiveness ". (C-03)** - " This activity should be evaluated from the national level down to the grassroots. This activity should be directed as a work objective of the Ministry of Public Health". "The norms or policies that regulate and control the activities of pharmacists in their environment are not bad, but they should be improved and established as at the international level, of course with some particularities for each country or region, ... These norms should be updated. They could be guided by the policies of countries that are leaders in this activity, such as Spain and the United States. In Latin America, some countries have also begun to draw up policies to improve this activity. It is important that these policies that are established fully describe what are the real functions of the hospital pharmacist, because sometimes there are activities of these that are performed by other health professionals ". (C-08) - " The norms and policies that legislate and control the activities of pharmacists in Cuba are outdated and do not respond to the level of performance and development of competencies that pharmacists should have today ". (C-10)
	V. Barriers to the resolution and prevention of DRPs	- " Although the manual is explicit, it lacks clarity in the PhC part ". (C-03) - " The province has worked in this sense, but until the necessary measures are established at the national level, these problems will not be solved. The manual of standards and procedures does not describe this process clearly and objectively ". (C-08)

3. Staffing problems for pharmacists to participate in clinical pharmacy activities	I. Challenges to face by the pharmacist and application of regulatory policies	- " Another element is that the pharmacist takes care of other functions, not only PhC, and since many times this activity is not given the importance it deserves, we focus more on other functions. The lack of staff is a factor that affects a lot ". (C-02) -" The first thing is to have personnel, because there are many graduate pharmacists who are not practicing this activity. This is due to the fact that there are many pharmacists performing other functions, and although they are assigned to this activity due to the lack of personnel, they have to leave this function aside and dedicate themselves to others. Because of the other functions that the pharmacist must perform, they do not have enough time to carry out this activity ". (C-04)
	V. Barriers to the resolution and prevention of DRPs	- " Lack of personnel to carry out the activity ". (C-03) - " Barriers to staff availability ". (C-05) **- " One of the barriers that, from my point of view, most affects this activity is related to staff, since the clinical pharmacist positions have not yet been approved ". (C-08)**
4. Lack of systematic practice of Pharmaceutical Care	I. Challenges to face by the pharmacist and application of regulatory policies	- " Once the investigation ended, this activity declined. Currently, there is inconsistency in the activity because it is alternately done by different pharmacists, resulting in a loss of credibility. Due to health problems, I was out of work for a long time and when I returned, all the progress made in patient pharmaceutical care had been lost. When physicians change, the pharmacist-physician relationship is lost in a certain way and it is necessary to regain ground ". (C-02). **- " We were relatively stable for a period, not excellent, but good. However, in the field of community pharmacy, our involvement in this activity has declined significantly. Personally, I used to work extensively with various at-risk groups, dedicating myself to this activity. As the country stabilizes, I believe there is potential for improvement in this activity [Pharmaceutical Care] ". (C -03)** **- " One or two pharmacists should be assigned if the health institution is very large and exclusively dedicated to this activity. Another important aspect is that there should be changes in the work system ". (C-04)** - " This can be achieved by assigning the clinical pharmacist once a month for a few days exclusively to this activity ". (C-05) **- "...they may often provide drug information, but typically they do not document the service provided. In some cases, they also engage in passive pharmacovigilance... The topics discussed in commissions regarding pharmacies do not always focus on patient-oriented services; instead, issues related to drug availability and shortages are prioritized ". (C-10)**
	II. Management of Drug-Related Problems (DRP) in clinical pharmacy practice	- " In Cuba, the practice of Pharmaceutical Care is not implemented, despite being mentioned with very limited details in the Manuals of Standards and Procedures and in Chapter XI of the General Regulation of Community Pharmacies of 2016, specifically in Articles 82, 83, 84, and 85 ".(C-10)
	IV. Follow-up and documentation of clinical pharmacy activity with the patient	- " ... The triad consists of a family physician, a polyclinic pharmacist, and a community pharmacy pharmacist ". (C-10)
5. More time to provide Pharmaceutical Care	I. Challenges to face by the pharmacist and application of regulatory policies	**- "... To provide adequate PhC, you have to spend time with the patient and also add other functions... this causes the pharmacist to lose interest in this area ". (C-01)** **- " ... But then, I had to allocate my time to other services such as dispensing, where you find yourself occupied with different tasks... ". (C -03)** **-" The activities performed by the pharmacist are affected and make the pharmacist more involved in dispensing. In community pharmacy only very few professionals carry out clinical pharmacy activities because they have to perform other functions that take up a lot of time ". (C-07)** **-" The pharmacist performs several functions, which limits the time.... as a consequence of the lack of staff, pharmacists focus more on dispensing ". (C-08)**
6. Need for privacy	V. Barriers to the resolution and prevention of DRPs	**- " Infrastructure is the main problem, because at the time of the follow-up visit, you don't even have a place to sit and talk comfortably with the patient". (C-01)** - " We need to find a suitable area to exchange ideas and knowledge with professionals dedicated to this activity as there is currently no space available. (C-03) - " Hospital centers lack premises for this activity ". (C-04) - " Sometimes, even when there is space available, pharmacists prefer to use the counter, making it difficult to have adequate space for this activity ". (C-07)

7. Pharmacists attitude and commitment to the patient	I. Challenges to face by the pharmacist and application of regulatory policies	- " To strive, despite the challenges we face, to perform this activity in the best possible way ". (C-03) - " I believe that pharmacists who graduate from the Universidad de Oriente have not made progress compared to our level of preparation ". (C-04) - " One of the main challenges that this professional would have to confront is to make their profession valuable, to demonstrate through their work and dedication their worth and the contributions they can make if they become part of the healthcare team ". (C-06) **- "...Through experience, dedication, and the use of therapeutic alternatives, pharmacists strive to help patients overcome their health issues ". (C-07)** The initial challenge that pharmacists must confront in order to enhance pharmaceutical care is to break away from traditional thinking and recognize themselves as integral members of the healthcare team, rather than mere dispensers of medications. (C-08) **- " Personally, I've spent many years working in the healthcare field. I've also held management positions. But I have always maintained an active role in patient care. I believe there are essential elements that characterize every professional's journey: an unwavering respect for our work, a commitment to continuing learning, and a humble attitude ". (C-09)**
	V. Barriers to the resolution and prevention of DRPs	**- " Initially, I faced personal challenges, mainly due to the fear of interacting with doctors. The lack of support and interest from other pharmacists further compounded the difficulties ". (C-02)**
8. Limited access to patient's clinical information in community pharmacies versus hospitals	II. Management of Drug-Related Problems (DRP) in clinical pharmacy practice	**-"...In the hospital, you cannot easily access that patient's medical history". (C-04)**
9. Concerns and good experiences interacting with physicians	IV. Professional collaboration between the pharmacist and the health team	- " Sometimes, even if you address medical personnel with utmost ethics and respect, they may get offended and refuse to listen or change the treatment because they believe they know better. My relationships with them are good ". (C-01) - " There are some medical personnel who are easier to reach and others who are more resistant ". (C-02) **- " With respect to the indication, sometimes you have to intervene with the physician. Concerning safety, the same is done with the physician to find a safer medication, if possible. Dosages are easily resolved with the physician, as is duplication of medication or when the medication is not necessary...". (C-03)** **-" My relationship is good; there are always some staff who are reluctant to listen to and implement the pharmacist's advice, but overall, it is good ". (C-04)** - " I have not faced any limitations due to the relationship between the healthcare team. The main limitation I face is lack of time ". (C-05) **- " With physicians? [limitations] Yes, because when new physicians arrive who are not accustomed to working with us, they tend to perceive us as just pharmacists and doubt our ability to make decisions regarding the patient's treatments ". (C-06)** - " You can say that the relationship between the primary care level and pharmacy is acceptable. Before 2021, there were some problems, but due to the shortage of medicines, they are now very open to any suggestion ". (C-07) - " Doctors are a bit more reluctant ". (C-09)
	V. Barriers to the resolution and prevention of DRPs	- "...sometimes the physician does not attend you at the time..." (C-04) - " Sometimes it is the patient who does not accept to be attended by pharmacists, and sometimes it is the physician who does not want the patient to receive PhC." (C-06) - " Another barrier that may arise in the implementation of PhC service is the inadequate pharmacological training of the physicians responsible for diagnosis and prescription, and in these cases the pharmacist must record that the proposed intervention was rejected." (C-10)

10. Need of collaborative practice	I. Challenges to face by the pharmacist and application of regulatory policies	- " In the field of Pharmaceutical Care (PhC), the initial challenge is to establish a sense of empathy with the healthcare team, particularly when interacting with physicians and nursing staff. It is of utmost importance to integrate into the healthcare team and for the team to have confidence in the pharmacist ". (C-04) -" To accomplish this, we must assert ourselves as pharmacists because while physicians specialize in diseases, we specialize in medications. The inclusion of pharmacists in the healthcare team is achieved through hard work, dedication, and demonstrating our knowledge, all of which should be based on scientific evidence ". (C-06)
	II. Management of Drug-Related Problems (DRP) in clinical pharmacy practice	- " When communicating with healthcare professionals, it is important to approach them ethically and respectfully, whether it is a doctor or nurses. It is always advisable to discuss suggestions rather than imposing them ". (C-02) **- " Another aspect is that when a doctor goes to the pharmacist for advice, we should try to give a clear, objective answer as quickly as possible. The pharmacist must handle the issue with the utmost ethical consideration, the reason for the problem is explained and how it can be solved on a scientific basis ". (C-05)** - " We must consider the concept of ethics, as it is not about imposing my own criteria, but rather about persuading the physician to understand where the fault lies and how it can be improved ". (C-06)
	III. Professional collaboration between the pharmacist and the health team	-" It is essential to empathize with these professionals ". (C-01) - " Respecting these professionals should be taken into consideration ". (C-02) - " Encouraging communication is crucial because often one may have an idea, but upon listening to another professional, they realize that the other professional is correct. This applies not only to physicians but also to nursing staff, microbiology laboratorians, healthcare providers, etc ". (C-03) - " Continuing to strengthen the connection between pharmacists and physicians is important to address the patient's drug-related issues in this critical situation ". (C-07) **-" Opportunities for dialogue and suggestions for change are sought, for example in the daily antimicrobial subcommittee meeting and in case discussions after each on-call service ". (C-09)** - " Maintaining a close connection with the healthcare team ". (C-10)
11.Pharmaceutical care is not fully recorded	IV. Follow-up and documentation of clinical pharmacy activity with the patient	**- " During the hospital visit, I carry out this follow-up and check whether the patient has achieved the therapeutic goals with the interventions. This is the most difficult part for me. The patient's therapeutic record is very long and I have to summarize this information in a single page ". (C-01)** - " It is important to monitor patients after interventions to ensure that they improve and their problems are resolved. This information is recorded in the pharmacotherapeutic profile ". (C-02) - " Once a problem is identified, we work with the physician to intervene and then give it time to see if the intervention is successful. This process must be systematic, as solving one problem can sometimes generate another. We record all of this information in the pharmacotherapeutic profile, along with an information sheet for the physician and a model of informed consent for successive interventions ". (C-03) - " After a problem is detected, identified, and solved, we continue to visit the patient regularly ". (C-04) - " We return to the ward to check if the patient has met their therapeutic objectives and, if there has been a medication change, ensure that the change was successful. All of this information is recorded on sheets, and at the end of the month, a summary is created ". (C-05) - " When a Drug-Related Problem (DRP) is identified, the case is examined and appropriate interventions are implemented. The patient is also visited to assess their compliance with the interventions and the achievement of the proposed therapeutic goals. It is important to note that not all interventions are always accepted by the physician. We focus on the interventions that are accepted by the physicians. In addition, the analysis of each case is documented in sheets during profiles and all visits ". (C-06) - " In the case of the hospital pharmacy, pharmacotherapeutic follow-up is conducted by providing medications to patients in the wards upon request. If it is observed that multiple patients with the same disease are experiencing similar side effects, an intervention can be made to address this situation ". (C-07) - " The activity related to pharmacotherapeutic care (PhC) is recorded in the pharmacotherapeutic profile ". (C-09) - " It is necessary to record the activity related to pharmacotherapeutic care (PhC) in the history of the pharmacotherapeutic profile ". (C-10)

12. Challenges in continuity of care	IV. Follow-up and documentation of clinical pharmacy activity with the patient	- " In my many years of experience, I have only done that once. On that occasion, the follow-up was only verbal and not documented due to the resource problems I mentioned earlier ". (C-01) - " Patients who visit their local health area and require narcotics and psychotropic drugs sometimes face challenges. For instance, I recall an incident when I attended to a patient from Pilón, a municipality in Granma province. This patient was prescribed morphine, but the journey from my location to Pilón is quite long. To ensure a smooth process, I contacted X, the Pharmacist of the Provincial Health Directorate, who then communicated with the doctors in Pilon attending to the patient. This way, by the time the patient arrived, the prescription process was already underway ". (C-02) **- " From the cancer hospital .... when the patient is discharged, I receive information from the hospital pharmacist and then I follow up the patient who takes psychotropic and narcotic drugs ". (C-03)** - " Yes, I have encountered patients who are referred from a different level of care. In the oncology hospital, we receive patients who receive cytostatic serum. However, any issues that arise after the administration of the serum must be addressed in the primary care area. This poses a problem because often there are no pharmacists available in primary care to provide follow-up. As a result, the patient needs to be directed elsewhere, and if the reaction or problem is severe, the patient must go to the hospital ". (C-04) **- " I have not had any experience [communication with community pharmacist]. Occasionally some patients from community pharmacies come asking for information about a specific medication ". (C-05)** - " When a patient comes from a secondary level of care, the relationship between the physician and pharmacist becomes more complicated due to the distance between them ". (C-07)
Non-overlapping themes from Belgium and Cuba interviews		
1.Lack of materials and technological resources	I. Challenges to face by the pharmacist and application of regulatory policies	**-" There are also infrastructure problems, along with a shortage of office supplies ". (C-01)** **- " Technology also influences the updating of the information we have. It is important to guarantee office material, at least the patient's therapeutic record sheets ". (C-02)** - " Some pharmacists do not have smartphones to access updated information related to certain treatments because the paper literature found in hospitals is outdated ". (C-05)
	V. Barriers to the resolution and prevention of DRPs	- " In addition to the insufficient resources for documenting this activity ". (C-01) **- " Technology also influences the updating of the information we have. It is important to guarantee office material, at least the patient's therapeutic record sheets ". (C-02)** **- " Some pharmacists do not have smart phones to look for updated information referred to some treatment because the literature in paper format found in hospitals is outdated ". (C-05)** **- " Due to inadequate information available at the hospital, there is a scarcity of literature sources. The hospital has access to the internet, but it does not have any facilities. The existing facilities belong to me, not the hospital ". (C-06)**
2. Drug availability problems	I. Challenges to face by the pharmacist and application of regulatory policies	- " In recent times, the provision of PA has become more complex due to difficulties in the supply of medicines. As a result, the focus has shifted towards the distribution and dispensing of medicines. Consequently, substituting one drug for another for a patient during PhC has become challenging ". (C-01) **- " The unavailability of drugs has a significant impact because when a DRP is identified and requires a change in treatment, the lack of an alternative drug becomes a problem. These are challenges that we have to try to improve ". (C-03)** - " The pharmacist is confronted with the critical situation of the country where the necessary medication is not available to switch one drug for another ". (C-05) - " Due to the unavailability of drugs, many patients have to change their treatment. This necessitates pharmacists to be adequately prepared to handle such patients and find suitable alternatives ". (C-07)
	II. Management of Drug-Related Problems (DRP) in clinical pharmacy practice	- " Problems with the availability of medicines are causing further delays ". (C-02) - " When I am unable to receive my intervention, it is because there is no actual opportunity to access medicines ". (C-03)
	IV. Professional collaboration between the pharmacist and the health team	- " The most significant challenge I have encountered is the unavailability of specific medications, despite their inclusion on the national list and their frequent absence from pharmacies ". (C-03)
	IV. Follow-up and documentation of clinical pharmacy activity with the patient	- " At other times, when there is a lack of medicines, the problem cannot be solved ". (C-06)

3. Inadequate administrative support	I. Challenges to face by the pharmacist and application of regulatory policies	**-" It is necessary to give resources to the people who manage the activity; doctors and dentists have been given computers and business telephones. But sometimes even the managers of pharmacies are not given these resources. This work is fundamental because, for the vision of the managers, it is one more salary, but they do not see that this salary would be a reduction in the cost of medicines for their irrational and incorrect use ". (C-02)** - " The first step is to seek recognition of pharmacists as personnel who should be integrated into the healthcare team. It is of utmost importance to include them, as pharmacists are often only perceived as drug dispensers. They are not given the value they truly deserve ". (C-06)
	V. Barriers to the resolution and prevention of DRPs	- " The absence of support from managers ". (C-03)