



Home care nurses' perceptions about their role in interprofessional collaborative practice in clinical medication reviews

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ABSTRACT

Regular clinical medication reviews (CMRs) are recommended for monitoring and addressing potential drug-related problems, especially in elderly people. Interprofessional collaborative practice (ICP) by general practitioners, community pharmacists, and nurses in a CMR is recommended and expected to produce more efficient CMRs. Involving home care nurses in ICP is not yet well implemented, and their perspectives are unclear. This study explores how they perceive their role in ICP in CMRs and the requirements to assume that role.

Structured interviews were performed, using case-vignettes; data were analyzed with a thematic analysis approach.

Twelve home care nurses were interviewed. Three themes regarding the nurses' role were identified: (1) observing, recognizing, and communicating information for a CMR to prescribers and community pharmacists (2); helping to provide patient information and education about implemented changes in the pharmaceutical care plan; and (3) the nurses' level of involvement in ICP. Three themes regarding requirements were identified: (1) nursing competences, (2) periodic interprofessional consultation and ad hoc interprofessional communication, and (3) guidelines describing the role of nurses.

Home care nurses could provide additional support in a CMR. Nursing competences, periodic interprofessional consultation and ad hoc interprofessional communication, and guidelines describing the role of home care nurses are required.

Declaration of interest

None.

1. Introduction

Older home care patients often have comorbidities for which they take multiple medicines each day. Medication is important for treatment and prevention of symptoms and diseases but may also result in drug-related problems (DRPs). A DRP is defined as "an event or

circumstance involving drug therapy that actually or potentially interferes with desired health outcomes".¹ Older people are particularly vulnerable to DRPs, because of age-related changes in pharmacodynamics and pharmacokinetics, leading to adverse drug effects^{2–5} and changes in cognitive, physical, and visual function, leading to incorrect use and usage problems.^{6–9} Furthermore, many healthcare professionals are involved in pharmacotherapy processes such as prescribing, which sometimes results in medication discrepancies and even mistakes, especially when people are being prescribed multiple medications.^{10–14} DRPs may negatively affect a person's perceived quality of life and may

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increase morbidity, mortality, health care costs, and the risk of hospital admissions and readmissions.^{8,15–17} To observe and address DRPs, guidelines recommend a regular review of medication through a clinical medication review (CMR).^{18,19} A CMR is defined as “a structured evaluation of a patient’s medicines with the aim of optimizing medicine use and improving health outcomes. This entails observing DRPs and recommending interventions”.²⁰ CMRs are included in clinical practice in several countries, are often named differently, and the healthcare professionals’ roles differ.^{18,19,21–28} The Dutch national guidelines “Polypharmacy in the Elderly,” advise a CMR by using the Systematic Tool to Reduce Inappropriate Prescribing (STRIP) method and interprofessional collaboration practice (ICP) between the general practitioner (GP), community pharmacist, and home care nurse and the patient and/or informal caregiver.¹⁸ The STRIP method supports a structured process for selecting frail patients who would benefit most from a CMR because of their vulnerability to DRPs, by following five steps: (a) the pharmacotherapeutic anamnesis, (b) the pharmacotherapeutic analysis, (c) an interprofessional discussion to propose a pharmaceutical care plan, (d) shared-decision making with the patient and/or informal caregiver, and (e) monitoring and follow-up of implemented actions.

In a recent revision of the CMR, it was concluded that in selecting patients for a CMR, the strict patient characteristics and risk factors for DRPs (e.g., age ≥ 65 , polypharmacy, impaired renal function, cognitive decline) are no longer necessary as a CMR for patients with these characteristics is not always effective.²⁹ Instead, the signs and symptoms observed by home care nurses are one of the recommendations for considering a CMR.¹⁸ It is plausible that home care nurses observe signs and symptoms of potential DRPs, as they are the only healthcare professional who actually visit a patient’s home on a regular basis, which is a place where many potential DRPs can be identified.^{30,31} In the literature, other nursing activities in ICP have been described, such as monitoring therapeutic effects, discussing DRPs and patient preferences with other healthcare professionals, and providing patient information and education.^{32–34} The literature also describes that nurses’ activities in ICP are sometimes hindered by several factors, such as a lack of competences, inadequate education, and a lack of time.³⁵

The perception of home care nurses about their role, for example, in observing potential DRPs and/or other roles in CMRs is unclear—not to mention their perceptions of what is required in order to assume their role in ICP in CMRs.¹⁸ Their perceptions may help to guide more efficient ICP by home care nurses in a CMR, including practical recommendations that are so far lacking.¹⁸ Therefore, the aim of this study is to explore the perceptions of home care nurses about their role in ICP in CMRs and the requirements to assume their role.

2. Materials and methods

2.1. Research design

The research employed a qualitative study design with structured interviews. The start of the interviews was guided by a vignette technique. A vignette technique is a method that can elicit, for example, perceptions from responses or comments to stories depicting scenarios and/or situations.³⁶ In this study, three case-vignettes were created to stimulate discussion about the role of nurses in observing potential DRPs and other potential roles in ICP. This study is reported according to the Standards for Reporting Qualitative Research to enhance the transparency of the study approach, execution, analysis, and reporting of research data.³⁷

2.2. Research setting and participants

Home care nurses with a bachelor’s degree (level 6 of the European Qualification Framework) were included. In the Netherlands, home care teams consist of registered nurses (level 4 and 6), licensed practical nurses (level 3) and/or nurse assistants (level 2). All home care nurses

have the responsibility to administer medication (the higher the level, the more classes of drugs may be administered), and to monitor and evaluate any potential problem related to the therapy. Home care nurses with a bachelor’s degree have an extra responsibility to perform a patient anamnesis, to plan, coordinate, and supervise home care, including pharmacotherapy. For this study, home care nurses with a bachelor’s degree were considered as suitable informants for providing perceptions about the role of nurses in ICP with other healthcare professionals in a CMR.

2.2.1. Recruitment

Home care nurses were recruited through personal network sampling and a snowball sampling technique. First, seven home care nurses in the network of the researcher (NED) were approached (May 2021). The home care nurses received an email with general information about the aim and procedure of the interview study. After the home care nurses consented to participate, an interview was scheduled. Since it was expected that more than seven interviews were needed for data saturation, each home care nurse was asked to invite one other home care nurse for an interview. The home care nurses forwarded the invitation email to a home care nurse of another organization or the same organization but in another district. Six additional home care nurses agreed to participate.

2.3. Data collection method and process

The preferred data collection method was face-to-face interviews; however, due to the COVID-19 pandemic, participants could choose to be interviewed either live or virtually (via Microsoft Teams). The interview guide (see Appendix) opened with a general introduction of the interview aim and procedure, as well as an explanation of the STRIP method, before proceeding with open-ended questions.

Open-ended questions were intended to provide insights into the perceptions of home care nurses about the following¹: their ability to provide support in observing and recognizing signs and symptoms of DRPs and patient preferences, using case-vignettes and other roles in ICP²; their perception about ways to collaborate efficiently with other healthcare professionals; and³ what is required to assume their role.

2.3.1. The case-vignettes

Three realistic case-vignettes (Box 1) were developed by using the technique for developing vignettes as described by Jackson et al. (2015).³⁸ In addition to the hypothesis that home care nurses could observe signs and symptoms of potential DRPs, examples of patient preferences were added to the vignettes. The reasons for this are that preferences have been shown to be important observations that should be addressed in a CMR³⁹ and because home care nurses could be expected to observe these as well. Reality-based examples were used that had been observed and recognized by pharmacists in the randomized controlled trial known as DREAMer—that is, “Drug use Reconsidered in the Elderly using goal Attainment scales during Medication Review”.^{22,40} The trial was performed in 35 Dutch community pharmacy franchisees of “Service Apotheek” and 113 collaborating general practices. In this trial, CMRs were performed in 315 patients aged 70 or older, using seven or more chronic drugs daily, of which 37 received home care.⁴¹ Two participants declined consent to use the data for future research and two persons were excluded because of missing data, which resulted in data from 33 home care patients for the vignettes. The case-vignettes were constructed by the research team. In total, three examples of DRP types—that is, overtreatment, drug not effective, suboptimal therapy, (potential) adverse effects, dose too high or too low, usage problem, clinically relevant contra-indication or interaction, and medication non-adherence—as well as and patient preferences were included in the vignettes. In total, 27 examples of DRPs and patient preferences were described, along with additional information such as the name of the medication, the dose and frequency, health complaints, vital parameters and/or laboratory values. It was ensured that the

Box 1

Three case-vignettes

Vignette 1

An 87-year-old female home care patient takes pantoprazole every day. It appears that the indication for the medication is unknown (overtreatment); it could be that pantoprazole was started during a hospital admission and was not stopped and evaluated. The patient indicates that she has no stomach problems.

Furthermore, it appears that the patient was prescribed atenolol for migraine a couple of years ago and takes it every day. She did not have any more migraines (overtreatment). Furthermore, the patient uses three different types of blood pressure medication (losartan-hydrochlorothiazide and two other types) and has a stable and normal systolic and diastolic blood pressure of 120/70 mmHg (target blood pressure levels are <150 systolic mmHg and ≥70 mmHg diastolic) (overtreatment). The patient has sleeping problems and hallucinations potentially caused by metoprolol (potential side effect) and hematoma and bleeding potentially caused by acenocoumarol (using for atrial fibrillation) (potential side effect).

It was noticed that the patient uses prednisolone which is prescribed for temporal arteritis which, in combination with heart failure, can cause complications (contra-indication). The patient said she suffers from constipation, and it appears that a laxative, such as magnesium oxide is not prescribed (suboptimal therapy). She has shortness of breath for physical activities with low intensity, which limits daily activities (dose too low). She does not take Ursodeoxycholic acid as advised (medication non-adherence) as she does not like to take all her pills. Therefore, she would like to take fewer pills, and she prefers to have two pills deprescribed (personal preference).

Vignette 2

An 87-year-old male home care patient was diagnosed with a stroke in 2016 and COPD, heart failure, and diabetes in 2019. He uses simvastatin (40 mg) for high cholesterol (LDL 4.6 mmol/L, target value is < 2.6 mmol/L) (drug not effective), metformin, and has a HbA1C level of 69 mmol/mol (target value is 54–58 mmol/mol) (dose to low); moreover, he uses dipyrindamole and indicates being dizzy (potential side effect).

Four days ago, the patient fell, and since then has lower backpain (VAS 9, values range from 0 to 10) and uses fentanyl (12,5 µg.) every day. The pain remains the same (VAS 9) (drug not effective). In 2015, he was diagnosed with vertebral fracture (L2), and a humeral fracture was diagnosed in 2019. A check of the prescribed medication indicated missing preventive treatment for fractures—for example, calcium/vitamin D or a bisphosphonate (suboptimal therapy).

Furthermore, it appears that no beta blocker is prescribed for heart failure (suboptimal therapy).

The patient said he is afraid to make mistakes with taking medications as he has no overview of which medication he has to take at what time and that organizing the medication takes too much time (usage problem). He would like to have the medicines in a medication dispenser or in a 7-day pill box organizer (personal preference). It also appears that the patient did not take Spiriva daily as advised (medication non-adherence).

Vignette 3

A 71-year-old male home care patient was diagnosed with hypercholesterolemia, angina pectoris, severe renal failure, heart failure (with high blood pressure and edema in the legs), and constipation. He is prescribed with acetaminophen, metformin, hydrochlorothiazide 50 mg. (dose too high), eprosartan, simvastatin (contra-indication metformin and renal failure), diltiazem (interaction with simvastatin), and lemon flavored macrogol. He indicates that he dislikes the flavor of the macrogol (usage problem), and he experiences problems with swallowing the eprosartan (usage problem). Furthermore, he indicates that he has pain because of hip arthrosis and that the pain does not diminish (drug not effective).

He also indicates that he did not use the simvastatin for a while because he uses so many medicines and no longer understands the importance of taking them (medication non-adherence). In addition, he indicates that he wants to suffer less from a dry mouth which he gets from venlafaxine. He wants to reduce the complaint of dry mouth from six days to two days a week at the most (personal preference).

examples covered medicines from as many different classes of medication as possible. The trial data of home care patients did not contain examples for the DRP type “interaction.” Therefore, two examples of patient interactions without home care of the trial were used. Fictional patient names and ages were used in each case-vignette. The case-vignettes were checked for accuracy by the researchers with expertise in clinical pharmacology and therapeutics (SV; MLB; ERH) and checked for readability by two home care nurses.

The participants received the case-vignettes at least one week before the interview. They were asked to read the vignettes, to think about which of the examples could be observed and recognized by home care nurses, and to confirm these by checking boxes. During the interview, they were asked to provide the motivation behind their answers.

The interview guide was tested with two home care nurses by the researcher (NED) prior to the start of the interview study to check the clarity of the questions and make final revisions if needed. No revisions were needed, and the interview data from these interviews were included in the data analyses. In addition, information was collected regarding general participant characteristics, such as gender, age, years of work experience as a nurse in home care/health care, and experiences in ICP in a CMR.

The interviews were conducted by the researcher (NED) in June and July 2021. The interviewer has been trained in interview techniques and has experience with performing interviews in a previous project. Participants could withdraw from the study at any time. The interviews were digitally audio recorded to enable verbatim transcription. Mean interview length was 39 min (range 29–60 min). Audio files were deleted from the recording system after they were transcribed. Transcriptions were stored on a secure server of the University of Applied Sciences Utrecht.

2.4. Data analysis

Interview transcripts were analyzed by two independent persons—a researcher (NED) and a research assistant (RP)—using content analysis with a directed approach.⁴² First, the two researchers read the transcripts and notes in their entirety to gain an overall picture regarding the research objective. Next, the transcripts were reread, and meaningful paragraphs were coded by both researchers independently that conveyed themes about the role of home care nurses, ways to collaborate, and requirements. All data were coded with all forms of identifiers removed. The codes were discussed afterwards until consensus was

reached. Subsequently, the researchers checked the labeling of the themes for completeness and clarity with the research team. Finally, the meaning of the themes was described, including the perceptions of home care nurses about which DRPs and patient preferences in the case-vignettes could be observed by home care nurses; these were then complemented with quotes from the participants, leading to a detailed description of the results. Data saturation was reached after 10 interviews, when no new information emerged from the interviews that added to an understanding of the themes. For validation, two additional interviews were conducted. Descriptive statistics were used to describe the participants' age, gender, years of work experience as a nurse in home care as well as total years of work experience, and years of experience with ICP in a CMR.

2.5. Ethics

The ethical review board of the University of Applied Sciences Utrecht has declared that this study does not fall within the remit of the Medical Research Involving Human Subjects Act (WMO; registration number 146-000-2021). This means that this study did not need additional approval by an accredited medical ethics committee. All participants gave informed consent prior to study commencement.

2.6. Results

2.6.1. General participant characteristics

The general characteristics of the participants are presented in Table 1. Four of the twelve participants had experience with ICP with other healthcare professionals in a CMR. Half of the interviews were held via Microsoft Teams.

2.6.2. Perceptions about the role of home care nurses in ICP in a CMR

Three main themes were identified, with several incorporated sub-themes: (a) observing, recognizing, and communicating information for a CMR to prescribers and pharmacists; (b) helping to provide patient information and education for implemented changes in the pharmaceutical care plan; and (c) the home care nurses' level of involvement in ICP in CMRs. Hereafter, the themes and sub-themes are described and illustrated with quotes.

Theme 1: Observing, recognizing, and communicating information for a CMR to prescribers and community pharmacists.

2.6.3. Signs and symptoms of potential DRPs, patient preferences, and potential therapeutic effects

All participants indicated that home care nurses of all levels could

Table 1
General characteristics of participants of the interview study (N = 12).

ID	Age (years)	Gender	Work experience as a nurse in home care (years)	Work experience as a nurse in total (years)	Experience with ICP in a CMR (years)
R01	52	F	17	21.7	1
R02	24	F	5	8	0.7
R03	51	F	9	35	0
R04	57	F	7	19	3
R05	24	F	1.5	5.5	0
R06	28	F	5	8	1
R07	34	F	5	6	0
R08	25	F	1.2	1.2	0
R09	23	F	1.5	1.5	0
R10	32	F	1.8	14.8	0
R11	62	F	20	22.5	0
R12	28	F	1.8	2.8	0

play an important role by providing information about signs and symptoms of several potential DRPs and patient preferences to prescribers and pharmacists. The participants indicated that because of their frequent contact with patients in their own home, they regularly observe signs and symptoms such as non-adherence, usage problems, and side effects; moreover, they believed that this information is important for other healthcare professionals, as prescribers and pharmacists, for example, could use this information to analyze a patient's pharmaceutical care plan and to define actions.

"Yes, I believe that home care nurses of all levels could observe and recognize problems. Medication non-adherence, the use of over the counter medications, usage problems, preferences and side effects, these can be observed by home care nurses." R10

The participants indicated that some examples of DRPs in the vignettes are easier to observe and recognize than others. For example, all examples of the usage problems, patient preferences, and medication non-adherence were mentioned as being easily observable and recognizable. Some examples of side effects could be more easily observed than others, especially when it comes to medicines that nurses administer frequently. Most of the participants mentioned that it would not be possible for nurses to identify problems related to the interpretation of lab values or clinical parameters (contra)-interactions and the accuracy of prescriptions according to their guidelines. The participants considered these to be observable activities for prescribers or pharmacists as they require certain knowledge of pharmacokinetics and dynamics.

"... and the side effects, sometimes you really know the side effects, because we get the knowledge of the side effects as the side effects belongs to medication that are prescribed in older patients and the side effects occur regularly." R02

"I believe that a home care nurse should not interpret blood values. It comes to what a nurse can see, so health complaints. For example, a high blood value of cholesterol, yes, that is not what we can observe when we see the patient, just like an impaired renal function. But when it comes to the impaired renal function, we can see for example health complaints related to it, oedema." R02

"For medicines, yes, situations such as interactions, it is more the task of a pharmacist to recognize it." R10

The participants indicated that they can also observe and measure vital parameters and recognize changes in a patient's health status that could be the result of implemented changes in pharmaceutical care plans. The participants believed that this information could be helpful for prescribers and pharmacists to assess the effectiveness of implemented changes.

"If follow-up and monitoring is needed then we can do it. For example, fatigue or dizziness, just some symptoms, we can monitor any changes. We can pass the information to others. As we see the patient more often, and speak to the patient often, we can do the monitoring. We like to do it." R04

2.6.4. Additional patient information

The participants indicated they could provide to pharmacists and prescribers additional patient information concerning what may cause potential DRPs, such as the use of over-the-counter medication, insufficient medication knowledge, and any other concerns they might have about side effects and cognitive, physical, and/or visual problems. The participants indicated the necessity for interprofessional communication about these issues, as this could facilitate the pharmacotherapeutic analysis and help to fit patient information and education to the individual patient's needs.

"There is a lot we can see in the patient's home and I think we have the role to do something with it. For example, some information is

hard for pharmacists to see. ... for example if the patients use over-the-counter medicines. We can see the bottles or we ask the patient 'do you use this also?'. And we can inform other professionals about what we see." R02

Theme 2: Helping to provide patient information and education for implemented changes in the pharmaceutical care plan.

Several participants indicated that they could identify any misunderstanding patients might have concerning the information and education provided by prescribers and pharmacists about implemented actions and that they could provide additional information or answer a patient's questions about the information and education.

"Yeah, sometimes the patients don't understand the information from the pharmacist or general practitioner. Then they tell us, the home care nurse, that they don't understand it. The explanation, explaining it in a normal understandable language, that is what we can do" R07

"Yes, we should ask patients if they understand the information. Many patients don't understand it. For example, one of our patients. He was informed to take one tablet every day. We asked him about how he should take the medication. He said, yes I know how to take it, I have to take one of it. So, he took only one tablet in the last week." R04

Theme 3: Home care nurses' level of involvement in ICP in CMRs.

The participants indicated that the involvement of home care nurses in ICP is probably only needed under certain conditions. The participants mentioned that the role of home care nurses should be considered as additional support for other healthcare professionals involved in the CMR and they believed that the role of nurses improved the efficiency and effectiveness of a CMR.

"... we are somewhat the ears and eyes of pharmacists, because we visit patients often. So, I think we can provide additional support in the review for others." R08

"As we see the patient we gain a lot of information, we know exactly how patients behave and if they have problems. This should be considered as additional information for the review, right. So, I think it would be good that reviewing patients' medicines will be performed in collaboration with prescribers and pharmacists. In this way, three disciplines bring important information together." R04

Participants believed that their involvement would be needed for patients with conditions that hinder constructive discussions between the patient and the pharmacist and/or GP. The following conditions were mentioned: cognitive decline, mental disorders, health literacy, language barriers, loss of a family member, missing social network or situations or events that may provoke DRPs (such as visual and physical problems, hearing loss, and hospital admissions).

"I believe that our role in this, well that is not needed for all patients. ... so patients for example with cognitive decline, we could help to give information to the patients' prescriber. And also afterwards, then we can have a task too, to repeat information." R11

2.6.5. Requirements to take up the nurses' role in ICP in a CMR

Three main themes were identified, with several incorporated sub-themes: (a) nursing competences, (b) periodic interprofessional consultation and ad hoc interprofessional communication, and (c) guidelines describing the role of home care nurses in ICP in a CMR.

Theme 1 Nursing competences

The participants mentioned that home care nurses need several competences to be able to take part in ICP. Participants indicated, for example, knowledge regarding pharmacotherapy and its related problems, skills in questioning patients for problems and preferences and for observing signs and symptoms, and a proactive attitude for observing and recognizing signs and symptoms of potential DRPs.

Some participants indicated that the knowledge of home care nurses regarding pharmacotherapy and its related problems should be improved by training; moreover, nurses need to have a more constant, proactive attitude about observing and recognizing signs and symptoms of potential DRPs, with a heightened awareness of the importance of careful observation and interprofessional collaboration. A training and a nurse coordinator for ICP in a CMR were mentioned as solutions to optimize the competences.

"Yes, it is knowledge. We need that. Knowledge of medications, right, what do medication do with the patient, what are problems that could be related to medication. Currently, this knowledge is missing." R04

"I believe that awareness of the nurses' role is needed. I notice that awareness, that it diminishes, (...) but if you discuss the importance of observing it, then, let's say, it comes back, it is refreshed."

"... a training that focuses on what a nurse should know and do and why she will do it. Information as, if you visit a patient, what do you need to observe or what do you ask the patient, what do you need to arrange? That kind of knowledge would help to refresh nurses' awareness." R02

Theme 2: Periodic interprofessional consultation and ad hoc interprofessional communication.

The participants preferred periodic interprofessional consultation meetings with at least the patient's pharmacist and GP. The participants mentioned that other professionals ideally should be involved, such as a general practice nurse, nurse specialist, and a geriatric care physician. The participants mentioned that interprofessional consultation meetings are needed to evaluate the pharmaceutical care plan, discuss potential problems and/or patient preferences, and to make joint agreements about required actions. The participants believed that meetings create coordination and communication among healthcare professionals. Some of the participants expected a challenge in having meetings with the patient's GP, pharmacist and/or other healthcare professionals; as they work in different general practices and pharmacies, coordination demands efficient organization and time commitment from each healthcare professional.

Some of the participants already have experience with interprofessional consultation meetings with several healthcare professionals (such as pharmacists, GP, and general practice nurses) that are periodically performed (e.g., four times per year or less often). Participants acknowledged that regular consultation meetings are helpful for getting joint agreements about changes in the pharmaceutical care plan and for strategies to evaluate its effectiveness.

"Yes, it would be wonderful if home care nurses, general practitioners, and pharmacists can have meetings. Then you get an overall aim for the patient, for the medication. That would be great for the patient as well, they should benefit from the medicines. But, I am wondering if this is feasible, in terms of time." R10

"If any problems arise then it is, I mean beyond the consultation meetings, like urgent problems, then home care nurses should take actions and they should get in touch with the pharmacist as well." R07

‘We already have a meeting with the patients’ pharmacist twice a year. And in case of problems, such as medication non-adherence, or other things or concerns we discuss it with the pharmacist between the two meetings.’ R04.

Furthermore, the participants mentioned that interprofessional communication between the consultation meetings are necessary since DRPs could arise at any moment, requiring interprofessional discussions to decide on actions and strategies for follow-up.

Many participants mentioned that interprofessional communication should be improved, as they currently experience that information about a patient’s pharmaceutical care plan (e.g., any DRP, changes in prescriptions, motivation for a change, provided information and education) are not well communicated to all the healthcare professionals involved in the patient’s pharmacotherapy. Moreover, they mentioned that information is currently shared through several means, such as e-mail and the Siilo medical messenger app.

Participants mentioned that the use of these systems limits the preservation of an overview of patient information. The need was expressed for interprofessional communication— preferably via a user-friendly digital system that is accessible to all healthcare professionals.

‘Well, yes, I know that a patient information system for all professionals is needed, as well as for non-pharmaceutic care. I think that it creates better collaboration and communication. Then everyone has all the information about the medication, problems, actions etc.’ R05

Theme 3: Guidelines describing home care nurses’ role in ICP in a CMR.

All participants indicated that they need guidelines that describes the process of ICP in a CMR that includes the role of home care nurses, the role of other professionals involved in a CMR, a tool that helps them observe and recognize information needed for a CMR, and strategies for efficient interprofessional consultation and communication.

All participants indicated that they were not aware of guidelines for a CMR, such as the national guidelines, ‘Polypharmacy in the Elderly.’ All participants indicated that the national guidelines could be useful for home care nurses if it provides the above-mentioned information and a checklist.

‘I believe that a screening tool would be good, because then you won’t forget things. Then you know what you should observe or ask the patient.’ R02

‘... it would be helpful (...) that we get a protocol, with agreements. Then it will be clear for everyone which professional should be contacted, when you go to the general practitioners and when you need to go to the pharmacist.... it would be helpful for the pharmacist and general practitioner that they know they can approach us, because some things are easier to do for us then for others, such as observing changes in health complaints.’ R05

3. Discussion

This qualitative study explored the perceptions of home care nurses about their role in ICP along with other healthcare professionals in CMRs and the requirements for assuming their role. The results indicate that home care nurses could provide information to other healthcare professionals involved in a CMR and check a patient’s understanding of changes in the pharmaceutical care plan and/or repeat information for them, especially for patients with certain conditions. Several requirements were identified for performing these activities, and the results and implications are discussed below.

As described in the introduction, the national guidelines indicate that a CMR could be considered when home care nurses have observed signs and symptoms of potential DRPs.¹⁸ This requires home care nurses to be able to observe signs and symptoms of problems and to communicate it

to other professionals. It is no surprise that participants of this study indicated that home care nurses could indeed play a role in observing and providing information about signs and symptoms, as home care nurses already perform this role in clinical practice.^{32–34}

This study expands the above-mentioned role, suggesting that home care nurses can perform other roles in ICP in a CMR. The first role is that home care nurses can also provide additional patient information that could help in the analysis of a patient’s pharmacotherapy, thus helping to define recommendations that fits the patient’s situation. It could be that the additional information supports prescribers and pharmacists in analyzing DRPs and defining effective changes in the pharmacotherapeutic care plan. Home care nurses’ involvement in ICP in a CMR has been shown to result in a more complete picture of a patient’s situation and needs and that the information could result in a better quality of a CMR.^{43,44}

The second role is that home care nurses could check a patient’s understanding of information and education concerning changes in the pharmaceutical care plan provided by prescribers and pharmacists. Elderly often have problems with remembering the information provided to them, which could result in unintentional medication non-adherence.^{45–47} Since home care nurses visit patients in their home frequently, they are well positioned to check a patient’s understanding of information and correct any misunderstanding.⁴⁸ Third, this study demonstrates that home care nurses can also provide information that could be helpful when evaluating the effectiveness of treatments in the follow-up phase of the CMR. Currently, prescribers and pharmacists often lack information about patients’ medication use and therapeutic effects after changes in the pharmaceutical care plan. This information is of importance to decide whether there are still medication errors and to increase medication adherence and patient safety.⁴⁹ Home care nurses are able to provide the lacking information which could improve the follow-up phase.⁵⁰

Interprofessional collaborative practice by home care nurses, pharmacists, and general practitioners could result in improved patient safety and a higher quality of patient care.^{43,50–52} However, the results of ICP by home care nurses, prescribers, and community pharmacists are yet unknown, and further research is needed to evaluate the implications for both patients and healthcare professionals.

The professional Dutch associations for nurses, general practitioners, and pharmacists stressed the need of ICP in a CMR.^{53–55} However, ICP in a CMR has not yet been well implemented. It is recommended that the importance of ICP and strategies for ICP by home care nurses, prescribers, and pharmacists be disseminated; moreover, it is recommended that a number of actions be taken to implement these changes.

First, the study participants indicated the need for guidelines that describes the role of home care nurses in ICP, along with healthcare professionals and other disciplines, in a CMR. The current national guidelines provide information about the observations of home care nurses and the recognition of DRPs that could be a starting point for a CMR. Ideally, the guidelines also provide the additional role of home care nurses in providing additional information, checking a patient’s understanding of information about changes in the pharmaceutical care plan, and supporting follow-up and monitoring; also included in the guidelines should be agreements about collaboration and communication and a checklist for nurses describing the necessary observations for a CMR. The additional information is helpful for home care nurses as well as for prescribers and physicians as it may result in a comprehensive view of the role of all professionals involved in the CMR; this, in turn, could stimulate the implementation of this approach in clinical practice.

The guidelines should recommend ways for the efficient exchange of information among healthcare professionals. To ensure the efficient exchange of information by healthcare professionals, efficient digital tools could be considered, such as the digital home care observation of medication-related problems by home care employees instrument (i.e., the eHOME-instrument).⁵⁶

Second, it is necessary to evaluate the required competences of home

care nurses for ICP. In this study, participants mentioned their concerns about the competences of home care nurses. Consequently, they expect that the nurses' role cannot be applied well, which is confirmed in a study by Simonsen et al.⁵⁷ It is known from previous research that the competences of home care nurses have been assessed negatively and should be improved.^{51,58,59} Currently, it is unknown to what extent home care nurses are fully competent for these tasks. Therefore, it is recommended that further research to evaluate their competences be conducted, using the competence framework for nurses in pharmaceutical care.⁶⁰

Third, community pharmacists, prescribers, and home care nurses are advised to organize periodic interprofessional pharmacotherapeutic meetings. Interprofessional meetings may improve the quality of pharmaceutical care for patients.⁶¹ The meetings facilitate the communication and discussions of home care nurses' observations. Healthcare professional can then discuss the initiation of a CMR and each other's roles and also evaluate effectiveness of changes in the pharmaceutical care plan and any follow-up actions.

3.1. Strengths and limitations

We believe that this is the first study that addresses the role of home care nurses in ICP with other professionals in a CMR. This information could be used to further shape ICP in a CMR in clinical practice. However, some limitations should be addressed. A first limitation is that home care nurses were recruited via our own network, which may result in selection bias. The study, therefore, may not be a representative sample of home care nurses. However, we believe that this sample did not limit the ability to gather perceptions about the role of home care nurses and the requirements for their role in ICP in a CMR.

A second limitation is that the case-vignettes involved between eight and 10 examples of DRPs; this is not a representative number of problems in CMRs performed in clinical practice, which is about 3.6 DRPs (SD1.2) per patient.⁶² As a result, the cases seem slightly less representative for what could be expected in clinical practice. However, the aim of the case-vignettes was to establish a conversation with home care nurses about their role, among other things, in observing and recognizing DRPs, by providing compromised information about reality-based examples of DRPs. This aim was achieved.

4. Conclusion

Home care nurses can provide additional support in ICP with other healthcare professionals in a CMR. This support involves providing information about the signs and symptoms of potential DRPs, patient preferences, and potential therapeutic effects. Furthermore, home care nurses can assist in checking and correcting a patient's understanding of information about implemented changes in the pharmaceutical care plan.

Nursing competences, periodic interprofessional consultation and ad hoc interprofessional communication, and a more comprehensive set of guidelines for ICP in a CMR are required for home care nurses to fully assume their role in ICP. Further research should evaluate the competences of home care nurses in ICP and the outcomes of ICP in a CMR for both patients and healthcare professionals.

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Data availability statement

Due to the nature of this research, participants of this study did not agree for their data to be shared publicly, so supporting data is not available.

CRediT authorship contribution statement

Nienke E. Dijkstra: Conceptualization, Methodology, Formal analysis, Investigation, Data curation, Writing – original draft, Visualization, Project administration. **Carolien G.M. Sino:** Conceptualization, Methodology, Writing – review & editing, Supervision. **Lisette Schoonhoven:** Conceptualization, Methodology, Writing – review & editing, Supervision. **Sanne Verdoorn:** Methodology, Resources, Writing – review & editing. **Marcel L. Bouvy:** Methodology, Writing – review & editing. **Eibert R. Heerdink:** Conceptualization, Methodology, Writing – review & editing, Supervision.

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Appendix A. Supplementary data

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