Harmonizing the definition of medication reviews for their collaborative implementation and documentation in electronic patient records: A Delphi consensus study

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Competing interest statement

- I have no competing interests to declare.

Introduction (1)

- Pharmacotherapy is among the most common medical interventions and constitutes one of the most common risk factors for patient safety.
- A key tool for prospective medication risk management is individual optimization of patients' medications with medication reviews.
- Medication reviews practices have evolved internationally in a direction in which not only physicians, but also other healthcare professionals conduct medication reviews according to agreed practices.
- **Collaborative practices have highlighted a need for:**
  - **Harmonized medication review definition**
  - **Joint electronic platforms where information on medication regimens and their implementation can be documented, updated, and shared**

Introduction (2)

- A prerequisite for the collaborative implementation and documentation of medication reviews in electronic patient records in different healthcare environments is to reach an interprofessional consensus on the definition and key content of medication reviews.
- Currently, there is no general and universal definition for medication reviews, and definitions and practices are often incompletely described in the literature and differ between countries and even within a country.
- The heterogeneous terminology stems from differences in medication review practices in different countries and from the specific characteristics of different operating environments.
- **As a result, the concept of medication reviews is widely used for a broad range of practices and services.**

Objectives

- The aim of this study was to harmonize medication review definitions and create a unified conceptual basis for their collaborative implementation and documentation in electronic patient records.
  - Appellation of the new definition: Collaborative medication review (CMR)

Delphi consensus method

- The study was conducted using the Delphi method
  - A qualitative consensus method
  - A questionnaire-based study gathering views of experts and aiming to reach consensus on the studied subject.
- The key features of the Delphi method are:
  - The anonymity of experts
  - Delphi rounds (iterations)
  - Feedback to experts in the form of a summary of previous round responses.

Implementation of the study

- The Delphi study was conducted
  - in Finland
  - as three-round electronic surveys
  - September–December 2020
  - using the Delphi Method Software (eDelphi)
- The first round’s survey was piloted
- The consensus rate was set at 80%

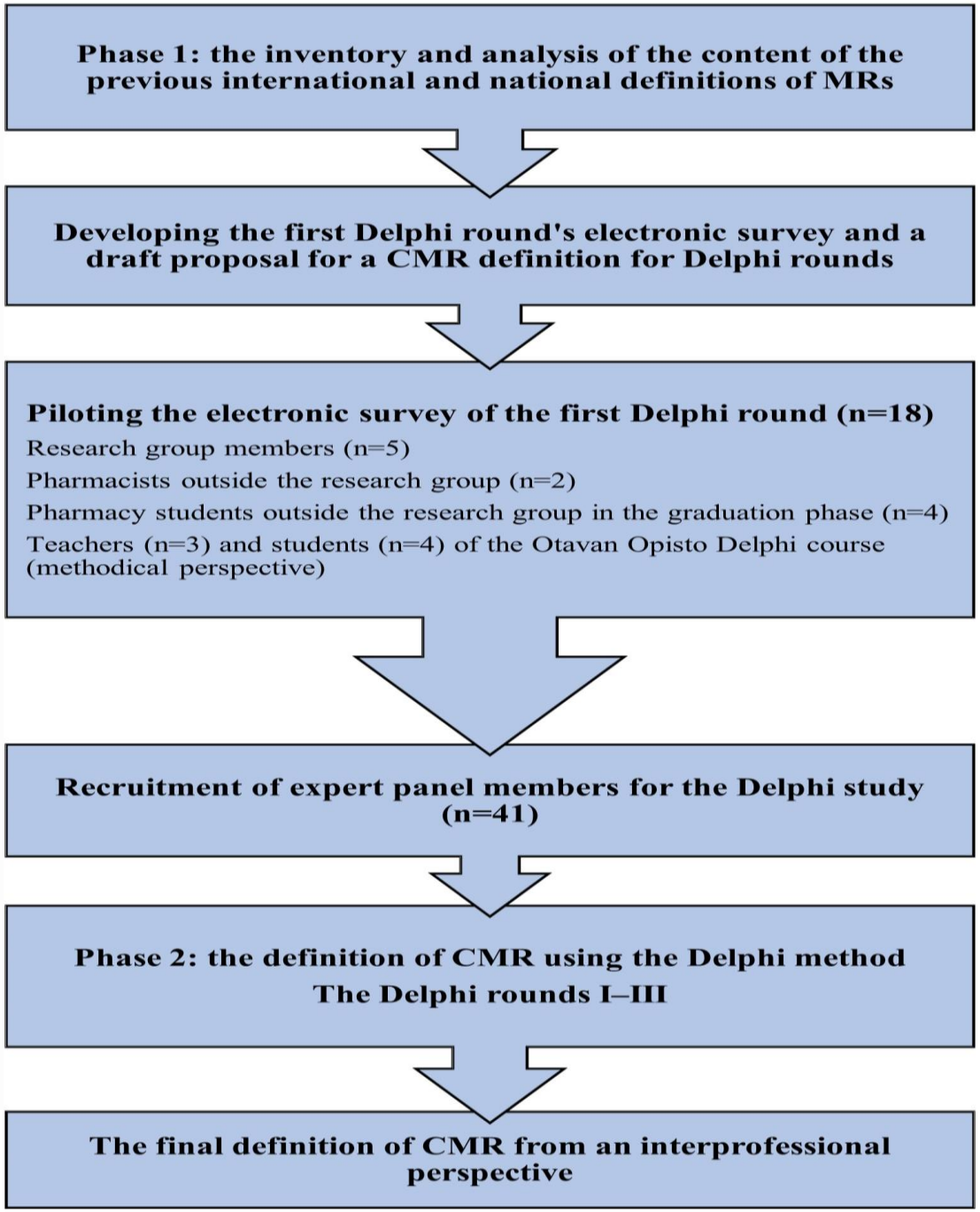

Fig. 1. Outline of the Delphi consensus process to define and validate the concept of collaborative medication review (CMR) from an interprofessional perspective.

Phase 1: Development of the definition of collaborative medication review from an interprofessional perspective

- The draft definition of CMR was based on the international and national inventory of medication review definitions, which was content analyzed.
  - Internationally, the medication review definitions from the USA, Australia, the UK, Sweden, and the Pharmaceutical Care Network Europe (PCNE) were utilized.
- The analysis identified structural and content-specific similarities, differences, and possible shortcomings in the definitions.
- The different parts of the medication review definitions were classified based on the question to which the definition part was deemed to correspond.

➢ The definition parts were divided into different **themes**, which were presented as **five interrogative words**. These were **expanded into sentences** that more accurately described the contents of the theme.

Phase 1

The definition of CMR was analyzed to include the following five themes:

1) *What?* = Actions that should be included in the CMR.
2) *Why?* = Benefits to be achieved by the CMR.
3) *Who?* = Patient groups to whom the CMR should be targeted where applicable.
4) *When?* = Situations where the need for CMR should be considered and, the CMR should be conducted as applicable.
5) *Where?* = Settings where the CMR should be conducted where applicable.

- The themes' contents were further divided in 75 items, each describing the themes' contents in more detail.

What? = Actions that should be included in the CMR (n = 24/24).
• Updating the patient's medication list to include all medicines in use (prescription and over-the-counter medications, food supplements, and natural products)
• Identifying drug- and medication-related problems
• Ordering necessary additional tests (e.g., missing/old laboratory values)
• Recommending appropriate interventions
• Providing the patient with medication counselling
• Discussing with the patient about necessary medication changes
• Documenting information in the patient records
• Prescribing missing drugs based on the CMR
• Performing follow-up at the care setting (e.g., monitoring of desired outcomes/ potential adverse drug events, medical tests, assessment of functional ability)
• Collecting the necessary pre-information about patient for CMR
• Familiarizing with the pre-information collected
• Performing medication review = examination of the patient's overall medication, condition, and status (compilation, finding the connection between the detected problem and the medication, prioritizing the detected problems, preparing amendments)
• Confirming proposed changes to medication/confirming that there will be no changes
• Identifying patients benefiting from the CMR
• Deprescribing
• Guiding for medication self-management
• Performing follow-up in home conditions, especially regarding long-term medications (e.g., monitoring of desired outcomes/potential adverse drug events, medical tests, assessment of functional ability)
• Ensuring the implementation of follow-up
• Interviewing the patient or person responsible for the patient's care regarding the implementation of medication
• Implementing the changes
• Performing clinical examination of the patient for general status (incl. collecting preliminary data and subsequent examining the patient e.g., at the reception)
• Compiling or editing a patient-specific pharmacotherapy plan (incl. planning the implementation of changes)
• Deciding to conduct deprescribing
• Informing other care participants of changes

Fig. 2. An example of a table where the items describing the contents of the themes were presented in detail (*What? items*)

Delphi expert panel

- A total of 58 healthcare and information management professionals were invited to the Delphi study.
- **The final expert panel consisted of 41 participants: 12 physicians, 13 pharmacists, 10 nurses, and six information management professionals familiar with health informatics.**
  - The primary criterion for experts was the expertise related to the medication reviews.
  - In the case of information management professionals, the primary target group of the recruitment was those working on developing electronic patient records or other national health information systems.

Phase 2: Definition and validation of CMR from an interprofessional perspective using the Delphi method *(The Delphi rounds I–III)*

- The interprofessional expert panel was asked to assess which pre-selected items presented in the Delphi survey (n=75) characterizing medication reviews should be included in the CMR definition.
- Based on the results of the first round, a definition proposal for CMR was added to the second round and was divided into 10 parts to facilitate both the response and the analysis of the results.
- The experts were asked to submit comments and arguments for their choices and to add potentially missing items to the open comment fields.
- The answer options were: (except for prioritizations)
  - Yes, as presented
  - Yes, but modified
  - Not at all
  - Cannot say

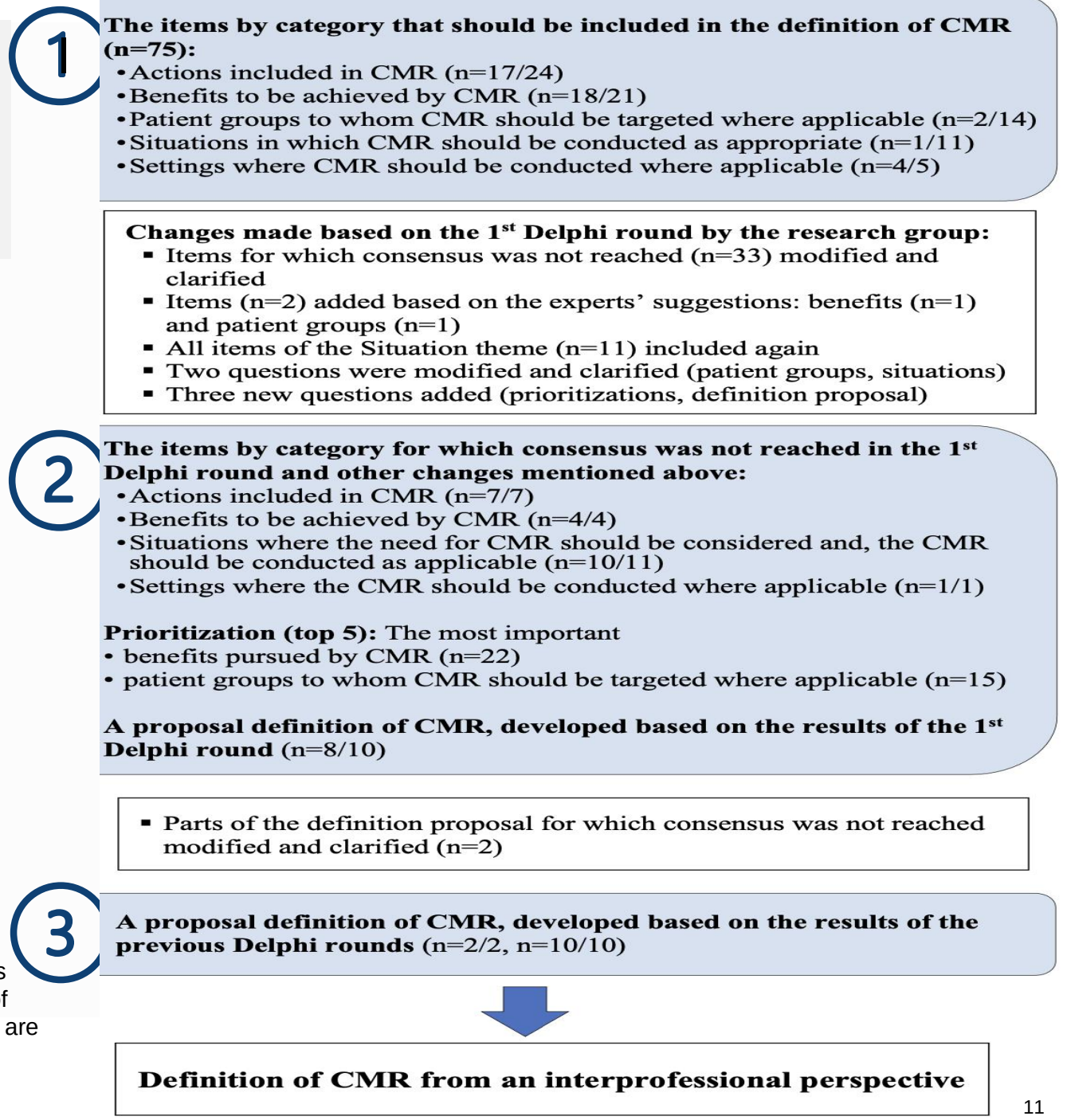

Fig. 3. A summary of the content of the Delphi rounds I–III. The number of items included in the themes and how many of them reached consensus in each round are shown in parentheses.

Results

The results consisted of the consensus and prioritization reached in three Delphi rounds concerning the definition of CMR.

The response rates for all respondents were 63–88% during the three Delphi rounds when the total number of experts invited to respond was 41.

Table 1. The number of experts, the number of respondents, and the response rates of the Delphi rounds (n=3). The changing number of respondents means that in the Delphi round, not all respondents answered all question items.

Expert panel	Round I	Round II	Round III
Experts participating in the study (n)			
All professional groups	41	41	41
Physicians	*12*	*12*	*12*
Pharmacists	*13*	*13*	*13*
Nurses	*10*	*10*	*10*
Information management professionals	*6*	*6*	*6*
Respondents by the Delphi round (n, %)			
All professional groups	**31–36 (76–88%)**	**26–29 (63–71%)**	**27–28 (66–68%)**
Physicians	*8–11 (67–92%)*	*7–8 (58–87%)*	*6 (50%)*
Pharmacist	*13 (100%)*	*12 (92%)*	*12 (92%)*
Nurses	*6 (60%)*	*5–6 (50–60%)*	*6 (60%)*
Information management professionals	*4–5 (67–83%)*	*2–4 (33–67%)*	*3–4 (50–67%)*

Results – Themes and items

- In the **first round,** consensus was reached on 42/75 items (56%), and in the **second round** on 22/23 items (96%) that should be included in the definition of the CMR.

- Considering only the items selected in the prioritizations, the consensus and prioritized data contained a total of **51 items**, which should be included in the definition of CMR:

1) What? = Actions that should be included in the CMR **(24 items accepted out of 24)**
2) When? = Situations where the need for CMR should be considered and, the CMR should be conducted as applicable **(10 items accepted out of 11)**
3) Where? = Settings where the CMR should be conducted where applicable **(5 items accepted out of 5)**
4) Who? = The most important patient groups to whom the CMR should be targeted where applicable. **(n=6*)**
5) Why? = The most important benefits to be achieved by the CMR. **(n=6*)**

*) Prioritization (top 5): A consensus was not sought for the question but prioritized the most important items of the theme. The same percentage for two items, both were included.

Results – The CMR definition

- The second Delphi round reached a consensus on 8/10 parts (80%) of the CMR definition proposal.
  - The two definition parts for which consensus was not reached were modified based on the experts' suggestions and added to the third Delphi round.
- The remaining definition parts (n=2) reached a consensus in the 3rd round, and experts did not give any additional comments on the definition parts that had already reached a consensus (n=8).
- **As a result of three Delphi rounds, the experts reached a strong consensus on the definition of CMR in its entirety (100%, n=10/10).**

Final consensus definition of collaborative medication review (CMR)
(Divided into ten parts)

1) The CMR based on the patient's up-to-date medication list.
2) In the CMR, the appropriateness, the implementation, effects, and necessity of the medication are assessed in a structured manner, considering the patient's individual needs and situation.
3) CMR consists of preventing, identifying, and solving clinically significant drug-related problems, identifying the need for support, and compiling a follow-up plan for medication changes and medication regimens. If necessary, this includes deprescribing. Appropriate follow-up is included in the CMR, especially for patients using long-term medication.
4) The coordination in the medication management is used to optimize the effectiveness of medication, reduce the drug-related risks and harms, and reduce unnecessary medication costs.
5) The CMR promotes the patient's participation in the medication by identifying and resolving aspects related to the implementation of medication, such as adherence and the success of self-treatment, to reach a consensus between the parties.
6) The overall goal is to promote the implementation of effective, safe, high-quality, economical, and equal pharmacotherapy.
7) CMR is applicable in all social and healthcare units with the necessary resources and competence.
8) The need for a CMR should be identified upon arrival at the hospital or other care settings, in connection with inter-hospital/care institution transfers, at the start of automated dose dispensing, and when identifying a drug-related problem, due to a poor response to long-term medication, or when a new symptom appears, if there is reason to suspect that the symptom is drug-related. At least the reconciled medication list should be ensured when discharged from care settings. In addition, the need for CMR should be periodically identified for patients using long-term medications and patients using automated dose dispensing.
9) CMR is especially to be considered for older adults of at least 75 years of age using long-term medication, patients with excessive polypharmacy, patients using automated dose dispensing, patients with renal/hepatic insufficiency, and patients with frequent visits to the emergency department.
10) The physician is responsible for the patient's overall medication and confirms the medication changes or the fact that no medication changes are needed. Pharmacists and nurses participate in the different stages of the review within the framework of their own professional competence.

Discussion

- The new definition of CMR is relatively long compared to the previous ones.
- A conscious decision was made to create a new definition of CMR, the content of which is described in a more structured and verbose manner.
  - The length of the new CMR definition can make it more challenging to apply in practice, as it is customary for medication review definitions to be brief.

➢ **The new definition:**

- **is more concrete**
- **has the advantage that it also takes a comprehensive stance on the content of the CMR**
- **opens the content and process of CMR better**
- **facilitating the development and implementation of CMR procedures and practices suitable for structured documentation in electronic patient records with unified terminology.**

Conclusions

- A strong interprofessional consensus was reached on the definition of collaborative medication review (CMR).
- The new definition and the unified terminology enable the development of digitized, closed-loop medication management processes that can be integrated into electronic patient records.

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