Co-designing municipal multimorbidity rehabilitation leveraging health literacy and social networks: Protocol for the CURIA study

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Tina Junge¹, Gitte Thybo Pihl¹, Carsten Kronborg Bak² and Søren Thorgaard Skou^{3,4}

Abstract

Background: Managing multimorbidity poses significant challenges for individuals, their families, and society due to issues with health information comprehension, communication with healthcare providers, and navigating the healthcare system. These challenges emphasise the critical need to prioritize individual and organisational health literacy. Multimorbidity is associated with a lack of social support for health; however, social networks and community dynamics can enhance health literacy. The "Co-designing municipal rehabilitation" (CURIA) project targets enhancing individual and organisational health literacy, and social networks for individuals with multimorbidity, with the overall aim of addressing health inequity through a collaborative local co-design process involving stakeholders.

Methods: The CURIA study employs a mixed-method approach that initially explores the health literacy experiences of individuals with multimorbidity participating in rehabilitation programs in selected Danish municipalities and the practices of professionals overseeing these programs. The subsequent co-design process will comprise individuals with multi-morbidity, their relatives, municipalities, general practitioners, civil society, and knowledge institutions working together. This iterative and collaborative process involves tailoring and aligning health literacy needs with responsiveness within the context of local healthcare systems and developing supportive social networks.

Discussion: Given the increasing burden of multimorbidity, there is an urgent need to develop evidence-based practice for multimorbidity rehabilitation practices, developed in collaboration with municipalities and civil society. Emphasising self-care support for individuals, managing complex rehabilitation needs, and involving individuals in intervention prioritisation and customisation are crucial aspects addressed by CURIA to enhance health literacy and align municipal rehabilitation with identified needs.

Keywords

Multimorbidity, health literacy, social networks, co-design, municipal rehabilitation, health inequity, evidence-based practice, civil society

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¹Health Sciences Research Centre, UCL University College, Odense, Denmark

²Department of Social Work, University College of Southern Denmark, Esbjerg, Denmark

³Center for Muscle and Joint Health, Department of Sports Science and Clinical Biomechanics, University of Southern Denmark, Odense, Denmark ⁴The Research and Implementation Unit PROgrez, Department of Physiotherapy and Occupational Therapy, Næstved-Slagelse-Ringsted Hospitals, Slagelse, Denmark

Corresponding author:

Tina Junge, Health Sciences Research Centre, UCL University College, Niels Bohrs Allé I, Odense 5230, Denmark. Email: tiju@ucl.dk



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SAGE and Open Access pages (https://us.sagepub.com/en-us/nam/open-access-at-sage).

Background

Approximately 40% of European adults in community settings are living with multimorbidity, defined as two or more diseases coexisting in the same individual, and the prevalence is increasing.^{1,2,3} Common diseases in individuals with multimorbidity include diabetes, heart disease, musculoskeletal conditions, chronic obstructive pulmonary disease (COPD), and depression.² The complexity of multimorbidity arises from the intricate interplay of multiple chronic diseases, the impact on daily life, polypharmacy, the diversity of treatment plans, and the coordination of care within healthcare systems. Managing multimorbidity poses challenges, as current healthcare often falls short, being ineffective, incomplete, inefficient, and costly.⁴ The Danish healthcare system is characterised by a disease-specific and disconnected structure, often referred to as siloes, which can impede effective communication and coordination of care and rehabilitation for individuals with multimorbidity. This can include disconnectedness between hospitals and municipalities, as well as within organisations and sectors, leading to challenges in managing the complex needs of individuals with multimorbidity. Navigating a healthcare system that is structured around a single-disease framework proves challenging for individuals with multimorbidity, their families, and healthcare professionals.² Usually, this framework does not match the multifaceted needs of individuals with multimorbidity, which often requires a person-centred approach. thereby challenging optimal healthcare.^{3,5}

The Danish healthcare system operates on a two-tiered model, encompassing primary and secondary care. Within this structure, municipal rehabilitation forms a core component of primary and community care. This sector includes specialised services such as physiotherapy, occupational therapy, and tailored rehabilitation programs designed for individuals with disease-specific conditions such as diabetes type 2, cancer, COPD and heart diseases. In this context, rehabilitation specifically refers to these targeted programs managed by e.g. professionals such as therapists and nurses. To date, there are no widespread, dedicated programs for multimorbidity.

Noteworthy diversity exists in how health services and rehabilitation programs are organised at the municipal level for individuals with multimorbidity. This diversity poses challenges by making it difficult to have a comprehensive view of available interventions, potentially causing obstacles in referrals and leading to conflicting interventions across different sectors.⁶ Additionally, there is a knowledge gap regarding evidence-based municipal rehabilitation for people living with multimorbidity^{6,7} and the transition to post-rehabilitation options, like social networks, which are crucial for effectively managing multimorbidity.

Individuals of working age with multimorbidity may engage in concurrent interventions and receive services

from various municipal administrations with different regulatory rationales, in addition to interventions from hospitals, specialist doctors, and outpatient clinics. In a Danish municipal context, examples of various municipal administrations that individuals with multimorbidity may engage with include the health department, job centre, and social services department. However, challenges may arise from different municipal administrations failing to communicate effectively with each other, resulting in fragmented services and poor coordination in the rehabilitation of individuals with multimorbidity. Only 30% of workingage Danes with multimorbidity are either employed or in education.⁸ Addressing the low rate of participation of individuals with multimorbidity in the labour market requires a collaborative effort, both organisationally and in terms of the competencies of the various professionals involved in their care.9

Individuals with multimorbidity request coherent and coordinated interventions from the healthcare system, emphasising a focus on everyday life, and active involvement in their care.¹⁰ However, the complexity of the healthcare system presents challenges to an individual's health literacy - the ability to obtain, understand, and apply health information.¹¹ Individuals with multimorbidity and lower health literacy skills encounter difficulties comprehending medication instructions, understanding treatment plans, and effectively communicating with healthcare providers.¹²

Recent reviews reveal a notable gap in understanding the relationship between health literacy and the social context.¹³ Multimorbidity is associated with a lack of social support for health, irrespective of age, gender, cohabitation, ethnicity, and education.^{2,14} Correspondingly, the relatively new concept of distributed health literacy aims to shift from viewing health literacy as solely an individual's ability to comprehend health information to acknowledging the significance of social support and community dynamics in shaping health-related knowledge and behaviours.¹⁵ Furthermore, there is a recognised need to focus on organisational health literacy, referring to the capacity and responsiveness of healthcare organisations to effectively communicate health information and provide accessible and understandable health services.¹⁵

Effectively managing multimorbidity necessitates a paradigm shift away from cumulatively adding on singledisease interventions. Instead, there is a call for comprehensive, person-centred, and family-centred healthcare that prioritises individual and familial concerns. This approach aims at healthcare that aligns with the values and priorities of the individuals involved, is well-coordinated, and integrates seamlessly into everyday life.²

Consequently, there is an urgent demand for an innovative approach to researching, rethinking, and developing municipal rehabilitation focusing on health literacy and social networks as important aspects in managing everyday life for individuals with multimorbidity and their relatives. Involving individuals with multimorbidity, their relatives, municipal professionals, leaders, general practitioners, and civil society throughout the research process is crucial. This inclusive approach incorporates relevant local insights for the development of actions and interventions, facilitating the sustainable implementation of municipal multimorbidity rehabilitation.¹⁶

We hypothesise that transitioning from a single-disease framework to tailoring organisational health information and interventions based on individuals' health literacy needs and developing social networks to support health can lead to a reduction in health inequity.

Therefore, the "Co-designing municipal rehabilitation" -CURIA - study aims to enhance individual and organisational health literacy as well as social networks for and with individuals living with multimorbidity in selected Danish municipalities.

The purposes of CURIA are threefold: 1) to enhance the health literacy of a specific target population with multimorbidity, as identified and prioritised by the individual municipality; 2) to develop the organisational response of each municipality to align with the identified health literacy needs; and 3) to involve civil society in the development of social networks aimed at enhancing health literacy.

In the current study, health literacy aspects encompassing individual, organisational and collective health literacy are addressed in the co-design process. As the project's broader goal is to address health inequity through a collaborative local co-design process involving stakeholders, it implies that the entire rehabilitation program may be co-designed.

Methods

Study design

CURIA constitutes a three-phase sequential mixed methods research study, as described in detail below. Initially, our focus is on studying health literacy needs, including the role of social networks. This new knowledge is derived from local quantitative and qualitative data collected from individuals with multimorbidity, their relatives, and the identified municipalities. These local insights, in conjunction with international evidence-based knowledge, provide the foundation for the subsequent development phases of CURIA.

CURIA is founded on the Ophelia framework: 'Systematic development and implementation of interventions to **Optimise Health Literacy** and **Access**, a systematic approach for co-design of interventions to improve health literacy and equity of access.¹⁷ CURIA operationalises the Ophelia framework through eight steps across three main

phases: needs assessment, development, and application of health literacy.¹⁵

- **Phase 1** is a local strength and needs assessment of multi-dimensional health literacy and municipal rehabilitation practices to lay the groundwork, providing the knowledge base for subsequent phases.
- **Phase 2** involves a collaborative process that engages individuals with multimorbidity, their relatives, health professionals, social workers, managers within the health department and job centre in the municipalities, general practitioners, hospital staff and civil society (including unions and volunteers). Together, they select, plan, and conduct small-scale testing of actions strategically designed to address the identified local needs identified in Phase 1.
- Phase 3 focuses on scaling up, implementing, evaluating, and refining actions and interventions from Phase 2 within each municipality. The objective is to ascertain whether these specific actions and interventions can effectively develop and enhance the identified local health literacy needs and responsiveness.

Co-design serves as the main approach for collaboration among the stakeholders in CURIA. This process involves meaningful engagement between individuals with multimorbidity, their relatives, health professionals, social workers, researchers, and civil society. The aim is to uncover local knowledge and ensure that fit-for-purpose. needed and wanted health literacy actions are developed and implemented through collaborative communicative processes, focusing on specific situations and their context.¹⁷ The Plan-Do-Study-Act (PDSA) method is employed as an iterative structure to test, evaluate, and refine new actions and interventions aimed at improving health literacy and social networks.¹⁸ In the PDSA cycle, the "Plan" phase involves identifying the problem, setting goals, and formulating a strategy. Next, the "Do" phase tests the plan on a small scale for feasibility and effectiveness. The "Study" phase involves the evaluation of the intervention and pinpointing improvements. Adjustments are made in the "Act" phase, refining the intervention based on these findings. This cycle is repeated as necessary, allowing for continuous refinement and adaptation to meet the needs of individuals and organisations.¹⁸ This collaborative, iterative process effectively tailors health literacy to local healthcare systems and strengthens supportive social networks.

The participating sites include the health department and the job centre in three municipalities within the Southern Denmark region: Nordfyn, Svendborg, and Vejle. The region of Southern Denmark constitutes 21% of the Danish population. The three municipalities differ in population size; Nordfyn has a population of 30,000 citizens, Svendborg has 59,000 citizens, and Vejle is a larger city with 122,000 citizens. The Municipality of Nordfyn is considered a rural district; Svendborg Municipality can be described as a mid-sized municipality with a mix of urban and rural areas; and Vejle is considered a large municipality with a mix of urban and rural areas.

Study population

The study focuses on individuals of working age who have been referred to the municipality's health department for rehabilitation. Individuals can be referred to municipal rehabilitation after preliminary assessments at the hospital or after hospital discharge, by general practitioners or by the local job centre. The specific target population within multimorbidity will be defined and prioritised by each municipality, encompassing individuals with chronic somatic and/or mental conditions. In this exploratory study, the study participants will be identified and recruited through a systematic process involving various methods. The recruitment process will involve municipal employees, managers, and researchers to ensure a diverse and representative sample for the study.

Key stakeholders in CURIA comprise individuals with multimorbidity, their relatives, municipal employees, managers, researchers, and members of civil society.

Data collection

In Phase 1, Step 2, data will be gathered from three complementary working groups.

Work group 1: Individual health literacy. Quantitative data on individual health literacy, including digital health literacy and social networks, will be derived from the validated multi-dimensional questionnaire, "The Health Literacy Questionnaire" (HLQ).¹⁹ The HLQ will be used for both the needs assessment and the evaluation of interventions for individuals with multimorbidity within the specific municipality. The questionnaire will be distributed during the initial consultations with individuals identified with multimorbidity in their respective municipalities.

In a mixed-methods sequential exploratory design, the initial data from the HLQ survey will be utilised to guide the individual qualitative interviews with four to six individuals with multimorbidity with and without their relatives within each municipality. The purpose of the qualitative phase is to explore and discover in-depth information about the needs and experiences of different aspects of health literacy from the results obtained in the first, quantitative phase.

The team arrived at the stated numbers for interviews based on a mixed-methods sequential exploratory design.

Work group 2: Organisational health literacy. The 'OS! Approach for improving local health literacy responsiveness', is a process for evaluating organisational health competence and planning improvement measures based on the local assessment.²⁰ For each municipality, the process will involve two observation sessions of daily practices and two focus group interviews. These focus group interviews will include a representative sample of four municipal professionals and two leaders from the health department and the job centre. The assessment will cover the following dimensions of organisational health literacy: Leadership and culture; Systems, processes, and policies; Communication practices and standards; and Employee health literacy.²⁰

Work group 3: Existing municipal population data. For the specific municipality, quantitative data will be extracted retrospectively from the health department and job centre databases. This process will aim to construct a comprehensive profile of the study population. In Danish municipalities, extracting data from local data systems may not always be feasible. As a result, we are unable to specify the exact types of data we will collect, only providing a general description of the data in broad terms. The requested data includes various dimensions, such as the annual prevalence of individuals with multimorbidity within the specified target population, socio-demographic factors and overarching categories encompassing health diagnoses and conditions. Additionally requested data cover details such as the referring authority; the municipal professional handling of the rehabilitation process, types of services received within the health department in the Municipality, employment status, and information on sick days and early retirement, where applicable. Furthermore, number of referrals from the job centre to other health services or programs will be requested.

Subsequently, the collected data will be analysed, and materials for stakeholder and community engagement activities will be prepared based on the findings. For more details, refer to the 'Analytical Approach' section.

In accordance with the Ophelia framework, Figure 1 illustrates the phases of CURIA, which are described in detail below.

Description of Phase I: Identify strengths, needs and action ideas

Step 1. Project set-up (2 months) The purpose of this phase will be to define the aim, focus and scope, establish the project team, the project timeframe and budget, and engage and inform the relevant municipalities.

Step 2. Data collection (6 months, 2 months buffer) During this phase, data will be systematically gathered

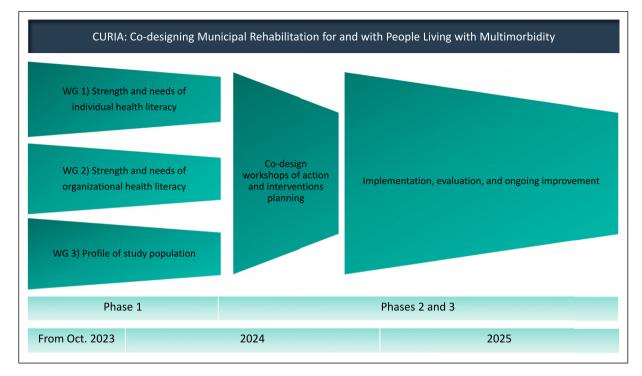


Figure 1. Overview of CURIA study phases. WG=Work Group.

from Work Groups (WG) 1, 2 and 3 through a combination of individual interviews, focus group interviews, observations, and existing municipal population health data, as detailed earlier. These diverse datasets will serve as the foundation to identify local strengths, needs and preferences, as well as for constructing a profile of the study population. Subsequently, the collected data will be analysed, and materials for stakeholder and community engagement activities will be prepared based on the findings.

In Phase 1, we will recruit an individual with multimorbidity who will be invited to join the Steering Committee at the start of Phase 2.

Description of Phase 2: Co-design of actions and interventions

Step 3. Co-design workshops (3 months, 1 month buffer) Based on Step 2, important local development areas will be identified and action ideas for strengthening health literacy will be generated in three local co-design workshops, each involving 12 key stakeholders. These stakeholders will include three individuals with multimorbidity (two without relatives, one with a relative), one relative, two municipal health care professionals, two researchers, and two representatives from civil society. The methodology employed in the workshop is a collective idea-generating session, facilitated by an experienced moderator.

The co-design workshops will be applied for the specific municipality in a standardised set-up, following the Ophelia framework. The sessions will commence with short participant introductions and an overview of the workshop's objectives. A digital presentation will follow, providing a condensed summary of results from the various data sources and presenting two to three vignettes featuring concise descriptions of fictional personal cases. This aids workshop participants in recognising or identifying individuals with multimorbidity.

Subsequently, a systematic discussion will unfold around each vignette, guided by key questions designed to facilitate dialogue and generate actionable ideas for enhancing health literacy. The workshop process will conclude with a summary of the ideas generated during the workshop session.

Step 4. Intervention design (3 months, 1 month buffer) Based on Steps 2 and 3, specific health literacy actions will be selected and prioritised at both an individual level and organisational level using a program logic model. The prioritisation process will take place in co-design workshops using the Ophelia framework, where key stakeholders including individuals with multimorbidity, their relatives, municipal employees, researchers, and civil society representatives will participate. These sessions will involve structured discussions based on crucial questions to enhance health literacy. Insights from these workshops will guide the prioritisation of health literacy needs, ensuring effective and equitable solutions, within the existing municipal frame and economy. The objectives will be linked to selected health literacy actions and international evidence-based knowledge. Typically, actions will fall into two categories: direct enhancements to individuals' health literacy or the restructuring of organisational services and processes to ensure greater accessibility of health information or services for individuals with varying levels of health literacy.¹⁷

Examples of specific ideas are typically related to:

- Behaviours: e.g., how individuals engage and communicate with healthcare providers and, reciprocally, how providers interact and communicate with individuals with multimorbidity.
- Skills, knowledge, and attitudes: e.g., at the individual level: skills to locate and assess digital health information critically; for municipal organisations, fostering digital health literacy can involve delivering LIX-differentiated health information, which entails tailoring content to diverse reading abilities based on LIX numbers, thereby ensuring accessibility for individuals with varying levels of reading proficiency. LIX, short for "Läsbarhetsindex," is a readability formula developed to measure the complexity of texts in Scandinavian languages. It uses average sentence length and the percentage of long words to produce a score that indicates the text's readability, with higher scores indicating more complex texts.
- *Supports and resources*: e.g., Community volunteers serve as local health mentors to contribute to enhancing capabilities by providing valuable support, guidance, and information.

Depending on available funding, three or more health literacy initiatives will be conducted in each municipality. **Step 5. Intervention planning (3 months, 1 month buffer)** Actions with the potential to respond to local health literacy needs will be planned, and implementation and evaluation plans will be developed. **Step 6. Intervention refinement (6 months, 2 months buffer)** PDSA (Plan-Do-Study-Act) quality improvement cycles will be carried out to develop, pre-test and refine actions and processes and specify evaluation activities.

Description of Phase 3: Implementation, evaluation, and ongoing improvement

Step 7. Implementation and evaluation activities (6 months, 3 months buffer) Health literacy actions and interventions (e.g., screening of health literacy, municipal

facilitation of social networks with unions) will be applied as PDSA to actively improve local implementation and sustainability.

Step 8. Development of an ongoing quality improvement strategy The pilot actions and interventions with the potential to improve health literacy and organisational responsiveness will be embedded into existing local processes. Ongoing quality improvement strategies will be developed.

Analytical approach

Notable findings from the individual HLQ questionnaires, particularly responses indicating a "total disagreement" within the study population, will be employed to explore specific themes and topics during the individual interviews. Additionally, the data from the HLQ survey will undergo analysis and be reported in terms of means and standard deviations, both collectively and for each scale.

Data from the individual interviews will be interpreted and analysed according to Kirsti Malterud's systematic text condensation strategy.²¹

The focus group interviews will undergo thematic analyses aligned with the study objectives.²²

Descriptive statistics will be applied to the data from municipal databases to form a profile of the identified groups specific to the municipality.

Triangulation will be employed to explore, compare, and contrast data across various quantitative and qualitative methods, as well as different sources. This includes individual health literacy questionnaires, qualitative interviews with individuals with multimorbidity, and focus group interviews with municipal professionals and leaders.

Knowledge dissemination

Throughout the project period, both preliminary and final knowledge will be consistently disseminated through various channels to reach different stakeholders. This dissemination will occur via SoMe, workshops and through the publication of at least four scientific papers addressing topics such as multimorbidity and organisational health literacy; municipal multimorbidity rehabilitation and social networks covering the collective health literacy aspect; multimorbidity and management of everyday life; and experiences with researchinformed development of municipal rehabilitation. Additionally, diverse reports will be disseminated to Danish municipalities, accompanied by educational materials designed for use by municipalities, university colleges, universities, general practitioners, and university hospital doctors.

Research team

A comprehensive study of multimorbidity necessitates an interdisciplinary research team. CURIA will leverage the insights and expertise gained from a prior municipal rehabilitation co-design project, conducted by several researchers involved in the current project. The research team comprises researchers and lecturers from diverse fields including nursing, physiotherapy, sociology, and management. Their competencies span complex care needs, rehabilitation, co-design methodologies, development of municipal practices in healthcare and social care, and expertise in public management.

Steering committee

The steering committee consists of Anne Højmark Jensen, Head of the Health Department, Municipality of Svendborg; Søren T. Skou, SDU and Region Zealand (expertise in multimorbidity); Anna Aaby, AU and Aarhus University Hospital (expertise in health literacy); Prof. Jens Søndergaard, SDU (expertise in General Practice); Lene Dørfler, Special Consultant, Local Government Denmark, Health and Elderly Care; Kim Bøg-Jensen, Director of Health Department (expertise in educations), UCL; Prof. Morten Balle Hansen, UCL (expertise in Public Management); Peter Sørensen, Head of Welfare Research, UCL (expertise in leadership).

Discussion

With the increasing prevalence of multimorbidity, there is an urgent need to develop evidence-based practice for multimorbidity rehabilitation with individuals with multimorbidity and the municipalities as collaborative partners. Given the municipalities are not obliged to perform research, they may lack a robust research-based foundation for practice development or evaluation of interventions. However, due to the trends of more complex care needs in the local healthcare system. strengthened and extended research with the local healthcare system as a partner is recommended.^{6,16} Focusing on supporting the individuals' self-care, addressing the provision and management of complex care needs, and including individuals with multimorbidity in the prioritisation and customisation of interventions is essential. CURIA aims to enhance individuals' health literacy and social networks, aligning organisational health literacy with these identified needs through systematic development and implementation of interventions.

Declaration of conflicting interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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Ethical statement

Ethical approval

Upon request, The Regional Committees on Health Research Ethics for Southern Denmark have determined that the current study, filed under number S-20232000-147 is not required to undergo submission to or approval by the Committees. The decision is based on the nature of the study, which involves only interviews, focus group questionnaires, and data extraction from registers, and, according to Danish legislation, falls within the category of exempted studies.

Informed consent

Participation in the study encompassing interviews, focus groups, and questionnaires, is voluntary. Subjects express their acceptance through an informed consent process, wherein they receive, understand, and accept research-related information detailing the research purpose, risks, and benefits. Participation could be ended at any point during the research process.

ORCID iDs

Junge Tina b https://orcid.org/0000-0002-3304-3010 Søren Thorgaard Skou b https://orcid.org/0000-0003-4336-7059

Data availability statement

The datasets used and/or analysed during the current study will be available from the corresponding author upon reasonable request.

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