WILEY

ENABLING DISCOVERY | POWERING EDUCATION | SHAPING WORKFORCES

Periodontitis E-learning Modules for Nurses

Periodontitis Knowledge Hub

Are you able to educate your patients with gum disease? Assess your your knowledge of gingivitis and periodontitis to enhance the treatment and care of patients with diabetes, cardiovascular disease, cognitive decline, and pregnancy.

"Gum disease is a threat to health that can cause serious complications. This site is an effective way to learn how vital good dental health is to patient health" Professor Debra Jackson AO RN PhD FRCSI SFHEA FCNA
Editor-in-Chief, *Journal of Advanced Nursing*

Visit the knowledge hub to access e-learning modules:

Pregnancy & Periodontitis

Cognitive Decline & Periodontitis

Cardiovascular Diseases & Periodontitis

Diabetes & Periodontitis

Access now

This Knowledge Hub is supported by Oral B.

Received: 19 April 2022 | Revised: 14 July 2022 | Accepted: 20 August 2022

DOI: 10.1111/jan.15429

JAN Leading Global Nursing Research WILEY

ORIGINAL RESEARCH:
EMPIRICAL RESEARCH - QUALITATIVE

Development of a medication literacy assessment instrument (MELIA) for older people receiving home care

Rahel Gnägi[1] | Franziska Zúñiga[1] | Thekla Brunkert[1,2] | Carla Meyer-Massetti[3,4,5]

[1]Institute of Nursing Science, Department of Public Health, University of Basel, Basel, Switzerland

[2]University Department of Geriatric Medicine, FELIX PLATTER Hospital, Basel, Switzerland

[3]Clinical Pharmacy and Epidemiology, Department of Pharmaceutical Sciences, University of Basel, Basel, Switzerland

[4]Institute for Primary Health Care BIHAM, University of Bern, Bern, Switzerland

[5]Clinical Pharmacology and Toxicology, Department of General Internal Medicine, Inselspital - University Hospital of Bern, Bern, Switzerland

Correspondence
Carla Meyer-Massetti, Inselspital - Universitätsspital Bern, Universitätsklinik für Allgemeine Innere Medizin, Pharmakologie, CH-3010 Bern, Switzerland.
Email: carla.meyer-massetti@extern.insel.ch

Funding information
This research received no specific grant from any funding agency in the public, commercial or not-for-profit sectors.

Abstract

Aim: To develop a consensus-based instrument [MELIA] to assess the medication literacy of older home care patients to ultimately optimize medication safety.

Design: This study was part of the project 'Study of Medication Safety in Home Care' (doMESTIC), which took place from 2016 to 2020 in Switzerland. The development process for the medication literacy assessment instrument encompassed six steps.

Method: First, a scoping literature search was conducted in the Pubmed, CINAHL, EMBASE and Cochrane Library databases as 2) a basis for the development of assessment items. This was followed by 3) a cognitive interview with home care patients and 4) the first round of a Delphi process. Then, 5) a focus group interview with home care experts was conducted before 6) the second Delphi round. The project took place between August 2020 and June 2021. With these different steps, perspectives of both patients and various home care and medication safety experts were included in the development of the assessment instrument.

Results: A detailed instrument consisting of 20 items as well as a 7-item short version were developed. The short version is intended for efficient preliminary screening to identify patients at high risk for medication management-related problems.

Conclusion: Medication literacy in patients 65 years and older receiving professional home care is a key issue in preventing medication errors. A targeted assessment, starting with an efficient short version of MELIA, allows for prioritization of patients for interventions to optimize medication safety while ensuring their independence as much as possible.

Impact: Systematic assessment of patients' medication literacy helps to provide them with targeted and individual support in their medication management to avoid medication errors and increase patient safety. The development of MELIA is a first step in providing an assessment instrument specifically for the home care setting.

Patient or public contribution: Patient participation was an integral part of the instrument development. The initial 23 items were optimized based on cognitive interviews with four home care patients. The next steps of the instrument development were based on feedback of health care professionals—encompassing advance practice

nurses, regular nurses, pharmacists and general practitioners—during a two-step Delphi process as well as a focus group discussion.

KEYWORDS
assessment, assessment instrument, home care agency, medication literacy, nurses, nursing, older patients

1 | INTRODUCTION

Worldwide, the population is ageing and the number of chronically ill patients with comorbidities is increasing (Divo et al., 2014), making medication management more complex and medication safety more important. Polymedication most commonly defined as a medication therapy consisting of five or more prescribed, regularly applied medications, implies a more complex medication regimen and is increasing the risk for medication errors (Hammar et al., 2009).

The National Coordinating Council for Medication Error Reporting and Prevention defines a medication error as a preventable event that results in improper medication use or patient harm while medication management is under the control of the healthcare professional (NCCMERP, 2019). The reasons for medication errors from the patient's perspective can be several: failure to pick up prescribed medications, failure to take prescribed medications, taking medications not prescribed by the general practitioner (GP) ('self-medication') and lack of understanding of how to take and store medications (Schwartz et al., 1962). Medication errors can increase morbidity—for example in the form of dizziness, falls and confusion, connected to hospitalizations at a cost of $177.4 billion in the United States annually (Ernst & Grizzle, 2001)—and mortality by up to 13% (Fattinger et al., 2000).

One impactful strategy to prevent medication errors is the strengthening of health literacy and more precisely medication literacy (Partin, 2006). Validated instruments are needed to systematically assess medication literacy in home care patients for subsequent interventions.

2 | BACKGROUND

Health literacy "…entails people's knowledge, motivation and competences to access, understand, appraise and apply health information to make judgements and take decisions in everyday life concerning health care, disease prevention and health promotion to maintain or improve quality of life during the life course." While concepts of health literacy differ, medication management as a sub-concept plays a role in different models (Sorensen et al., 2012). By improving health literacy, and therewith medication literacy, patients are encouraged to participate in their healthcare to the best of their abilities, for example by actively contributing to their medication therapy (LeBlanc & Choi, 2015) to avoid medication errors and improve medication safety (Kickbusch et al., 2013; Neiva Pantuzza et al., 2022).

With the trend from inpatient to outpatient care in older adults, home care services are increasingly tasked with managing complex medication therapies. This is reflected in the review by Meyer-Massetti et al. identifying polymedication as one of the most prevalent risk factors in home care patients (Meyer-Massetti et al., 2018). At the same time, home care organizations in Switzerland have the obligation to maintain independency and foster self-management of their patients, making the concept of medication literacy very pertinent to this setting.

So far, there is no uniform definition of medication literacy. Pouliot et al. suggest that "Medication literacy is the degree to which individuals can obtain, comprehend, communicate, calculate and process patient-specific information about their medications to make informed medication and health decisions in order to safely and effectively use their medications, regardless of the mode by which the content is delivered (e.g. written, oral and visual)" (Pouliot et al., 2018). Medication literacy is thus the degree to which the patient has the specific information about his or her medication that is necessary to make informed decisions and execute the necessary actions (Hanna et al., 2015). Our study is based on this understanding of medication literacy.

Several studies have shown that patients are often unaware of the necessity for their medication or unsure how to take their medication (Bailey et al., 2019; Schnelli et al., 2021). Therefore, systematic identification of people with limited or no ability to take responsibility for their medication therapy is critical (Gehring, 2015). A structured and regular assessment of patients' medication literacy should be conducted to ensure that they are managing their medications appropriately (Bailey et al., 2019). This is especially relevant for the home care population, as patients usually suffer from several chronic diseases and 35% are cognitively impaired (Schnelli et al., 2021).

However, very few assessment instruments have been found in our scoping literature review that can be used to assess the medication literacy of patients receiving home care. Those instruments are either not applicable in a true patient–healthcare professional dialogue because they are completed by the professional only, are too extensive for application during a regular nurse visit (extensive demonstration of medication management) or target the need for medication review instead of adjustments to self-management.

3 | THE STUDY

3.1 | Aim

The aim of this study was to develop a consensus-based instrument to assess medication literacy of patients in the home care setting, aiming at a target population of patients who are 65 years of age and

older, who take at least five regular medications prescribed by their primary care physician, and who receive care through professional home care services.

3.2 | Design

This study was part of the project 'Study of Medication Safety in Home Care' (doMESTIC), which took place from 2016 to 2020 in Switzerland. In the scope of the project, medication safety in the home care setting was systematically assessed. doMESTIC aimed at developing, implementing and evaluating evidence-based, interprofessional interventions to improve medication safety. The development process for the instrument encompassed six steps: (1) a scoping literature review, (2) the literature-based item generation for the assessment instrument, (3) cognitive interviewing with end users and subsequent optimization, (4) a Delphi survey of experts, round 1, (5) a focus group interview with experts/home care nurses and (6) a Delphi survey of experts, round 2, including compilation of the final assessment tool(s). The process is displayed in figure 1.

3.3 | Participants, data collection, analysis and validity/reliability/rigour

3.3.1 | Literature review

Data collection and data analysis

A literature review was performed in the databases Medline (via Pub Med), CINAHL (via EBESCOhost), Cochrane Library and EMBASE (via Ovid), using the following research question: What kind of assessment instruments exist to assess medication literacy among older home care patients?

Studies were included if they comprised instruments or questionnaires assessing medication literacy specifically or health literacy more generally, but including items pertaining to medication management, of patients taking more than one medication regularly, and whose medication management is supported by a professional home care service. The authors excluded instruments used for paediatric patients, maternity care as well as acute care and hospitalized patients. The flowchart is displayed in Figure 2. The search strategy, including the detailed search strings is available in Appendix S1. In addition, citation chasing in included studies was performed.

Data validity/reliability/rigour

The research question was developed by the whole research team. The literature search strategy was verified with an information specialist from the medical library. Inclusion and exclusion criteria were agreed on by the research team and individual publications for inclusion verified by two of the authors until agreement was reached.

3.3.2 | Item generation for the assessment instrument

The process of compiling the instrument followed the principles outlined in steps 1 to 3 recommended by Boateng et al. (Boateng et al., 2018).

Data collection

We identified five relevant publications with four different scales in the literature search. Based on these findings, the research group developed a comprehensive instrument for assessing patients' medication literacy in-home care in an iterative process. The following criteria guided the development process:

(1) The items must be relevant for the assessment of medication literacy or medication management abilities (Gusdal et al., 2011; Ownby, 2006); (2) the items must be easy to understand (Gentizon et al., 2021; King et al., 2011); (3) they must focus on the patient; (4) the administration of the assembled assessment instrument should not take longer than 30 minutes and (5) a registered nurse (RN) should be able to complete the assessment instrument during a routine visit.

Furthermore, based on the overall findings of the literature review, the following themes were added to the assessment instrument: the patient's knowledge about his/her disease and its therapy (to understand a medication's indication, therapy goals and potential outcomes, Neiva Pantuzza et al., 2022), the knowledge about his/her medication, the understanding of the effects of the medication on the health outcome, the ability/skill to take the medication and her/his knowledge of how to store and prepare the medication (Diedrich et al., 2021; Fitch et al., 2001; Gentizon et al., 2021; King et al., 2011; Pouliot et al., 2018).

Data validity/reliability/rigour

Application of criteria was verified by all authors until consensus to include or exclude an item was reached.

3.3.3 | Cognitive interviewing

A preliminary set of 23 items was included for cognitive interviewing.

Participants

Participants were directly approached and recruited by an advanced practice nurse (APN) from the home care agency; refusals were not reported. Patients received information about the relevance of medication safety, the study methodology, its purpose and the researchers in a written information letter beforehand.

A heterogeneous sample of four home care patients who were 65 years or older and regularly took at least five or more medications prescribed by their physician (and whose medication management was supported by the home care agency) were included. Participants provided written informed consent for the cognitive interview and its audio recording.

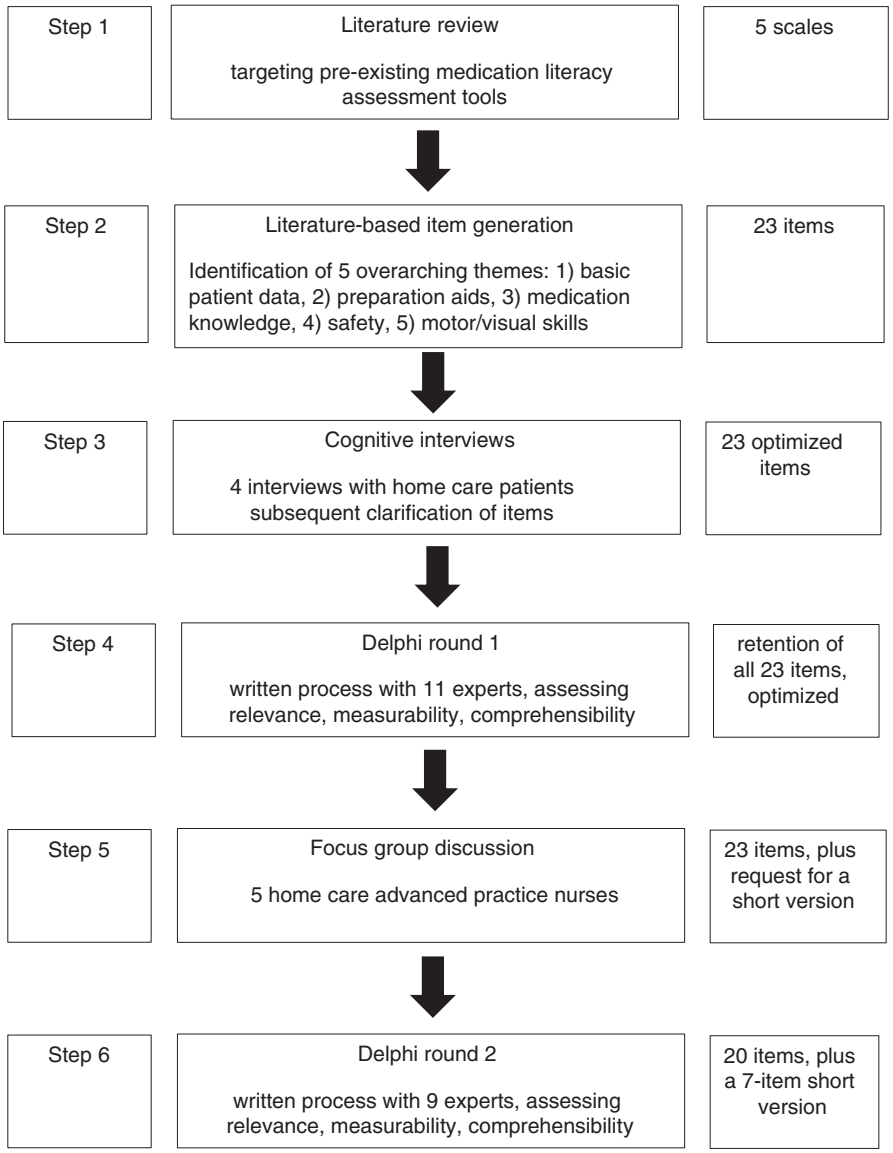

FIGURE 1 Six-step process for the development of MELIA—MEdication LIteracy Assessment instrument for older people receiving home care.

Data collection

The cognitive interviews were conducted by the primary author to include the patient's point of view in the development process of the instrument and to improve understanding of how respondents perform the task of answering items in this assessment instrument.

The cognitive interviews were conducted in November 2020 at the patients' homes; the stringent rules of the home care organizations for pandemic protection measures were diligently applied. The exchanges followed a specifically developed interview guide, discussing every item individually. Interviews lasted on average 30 minutes, addressing the following aspects for each item they answered:

a. How did you get to the answer?
b. How sure are you of your answer?
c. What, to you, is "…."? (e.g. the right time to take the medication?)
d. Was this question hard or easy to answer? Why was it hard (or easy) to answer the question?
e. Are you missing something among the answer options?

At the end of the interview, patients were asked if they had any general, additional comments about the assessment instrument.

Data validity/reliability/rigour

The interview guide for cognitive interviewing was tested, the interviewer trained the technique and she received feedback for the first interview based on the audio recording before continuing interviewing. All data were securely stored on a university server.

3.3.4 | Delphi process

The Delphi survey was used as a method for structured expert feedback on the proposed medication literacy assessment instrument. Based on the results of the cognitive interviews, the 23-item set was adapted and prepared for assessment by an expert panel.

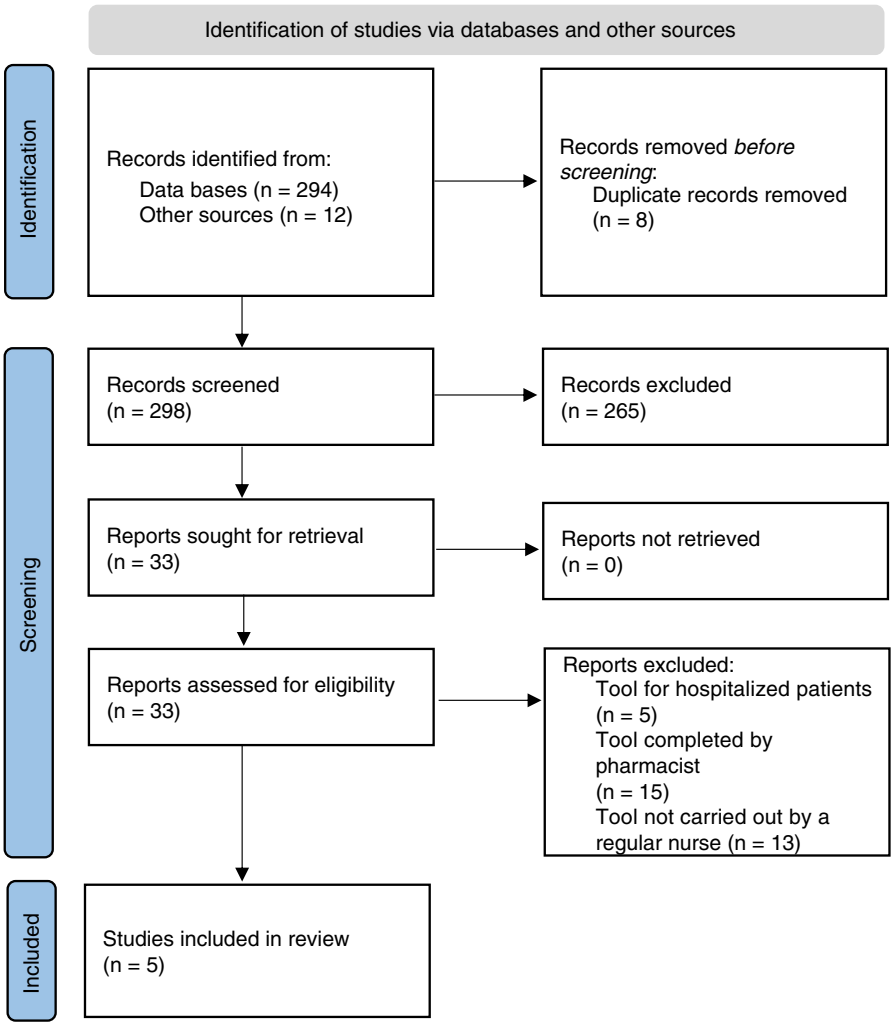

FIGURE 2 Literature review. Based on PRISMA 2020 flow diagram*.
*From: Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. BMJ 2021;372:n71. doi: 10.1136/bmj.n71; http://www.prisma-statement.org/.

Participants

The participants were included based on their expertise in the field of medication literacy or alternatively in the field of patient safety, preferably in home care. Additionally, they had to be qualified health professionals and able to write and speak German fluently. For both Delphi rounds, four advance practice nurses from different home care agencies, one RN, four GPs and two experts from patient safety and quality management were selected, adding up to 11 experts in total.

Data collection

After confirming their willingness to participate, the questionnaire and instructions were sent out by email. We asked about the relevance and measurability of each item. Answering options ranged on a scale from 1 – not at all relevant or not at all feasible to 9 – highly relevant or highly feasible complemented by the option to provide free text answers. Additionally, we evaluated the feasibility and user-friendliness for the overall instrument based on the COSMIN criteria (www.cosmin.nl). Free-text comments were possible on the comprehensibility of each item.

Data collection for the first Delphi round took place in November 2020 via email.

Data analysis

Data were analysed using the RAND/UCLA Appropriateness Method (RAM) (Fitch et al., 2001). This method uses the median to determine which items are considered appropriate, uncertain or inappropriate together with the disagreement index, showing the dispersion of ratings among experts about the individual items. The Interpercentile Range Adjusted for Symmetry (IPRAS; also called the disagreement index), which is part of the RAM method, was calculated as follows: IPRAS = IPRr + (AI * CFA). Whereby IPRr stands for Interpercentile Range required for disagreement when perfect symmetry exists, and the AI for Asymmetry Index (IPRCP-5). The IPRCP is calculated from the calculated value of the quantile 30% + the quantile 70% / 2 and the Correction Factor for Asymmetry (CFA) was defined as the numerical value of 1.5 (Fitch et al., 2001). Both the relevance and the measurability of the individual items were rated with median and disagreement index:

- Items with a median of 7–9 and no disagreement were incorporated into the assessment instrument without change.
- Items with a median of 4–6 or with disagreement were revised by the research group and, after a focus group discussion, sent to the experts for a second rating in the second Delphi round.

- Items with a median 1–3, with or without disagreement were defined as inappropriate and excluded.
- Medians median ratings that fell exactly between the 3-point boundaries, that is, medians of 3.5 and 6.5, were assigned to the higher ranking category.

Data validity/reliability/rigour

The questionnaires for the Delphi process underwent a test run before being fielded. Data entries for the Delphi survey were checked by a second research group member. Data extraction and calculation was done by one author and verified by another author.

All data were securely stored on a university server.

3.3.5 | Focus group discussion

Participants

In the next step, a focus group discussion with five consenting participants (all with an extended leadership role in nursing like APN in the home care agency) of the home care agency 'Spitex Stadt Luzern' was conducted to review the items that the research group had already adapted based on the feedback from the first Delphi round.

Data collection

The focus group interview took place in February 2021 via videoconference and lasted 60 min. Participants were encouraged to discuss the feasibility of the overall assessment instruments, its applicability and length. In addition, opportunity for general comments was provided.

Data analysis

The focus group interview was recorded, notes were taken, and aggregated in a protocol afterwards. Findings were used for subsequent optimization before the second Delphi round.

Data validity

Focus group recordings and corresponding notes were checked by a second person to assure agreement on the findings.

Findings from the focus group interview were discussed among the authors until consensus was reached pertaining to the content and prioritization of necessary adaptations to the instrument.

3.3.6 | Second Delphi round

Following the focus group interview, the second Delphi round was conducted in mid-March 2021.

Participants

The same experts participated as in the first Delphi round.

Data collection

The same method from the first round was used, albeit limited to the assessment of relevance and a narrower scoring system ranging from 1 – not at all relevant to 5 – highly relevant.

Since in the first Delphi round and the focus group interview the necessity of a short version of the assessment instrument was expressed, experts were additionally asked to mark the five questions that they consider 'red flags', that is, items deemed important to initiate further clarifications. An item was defined as a 'red flag' item if at least 50% of the experts identified it as an aspect requiring immediate intervention by a healthcare provider.

Data analysis and validity/reliability/rigour

The same methods were applied as described in the first Delphi round.

In addition to a final optimized extended version, a short version of the medication literacy assessment instrument was compiled.

3.4 | Ethical considerations

A request for clarification of jurisdiction Req-2020-00489 was submitted to the responsible ethics committee, resulting in a statement that this study does not fall under the Human Research Law Art.2 and therefore does not require an ethics committee approval.

4 | FINDINGS

4.1 | Results from the literature review

Through the scoping literature review, we identified five relevant publications: three quantitative studies (DeBrew et al., 1998; Lagerin et al., 2014; Pammett et al., 2015) and two qualitative studies (Dimitrow et al., 2014; Gusdal et al., 2011) that evaluated four different instruments to assess medication literacy of home care patients. The PRISMA flowchart is displayed in figure 2, the summaries of the included publications in Appendix S2. An overview of the characteristics of the four instruments is displayed in Table 1.

Two of the instruments were not designed for a provider–patient dialogue in the first place: Pammett et al. constructed a self-assessment-tool (Pammett et al., 2015), while Dimitrow et al. focused on risks for drug-related problems from a provider's point of view (Dimitrow et al., 2014). DeBrew used a time-consuming approach, addressing the handling of every drug individually (DeBrew et al., 1998). Gusdal et al. (2011) as well as Lagerin et al. (Lagerin et al., 2014) used the same tool: the Safe Medication Assessment SMA. The SMA came closest to what we were looking for with a combination of medication literacy- and lifestyle-related questions, but lacked certain steps of the medication use process like medication procurement and self-medication.

The instruments found only partially fulfilled the criteria defined by the research group: Therefore, the research group decided to develop an instrument adapted to the Swiss setting based on the literature and expert consensus.

The items in these publications used to assess medication literacy were categorized, tabulated and prioritized according to our item generation methodology described above. The items included

TABLE 1 Characteristics of the four scales identified through the literature review

			Tool			
Origin	**Title**	**Setting**	**Aim Application**	**Items**	**Validity**	**Unique feature**
2015 Canada (Diedrich et al., 2021)	Evaluation of a community pharmacy-based screening questionnaire to identify patients at risk for drug therapy problems	Community pharmacy 49 patients	Medication Risk Assessment Questionnaire (MRAQ) To determine if a short screening questionnaire can identify patients at risk for drug therapy problems (DTPs) in a community pharmacy setting Self-administration by patient	Five questions aimed at number and doses of drugs, number of comorbidities and identification of high-risk drugs	Interrater reliability between patient and healthcare professional Accordance of score level and number/severity of DRPs identified	Self-administration
2014 Finland (DeBrew et al., 1998)	Content validation of a tool for assessing risks for drug-related problems to be used by practical nurses caring for home-dwelling clients aged ≥65 years: a Delphi survey	Long-term home care service Home dwelling clients ≥65 years	(no name) Assessment of risks for drug related problems (DRPs) By practical nurses, answering yes/no questions	18 items 4 sections: 1. Basic client data 2. Potential risks for DRPs in medication use 3. characteristics of the client's care and adherence 4. recommendations for actions to resolve DRPs.	Based on a literature review Content validity in a 3-round Delphi process No field validation	In addition to identifying pharmacotherapeutic risks, the tool assists in finding solutions to these problems. Not devised as a tool for direct communication with the patient
2014 Sweden (Fitch et al., 2001)	District nurses' preventive home visit to 75-year-olds: opportunity to identify factors related to unsafe medication management	Health centres 113 older people receiving routine preventive home visits 75 years	Safe Medication Assessment SMA Investigation of factors related to unsafe medication management among 75-year-olds during preventive home visits By district nurses	Patient's self-reported drug consumption, and 16 observation items 3 sections: 1. medication profile 2. 16 observation items (with 3 sections: 4 screening questions, observations, lifestyle)	See DeBrew et al. (1998)	Use of the SMA tool in preventive home visits seems to be advantageous in improving the safety of medication management among older persons.
2011 Sweden (Schnelli et al., 2021)	District nurses' use for an assessment tool in their daily work with elderly patients' medication management	Primary healthcare centres, providing home care service 160 home care and prospective home care patients ≥75 years	Safe Medication Assessment SMA Identification of factors highly related to unsafe medication management among elderly patients By district nurses		District nurses perception of SMA's usefulness, factoring in simplicity, relevance, completeness, intelligibility, and time for implementation	Most patient assessments provided district nurses with new information otherwise regarded as inaccessible, Lifestyle-related questions
1998 USA (Gentizon et al., 2021)	Assessing medication knowledge and practices of older adults	Home health service 20 patients Patients ≥65 years	To develop and test an assessment instrument for use by home health nurses in evaluating the medication knowledge and practices of older adults	Three sections 1. Demographic information 2. Medication practices and lifestyle 3. Medication knowledge	Based on a literature review 5th grade reading level Content validity by a panel of experts Interrater reliability by role-play Test–retest reliability Usability (length it took to complete)	The use of an unstructured interview worked well, enabling nurses to paraphrase questions. Questioning about each medication revealed valuable information.

in the first version of the assessment instrument and used in the cognitive interviews are displayed in Appendix S3.

4.2 | Findings from cognitive interviewing

Four interviews were conducted with patients of the home care agency 'Spitex Stadt Luzern'. The interviewees indicated several terms used in the assessment instrument were not clear: medication list, medication dispenser, side effects, as-needed medication and medication regime. These terms were adapted in the assessment instrument for the next development, the Delphi process and reviewed again during the second Delphi round.

4.3 | Results from the first Delphi round

All 11 experts returned the evaluation on time via e-mail (response rate 100%). The detailed analysis based on the RAM method (SJB et al., 2001) is displayed in Appendix S4.

For relevance, all questions achieved a median between 7 and 9 and were left in the instrument. None of the items showed disagreement between experts, reinforcing the value of the questions for the instrument.

About measurability, all items were rated with a median of 6.5 to 9, which is slightly lower compared with their scoring for relevance. Nevertheless, all items were retained. The lowest scoring item with a median of 6.5 ('Do you take your medications as prescribed by your physician?') was also retained based on the rules defined.

While all items fulfilled the scoring criteria to be kept in the instrument, the detailed evaluation of the expert comments about comprehensibility in addition to the scoring itself revealed that there was a need for clarification about the wording of several items. The research group decided based on discussions to adjust these questions based on the feedback, although the goal of relevance was achieved. An additional reason for this decision was the expected time required to fill in the survey exceeding the targeted 30 min. Consequently, various items were combined and repositioned. This reduced the number of items in the revised instrument from 23 to 21. In addition, the compilation of a short version of the assessment instrument was considered for the second Delphi round.

Overall, the comments revealed that the experts considered the instrument useful, relevant, structured and simple for the assessment of the medication literacy of individual patients, having the potential to ultimately improve patient safety. However, they also encouraged the development of a manual accompanying the survey, including suitable interventional steps according to the assessment results.

4.4 | Results from the focus group discussion

In the focus group discussion, the instrument was considered useful, very comprehensive and containing all important aspects. Especially the items about the motor and visual abilities of the patients were considered important. However, concerns came up about time requirement in this group as well: pertaining to the implementation and application per se as well as the initiation of corresponding measures. Accordingly, an abbreviated version was considered beneficial. This might also remediate the request for more precise inclusion criteria for patients being submitted to the extended assessment.

4.5 | Results from the second Delphi round

In the second Delphi round, 9 of 11 experts responded, corresponding to a response rate of 82%. Some experts only partially filled out the form and did not answer when reminded, which resulted in missing data. The data pertaining to the analysis of relevance are displayed in Appendix S5.

Three items, including sub-items, were removed based on their score below 3.5, the threshold for inclusion pertaining to relevance.

In the open comments section, the experts still deemed the items assessing motor and visual skills important. Items addressing non-traditional medication literacy aspects like self-medication were also appreciated for their ability to provide information about the interest of patients in their health. Weaknesses identified by the experts encompassed lacking guidance for subsequent interventions, unspecific assessment of cognition and exclusion of informal caregivers in the assessment.

This process resulted in a final extended version, encompassing 20 items as displayed in Appendix S6.

The items included in the short version of the instrument are displayed in Table 2. Short instrument questions 6 and 7 were considered necessitating immediate notification of the GP, underlining their importance as part of the abbreviated version of the instrument.

We call the instrument MELIA for 'MEdication LIteracy Assessment instrument for older people receiving home care':

5 | DISCUSSION

Based on a 6-step approach, we developed the medication safety assessment instrument MELIA for use in older, polymedicated patients in the home care setting.

To our knowledge, this is the first instrument that consists of a combination of a short version for screening medication literacy, based on the practitioners' need for efficiency and incorporating red flags, and a subsequent extended version for an in-depth analysis specific to older patients in the home care setting.

In the classical sense of its definition, medication literacy focuses on a patient's ability to process medication-related information (Pouliot et al., 2018). In MELIA, we go a step further: Items not yet considered in other instruments were also endorsed by our experts, addressing the assessment of visual and motor skills. Since motor and visual abilities also decline with increasing age and therefore can have an influence on the patient's adherence to therapy, those aspects should be included in assessing medication literacy.

TABLE 2 Short Version of the MELIA Assessment Instrument for Medication Competency Evaluation of Home Care Patients, consisting of seven items

Demographic data (to be entered by Home Care Nurse/ Case Manager)	Date of Assessment:
1. Patient name:	
2. Patient age:	
Questions for patients on their taking and understanding of their medications	
3. a. Please explain clearly the correct way to take your medications. (Home care nurses consult the current medication plan.)	
b. (In case of deviations) What has led you to manage your intake differently with medication XX?	
4. Do you know which side effects/adverse effects you should report to your family doctor?	
5. Do you take any additional self-purchased medications or pharmaceutical/drugstore products in addition to those prescribed by your family doctor?	
Questions to ask the patient about using aids and obtaining medications	
6. Which device(s) do you use to help you prepare and/or take your medications?	
a. medication plan	
Questions about the patient's motor and visual capacities (demonstrations required)	
7. Can you take this medication from its package/dispenser?	

Note: Additional explanations on the use of MELIA, including the meaning of the colour coding, are displayed in Appendix S6.

MELIA is unique in other regards as well: The development process enabled not only the inclusion of the perspective of different healthcare professions, but also of patients. Compared with other instruments (DeBrew et al., 1998; Dimitrow et al., 2014; Gusdal et al., 2011; Lagerin et al., 2014; Pammett et al., 2015), the final product is not intended for self-assessment by a patient, but for an interactive assessment in collaboration with the patient, led by a RN. Special care was taken to ensure MELIA's applicability during a routine home visit, keeping the time needed for application in mind as well as the setting. The subsequent interventions to address gaps in medication literacy and described in the extended version of MELIA, derived from the instrument results, promote interprofessional involvement: MELIA fosters interprofessional solving of medication-related problems by suggesting the involvement of different healthcare providers, depending on the problems identified. In addition to the well-known role of the family physician, pharmacists can be integrated for medication review, therapy simplification and educational purposes. After a profession-specific intervention, interprofessional exchange is encouraged again.

Given that MELIA was developed specifically to be used by RNs in the home care setting with older persons, any application in another age group or setting would need further adaptations and testing.

5.1 | Limitations

Interview participants were suggested by the home care nurses responsible for their care. This might have influenced the level of medication literacy represented as well as the potential data saturation. Medical background was not a selection or exclusion criteria for participating patients. Due to the limited number of participants, no age-based sub-group analysis was performed.Due to the COVID-19 pandemic, a pilot test could not be conducted as planned. Therefore, this assessment instrument has not yet been tested in practice and its applicability needs validation, for example in the scope of a future study. The original assessment instrument was created in German and the English translation took place in the research group. A validated English version of the assessment instrument should be developed.

6 | CONCLUSION

Assessing medication literacy in patients 65 years and older who are cared for by a home care agency is essential in preventing medication errors through optimization of role allocation in the medication use process, involving patients, informal caregivers and nurses to the best of their abilities. MELIA consists of a short screening tool for an efficient assessment of a home care patient's medication literacy with the option for an in-depth assessment with the extended version, putting the dialogue with the patient at the centre. Compared with existing instruments, we also integrated the assessment of a patient's motor and visual skills, extending the concept of medication literacy. In the next step, the instrument will need to be validated in practice.

6.1 | Relevance for clinical practice

The systematic use of a structured medication literacy assessment instrument specifically designed for patients 65 years and older has the potential to improve their medication management. They could receive more targeted and individualized support based on the assessment results, which could reduce medication errors and improve patient safety.

AUTHOR CONTRIBUTIONS

All authors have agreed on the final version and meet at least one of the following criteria: (1) substantial contributions to conception and design, acquisition of data or analysis and interpretation of data; (2) drafting the article or revising it critically for important intellectual content.

ACKNOWLEDGEMENTS

The authors thank the students of the master's seminar and the lecturers at the University of Basel for their collegial feedback and the patients and experts who participated in the study. Open access funding provided by Inselspital Universitatsspital Bern.

CONFLICT OF INTEREST

No conflict of interest has been declared by the authors.

PEER REVIEW

The peer review history for this article is available at https://publons.com/publon/10.1111/jan.15429.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

ORCID

Franziska Zúñiga https://orcid.org/0000-0002-8844-4903
Carla Meyer-Massetti https://orcid.org/0000-0002-3523-5729

REFERENCES

Bailey, S. C., Opsasnick, L. A., Curtis, L. M., Federman, A. D., Benavente, J. Y., O'Conor, R., & Wolf, M. S. (2019). Longitudinal investigation of older adults' ability to self-manage complex drug regimens. *Journal of the American Geriatrics Society*, *68*(3), 569–575.

Boateng, G. O., Neilands, T. B., Frongillo, E. A., Melgar-Quinonez, H. R., & Young, S. L. (2018). Best practices for developing and validating scales for health, social, and behavioral research: A primer. *Frontiers in Public Health*, *6*, 149.

DeBrew, J. K., Barba, B. E., & Tesh, A. S. (1998). Assessing medication knowledge and practices of older adults. *Home Healthcare Nurse*, *16*(10), 686–691 quiz 91–2.

Diedrich, D., Zuniga, F., & Meyer-Massetti, C. (2021). Medikationsmanagement in der häuslichen Pflege – der Medikationsprozess aus der Perspektive von Klient:innen und ihren Angehörigen [Medication management in home care-The medication use process from the perspective of clients and their caregivers]. *Zeitschrift für Gerontologie und Geriatrie*. Advance online publication. https://doi.org/10.1007/s00391-021-01985-6

Dimitrow, M. S., Mykkanen, S. I., Leikola, S. N., Kivela, S. L., Lyles, A., & Airaksinen, M. S. (2014). Content validation of a tool for assessing risks for drug-related problems to be used by practical nurses caring for home-dwelling clients aged >/=65 years: A Delphi survey. *European Journal of Clinical Pharmacology*, *70*(8), 991–1002.

Divo, M. J., Martinez, C. H., & Mannino, D. M. (2014). Ageing and the epidemiology of multimorbidity. *European Respiratory Journal*, *44*(4), 1055–1068.

Ernst, F. R., & Grizzle, A. J. (2001). Drug-related morbidity and mortality: updating the cost-of-illness model. *Journal of the American Pharmacists Association*, *41*(2), 192–199.

Fattinger, K., Roos, M., Vergeres, P., Holenstein, C., Kind, B., Masche, U., Stocker, D. N., Braunschweig, S., Kullak-Ublick, G. A., Galeazzi, R. L., Follath, F., Gasser, T., & Meier, P. J. (2000). Epidemiology of drug exposure and adverse drug reactions in two swiss departments of internal medicine. *British Journal of Clinical Pharmacolog*, *49*(2), 158–167.

Fitch, K. B. S., Aguilar, M. D., Burnand, B., LaCalle, J. R., Lazaro, P., van het Loo, M., McDonnell, J., Vader, J. P., & Kahan, J. P. (2001). *The RAND/ULCA Appropriateness Method User's Manual*. RAND. www.rand.org

Gehring, K. (2015). *Speak up - Wenn Schweigen gefährlich ist Zürich*. Swiss Patient Safety Foundation. www.patientensicherheit.ch

Gentizon, J., Hirt, J., Jaques, C., Lang, P. O., & Mabire, C. (2021). Instruments assessing medication literacy in adult recipients of care: A systematic review of measurement properties. *International Journal of Nursing Studies*, *113*, 103785.

Gusdal, A. K., Beckman, C., Wahlstrom, R., & Tornkvist, L. (2011). District nurses' use for an assessment tool in their daily work with elderly patients' medication management. *Scandinavian Journal of Public Health*, *39*(4), 354–360.

Hammar, T., Perala, M. L., & Rissanen, P. (2009). Clients' and workers' perceptions on clients' functional ability and need for help: home care in municipalities. *Scandinavian Journal of Caring Sciences*, *23*(1), 21–32.

Hanna, M. L. I., Wilson, S., & O'Leary, K. (2015). Patient and general practitioner perspectives of the Hospital Outreach Medication Review service at Monash Health. *Journal of Pharmacy Practice and Research*, *45*(3), 282–290.

Kickbusch, I. P. J., Apfel, F., Tsouros, A. D. (2013). *Health literacy. The solid facts*. The World Health Organisation Europe.

King, S. R., McCaffrey, D. J., & Bouldin, A. S. (2011). Health literacy in the pharmacy setting: defining pharmacotherapy literacy. *Pharmacy Practice (Granada)*, *9*(4), 213–220.

Lagerin, A., Carlsson, A. C., Nilsson, G., Westman, J., & Tornkvist, L. (2014). District nurses' preventive home visits to 75-year-olds: An opportunity to identify factors related to unsafe medication management. *Scandinavian Journal of Public Health*, *42*(8), 786–794.

LeBlanc, R. G., & Choi, J. (2015). Optimizing medication safety in the home. *Home Healthcare Now*, *33*(6), 313–319.

Meyer-Massetti, C., Meier, C. R., & Guglielmo, B. J. (2018). The scope of drug-related problems in the home care setting. *International Journal of Clinical Pharmacy*, *40*(2), 325–334.

National Coordinating Counsel for Medication Error Reporting and Prevention (NCCMERP). (2019). Consumer Information for Safe Medication Use. https://www.nccmerp.org/consumer-information.

Neiva Pantuzza, L. L., Nascimento, E. D., Crepalde-Ribeiro, K., Botelho, S. F., Parreiras Martins, M. A., Camila de Souza Groia Veloso, R., Gonzaga do Nascimento, M. M., Vieira, L. B., & Moreira Reis, A. M. (2022). Medication literacy: A conceptual model. *Research in Social and Administrative Pharmacy*, *18*(4), 2675–2682.

Ownby, R. L. (2006). Medication adherence and cognition. Medical, personal and economic factors influence level of adherence in older adults. *Geriatrics*, *61*(2), 30–35.

Pammett, R. T., Blackburn, D., Taylor, J., Mansell, K., Kwan, D., Papoushek, C., & Jorgenson, D. (2015). Evaluation of a community pharmacy-based screening questionnaire to identify patients at risk for drug therapy problems. *Pharmacotherapy*, *35*(9), 881–886.

Partin, B. (2006). Preventing medication errors: An IOM report. *Nurse Practitioner*, *31*(12), 8.

Pouliot, A., Vaillancourt, R., Stacey, D., & Suter, P. (2018). Defining and identifying concepts of medication literacy: An international perspective. *Research in Social and Administrative Pharmacy*, *14*(9), 797–804.

Schnelli, A., Ott, S., Mayer, H., & Zeller, A. (2021). Factors associated with aggressive behaviour in persons with cognitive impairments using

home care services: A retrospective cross-sectional study. *Nursing Open*, *8*(3), 1345–1359.

Schwartz, D., Wang, M., Zeitz, L., & Goss, M. E. (1962). Medication errors made by elderly, chronically ill patients. *American Journal of Public Health and the Nation's Health*, *52*, 2018–2029.

SJB, K. F., Mguilar, M. D., Burnand, B., JR, L. C., Lazaro, P., von het Loo, M., McDonnell, J., Vader, J. P., & Kahan, J. P. (2001). *The RAND/ULCA appropriateness method* users manual. RAND.

Sorensen, K., Van den Broucke, S., Fullam, J., Doyle, G., Pelikan, J., Slonska, Z., Brand, H., & (HLS-EU) Consortium Health Literacy Project European. (2012). Health literacy and public health: a systematic review and integration of definitions and models. *BMC Public Health*, *12*, 80.

SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

How to cite this article: Gnägi, R., Zúñiga, F., Brunkert, T., & Meyer-Massetti, C. (2022). Development of a medication literacy assessment instrument (MELIA) for older people receiving home care. *Journal of Advanced Nursing*, *00*, 1–11. https://doi.org/10.1111/jan.15429