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Qualitative study of medication review in Flanders, Belgium among community pharmacists and general practitioners

Abstract

Background:
A pilot project on advanced Type 3 medication review, which is new in Flanders (Belgium), was launched by the Royal Pharmacists Association of Antwerp.

Objective:
Examining the implementation barriers and facilitators of this service as provided by Belgian community pharmacists in collaboration with general practitioners.

Setting:
Community pharmacies in Flanders.

Method:
Qualitative study through interviews of pharmacists and general practitioners.

Main outcome measure:
Opinions and experiences of pharmacists and general practitioners about type 3 medication review.

Results:
Sixteen community pharmacists and thirteen general practitioners were interviewed and generally gave a positive assessment of the project. The general practitioners saw the pharmaceutical and pharmacotherapeutic recommendations of the pharmacists as an added value for the patients. The pharmacists indicated that performing an medication review was time-consuming, but that it improved their professional relationship with general practitioners and patients. They reported obstacles in obtaining information: cumbersome access to individual patient data (laboratory values) and difficulties in finding and choosing adequate medical information sources. Moreover, pharmacists indicated that there is a need for adequate reimbursement and additional training to make the implementation sustainable.

Conclusion:
Both pharmacists and general practitioners were enthusiastic about medication reviews. The implementation improved the interprofessional collaboration. However, important barriers remain, such as the considerable investment of time and the difficulty in gathering all the necessary information. The sustainable implementation of type 3 medication review in Belgium requires adequate reimbursement and additional training.

Keywords
Medication review, community pharmacy services, pharmaceutical services, pharmacists, general practitioners, qualitative research, Belgium.

Impact of findings on practice statements

- The implementation of type 3 medication reviews made general practitioners more aware of the expertise of community pharmacists in optimising the patient's medication.
- Both pharmacists and general practitioners were of the opinion that patients would benefit from the implementation of type 3 medication reviews in Belgium.
- Cooperation between pharmacists and general practitioners was suboptimal, this project showed that both groups were open to improvements.

- There is unanimity that an adequate remuneration, in accordance with the time investment, is an important precondition for the continued implementation of type 3 medication review in Belgium.

Introduction

In community pharmacies globally there is a trend towards more patient-oriented pharmaceutical care and pharmacist-led cognitive services.(1, 2) Offering these services can potentially improve the clinical outcomes for the patient by reducing drug-related problems and increasing medication adherence.(3-5)

An medication review (MR) is a structured evaluation of patient's medication with the aim of optimizing medicines use and improving health outcomes. This includes detecting drug-related problems and recommending interventions.(6, 7) The Pharmaceutical Care Network Europe (PCNE) classifies medication reviews into three types: simple (type 1), intermediate (type 2) and advanced (type 3) medication reviews. (6) In a basic MR (type 1), only the medication history in the pharmacy is consulted and this is part of the routine dispensing.(2) In an intermediate MR (type 2), a patient is interviewed (type 2a) or clinical data (type 2b) are consulted together with the medication history. Clinically positive effects have been reported for a type 2 MR, with impacts on low-density lipoprotein, blood pressure and medication adherence.(2, 8) Moreover, economic analysis showed a consistent positive cost/benefit ratio.(9) Other studies indicated that medication review has a positive influence on pharmacotherapy (9), for example by tackling polypharmacy i.e. the use of five or more chronic medications, and by improving medication knowledge and adherence.(10)

Advanced or clinical MR (type 3) starts from a complete medication history, adds medical data and includes an extensive interview with the patient and feedback from the physician.(6) Meta-analysis of type 3 MR demonstrated reduced hospitalization rates, without a proven reduction in mortality.(2, 5, 8)

MR has been implemented in nineteen out of the thirty-four European countries.(2) In three of these countries, namely the Netherlands, Austria and Germany, type 3 MR is implemented and routinely reimbursed in community pharmacies.(1, 2) In Finland, pharmacists were reported to provide type 3 MR, but without remuneration by the government or health insurance. In Slovenia and England, clinical pharmacists perform type 3 MR outside the community pharmacy.(2)

In Belgium, pharmacy practice is also becoming more patient-oriented and is gradually introducing elements of pharmaceutical care.(11, 12) The first reimbursed pharmaceutical care service was introduced in 2014 and aimed at the rational and appropriate use of inhaled corticoids for the treatment of asthma. The protocol-based intervention allows the pharmacist to asses asthma control and medication adherence.(11) A more recently introduced service (2017), known as ‘home pharmacist’, allows ambulatory and poly-medicated chronic patients to choose a community pharmacist as their reference pharmacy.(11, 13) The most important part of this service is to provide an up-to-date medication schedule, i.e. a detailed intake plan of all medications. In addition, the pharmacist is expected to assess the medication adherence of the chronic pharmacotherapy. The pharmacist receives an annual fee for this service.(13) MRs or other forms of medication assessment are currently not reimbursed in Belgium.

In September 2017, the Royal Pharmacists Association of Antwerp (KAVA) launched a pilot project implementing type 3 MR because, as a professional association, it is strongly committed to further strengthening the patient-oriented role of the pharmacist.(14) In order to scientifically evaluate this project, the University of Antwerp and the Vrije Universiteit Brussel were asked to become partners of this project.

Aim of the study

The objective of this study was to investigate implementation barriers and facilitators of MR among community pharmacists and general practitioners (GPs) in Belgium. The opinions and experiences of participating healthcare professionals are useful for the further implementation of MR in Belgium.

Ethics approval

In the Belgian setting, an ethics approval was not required because no patients were enrolled in this survey. Participation in the study and interview was voluntary and verbal consent was required.

Method

A qualitative research approach was used to evaluate the opinions and experiences of participating community pharmacists and GPs.(15) Only pharmacists and GPs who had experience with or at least basic understandings of MR were included. We have elaborated the methods used in this qualitative study by applying the Consolidated Criteria for Reporting Qualitative Research (COREQ guidelines).(16)

Sample

This pilot project included pharmacists from twenty pharmacies, fifteen of them were independent pharmacies, the remaining five were chain pharmacies. The pharmacists were highly motivated and volunteered to participate in this project.

Study design

From September 2017 to January 2018, approximately twenty-five pharmacists were trained in type 3 MR. Since the pharmacists registered with their whole team, one or two pharmacists could always be present at the training sessions. The exact number therefore varied for each session. The twenty hours of training included the use of reliable sources and guidelines, the interpretation of laboratory results, a workshop on communication and the practice of MR through case studies.

Subsequently, the pharmacists who followed the training carried out the MRs in practice. They worked together with a GP of their choice. The following patient inclusion criteria, based on the Royal Dutch Society for the Advancement of Pharmacy (KNMP) medication evaluation guideline (17), were used: over 65 years of age, use of more than five chronic medications and, if possible, at least one of the additional criteria, namely decreased renal function, reduced cognition, increased risk of falling (more than once in the last 12 months), signs of impaired medication adherence or recent hospitalization for an acute reason. Various methods can be used to detect and determine reduced therapy adherence: by performing calculations based on the delivery history and/or active survey of patient or his caregivers or attending physician with respect to therapy adherence. (17) Patients who met the inclusion criteria were not randomly admitted, but chosen by the pharmacists and/or GPs. The GPs were also not randomly included, they were contacted by pharmacists with whom they already had a good professional relationship. To structure the MR, pharmacists used a locally adapted step-by-step approach, based on the Dutch KNMP medication assessment guideline.(17)

Design and content validity of the survey

All pharmacists who followed the training and their collaborating GPs were contacted by e-mail and/or telephone in the period of October-November 2018. To guarantee the anonymity of the pharmacists and GPs, they are represented by a specific number in the results list. Sixteen pharmacists and thirteen GPs were interviewed by two female master students pharmaceutical care. Great care was taken to formulate the questions in an unbiased way, so that the interviewees could freely express their opinions, and a well-founded theory-based analysis could be made. The interview guide used during the interviews can be found in the appendix. The interviews of the pharmacists were conducted in their own pharmacy. Two pharmacists were, at their own request, interviewed together and this was analysed as a single interview. Of the thirteen GPs, six agreed to a personal interview in their own practice, three preferred contact by e-mail, and the remaining four preferred an interview by telephone. Participation in the study and the interview was voluntary and verbal consent was required. The semi-structured interviews were recorded and both the facilitators and the barriers for carrying out the MR were assessed. One of the interviewees specifically asked not to make any audio recordings of the conversation and this interview was analysed using the written notes.

Data consolidation and consensus seeking procedure for the results obtained
Codes were compared and differences in opinions between the researchers were discussed with a third researcher in order to reach a consensus.

Data analysis

The audio recordings were transcribed and coded using Nvivo 12, a program for qualitative data analysis.(18) The authors of this study are pharmacists who tried to analyse the interviews as objectively as possible. Our primary goal was to get to grips with issues that hamper or facilitate implementation.

Results

The thematic analyses of the transcripts revealed the following topics: motivation, time investment, selection criteria and reimbursement. The results were therefore subdivided into seven topics for both pharmacists and GPs. Data saturation coincided with the number of interviewed pharmacists and GPs.(19) Examples of pharmacists' and GPs' quotations are referred to with quotations references (for example Q1), which can be found in the appendix.

Pharmacists' responses
Of the twenty different pharmacies, sixteen pharmacists from fifteen different pharmacies agreed to participate in the interview. As mentioned before, there was one shared interview, which we recorded as one number in the analysis. Fourteen pharmacies were located in the province of Antwerp and one in the province of Limburg. The interviews with the pharmacists lasted 36 minutes on average.

The pharmacists carried out the medication reviews between January 2018 and December 2018.

Motivation
All pharmacists considered the MR service as an added value for the patient and saw no disadvantages in the provision of this service. The comprehensive nature of the analysis of the medication use was seen as the biggest advantage (Q1).

The medication review service has increased awareness of the role of the pharmacist. It was also seen as an opportunity to develop interprofessional contacts with the GPs and to improve

the relationship with the patient. Furthermore, pharmacists considered MR as a type of pharmacotherapeutic refresher course and as an opportunity to increase their knowledge (Q2).

All pharmacists remained motivated to put MR into practice. Almost all interviewed pharmacists agreed that offering such a pharmaceutical care service is an integral part of the role of the pharmacist (Q3 and Q4).

Time investment

Medication review was perceived to be time-consuming for pharmacists. Contact with the GPs was not always smooth. All pharmacists unanimously stated that they spent most of their time collecting information and consulting reference material, such as the summary of product characteristics (SmPC), interaction checkers, guidelines and textbooks (Q5). The pharmacists wanted to be very comprehensive because they were concerned that certain drug related problems (DRPs) would be missed or misunderstood. The results also indicate that independent pharmacists had slightly more difficulties in conducting MRs than their colleagues working at chain pharmacies.

Moreover, it was difficult to determine where all the information could be found or to distinguish between relevant and irrelevant sources. Most pharmacists indicated that the preparation took a long time because it was still largely unknown territory. The conversation with the patient was also time consuming (Q6). As a consequence, some pharmacists performed the MRs during off-hours, for example during the lunch break.

Type of medication review

Laboratory values are seen as a prerequisite for type 3 MR. Nine out of the sixteen pharmacists considered type 3 MR to be the best possible form of MR in a community pharmacy (Q7). At the same time, some pharmacists reported that starting with the extended type 3 MR compared to type 1 and 2 MR was a challenge, especially because it was very time-consuming (Q8).

According to the pharmacists, a high-quality MR should also include the following parameters: an interview with the patient and the GP, recent laboratory values, indications, allergies, intolerances and an overview of the medication. In other words, most respondents indicated that the completeness of a type 3 MR is an important characteristic to guarantee quality (Q9).

In addition, pharmacists considered it essential to provide both GPs and patients with their feedback. On the other hand, both care providers need to agree afterwards who will take responsibility for the follow-up of the patient (Q10).

Patient selection criteria

The opinion of pharmacists about the eligibility of patients for a type 3 MR was heterogeneous. A large majority of pharmacists felt that the selection criteria should be extended. There was a consensus on the polypharmacy criterion, but MR can also be of interest to people less than 65 years of age, patients who use a lot of OTC medications or patients who ask for a review themselves (Q11 and Q12).

Cooperation with the GP

For the vast majority of pharmacists, cooperation with GPs went well; for a minority of pharmacists this was however a greater challenge (Q13).

We identified the time investment as a recurring barrier. The transfer of data between GP and pharmacist was partly to blame, because a fast and secure communication solution was not immediately available (Q14 and Q15).

The degree of acceptance of the pharmacist's advice was a small barrier (Q16). Not accepting the suggestions was not seen as a major problem at this initial stage of the introduction of MR. Fourteen pharmacists indicated that the GPs were open to changes or suggestions (Q17 and Q18).

The pharmacists had the impression that GPs were reluctant to adjust medications initiated by other physicians. GPs were not inclined to make changes unless absolutely necessary (Q19).

Results of the medication reviews
The most common drug related problems highlighted during the reviews were under- and overtreatment, such as the high use of benzodiazepines and the under-use of osteoporosis prophylaxis. In addition, there were other problems such as drug-drug interactions, failure to adjust the dose according to kidney function, therapy non-adherence, incorrect medication use and double medication (Q20).

Remuneration
Because of the considerable investment of time, all pharmacists agreed that reimbursement is necessary to perform MRs, but they did not agree on how this should be done (Q21, Q22 and Q23). The majority of pharmacists thought that this would require a fixed fee per MR. Some argued that the pharmacist's entire payment system would have to change, because they are currently paid for each product dispensed and not for the pharmaceutical care they provide (Q24). The majority want this service to be reimbursed with minimal or no copay by the patient.

Optimisation of the medication reviews
The aspects that need to be optimised, and which were most frequently cited, were the time investment on the one hand and the difficulties in obtaining the patient's medical data on the other hand (Q25).

Responses from the GPs

A total of 21 GPs were contacted. Thirteen GPs were interviewed in three different ways: six physicians agreed to a personal interview in their own practice, three preferred contact by e-mail, and the remaining four preferred a telephone interview. Two of the GPs were interviewed at the same time because they work in the same practice. Two GPs did not participate, citing lack of time, and in another six cases, the physician was not consulted by the pharmacists to discuss the MR. Accordingly, questioning those GPs would be irrelevant. The GP interviews lasted 27 minutes on average.

Motivation
The motivation of the majority of GPs was to clarify the issues of polypharmacy (Q26). One GP also indicated that MR was a great help for correcting many errors and misunderstandings (Q27).

Time investment
On the one hand, according to some GPs, a lot of time was spent on the implementation of MRs. One of the GPs indicated that this was due to the selection of complex cases. Accordingly, a lot of time was spent on investigating the entire therapy. A second GP responded that this was due to limited experience in performing MRs. A third GP reported that providing laboratory values and medication related info to the pharmacists was cumbersome and therefore it was time-consuming to prepare medical records for the pharmacist.
On the other hand, there were two GPs who did not experience the implementation of MRs as too labour-intensive or time-consuming. One GP explained that if medical records were

properly organised, it really does not take too much effort to provide the needed data. For two other GPs, the time spent was not insurmountable in itself, however they did not expect that there would be enough time to carry out such MRs systematically (Q28). Moreover, it was clear that as long as no reimbursement is provided, it is difficult to make time for MRs (Q29).

One GP suggested appointing a pharmacist to carry out reviews in several pharmacies to partly compensate for the lack of time that the pharmacists struggled with.

Patient selection criteria

Most GPs found patients with polypharmacy the most interesting target group for performing an MR. Patients taking few medications were not considered useful and the GPs therefore advised against recording them (Q30).

One physician found the presence of polypharmacy a poor selection criterion. He found it useful for everyone, regardless of the exact number of prescribed medications. It is essential to determine whether the medication was prescribed correctly and to check, among other things, for adverse effects.

Moreover, the majority felt that this should be possible for both older and younger patients (Q31). However, as older patients often have the most complex therapy, this target group was the most eligible for an MR. Two GPs said that younger patients have little need for an MR because they are better with medication management, but it can be useful when they have mental problems (Q32). Another GP thought it would be unnecessary for younger people who are chronically ill.

Opinions about the psychiatric patients were very diverse. For example, one physician found it useful to perform MRs on patients taking psychotropic medications such as benzodiazepines (Q33). There were two GPs who wanted to exclude psychiatric patients in MRs because of the specific nature of their treatment not following general guidelines. Moreover, according to both GPs, extra caution is needed in order not to undermine existing therapeutic relationships in this vulnerable group. Finally, one GP targeted an MR mainly for elderly patients and patients discharged from the hospital.

Cooperation with the pharmacist

All GPs agreed that pharmacists need the patient's medical history (Q34). Moreover, the majority of the GPs interviewed also found that the laboratory values were necessary for performing an adequate MR. Almost all GPs indicated that kidney function and liver values were the most important parameters (Q35).

The opinions regarding the other lab parameters were divided. One GP indicated that the degree of coagulation might be relevant in certain situations. However, another physician wanted to limit this information to kidney function because it is the task of the GPs to interpret the other laboratory values. In addition, two GPs doubted whether pharmacists have the knowledge to correctly interpret laboratory parameters (Q36).
Only two GPs were of the opinion that pharmacists do not need the laboratory values to be able to do their work properly (Q37). Three GPs spontaneously said that pharmacists should be informed of intolerances and allergies that the patient has (Q38).

All GPs experienced the professional relationship with the pharmacist as something very positive (Q39). Some stated that they were open to closer cooperation. Two GPs, on the other hand, noted that there is still some hesitation among pharmacists, especially when it comes to making telephone calls (Q40).

Almost all GPs would like to see the exchange of patient data digitalised in the future (Q41). One GP suggested the Siilo-app, while others mentioned data exchange via eHealth or

Vitalink.(20) Siilo is a secure online application for healthcare professionals, as a type of replacement for WhatsApp.(21) Vitalink is an initiative by the Flemish government that focuses on the sharing of health and medication data to support primary healthcare.(20)

GPs expected pharmacists to critically review the patient's medication schedules during an MR. The GPs themselves do not always have enough time and according to them pharmacists are better trained to deal with medication errors and problems (Q42). GPs were confident that pharmacists could make a clear distinction between relevant and minor drug related problems (DRPs). For example, only the clinically relevant DRPs should be discussed with the GPs (Q43).

One physician even emphasized the importance of considering pharmacists as the ones responsible for the final verification of the effectiveness and correctness of the prescriptions made by the GPs. The GPs considered the collaboration with pharmacists as a support (Q44). Both the ability and willingness to complement each other are important factors. Moreover, pharmacists often receive additional information through a thorough conversation with the patient (Q45).

Results of the medication reviews

According to the GPs who participated in this project, comprehensive oversight and fine-tuning of the medication are the most prominent benefits for the patient. They confirmed that performing MRs optimizes the therapy because several DRPs were detected (Q46). As a result, they believe that this leads to fewer side effects, improving the patient's quality of life. Moreover, they suspect that in this way the number of hospital admissions and medical costs may decrease.

Remuneration

Only one GP did not consider it necessary for pharmacists to receive remuneration for doing an MR. An aspect many GPs questioned was whether an MR should be reimbursed in full or whether it is already part of the services provided by the pharmacist (Q47, Q48 and Q49). Three GPs indicated that GPs should also be fully reimbursed for this service.

Optimisation of the medication reviews

The majority of GPs indicated that the time spent on an MR is a problem. The GPs found it labour-intensive and that it would be a huge task if the MR would be applied to all patients with polypharmacy. Theoretically, consultation between GPs and pharmacists is a good idea, but, as one of the interviewed GPs said, this proved not always to be workable in practice (Q50).

Another aspect that can be optimised and that has repeatedly been raised as a point of discussion is the exchange of patient data. During the project, this point was not immediately perceived as a major obstacle, but it would run more smoothly if the exchange could take place via an electronic platform such as eHealth.

Discussion

Interpretation of the findings

Motivation

Our study showed that there is a willingness to perform type 3 medication reviews in Belgium. Participating pharmacists were aware of MR, had voluntarily joined the training and were willing to participate in this project. For most of the GPs, MR was unknown territory and therefore they were informed about this type of review by their local pharmacist.

Type of medication review

The type 3 MR has several interesting features, such as the incorporation of data from medical records (diagnosis, laboratory values, intolerances, allergies) and conversations with patients and GPs. While some pharmacists reported that starting with the extended type 3 MR compared to type 1 and 2 MR was a challenge, especially because it was very time-consuming, most pharmacists experienced MR as innovative. On the other hand, the majority of them considered the medical record to be an essential part of the preparation of a high-quality MR. Kwint et al.(22) confirms that several drug related problems (DRPs) relate to the monitoring of laboratory data, thereby documenting the need for a type 3 MR.

Exchange of data

For the GPs, most of them agreed that pharmacists should have access to the patient's medical records, including the laboratory values. At present, this is not the case. However, a minority of GPs was reluctant to share this data. This may indicate a lack of trust towards pharmacists, as also mentioned by Hatah et al.(23) It should be noted that these values are only meant to be used for monitoring pharmacotherapy and not for diagnostic purposes. This information item was also explicitly emphasized during the pharmacists' training for this project.

Collaboration between GPs and pharmacists

MR improves the interaction between GPs and pharmacists. There is currently no structural cooperation between general practitioners and pharmacists. As a consequence, some pharmacists were somewhat reluctant to address the GPs. They feared a reserved attitude from the GPs. For that reason, most pharmacists worked with GPs with whom they already had a good relationship. The GPs in this inevitably biased sample were very positive about the collaboration with the pharmacists. A study conducted in New Zealand reported that GPs had mixed feeling towards different new services such as type 3 MR.(23) On the one hand, the potential strengths were benefits to GPs and patients and pharmacists' medications knowledge. On the other hand, potential weaknesses were mentioned such as privacy issues, conflict with GPs, pharmacists' skills, undermining of the GP's practice and duplication of work. When they discussed conflict and irritation, the GPs mentioned an overload of significant information e.g. clinical irrelevant drug interactions.(23) Australian studies reported that the Home Medicines Review (HMR), a type 3 MR, encouraged the GP to review and discuss the patient's medication therapy with the pharmacist.(24, 25) Other studies conducted in New Zealand reported that pharmacists were concerned about the lack of skills and confidence to provide the input for a type 3 MR. Pharmacists should have more confidence when discussing patient-related issues with GPs. (26, 27) Studies of pharmaceutical care for dementia showed that better communication between the physician, pharmacist and nurses can improve collaboration, and ultimately enhance the quality of medication assessment.(28, 29)

Optimalisation of the medication reviews

Therefore, collaboration between pharmacists and GPs needs to be optimised step-by-step. Awareness-raising, targeted communication and interprofessional education of the healthcare providers could provide a good solution for improved collaboration. An Australian study suggested the need to establish systems, including the development of local protocols for collaboration of the HMR.(30) The cooperation, which is part of the type 3 MR, takes time, especially in the initial phase. As previously shown by Kennelty et al., time turned out to be the most important obstacle for most pharmacists.(31) Some pharmacists performed the MRs during off-hours, which illustrates their commitment and motivation. However, pharmacists emphasized that this is not feasible in daily practice. A possible strategy for overcoming this time barrier is to set up a different reimbursement system.(31, 32) Reimbursement of this MR service was deemed necessary by all participants. The lack of reimbursement inevitably limits motivation, according to both pharmacists and GPs. However, the fee in itself cannot be sufficient to implement the MR service, but will help further implementation.

GPs advise to save time by grouping the MR conclusions for several patients and focusing on the action points. The GPs expected that only the clinically relevant DRPs would be presented and assumed that the pharmacists would be able to propose a concrete alternative to these problems. Despite their lack of experience with MR, the action points proposed by pharmacists were generally well received by the GPs. They also preferred a face-to-face to a telephone consultation. Furthermore, some GPs agreed that after the initial investment of time, cooperation could even be timesaving because pharmacists take over part of the work. The pharmacists also thought about the participation of specialists, because GPs are often reluctant to change medication that was not initiated by themselves. A GP suggested appointing a pharmacist to carry out reviews in several pharmacies. Our research also indicates that chain pharmacists had less difficulty in performing MRs compared to their independent colleagues. A possible reason for this was that the latter group of pharmacists received more structured support, such as the monthly round table among colleagues and a flexible work schedule. The independent pharmacists are not used to collaborate in such a systematic way. They had the possibility to address their questions both towards the project coordinator and each other, but that made the threshold even higher.

Furthermore, the GPs and pharmacists interviewed indicated that the execution of the type 3 MR service took a great deal of time and effort. On the one hand because of the complexity of polypharmacy, on the other hand due to the lack of experience. A strategy that can be applied to overcome this obstacle is to refrain to start with a very complex patient and rather start with, for example, limited complex diabetes patients or hypertension patients. Some pharmacists also reported that the time investment decreased the more MRs were performed. The literature also shows that the time investment can be reduced by two-thirds with good external support.(33) This support consisted of different levels, both with organizing and planning the services, as well as with all technical and administrative tasks. Finally, the mentoring pharmacist was also able to provide pharmacotherapeutic support.(33)

Inclusion criteria

The opinions on the appropriateness of the inclusion criteria differed widely. On the one hand, most pharmacists and GPs found the age criteria too restrictive and wanted to include younger patients with complex needs. On the other hand, according to some other healthcare providers, patients with too complex therapies, psychiatric problems or limited awareness are better not included. In case of polymorbidity, patients often see several specialists in addition to the GP and all pharmacists thought that it would be interesting to also involve them in the MR. There only was one pharmacist who expressed doubts about this, because specialists are not always easy to approach. Some pharmacists proposed contacting only the specialists in undecided cases in order to obtain a second opinion. For some other participants, it was important not to include patients based on quantitative criteria, such as the number of medications, but on the basis of qualitative criteria, such as the level of care needed. In European countries where type 3 MR is available, the most overlapping selection criteria are patients taking more than five long-term medicines. In addition, the selection is sometimes based on financial aspects, such as in a German project, where the selection depends on the insurance of the patient.(2)

Interaction with the patients

The pharmacists were very positive about the interactions with patients and no barriers were perceived. This interview provided an opportunity to determine what the patient was interested in; it was also considered important to identify relevant DRPs. A follow-up interview was necessary in order to reach agreement on pharmacotherapy between the patient, GP and pharmacist. The only barrier mentioned by pharmacists was time management: it was difficult to keep the focus on the pharmacotherapy of the patient and not deviate to less important topics.

Quality of the medication reviews

It is known that the quality of an MR varies.(22) A detailed report is a prerequisite for a high quality MR service. Further research is needed to develop a monitoring system to ensure quality.

Electronic exchange

Finally, facilitating the electronic exchange of patient data could improve cooperation. All the care providers interviewed indicated the lack of shared experience or the lack of a convenient digital platform as a bottleneck. Due to the privacy legislation, such as the General Data Protection Regulation (GDPR), patient data cannot be sent by unsecured electronic mail. This data has to be exchanged in person or sent by postal mail, which slows down the process. Technology optimisation will lead to time savings. In recent years, the possibilities for exchanging patient data have increased, but there is still a long way to go in terms of user-friendliness.(34)

Strengths and weaknesses of the study

Because of the qualitative nature of this study, we only investigated the opinions of a relatively small number of motivated pharmacists and GPs. Both care providers were not chosen at random. The pharmacists were highly motivated and volunteered; the GPs were contacted by pharmacists with whom they already had a good professional relationship. The patients were not selected at random, they had to meet the inclusion criteria, but were otherwise chosen freely by the pharmacists and/or GPs. Finally, the authors of the study are pharmacists, who have described the data as objectively as possible

Similarities and differences in relation to other studies

In Belgium, research has already been carried out into the implementation of MUR in community pharmacies.(35) The pharmacists surveyed in this study considered MUR to be a satisfactory activity. However, prior to the actual implementation, several adjustments had to be made, such as the reorganisation of the internal workload of the pharmacy and the additional support such as wide-ranging media campaigns and adapted software.(12) The complete MR was only studied as a pilot project in the hospital environment and was performed by a clinical pharmacist.(36) On the other hand, our study describes the first investigation of type 3 MR in community pharmacies in Belgium. At present, type 3 MR is a routine service reimbursed in community pharmacies in the Netherlands, Austria and Germany.(1, 2) There are some international studies describing the opinions of both GPs and pharmacists about collaboration on new medication management services.(23, 31, 37) In Australia, GPs took a positive view of the Home Medicines Review (HMR) to reduce polypharmacy and to play an important role in the education of both GPs and pharmacists.(38) The new services provide novel opportunities, such as improved communication and better collaboration and integration with the GPs' practice.(38) Apparent threats were the GPs' perception of a related, and non-remunerated increase in the GPs' workload, and the perception of a limited benefit for the patients.(23) Weaknesses focused on potential confusion and harm for the patient, conflicts and irritation to GPs' practice, and the possibility of fragmenting care for the patient.(23)

Open questions and future research

During this study, new questions were raised for further research. Firstly, we do not know which target group would benefit most from the type 3 MR.(39) Secondly, the healthcare providers also emphasized that implementation would be difficult without reimbursement. Moreover, if the reimbursement were to be granted, careful consideration should be given to how this would be organised in Belgium.(39) Thirdly, there was the barrier around time investment. It remains to be determined how the workload could be reduced.

Few studies have examined the opinions of patients.(40-43) That is remarkable because with this service we mainly want to improve patient care. Moreover, there is currently no method available for guaranteeing the quality of the MR. As a high quality MR is of the utmost

importance, this should continue to be a matter of concern.(44) Objective quality parameters are also needed to investigate whether an MR improves the clinical outcomes of patients.(45) In addition, pharmacists need to know how GPs deal with the pharmacists' suggestions.(46, 47) Finally, the opinion and role of other stakeholders and potential payers (insurance, private insurers, etc.) should be examined as well.(39)

Conclusion

This pilot project seems to indicate that there is a willingness to perform a type 3 MR in Belgium. It was a positive experience for all GPs and pharmacists that participated in this study. According to the healthcare providers involved, MR will not have negative consequences for the patient. Although this pilot project was well received by this specific group of pharmacists and GPs, important steps still need to be taken to achieve a successful general implementation of MR in Belgian community pharmacies. Further research and action is needed on how to deal with the main barriers such as the considerable time investment and the lack of reimbursement. In addition, quality control of the MR process is needed, which includes, amongst others, proper training of health care providers. Finally, the implementation of MR can likely be improved by facilitating the electronic exchange of patient data.

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Conflicts of interest

The authors declare that they have no conflicts of interest related to this study.

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Questionnaire for general practitioners

1. What made you first hear about medication review?
2. What motivates you to participate in medication reviews? In other words, what are the advantages?
3. How much work did you put into the performance for you as a doctor?
4. What are the advantages and/or disadvantages for the patient?
5. For what kind of patients do you think it is useful to perform a medication review? When would you rather discourage it?
6. In your opinion, what medical data should the pharmacist have in order to carry out a proper medication review?
7. How would you describe your relationship with the pharmacists?
8. How did the exchange of patient data go between yourself and the pharmacists?
9. How would you prospect the future exchange of patient data?
10. How did the discussion of the report with the pharmacists go?
11. How does the patient's follow-up go after the review?
12. What exactly do you expect from the pharmacists during a medication review?
13. According to you, which part of the entire process could even be optimised?
14. How would you react if you heard that pharmacists will be compensated for this in the future?
15. Which suggestions do you have for other general practitioners (and pharmacists) when performing medication reviews?

Questionnaire for pharmacists

1. What is your motivation to perform medication reviews? In other words, what do you think are the advantages?
2. How much work did it take to complete all different components?
3. What is your opinion about the type of medication review you performed?
4. What was it like to recruit patients?
5. For what kind of patients do you think it would be useful to perform a medication review for? When would you rather discourage it?
6. How did the interaction go with the patients?
7. At what place the conversation has been held and did it took place during working hours or outside?
8. What was it like to recruit doctors?
9. What is your opinion about the collaboration with the doctors?
10. Which specialists would you like to see involved in the process of medication review?
11. How would you describe the exchange of patient data between yourself and the GPs?
12. How would you prospect the future exchange of patient data?
13. What was the impact of the medication reviews?
14. How does the patient's follow-up go after the review?
15. In which way the medication reviews have been implemented by the whole team?
16. According to you, which part of the entire process could even be optimised?
17. How did the pharmacotherapeutic analysis go?
18. What kind of information sources did you consult?
19. After having carried out some first medication reviews, how easily did they became for you?
20. How this part of the pharmaceutical care should be reimbursed?
21. What characteristics a medication review needs to have in order to be of high quality?
22. What suggestions do you have for other general practitioners and pharmacists when performing medication reviews?

Examples of pharmacists' quotations

Classification	Quotations references	Quotations
Motivation	Q1	*"Everyone has a piece of information, collected from their own perspective. If you then start piecing all the bits of information together, then you can do a lot more for that patient." (Pharmacist 6)*
	Q2	*"Why I'm so enthusiastic about MR? Medication review in itself is interesting but is also very important for the future of our profession. Actually, it is the core of our profession and is integral for collaboration with the GPs. The fact that there are some pharmacists who don't perceive MR as an asset … I really don't understand that opinion." …(Pharmacist 2)*
	Q3	*"I think it is important to keep growing, so that's why it [MR] is a real added value for our profession. No doubt about it. The past couple of years I feel like we're moving in the right direction, but MR is definitely something to be carried out in the community pharmacy." (Pharmacist 3)*
	Q4	"*Because it [MR] brings us back to our key task, it is the core business of the pharmacy. That's what it is all about." (Pharmacist 9)*
Time investment	Q5	*"You need to check the guidelines for each pathology. When guideline adherence is high, everything is fine, and no intervention is required. But, often, those directives were not followed properly. If that's the case, then you can't always find the exact reason, despite researching various sources. So, even after consulting ten sources, the answer is still unclear" (Pharmacist 6)*
	Q6	*"The conversation takes at least an hour, but it gives you a lot of information and this also includes things that patients typically wouldn't share with their GP." (Pharmacist 13)*
Type of medication review	Q7	*"Without the medical data provided by the physician, pharmacotherapy cannot be properly evaluated. Having that information is the most crucial part and thus the strength of this project." (Pharmacist 15)*
	Q8	*"I think a comprehensive review is good, but it may be a bit ahead of its time" (Pharmacist 4)*
	Q9	*"A more extensive MR is obviously better. The quality of the review increases when more people are involved, such as specialists and other care providers. But that does not mean that a basic review is not useful. On the contrary, it should be an impetus to not postpone things that you can resolve quickly." (Pharmacist 8)*
	Q10	*"The medication review is not a one-off thing, it's an ongoing effort. It should not just stop at some point, there needs to be a follow-up. Once initiated, the medication review needs to be updated just like a personal medication schedule." (Pharmacist 6)*
Patient selection criteria	Q11	*"For patients with a chronic illness, I would advocate [a MR] as soon as possible. There are younger people for whom it may even*

		be more beneficial than for example an 80-year-old woman. For a younger person, it might pay off more while for an octogenarian changing things may not be useful. (Pharmacist 15)
	Q12	*"I would not dissuade anyone [from MR], as changing things is not mandatory, changes are only proposed, and you try to substantiate these." (Pharmacist 8)*
Cooperation with the GP	Q13	*"So far, we've had one conversation with a GP to discuss a whole group of patients at once and that went really well, he was really supportive about everything. Before the actual meeting, we had a quick phone call and he told me that he really looked forward to it." (Pharmacist 15)*
	Q14	*"In some instances, you need to prompt and remind them [the GPs], and that is not pleasant, but it has to be done." (Pharmacist 4)*
	Q15	*"In the beginning, all information was sent by email, but because of the GDPR[1] legislation this was suddenly no longer permitted. That was a bit annoying, because we then always had to collect that data ourselves and that was more time consuming." (Pharmacist 12)*
	Q16	*"One patient's GP didn't want to change anything. That patient then went to the nephrologist, who confirmed what I told her before. With that information she went back to her GP. (...) Physicians shouldn't consider this as an offense, but rather as a way to cooperate. This has to be emphasized." (Pharmacist 3)*
	Q17	*"The cooperation with the GPs was a real success, they happily revealed that they were learning a lot and subsequently we have been holding meetings every month." (Pharmacist 12)*
	Q18	*"The GP was very helpful and very amenable, but in the end, she always thought she got it right. But then again, it's a start! " (Pharmacist 9)*
	Q19	*"I would like to contact the specialists, because GPs are often not willing to adjust medications initiated by the specialist. This would then allow us to provide more information to the GPs." (Pharmacist 9)*
Results of the medication reviews	Q20	*"That's why we do this, isn't it? For the benefit of the patient. You don't do this for yourself, nor for the GP, it's about helping the patient in the first place. When he tells you that his kidney function has improved, and that he doesn't have to go to predialysis any longer, then that's a life changing experience…. Then you can think: "Mission accomplished!". (...) This keeps you motivated to continue." (Pharmacist 6)*
Remuneration	Q21	*"I wouldn't be too modest about it but the bar should be raised high. When doing the review, this is your only focus, so that time must be paid for. There is competitive pressure amongst pharmacists and you can make a difference by offering quality. I think we are far too accommodating and too afraid to request remuneration for this service. In every other place advice must be paid for, so why should it be any different for us?" (Pharmacist 1)*

[1]In the past, there was already a restriction on the sending of confidential information by e-mail but the introduction of the General Data Protection Regulation (GDPR) legislation has increased awareness of these issues.

	Q22	*"Working with the patient in a personal way means that you are actually involved in a type of consultation, so it should be paid for as such. " (Pharmacist 3)*
	Q23	*"In my opinion there is some need for a protocol. Payment should only happen after submitting an appropriate report, and an extra fee is needed for follow-up interviews. So, in fact remuneration should be compartmentalized." (Pharmacist 1)*
	Q24	*"Being a pharmacist, it's sometimes difficult not to shoot yourself in the foot by providing the patient with your advice. (…) You look things up, you phone the GP and in the end the patient may leave without purchasing anything. Pharmacists that don't check things carefully, may just say "take this" and they will then have been remunerated for their service . That's the tricky thing about it, this type of advice should be remunerated." (Pharmacist 8)*
Optimalisation of the medication reviews	Q25	*"Lack of time is a real obstacle for us. The review is an extra task that comes on top of the everyday work. Because, in contrast to the GP, there is currently no possibility of a pharmacist planned consultation. Maybe we should aim for that: creating two sources of revenue, one for OTC medicines and a second one for the remaining aspects." (Pharmacist 5)*

Examples of general practitioners' quotations

Classification	Quotations references	Quotations
Motivation	Q26	*"There is no hard scientific evidence that patients benefit from MR, but it's so obvious that it needs no proof." (Physician 5)*
	Q27	*"As a physician, you don't always know the exact list of medications that the patient is taking, so re-assessment is sometimes necessary. You're more likely to do so when there is a second opinion." (Physician 1)*
Time investment	Q28	*"It is good to have this pilot project, however, putting this into practice would be too labour-intensive. We took part because it is a study project and we aim for higher quality, but it is unsustainable. Most of my colleagues will abstain, certainly in its current form." (Physician 7)*
	Q29	*"The work is not reimbursed, so it's really something that you should be willing to take on as an extra." (Physician 6)*
Patient selection criteria	Q30	*"You have to set priorities, because you cannot organise [MR] consultations for every patient. Vulnerable patients in particular, such as the polymedicated ones, require most of our attention." (Physician 6)*
	Q31	*"It can sometimes also be useful for younger patients, such as for patients suffering from cystic fibrosis." (Physician 1)*
	Q32	*"I don't think that younger patients are an important target group [for MR]. Except when they have mental problems, then that's something to consider." (Physician 7)*
	Q33	*"Medication adjustment usually requires a big effort so when finalised, patients often get really attached to these medicines. In my view, there is no need to drastically change them. When*

		you decide to do so, it's absolutely necessary to discuss this first with the treating specialist, if the patient has one." (Physician 4)
Cooperation with the pharmacist	Q34	*"When a pharmacist gets a physicians' prescription and it is not clear to the pharmacist why the patient has been prescribed those medicines, then I can imagine that this must be very frustrating." (Physician 1)*
	Q35	*"It is very useful to provide the laboratory values, particularly values for kidney function. There is no need to communicate every small detail, but the more pharmacists know, the better they can advise their patients. It would be helpful if the prescription would indicate whether the patient suffers from renal insufficiency." (Physician 8)*
	Q36	*"I think there are some shortcomings in the training. You can only act on what you know. There is still a long way to go, as this should really be taught as a new course." (Physician 7)*
	Q37	*"A pharmacist is not a physician. I think that many pharmacists want to take over our role, which creates a big risk. (...) Lab values must be interpreted, this falls outside the scope of the pharmacists' competency." (Physician 6)*
	Q38	*"When a patient experienced an adverse drug reaction, then we must make that known [to the pharmacist]. (...) For example, the use of a certain antibiotic could trigger certain allergies, also impacting the safe use of other antibiotics. Then the pharmacist will also be able to act on such information." (Physician 8)*
	Q39	*"It's easy for me to cooperate with pharmacists because they know a lot more about medications than I do." (Physician 11)*
	Q40	*"I notice that many pharmacists are afraid of conducting a telephone conversation with GPs and that there is a type of hierarchy, presuming that the physician is the boss and that the pharmacist should only execute what the physician has instructed. This is disappointing and I think that this is an outdated way of collaborating." (Physician 12)*
	Q41	*"The [electronic] exchange of [patient] data is still not optimal. The government makes out that it is, but practice shows the opposite. They always launch new ideas and products, even when they are far from perfect." (Physician 8)*
	Q42	*"The pharmacist knows much more about medicines and everything that has to do with it in comparison to the average physician." (Physician 5)*
	Q43	*"It would be a real added value if pharmacists would focus on all our patients' chronic medication lists, on the identification of clinically relevant interactions and on making suggestions for optimisation." (Physician 12)*
	Q44	*"They [the pharmacists] actually take over a part of our task and that's a good thing, because eventually a medication can suddenly change or can be taken in a different way by the patient, we do not always know about that." (Physician 8)*
	Q45	*"It's a real team effort in which, from a medication-oriented point of view, pharmacists usually get closer to patients than GPs do." (Physician 8)*

Results of the medication reviews	Q46	*"It is for the benefit of the patient's health that we conduct more checks regarding the medication and that we evaluate the chronic medication more closely, which one usually prescribes too readily. Both pharmacists and physicians have a role to play here, and with physicians I do not only mean GPs but all the other specialists as well." (Physician 8)*
Remuneration	Q47	*"I would absolutely find it [a remuneration] normal, because in the end the pharmacist does more than just selling pills. For a part, we outsource this and that is absolutely worth it, because as a physician we sometimes aren't aware of the mistakes that are made. I'm in favour of this review and there should definitely be a budget for that." (Physician 8)*
	Q48	*"I think that in the future a different remuneration is needed for GPs and maybe also for pharmacists. It would not be a bad idea to disconnect the pharmacist's income from the amount of medicines that are sold, that system is really incomprehensible to me. The more a pharmacist sells and the more expensive the products are, the more he earns. That is aberrant and vice versa, when a pharmacist makes the effort to also confer with the doctor, he will not get paid for this. Rather, in some cases he has to dissuade patients from taking certain medications, his income will suffer from that advice. If you ask me, pharmacists should not be part of the consumer society any longer; they need to get away from that pressure. He [the pharmacist] should not be rewarded for stimulating this consumption cycle but he just needs to get compensated for his high quality advice and medical work, just like GPs should." (Physician 6)*
	Q49	*"I think compensation [for MR] is justified because it takes a lot of time. You can compare it with the global medical file we handle and for which we also receive a reimbursement per patient. All the money that the NIHDI (National Institute for Health and Disability Insurance) saves with this service should go to the pharmacists. That would be better for everyone. " (Physician 11)*
Optimisation of the medication reviews	Q50	*"It takes a lot of time for us to help patients with stopping the use of their medication. It would be a lot easier if we could collaborate with the pharmacists to accomplish this. If he informs the patient about which medication needs to be stopped, it would reduce our workload in discussing this with the patient. I really think that this is a super project!" (Physician 11)*