Universität Basel
Medizinische Fakultät
Departement Public Health

La Source.
Institut et Haute
Ecole de la Santé

Scuola universitaria professionale
della Svizzera italiana
SUPSI

Exploring international quality indicators and variables for risk adjustment in public reporting.

Final report - Work Package 3 / sub-aim 1

NATIONAL IMPLEMENTATION PROGRAMME – STRENGTHENING QUALITY OF CARE IN PARTNERSHIP WITH RESIDENTIAL LONG-TERM CARE FACILITIES FOR OLDER PEOPLE

NIP-Q-UPGRADE

Manno, 30.04.2024

Author(s): Nereide A Curreri, Jianan Huang, Anna Brambilla, Gabriela Cafaro, Megan Davies, Serena Sibilio, Sonja Baumann, Brigitte Benkert, Bastiaan Van Grootven, Emmanuelle Poncin, Nathalie I.H. Wellens, Franziska Zuniga, Laurie Corna

On behalf of the NIP-Q-UPGRADE Consortium

Institute of Nursing Science (INS), Department of Public Health, University of Basel, Basel
Institut et Haute École de la Santé (La Source), University of Applied Sciences Western Switzerland, Lausanne
Centre of Competence on Ageing, Applied University of Sciences and Arts of Southern Switzerland. (SUPSI), Manno

National Implementation Programme – **Strengthening quality of care in partnership with residential long term care facilities for older people** (NIP-Q-UPGRADE), commissioned by the Federal Quality Commission (FQC) to ARTISET with the industry association CURAVIVA and senesuisse –(admin.ch)

The NIP-Q-UPGRADE supports long-term care facilities in data-driven quality improvement based on the national quality indicators.

The National Programme is implemented using implementation science approaches. ARTISET and senesuisse have delegated the scientific management of the programme to their collaboration partner, the University of Basel, Institut for Nursing Science (INS). For its part, the INS works collaboratively with the Institut et Haute École de la Santé La Source (La Source), Universities of Applied Sciences Western Switzerland in Lausanne and the Centro Competenze Anziani, Scuola universitaria professionale della Svizzera italiana (SUPSI) to implement the programme nationally and has delegated different sub-aims to the partner institutions. The research institutes' interpretation of the scientifically substantiated results, their conclusions and recommendations to the trustee and to the Federal Quality Commission EQC may differ from the trustee's point of view.

Suggested citation: Nereide A Curreri, Jianan Huang, Anna Brambilla, Gabriela Cafaro, Megan Davies, Serena Sibilio, Sonja Baumann, Brigitte Benkert, Bastiaan Van Grootven, Emmanuelle Poncin, Nathalie Wellens, Franziska Zuniga, Laurie Corna. *Exploring international quality indicators and variables for risk adjustment in public reporting*. Final report for the attention of ARTISET industry association CURAVIVA and senesuisse as part of the National Implementation Programme – Strengthening quality of care in partnership with residential long-term care facilities for older people (NIP-Q-UPGRADE) on behalf of the Federal Quality Commission. Manno: Competence Centre on Ageing, University of Applied Sciences & Arts of Southern Switzerland (SUPSI); Basel: Institute of Nursing Science, University of Basel.

Table of Contents

Abstract **6**

Summary **7**

Mission *7*

Background *7*

Method *7*

Results *8*

Conclusion and Recommendations *9*

Introduction **10**

Objectives **11**

Review 1: Care quality indicators in international practice **11**

Methods *12*

Study design 12

Inclusion criteria 12

Search Terms 13

Data extraction *13*

Results *14*

Rapid review 1: Quality of Life and Quality of Care Frameworks *14*

Rapid review 2: Quality indicators *17*

Rapid review 3: PREMs and PROMs *18*

Properties domain *20*

Implications and Recommendations *22*

Conclusion *22*

Review 2. Risk Adjustment **23**

Literature review *23*

Results *23*

Discussion and recommendations *24*

Conclusion *25*

Overall Conclusion **25**

References **28**

Appendices **32**

Appendix A. Review 1 Modified PICO framework and key words guiding the rapid reviews of the literature. *32*

Appendix B: Review 1 PRISMA flow chart *33*

Appendix C: Review 1 Number of studies included by country and rapid review *34*

Appendix D: Review 1 Scales included in PREMs and PROMs *35*

Appendix E: Review 2 Search strings *37*

Appendix F: Review 2 PRISMA flow chart *38*

Appendix G: Review 2 Table 1 Study characteristics *39*

Appendix H: Review 2 Health information systems in countries *41*

Tables

Table 1 Results of thematic analysis of quality life/quality of care frameworks (RR1) 16
Table 2 Results of thematic analysis of QIs (RR2) 19
Table 3 Results of thematic analysis of PREMs and PROMs (RR3) 19
Table 4 Properties of QIs that emerged from RR2 and RR3 21
Table 5 Recommendations 26

Figures

Figure 1 Consolidated results show thematic overlap across frameworks and indicators 21

List of abbreviations

ACP	Advance care planning
CPS	Cognitive Performance Scale
FOPH	Federal Office of Public Health
FSO	Federal Statistical Office
INS	Institute for Nursing Science
La Source	La Source School of Nursing
LTC	Long-term care
LTCF	Long-term care facility
SUPSI	University of Applied Sciences and Arts of Southern Switzerland
NIP-Q-UPGRADE	National Implementation Programme - Strengthening quality of care in partnership with residential long-term care facilities for older people
PREM	Patient-reported experience measure
PROM	Patient-reported outcome measure
PRISMA	Preferred Reporting Items for Systematic Reviews and Meta-Analyses
QIs	Quality indicators
WP	Work Package

List of definitions:

These definitions are meant to guide the reader in understanding the different levels of results. The levels are nested within each other. For each literature review domains, main themes, and subthemes can emerge at different levels.

Domain: an umbrella area encompassing main themes and subthemes
Main theme: a category for a group of subthemes, a subset of a domain
Subtheme: a smaller theme that fits within a main theme
Quality indicator: a measurable element of an aspect of quality

Abstract

Project description: Sub-aim 3.1 aims to identify the range of quality indicators (QIs) used internationally that could be considered for Swiss residential long-term care (LTC) and to identify evidence about existing practices of QI reporting internationally. It summarises the evidence of 1) QIs at the resident level that are measured internationally in residential LTC to support data-driven quality improvement; 2) variables for risk adjustment for public reporting of pressure ulcers, medication review, and advance care planning.

Methods: Two structured literature reviews were performed.

Core results: Literature review 1summarises core domains and main themes emerging from three rapid literature reviews on quality of life and quality of care frameworks, international indicators, and patient reported experience and outcome measures (PREMs, PROMs). Overlap was found across the reviews between the concepts of quality of life and quality of care, particularly in the following domains: psychosocial aspects, environment, person-centred care, and health. This literature review provides a foundation for further selection and development of QIs for residential LTC in Switzerland.

Literature review 2 identifies age, functional status, and cognitive status as important risk factors for pressure ulcers, which cannot be easily modified by care practice. The findings confirm risk adjustment for care level (which includes age) and Cognitive Performance Scale (CPS) when reporting pressure ulcers. No relevant variables were identified for medication review or advance care planning.

Summary

Mission

This sub-aim report summarises the results from two literature reviews. The findings from Review 1 will guide the development of sub-aim 3.6, which includes interviews with national experts and an eDelphi consultation to identify and recommend additional quality indicators (QIs) for Swiss residential LTC. Review 2 will guide the specification of operationalisation of new QIs in sub-aim 3.2.

Background

Though continuous care quality improvement is an important goal for residential LTC for older people in Switzerland, limited resources and increasing diversified and complex case mix pose important challenges. Valid, reliable, feasible, appropriate QIs that are useful for stakeholders at all levels are essential for planning and implementing care quality improvement. Long-term care facilities (LTCFs) are obliged by the Federal Insurance Law (LAMal, Art. 59a) to report medical QIs to the Federal Statistical Office (FSO). Six indicators currently cover four clinical domains: polypharmacy, pain, weight loss (malnutrition) and the use of physical restraints. Reporting on incidence rates limits the involvement residents, their families, or staff, offering only partial perspectives of the residents' expectation of care quality. By focusing on the clinical aspects, potential positive elements and outcomes of care are not considered. Although high quality of care moves in parallel to high quality of life, indicators in the domain of quality of life are not yet a topic in Swiss LTC.

To enhance the scope of QI measurement themes in nursing homes, on behalf of the Federal Office of Public Health (FOPH), an expert group with representatives from relevant stakeholder groups selected and defined three additional measurement themes in 2021: pressure ulcers, medication review and advance care planning (ACP)[7] Given the significant impact of resident baseline characteristics on medical outcomes, it is crucial to consider these factors when interpreting reported data on QIs. Hence, proper risk adjustment with resident-level characteristics is vital for ensuring fair comparisons among LTCFs and identifying improvement potential.

Given the limitations of the specific focus of the existing indicator set mentioned above, and the needs to operationalise the newly proposed QIs, an overview of evidence is needed to outline practices in other countries, especially at resident level.

Method

Two literature reviews were conducted using various search strategies, including searching key databases (e.g. PubMed and CINAHL), screening reference lists and forward citations, and exploring grey literature sources. EndNote was employed for reference management, and study selection

adhered to standard procedures. For the first literature review, thematic analysis was employed to analyse the findings. For the second literature review, a narrative summary was generated.

Results

The first literature review found considerable overlap in existing frameworks conceptualising quality of life and quality of care, as well as within the indicators themselves, in at least four areas (see Figure 1). The first is the importance of the inclusion of psychosocial aspects, which is evident in PREMs and PROMs with a quality of life underpinning, but also with respect to quality of care, and in particular, health. The latter highlighted psychosocial indicators focused on end-of-life care, flexibility of care, quality of care processes, adequacy of care time, etc. A second conceptual area is that of the environment, a key-subtheme of both quality of life and quality of care frameworks, and often operationalised through structural features of the built environment, but also through aspects of care providers. The centrality of person-centred care also emerged as a common conceptual area, operationalised through numerous indicators from a quality of life perspective, and primarily reflecting aspects of wellness from a quality of care perspective. The final area is that of health and health-related quality of life, with indicators ranging from functional aspects, multimorbidity management, medication and monitoring. The findings provide evidence from the international stage for a multi-dimensional approach in the development and selection of further Qis for Swiss LTC.

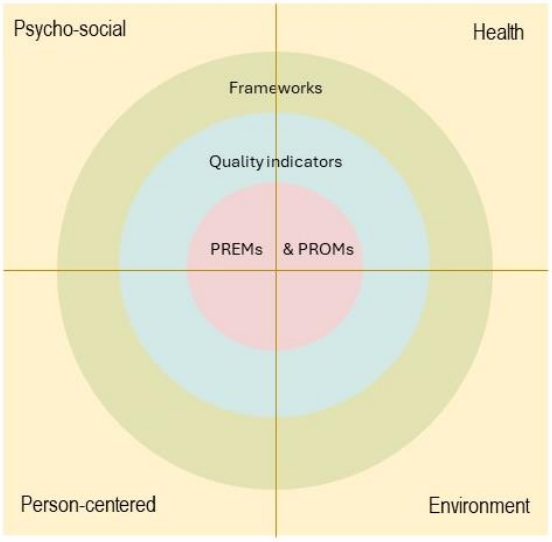


Figure 1 Consolidated results show thematic overlap across frameworks and indicators

The second review identified age, functional status, ethnicity, cognitive impairment, and a history of pressure ulcers as important covariates for pressure ulcers. Public reporting should consider at least the functional status and cognitive status of the residents as risk adjustment variables.

Conclusion and Recommendations

The variety of domains and themes identified by the first literature review suggest moving beyond a purely clinical perspective, allowing for quality of care and quality of life elements to be included in a more subjective assessment of quality. This study reviewed international literature, thus results can be adapted for the Swiss context, and applied in Switzerland and beyond. Development of further QIs should follow a multi-dimensional and multi-level approach and consider the development of a framework as a guide for LTCFs in the Swiss context of national QIs. For the operationalisation of pressure ulcers in NIP-Q-UPGRADE, we confirm previous work identifying care level and Cognitive Performance Scale (CPS) as variables for risk adjustment in public reporting. Further investigation is needed for risk adjustment variables of medication review and advance care planning in public reporting.

Introduction

In Switzerland, as in other countries, continuous care quality improvement is an important goal in residential long-term care (LTC) for older people. LTC systems are currently faced with limited and changing resources, as well as increasingly diversified and complex case mixes[1-3] . Hence, quality indicators (QIs) that are viewed as valid, reliable, feasible, appropriate and useful for stakeholders at all levels (e.g., cantonal and federal authorities, facility staff and residents/family members) are essential for planning and implementing care quality improvement[4]. As a result of a modification to the Federal Insurance Law in 1996 (LAMal, Art. 59a), long-term care facilities in Switzerland have been obligated, since 2019, to report *medical* QIs (LAMal Art 22a) to the Federal Office of Statistics. Following an extensive consultation process, the first indicator set was proposed in 2015 and includes six indicators on four clinical domains: polypharmacy, pain (self-reported and assessor-rated), weight loss (malnutrition) and the use of physical restraints (bedrails or seating that does not allow rising/trunk fixation)[5]. Since these indicators solely present risk-adjusted prevalence rates at a specific point in time, they provide only a partial perspective on the quality of care received by residents. In their current form, it is not possible to assess within-person evolution over time and they offer limited opportunities for residents, their family members, or staff to express their views on care quality, such as whether residents feel involved in care decisions whenever possible or whether their preferences are respected. By focusing on clinical aspects that emphasise problems in care, the potential positive outcomes of care, such as positive quality of life evaluations, or the maintenance of mental and physical capacity, are not considered. While medical quality indicators offer insight into specific aspects of healthcare in residential long-term care settings, social aspects that help make a LTC facility feel like home are often missed or not taken into consideration[6]. Finally, high quality care in LTC moves in parallel to high quality of life, both goals of residential long-term care. Yet quality of life domains that extend beyond medical care are seldom measured in LTCFs due to their subjectivity and intricacies.

Given the limitations of the specific focus of the existing indicator set, Review 1 aims to review the international literature to identify the central domains related to quality of care and quality of life, and associated indicators, including those which are resident-reported, that can facilitate their assessment in residential LTC for older people. This will provide the foundation for a subsequent study within the NIP-Q-UPGRADE that aims to identify and recommend further QIs.

In the shorter-term, three new measurement themes have been selected (pressure ulcers, advance care planning (ACP), and medication review) and will be introduced in NIP-Q-UPGRADE[7]. Given the important influence that baseline resident characteristics can have medical outcomes, it is crucial to

consider these factors through risk adjustment when interpreting reported data on QIs. Risk adjustment in public reporting means adjusting for characteristics of residents to promote a fairer comparison between facilities, and to identify problems directly related to care[8]. Because residents' baseline health and functional status vary, their characteristics can greatly influence their medical outcomes[8]. Consequently, the reported data on QIs are influenced not only by the quality of care but also by the case mix of residents in a LTCFs. These characteristics are independent from the care practice, and do not reflect the quality of care. Failing to consider these factors undermines the usefulness and comparability of QIs across LTCFs with different case-mixes and special functions[9], as well as missing indication of improvement potential. Risk adjustment with resident-level characteristics, which is not modifiable by the facilities, is therefore crucial for public reporting of QIs, and the specification of risk adjustment must be carefully considered. Apart from specification of measurement variables for the three new measurement themes, identifying variables for risk adjustment in public report is a vital aspect of the operationalisation.

Objectives

The objectives of this sub aim were to answer two main research questions. In this report, we present the findings from the two literature studies guided by these questions:

1. Which care QIs at resident level are measured in international practice (in LTC), to support data-driven quality improvement? (Review 1)
2. Internationally, which variables are used for risk adjustment in the reporting of pressure ulcers, advance care planning, and medication review? (Review 2)

The reviews and their findings are presented separately below.

Review 1: Care QIs in international practice

To address the first research question, three independent rapid literature reviews were completed and consolidated. Given the limitations of the current QIs, and with a view to gain a full perspective of the multiple dimensions of quality of life and quality of care that provide a foundation for the identification and recommendation of additional QIs in sub-aim 3.6 of WP3, we started with a broad research question on quality of life and quality of care frameworks, followed by two specific research questions on QIs. In doing so, we aim to identify the central domains, themes, and potential indicators that will guide consultations with national and international experts, as well as with LTC residents and their family members.

The questions guiding the three independent rapid reviews are:

1. What frameworks of quality of life and/or quality of care are used internationally in residential long-term care for older people?
2. What QIs are used internationally in the assessment of quality of life and quality of care in residential LTC for older people?
3. What patient-reported outcome measures (PROMs) and patient-reported experience measures (PREMs) are used as care QIs in residential long-term care for older people internationally?

Methods

Study design

The rapid review method was selected as a simplified systematic process to provide an overview of evidence useful for informing health policy and services[10, 11]. Guided by a focused question that restricts the search strategy and scope, a rapid literature review is a simplified yet rigorous method that uses components of the systematic approach to summarize evidence[9]. The rapid review methodology outlined by Smela et al[12] was followed: the PRISMA-checklist was used to guide the three rapid reviews and the PRISMA flow chart was completed[13].

Four databases were consulted for each rapid review: CINAHL Complete and SocINDEX with Full Text via EBSCO, PubMed, and PsycINFO. Appendix A illustrates the search concepts, following an adapted PICO framework (population/setting, concept, context), which inform the selection and trials of key words, and the inclusion and exclusion criteria for each rapid review. Inclusion criteria applied systematically to the three rapid reviews were sources published between 2013 and March 2024, and no language filters were applied. Despite being QIs, a separate rapid review for PREMs and PROMs was conducted as these sets of indicators are specific to users' experiences and are used to improve the experience as a user of healthcare, increase health systems' uptake of a person-centred approach, and improve outcomes, quality and safety[14].

Inclusion criteria

To answer the main research question, the three rapid reviews included studies in which older adults residing in residential long-term care were the population of interest (see Appendix A for an overview of the three rapid reviews using a PICO framework). In rapid review 1, the focus was on frameworks of quality of life and quality of care and their application to quality long-term care settings. For rapid review 2, the aim was to identify indicators used internationally relating to the quality of life and quality of care of older adults in LTC settings. As a starting point, this review built upon a recently published scoping review on publicly reported QIs in LTC[15]. This rapid review will perform the same search in two additional databases, SociIndex and PsychInfo, conforming to this study's protocol, updating and

expanding the scope of the previous scoping review. Rapid review 3 focused specifically on indicators labelled as PREMs PROMs relative to older adults in the LTC context.

We included original research, editorials, and grey literature, and included quantitative, qualitative, or mixed methodologies, or reviews (systematic reviews, meta-analyses, and scoping reviews). Theoretical studies, opinion papers and unavailable full texts were excluded.

Search Terms

Following a modified PICO framework, blocks of key terms were established for population, concept, and context, and were used in different combinations to ensure exhaustive searches (see Appendix A). To ensure the most relevant results, where the number of search terms were limited by the database, search trials were performed. The reviews considered older adults in LTCFs as the population of interest. Rapid review 1 used quality of life and quality of care frameworks as the search concept, rapid review 2 considered QIs as the search concept and rapid review 3 used PREMs and PROMs. Key terms included but were not limited to “older persons, elders, elderly, aged”, “care home, long term care facility (LTCF), retirement home, nursing home”, “frameworks, quality of life, quality of care”, “quality indicators, indicators”, “person related experience measures, PREMs, person related outcome measures, PROMs”. We did not place any limits on the context. During the searches, modifications and/or additions were made to the search terms if deemed necessary to identify relevant results. For example, initial searches for PREMs and PROMs relevant to older adults in residential long-term care yielded few relevant results. Search parameters were thus widened to include PREMs and PROMs for older people in any setting to allow for relevant results and potential exclusion at the screening phase.

Data extraction

A total of 1,147 articles were identified across the three rapid reviews as shown in the PRISMA flow chart (Appendix B): 935 articles from the frameworks searches, rapid review 1 (RR1), 130 for the QIs (RR2), and 82 articles from the searches for PREMs and PROMs (RR3). The same data extraction methodology was used in all three rapid reviews. The screening of titles was completed by two researchers, with a random agreement check of a small sample (5%) by a third researcher. Abstract screening was performed in the same way, and full text screening and data extraction was completed by two researchers for each rapid review. A third researcher conducted a random check of the full text screenings in all three reviews, with 90% agreement in RR1 and RR2, and 60% in RR3. Extracted data were inserted into an excel spreadsheet, and themes were derived through an inductive approach. Following Braun and Clark´s thematic analysis process, the initial themes were reassessed, consolidated, regrouped, and renamed[16] .This approach was selected to give breadth to

the full range of domains and themes covered in these bodies of literature, which will be used as the foundation for the subsequent phases of work aimed at identifying and recommending additional QIs. An additional domain that emerged from the rapid reviews of QIs and PREMs and PROMs, deals with properties of QIs rather than their substantive content. This domain, entitled properties, and its three main themes, are presented in Table 4. The importance of the indicator properties is acknowledged in this review, and thus these findings are described in a brief section below.

Results

The three searches produced rich sets of literature that provide important insight for the development of further QIs. Of the 62 studies included across the three rapid reviews, and not including multi-country studies, 14 of the studies represent countries in Europe, five studies represent Asian countries and two are from the Pacific (Appendix C). Within the grey literature on quality of life and quality of care frameworks, two multi-country reports by the WHO, one by OECD and one by the European Commission were included[17-20].

In what follows, we present the main findings (domains, themes and sub-themes) from each of the three rapid reviews, followed by a discussion of the ways in which they overlap, and at times, attribute different levels of influence to the same theme or sub-theme.

Rapid review 1: Quality of Life and Quality of Care Frameworks

Frameworks were reviewed with the intent of exploring how quality for older adults in residential LTC is conceptualised internationally, including the areas of focus and the key components guiding quality assurance. Our review identified only a handful of explicit quality of life[21-23] and quality of care[17, 20, 21, 24] frameworks specific to residential LTC for older people. We found several frameworks that address quality of life and quality of care for older people more generally and across various healthcare settings[22, 25-29]. Other frameworks, related to quality of care and life in LTC had a very specific focus, such as LTC system performance[30], LTC systems and supports[31], palliative care in LTC[32], resident satisfaction with LTC[33] and function-focused care in LTC[34]. The analysis of these documents revealed a rich set of concepts, but the lack of consensus on priority areas and essential components made it challenging to simply describe existing frameworks, and/or choose one or a few of them as guides. We therefore decided to extrapolate the various domains and themes they proposed. Using thematic analysis as a method to outline the focus areas, we were able to explore how different and similar themes are nested into domains across the reviews, and how the literature on frameworks and indicators presents interrelated focus areas (described in the conclusion).

Table 1 presents the main domains and themes that emerged from the rapid review on quality of life and quality of care frameworks: (1) quality of life, (2) quality of care and (3) outcomes. While quality of care frameworks often referred to aspects of care quality, and quality of life frameworks often cited quality of life as a goal, the schemes or models for conceptualising the two were mostly distinct. A third domain—a focus on outcomes— was cross-cutting.

Quality of life - Seventeen of the 30 studies included in the frameworks review presented data on the relevance of quality of life in LTC for older persons. The main themes featured within discourses of quality of life were: users' experience, environment, social aspects, health related quality of life (QoL), and integrated care (see Table 1).

The theme of users' experiences with respect to quality of life included factors such as perceptions associated with old age, control over daily life and independence, the ability to learn, grow and make decisions, and the trade-off between security and control[22, 26, 27, 35, 36]. The environment theme included accessibility and age friendliness, organizational and physical features, shared and public spaces and those created to encourage interaction[22, 31, 33, 37].

Social aspects that emerged were involvement in activities and social relationships and the quality of companionship, connection, inclusion and meaningful activities[21, 26, 33, 37-39].

The fourth theme within the quality of life domain was health related QoL, and referred to how specific health domains (illness, disease, treatment) affect overall quality of life. This included the physical and mental areas of health and focused on the clinical aspects and specialized services of care[17, 20, 22, 26, 31, 40].

The final theme of integrated care encompassed the centrality of a person-centred approach to care that addresses a variety of components ranging from personal goals to quality of sleep[21, 26, 27, 31, 40-43].

Quality of care – Two main themes emerged from the fourteen studies that framed quality of care: quality of care concepts, incorporating a variety of aspects of care, and staff (Table 1). Concepts of quality of care included processes such as collective compassionate actions; structural indicators such as explicit partnerships with families, communities, institutions, and other care providers, and architectural modifications to promote acceptance of place; multimorbidity was found to stand as an umbrella subtheme for "indicators that are an alternative to the inadequate combination of disease-

Table 1 Results of thematic analysis of quality life/quality of care frameworks (RR1)

Domains:	Main themes:	Subthemes:
quality of life	users' experiences	
	environment	
	social	
	health related QoL	
	integrated care	person-centred care
quality of care	concepts	process
		structural indicators
		multimorbidity
		medication
		monitoring
	staff	care staff
		ethnic diversity
		ethical knowledge
		interdisciplinary
outcomes	wellness	health
		social
		resident satisfaction
		positive effects
		person-centred care

focused quality metrics"[17, 20, 24, 30, 32, 39(p1143).] As a sub-theme, medication referred to ensuring agreement by all involved, including the resident, and reducing the unnecessary usage of antipsychotics, while monitoring and evaluating care staff regularly emerged as leading to a higher quality of care[24].

The second main theme within the domain of quality of care, staff, could be divided into four sub-themes. Frameworks referred to the importance of staff encouragement and benefits, as well as the maintenance of a qualified workforce, good working conditions, and respect and dignity for staff[19, 24, 32, 36, 43]. The value of staff's acceptance and knowledge of ethnic and cultural diversity, as well as their knowledge and respect of fundamental human rights to safeguard equality of treatment of residents and avoid discrimination[19, 20, 22, 43] were also recognised as central to quality of care. Lastly, the subtheme called 'interdisciplinary' highlighted the importance of bringing social and psychological disciplinary perspectives to complement the clinical, to drive meaningful care, consider what matters

to residents, foster cross-sector collaboration, acknowledge residents' personal preferences, and address residents' needs in an integrated way[19, 24, 25, 39, 40, 43].

Outcomes - The third domain, which emerged from fourteen studies, was outcome oriented, with wellness as a central theme. Wellness in later life is a multidimensional and holistic concept[28] . As a sub-theme of wellness, health encompassed age friendly care, age friendly medication, perceived health and functional ability as enablers of well-being[20, 24, 36, 37, 40]. Social aspects of wellness included social care related quality of life (SQRQoL), social contact and maintaining relationships[17, 27, 36]. Resident satisfaction as an indicator encompassed autonomy and privacy, and finally, the literature pointed to measuring the positive effects derived from healthcare[20, 44]. The person-centred care element of well-being focused on an individualized ageing concept and active participation in one's care process, choice and inclusion, rights and independence[19-21, 25, 34].

The results of this review provide a wide prospective on the domains and themes considered in the literature on frameworks of quality of life and quality of care. While the two principal domains, quality of care and quality of life, are largely distinct in the literature, they share a number of themes, confirming their interconnection in practice.

Rapid review 2: QIs

From the review on international QIs, seven main domains emerged as outlined in Table 2: (1) environment; (2) integrated care; (3) satisfaction; (4) psycho-social; (5) dementia specific; (6) dignity and (7) clinical care.

Environment - Twelve of the 17 studies included indicators within the environment domain, such as the frequency of a resident's access to spaces outside the facility and to a garden[45]. A subtheme of organizational structure was staff, which incorporated safety and attention to neglect or abuse, support in access to meaningful activities and occupation, and responsibility for care coordination and comprehensive documentation of this coordination[39, 46, 47]. Personalized spaces are an environmental factor utilized as an indicator of quality[29, 45].

Integrated care - Four studies presented data on the integrated care domain that featured holistic measures as its main theme. Some elements that emerged were looking forward to things, biopsychosocial needs and support, and choices for rehabilitation or no treatment[39, 46-48].

Satisfaction - The satisfaction domain included subjective and objective aspects such as personal satisfaction through meaningful occupation, time for care, and global care home satisfaction[45, 46, 49].

Psycho-social - The psycho-social domain was present in fourteen studies, with two main themes emerging: quality of care and quality of life. Within the quality of care theme, four subthemes were evident: end of life care, such as place of death; flexibility of care such as the staff's availability and

time; that the process of care included care plan development, self-management, staff to resident ratio; and user and person centredness reflecting the notion that each resident is a unique person with choice, freedom, and auto determination[29, 39, 45, 47-53]. The main theme quality of life also presented four subthemes: lifestyle, which incorporates a person's preferences, needs and desires; family/friend involvement and inclusion in the care and decision making; psychological support that comprised indicators on mood, distress, worries, depression and the social environment; and the subtheme of access to a meaningful environment with activities and social participation as indicators[29, 39, 45, 47, 49, 50, 53-55].

Dementia - Dementia specific indicators emerged in four studies that indicated cognitive functioning, improvement and/or decline, dementia related quality of life, delirium and physical restraints as common indicators[45, 47, 50, 52].

Dignity - One article referred to the dignity dimension related to what makes a person feel valued[51].

Clinical care - The clinical care and medications domain emerged in fourteen studies and can be subdivided into three main themes. Physical health embeds functioning, health and health behaviours; mental health includes depression and anxiety; ADLs/IADLs include improvement, decline, and desires to do tasks independently; and the medications theme involves regular medication reviews, and assessments done with the resident[29, 39, 45, 47-52, 55-57].

Rapid review 3: PREMs and PROMs

Fifteen studies were included from the rapid review on PREMs and PROMs, falling into two main domains. Twelve of the studies included data on (1) indicator sets while fourteen of the studies featured data on various elements of (2) quality (Table 3). Two main themes emerged within the indicator sets domain: scales included in the PREMs and/or PROMs and multidimensional indicators. interRAI, Core outcome set functional independence (COSFI), EuroQoL (EQ-5D-5L, EQ-HWB), Adult Social Care Outcomes Toolkit (ASCOT), Quality of Life – Aged Care Consumers (QOL-ACC), Long-Term Care Quality of Life (LTC-QoL) are just a few examples of scales presented in the studies (see Appendix D for a complete list)[58-61]. Within the multidimensional domain, themes of indicators varied from relating to specific chronic or neurological conditions such as rheumatoid arthritis and Parkinson's disease, to person-centredness; self-health management; perceived effectiveness and coping functioning, and service infrastructure indicators such as changes to processes, information or support systems[62-68].

Table 2 Results of thematic analysis of QIs (RR2)

Domains:	Main themes:	Subthemes:
environmental	access to garden organizational structure spaces	staff
integrated care	holistic measurement	
satisfaction	subjective/objective	
psycho-social indicators	quality of care	end of life care flexibility of care process of care person centredness
	quality of life	lifestyle family/friend involvement psychological support access to meaningful activities
dementia specific		
dignity		
clinical care	physical health mental health ADLs, IADLs medications	

Table 3 Results of thematic analysis of PREMs and PROMs (RR3)

Domains:	Main themes:	Subthemes:
indicator sets	scales included multidimensional	
quality	health related quality of life	physical health
		mental health
	quality of life	person centered emotional component
	quality of care	health literacy process

Three main themes emerged from the quality domain: quality of life, health related quality of life, and quality of care. Physical health included self-reported and assessed physical capacity, vitality, and participation; while mental health involved self-assessed cognitive skills, depression, anxiety, loneliness, social connection, emotions, acceptance, and confidence[58-64, 66, 69-72]. Within the quality of life main theme, the subtheme person-centred refers to a series of indicators such as: major life stressors; strong, supportive relationships; time alone; personal comfort and cleanliness; personal safety; control over daily life; social participation; dignity; shared decisions; personal choices; self-efficacy; agency; and meaning[58, 60, 61, 63, 70, 72]. The emotional component of quality of life includes empowerment; social support and social functioning; person-provider relationship; coping; and emotional safety and support[59, 61, 64, 69-71].

The quality of care main theme presented health literacy as one subtheme, outlining healthcare and treatment expectations, initiative, education and information[59, 64, 67, 68, 72]. Process was a second subtheme that comprised continuity of care workers; fluid communication of changes in care; flexibility of the service to meet needs and preferences; reliability of care workers; having a good relationship with care workers and feeling that they are caring, trustworthy, ensure privacy and dignity; technical and competence aspects; and service integration[61, 64, 68-70].

Properties domain

As shown in Table 4, the properties domain emerged from both rapid reviews 2 and 3, and thus, as mentioned above, the data was consolidated into one domain. It is presented separately, as this domain presents a different side of the indicators. Where this review aimed to identify substantive content for indicators guided by quality of life and quality of care frameworks, the properties of indicators raise the issue of what elements can guarantee authentic results.

Eight studies presented data on properties. Two main themes are present in this domain: content validity, and the combination of PREMs and PROMs. Five studies feature content validity that incorporated various factors about indicators and sets of indicators to consider in the development stage. Rationality implies avoiding redundancy, defining the purpose, and using a conceptual framework when selecting indicators[4]. The multidimensionality factor solicits the involvement of stakeholders in the development as well as inclusion of more than one dimension[4, 46]. Usefulness indicates defining the purpose of the measurements considering trade-offs with other criteria, such as tracking health care quality and equity conditions[4, 73]. Importance refers to the prioritization of essential indicators, and feasibility refers to reliability, complexity of language and concepts, and costs[4, 45]. The appraisal factor was comprised of different properties: acceptability, evidence-based, definition, reliability, and construct and overall validity[4, 45, 46, 53].

Three studies utilizing combinations of PREMs and PROMs found the critical use element of validity. It comprised of co-creation of the development of items and in establishing outcome measures, as well as testing comprehensibility of measures with care recipients as key; co-creation in critical meetings between stakeholders to perceive connections between experiences and changes; and using evidence based indicators as critical, to avoid themes that staff feel are not important or that are too far removed from the daily routine[64-66].

Table 4 Properties of QIs that emerged from RR2 and RR3

Domain	Main theme	Subtheme
Properties	content validity	rationality
		multidimensional
		usefulness
		importance
		appraisal
		feasibility
	combination PREMs/PROMs	critical use

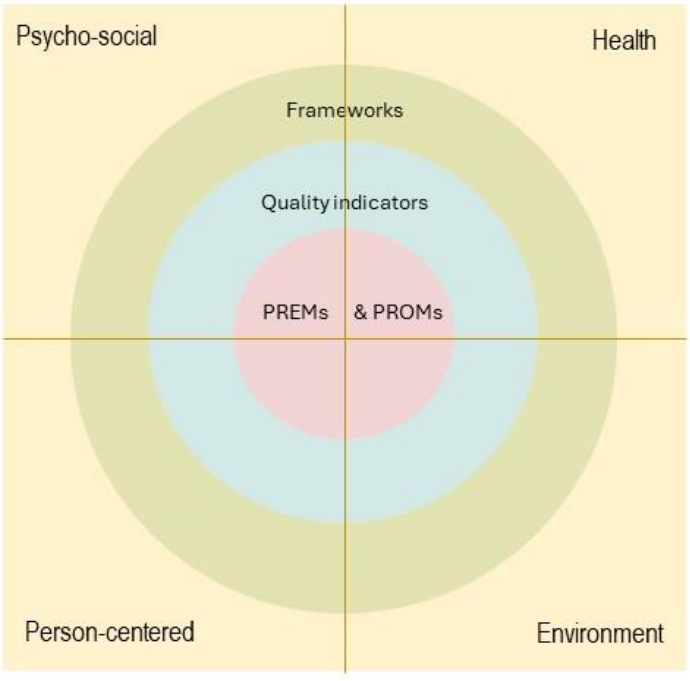


Figure 2 Consolidated results show thematic overlap across frameworks and indicators

Implications and Recommendations

The main objective of Review 1 was to provide the conceptual foundation for the identification, and eventual recommendation, of additional QIs that would be complementary to the existing and soon-to-be introduced medical QIs. It would be premature to offer concrete recommendations for additional indicators at this time, as the findings of the three rapid reviews will now inform the development of an interview guide for semi-structured interviews with national experts on the topic of QIs in residential LTC settings for older people in Switzerland. Building upon what we learn in this next phase, we will then develop and conduct a modified RAND/UCLA eDelphi study with national and international experts in the field to gain consensus on what further indicators could provide value to stakeholders in this field. Nonetheless, we present a series of recommendations to be considered at this time in Table 5.

Conclusion

Sixty-two studies from more than twenty countries were included in the three separate rapid literature reviews. Our findings reveal several ways in which quality of life and quality of care are framed for older people in residential LTC settings, with several approaches to evaluating quality. There are, however, several points of overlap between the quality of life and quality of care frameworks and the indicators utilised to assess both in this population. At times, similar themes are shared but emerge at different levels (key conceptual idea versus specific indicator that aims to operationalise it). Our analyses show at least four conceptual areas in which there is considerable overlap between quality of life and quality of care frameworks, and indicators used (Figure 1). The first is the importance of the inclusion of psychosocial aspects, which is evident in PREMs and PROMs with a quality of life underpinning, but also with respect to quality of care, and in particular, health. The latter highlighted psychosocial indicators focused on end-of-life care, flexibility of care, quality of care processes, adequacy of care time, etc. A second conceptual area is that of the environment, a key-subtheme of both quality of life and quality of care frameworks, and often operationalised through structural features of the built environment, but also through aspects of care providers. The centrality of person-centred care also emerged as a common conceptual area, operationalised through numerous indicators from a quality of life perspective, and primarily reflecting aspects of wellness from a quality of care perspective. The final area is that of health and health-related quality of life, with indicators ranging from functional aspects, multimorbidity management, medication and monitoring.

Review 2. Risk Adjustment

Literature review

To address the second research question specified in this report, we conducted a scoping review which followed the PRISMA-ScR checklist[74], based on methods developed by Arskey and O'Malley[75]. The approach entails specifying the question and purpose, identifying and selecting relevant studies, extracting and charting data from the selected studies, and providing a summary for reporting. The results were summarised by narrative synthesis, and discussed in relation to the research question[76].

The literature search was conducted using variants of 1) long-term care, 2) risk adjustment measures and 3) QIs in Pubmed and Embase (see Appendix 1). Studies were included if: they were conducted in/focused on a residential LTC setting; reported adjusted and unadjusted quality indicator data (either primary or secondary research with no limitation on design); or reported risk adjustment variables using a longitudinal cohort design. No date restrictions were applied. Language was restricted to studies published in English, German, French, Italian, Dutch, Spanish or Polish. Included studies were screened by one reviewer (MD). Data was extracted and tabulated using Microsoft Excel. Only literature about risk adjustment for pressure ulcers, ACP, and medication review were selected for review. Endnote 20 was used for reference management.

In addition, grey literature was searched using the following sources: The Knowledge Exchange database via the Knowledge Exchange website, The British Library, Library Hub (JISC), BASE, Cochrane Reviews, Google, and Google Scholar. Information was further sought using country specific websites, where pressure ulcers, medication review, and ACP have been reported, according to a recent literature review[15]. A list of websites can be found in Appendix H, which includes sites in Germany, Canada, Australia, New Zealand, Belgium, the Netherlands, Norway, and Sweden. A second reviewer (JH) summarised the results into a narrative synthesis.

Results

The literature search yielded a total of 428 studies screened by title and abstract. Among those, thirty-six articles were screened by full text. Six studies were eventually selected for the current review (Appendix F), focusing on pressure ulcers (see Appendix G). For ACP and medication review, no relevant articles were found.

The selected six studies spanned from 1997 to 2020, with one from New Zealand[77], three from the US[78-80], one from Germany[81], one comparing pressure ulcer outcomes in the Netherlands and Germany[82]. Sample sizes across the studies ranged from 13 LTCFs[77] to 3459 LTCFs[81]. All of the studies discussed resident and facility characteristics that might have influenced pressure ulcer outcomes. The peer-reviewed publications commonly presented only analytical findings, and therefore did not include details about whether their respective health authorities use these covariates

for pressure ulcers in public reporting. The review therefore focused purely on identifying covariates that influence pressure ulcer outcomes.

More specific information was found on QI information websites from health authorities. Information on the public reporting of pressure ulcers was found explicitly in German, Canadian and Australian health information systems. Although the Australian health information system indicates that their reporting is not risk-adjusted, Germany and Canada employ a stratified approach of reporting, using covariates in relation to resident and facility characteristics (see Appendix H).

The current review targeted characteristics that cannot be influenced by the care. Covariates in relation to care provision or facility characteristics, such as prevention measures[82] or staff knowledge [79], were recorded but not taken into account. Among the covariates for adjusting pressure ulcer outcomes, age was mentioned across almost all studies[77-79, 81, 82]. Functional status was another frequently used resident-level covariate, including care level, level of dependency, and comorbidity [77-81]. In the study using administrative data in Germany [81], care level had the strongest effect size on pressure ulcer outcomes. In the German reporting system, the outcome is reported in stratification of low and high-risk groups, however, the characteristics are unknown. The Canadian health information system considered age, dependency (Personal Severity Index and dependency in toileting), and cognitive impairment for stratification, with the latter identified as significant in the study by Arling et al[80]. Two studies in the US and New Zealand found ethnicity to be an influential factor[77, 78]. Two studies identified history of pressure ulcers as important risk factors[79, 80]. To summarise, age, functional status (dependency or care level), cognitive status, ethnicity of the residents, and a history of pressure ulcers are the main variables to be considered when the QIs are risk-adjusted.

Discussion and recommendations

As identified from both peer-reviewed and governmental documents, age and functional levels are the most important characteristics that influence the outcome of pressure ulcers and these cannot be modified by care practice. As age as a factor reflects the functional status and needs for care, it can be incorporated in the assessment of care level for the risk adjustment. Another risk adjustment variable to consider is cognitive impairment, as it is explicitly indicated in public reporting, also identified as a significant risk factor for pressure ulcers[83]. For the application in the Swiss context, cognitive status is assessed using the Cognitive Performance Scale (CPS) in Swiss LTCFs, and care levels are determined through needs assessment instruments for payment system. Both are used for risk adjustment for reporting existing QIs[84]. No addition is required, which enhances the feasibility in the facilities. Ethnicity in care can mirror socio-economic characteristics[85], including the type of care received. This covariate cannot categorically be considered as an unmodifiable factor in care.

To summarise, it is recommended for introducing the new QIs, that pressure ulcers as a quality indicator be risk-adjusted using care level and CPS in public reporting. Therefore, this review opts not to include ethnicity as a variable for risk adjustment. The review also opts not to include history of pressure ulcers for public reporting as this is not a modifiable factor.

Although risk adjustment is usually applied for outcome indicators, it is important to note that process-oriented indicators can also be affected by case mix differences of residents in facilities[80]. For medication reviews and ACP, no risk adjustment measure was identified from the available sources. It is nonetheless recommended to examine possible risk factors in further studies.

Conclusion

Specifically for the operationalisation of new measurement themes in WP 3, we recommend care level and CPS as variables for risk adjustment in reporting. We also recommend further investigation on covariates for medication review and ACP.

Overall Conclusion

Through the findings of this study, the lack of consensus on what topics to include in care quality assessment is evidenced, but more pertinent to the NIP-Q-UPGRADE programme, the variety of domains and themes to look to for additional QIs is introduced. These insights are valuable for all stakeholders (LTCFs, residents/families, care staff, healthcare professionals) as they both delineate potential directions for new indicators and open possibilities of delving into multiple diverse quality domains used internationally. What remains to be established are, in fact, which domains and themes are considered as most appropriate for residential LTC in Switzerland. The results presented here will feed into sub-aim 3.6, where the objective is to arrive at a consensus on quality domains and themes to focus on, and specific indicators to propose. In reporting indicators, risk adjustment allows for a more transparent and fair data comparison, thus should be incorporated in the measurement of every indicator. Resident level characteristics, specifically care level and cognitive functioning, are the variables to apply in risk adjustment for optimal reporting on pressure ulcers. Further research on potential risk adjustment variables is necessary for the other two new indicators.

Table 5 Recommendations

	Recommendation	Rationale	Link with NIP-Q-UPGRADE (numbers = sub-aims of Work package 3)
1	We recommend that additional QIs considered in NIP-Q-UPGRADE move beyond a purely clinical perspective.	Non-clinical domains and sub-themes linked to quality of care and quality of life for older people in LTC settings emerged from the three rapid reviews.	3.6 will carry forward these considerations in interviews with national experts, a RAND/UCLA modified e-Delphi with international experts, and workshops with residents and their family members.
2	We recommend that NIP-Q-UPGRADE considers subjectively assessed indicators (PREMs and PROMs) in subsequent projects that aim to identify and recommend further QIs in order to offer residents the possibility to express their views on quality of care and quality of life.	The value of user experiences for quality emerged in the rapid reviews of the literature. Other healthcare sectors incorporate patient-reported experience and outcome measures, and many of these developed for use with older people are relevant for LTC settings.	3.6 (as above).
3	We recommend that NIP-Q-UPGRADE considers QIs that assess person-centred care given the importance of this theme and its potential to offer a multi-dimensional and holistic view of care processes and outcomes.	Person-centred care emerges as an ubiquitous theme in the literature as it can be considered a model of caring and a means to achieving high personalized quality of life.	3.6 (as above).
4	We recommend that NIP-Q-UPGRADE considers QIs that incorporate an interdisciplinary or multilevel perspective to offer a more holistic view.	The importance of multiple perspectives on the same indicator emerged from the literature, including the importance of a multi-disciplinary perspective, as well as combining the assessments of multiple actors (e.g., resident and staff).	3.6 (as above).

	Recommendation	Rationale	Link with NIP-Q-UPGRADE (numbers = sub-aims of Work package 3)
5	We recommend that NIP-Q-UPGRADE consider the development of a conceptual framework that provide direction for a specific set of QIs crosscutting multiple domains.	The rapid reviews underscored the utility and value of developing an indicator set (as opposed to selecting individual indicators) to ensure all areas of quality in a given conceptual model are assessed. Such a model is currently lacking in LTC in Switzerland. A Swiss framework of quality in LTC could delineate and thus standardize national quality domains and indicators.	3.6 (as above).
6	We recommend that pressure ulcers be risk-adjusted using care level and CPS in public reporting.	Both are used for risk adjustment for reporting existing QIs, thus feasible.	3.2
7	We recommend that neither ethnicity nor history of pressure ulcers be used as variable in the risk adjustment of pressure ulcers indicator.	Ethnicity and a history of pressure ulcers both pose measurement challenges, and ethnicity, for example, may be a proxy for complex issues, such as socioeconomic position (and related care received in the past) as well as racism.	3.2

References

1. Barker RO, Hanratty B, Kingston A, et al. Changes in health and functioning of care home residents over two decades: what can we learn from population-based studies? Age and Ageing. 2021;50(3):921-7.
2. van den Brink AMA, Gerritsen DL, Voshaar RCO, et al. Residents with mental-physical multimorbidity living in long-term care facilities: prevalence and characteristics. A systematic review. Int Psychogeriatr. 2013;25(4):531-48.
3. Zúñiga F, Favez L, Baumann S, et al. SHURP 2018–Schlussbericht. Personal und Pflegequalität in Pflegeinstitutionen in der Deutschschweiz und Romandie. Universität Basel. 2021.
4. Schang L, Blotenberg I, Boywitt D. What makes a good quality indicator set? A systematic review of criteria. International journal for quality in health care. 2021;33(3):mzab107.
5. Zúñiga F, Blatter C, Wicki R, et al. Nationale Qualitätsindikatoren in Schweizer Pflegeheimen: Fragebogenerhebung zur Zuverlässigkeit der Daten und Nützlichkeit aus Sicht der Anwender. Z Gerontol Geriatr. 2019;52(8).
6. Leichsenring K. Quality in long-term care: a European perspective Brussels2019.
7. Zúñiga F, Osinska M. Schnittstellenkonzept zu den neu vorgeschlagenen medizinischen Qualitätsindikatoren für die stationäre Langzeitpflege. im Auftrag des Bundesamtes für Gesundheit: Pflegewissenschaft – Nursing Science, Departement Public Health, Universität Basel; 2021.
8. Jones RN, Hirdes JP, Poss JW, et al. Adjustment of nursing home quality indicators. Bmc Health Serv Res. 2010;10.
9. Mukamel DB, Weimer DL, Spector WD, et al. Publication of quality report cards and trends in reported quality measures in nursing homes. Health Serv Res. 2008;43(4):1244-62.
10. Khangura S, Konnyu K, Cushman R, et al. Evidence summaries: the evolution of a rapid review approach. Systematic reviews. 2012;1:1-9.
11. Tricco AC, Antony J, Zarin W, et al. A scoping review of rapid review methods. BMC medicine. 2015;13:1-15.
12. Smela B, Toumi M, Świerk K, et al. Rapid literature review: definition and methodology. Journal of Market Access & Health Policy. 2023;11(1):2241234.
13. Page MJ, McKenzie JE, Bossuyt PM, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. Bmj. 2021;372.
14. Gilmore KJ, Corazza I, Coletta L, et al. The uses of patient reported experience measures in health systems: a systematic narrative review. Health policy. 2023;128:1-10.
15. Osinska M, Favez L, Zúñiga F. Evidence for publicly reported quality indicators in residential long-term care: a systematic review. Bmc Health Serv Res. 2022;22(1).
16. Braun V, Clarke V. Using thematic analysis in psychology. Qualitative research in psychology. 2006;3(2):77-101.
17. Commission OE. A Good Life in Old Age? Monitoring and Improving Quality in Long-Term Care. 2013.
18. people EPftWaDoO. The European Quality framework for long-term care services. Brussels; 2012. Report No.: 1697-0152.
19. Beard JR, Officer A, de Carvalho IA, et al. The World report on ageing and health: a policy framework for healthy ageing. Lancet. 2016;387(10033):2145-54.
20. Cès S, Coster S. Mapping long-term care quality assurance practices in the EU–Summary Report. European Social Policy Network (ESPN) Brussels: European Commission. 2019.
21. Ibrahim JE, Fetherstonhaugh D, Rayner JA, et al. Meeting the needs of older people living in Australian residential aged care: A new conceptual model. Australasian Journal on Ageing. 2020;39(2):148-55.
22. Koehn SD, Mahmood AN, Stott-Eveneshen S. Quality of Life for Diverse Older Adults in Assisted Living: The Centrality of Control. J Gerontol Soc Work. 2016;59(7-8):512-36.

23. Emiliussen J, Engelsen S, Christiansen R, et al. The Good Life in Care Homes-a Qualitative Investigation with Residents, Relatives, Care Workers and Managers. Ageing Int. 2023;48(1):16-40.
24. Bhattacharyya KK, Molinari V, Black K, et al. Creating age-friendly nursing homes: The time is now. Gerontology & Geriatrics Education. 2023;44(4):613-30.
25. Cline DD. A concept analysis of individualized aging. Nursing Education Perspectives. 2014;35(3):185-92.
26. Saha S, Basu S, Pandit D. A framework for identifying perceived Quality of Life indicators for the elderly in the neighbourhood context: A case study of Kolkata, India. Quality & Quantity. 2023;57(3):2705-37.
27. Penton H DC, Hulme C, Young T. Patient-Reported Outcomes 2022.
28. Fullen MC. Defining wellness in older adulthood: Toward a comprehensive framework. Journal of Counseling & Development. 2019;97(1):62-74.
29. Grube MM, Mohler R, Fuchs J, et al. Indicator-based public health monitoring in old age in OECD member countries: a scoping review. BMC Public Health. 2019;19(1):1068.
30. Kim H, Jeon B. Developing a framework for performance assessment of the public long-term care system in Korea: methodological and policy lessons. Health Res Policy Syst. 2020;18(1):27.
31. Kane RA, Cutler LJ. Re-imagining long-term services and supports: towards livable environments, service capacity, and enhanced community integration, choice, and quality of life for seniors. Gerontologist. 2015;55(2):286-95.
32. Ho AH, Luk JK, Chan FH, et al. Dignified Palliative Long-Term Care: An Interpretive Systemic Framework of End-of-Life Integrated Care Pathway for Terminally Ill Chinese Older Adults. Am J Hosp Palliat Care. 2016;33(5):439-47.
33. Bhattacharyya KK, Molinari V, Hyer K. Self-Reported Satisfaction of Older Adult Residents in Nursing Homes: Development of a Conceptual Framework. Gerontologist. 2022;62(8):e442-e56.
34. Kim MS, Lee SJ, Park MS, et al. Toward a conceptual framework for the interdisciplinary function-focused care in nursing homes. Jpn J Nurs Sci. 2020;17(3):e12330.
35. OECD EC. Policy Brief A Good Life in Old Age. 2013.
36. Gichu M, Harwood RH. Measurement of healthy ageing. Age Ageing. 2023;52(Suppl 4):iv3-iv5.
37. Van Loon MS, Widdershoven G, Van Leeuwen K, et al. Implementing a broad quality of life tool for determining care wishes and needs of older adults living at home. Home Health Care Serv Q. 2021;40(4):262-75.
38. McDonald T, Russell F. Long-Term Care Quality-of-Life Scale utility in community home care. Nurs Health Sci. 2019;21(4):494-500.
39. Schulze J, Glassen K, Pohontsch NJ, et al. Measuring the Quality of Care for Older Adults With Multimorbidity: Results of the MULTIqual Project. Gerontologist. 2022;62(8):1135-46.
40. Mate K, Fulmer T, Pelton L, et al. Evidence for the 4Ms: Interactions and Outcomes across the Care Continuum. J Aging Health. 2021;33(7-8):469-81.
41. Hande MJ, Keefe J, Taylor D. Long-Term Residential Care Policy Guidance for Staff to Support Resident Quality of Life. Gerontologist. 2021;61(4):540-51.
42. Emery-Tiburcio EE, Mack L, Zonsius MC, et al. The 4Ms of an Age-Friendly Health System. Am J Nurs. 2021;121(11):44-9.
43. Cleland J, Hutchinson C, Khadka J, et al. What defines quality of care for older people in aged care? A comprehensive literature review. Geriatrics & Gerontology International. 2021;21(9):765-78.
44. Mizohata S, Jadoul R. Towards international and interdisciplinary research collaboration for the measurements of quality of life. Social indicators research. 2013;111:683-708.
45. Burgess JG, Maust DT, Myron Chang MU, et al. Identifying Quality Indicators for Nursing Home Residents with Dementia: A Modified Delphi Method. J Geriatr Psychiatry Neurol. 2023;36(2):164-70.

46. Haugan G, Drageset J, Andre B, et al. Assessing quality of life in older adults: psychometric properties of the OPQoL-brief questionnaire in a nursing home population. Health Qual Life Outcomes. 2020;18(1):1.
47. Foong HY, Siette J, Jorgensen M. Quality indicators for home- and community-based aged care: A critical literature review to inform policy directions. Australas J Ageing. 2022;41(3):383-95.
48. Kivelitz L, Schäfer J, Kanat M, et al. Patient-centeredness in older adults with multimorbidity: Results of an online expert Delphi study. The Gerontologist. 2021;61(7):1008-18.
49. Vassimon-Barroso V, Pantoni CBF, Zazzetta MS, et al. User and family satisfaction with nursing homes: a systematic review. Int J Qual Health Care. 2021;33(1).
50. Yan L, Pu H, Shi X, et al. Construction of key quality indicators for aged care facilities in China: A two-tier Delphi study: Key aged care quality indicators in ACF by Delphi method. Journal of Clinical Nursing. 2024;33(2):752-67.
51. Milte R, Ratcliffe J, Bradley C, et al. Evaluating the quality of care received in long-term care facilities from a consumer perspective: development and construct validity of the Consumer Choice Index–Six Dimension instrument. Ageing & Society. 2019;39(1):138-60.
52. Kent B. Commentary: Operationalising a modified Delphi study to progress quality care process nursing metrics for acute care. J Res Nurs. 2022;27(7):677-8.
53. Mitchell RJ, Wijekulasuriya S, du Preez J, et al. Population-level quality indicators of end-of-life-care in an aged care setting: Rapid systematic review. Arch Gerontol Geriatr. 2024;116:105130.
54. Ohura T, Higashi T, Ishizaki T, et al. Testing the validity and reliability of a newly developed instrument to assess the subjective needs of institutionalized elderly. Clinical Gerontologist. 2015;38(1):88-102.
55. Schapira MM, Shea JA, Duey KA, et al. The nursing home compare report card: perceptions of residents and caregivers regarding quality ratings and nursing home choice. Health services research. 2016;51:1212-28.
56. Jeon YH, Chien WT, Ha JY, et al. Application of the European quality indicators for psychosocial dementia care in long-term care facilities in the Asia-Pacific region: a pilot study. Aging Ment Health. 2018;22(10):1279-86.
57. Inacio MC, Lang C, Caughey GE, et al. The Registry of Senior Australians outcome monitoring system: quality and safety indicators for residential aged care. Int J Qual Health Care. 2020;32(8):502-10.
58. Cheung G, Edwards S, Sundram F. Death wishes among older people assessed for home support and long-term aged residential care. International journal of geriatric psychiatry. 2017;32(12):1371-80.
59. Dockx YJC, Molenaar E, Barten DJA, et al. Discriminative validity of the Core outcome set functional independence in a population of older adults. BMC Geriatr. 2020;20(1):309.
60. Engel L, Kosowicz L, Bogatyreva E, et al. Face Validity of Four Preference-Weighted Quality-of-Life Measures in Residential Aged Care: A Think-Aloud Study. Patient. 2023;16(6):655-66.
61. McDonald T. Measurement features of a long-term care quality of life (LTC-QoL) assessment scale. Journal of Care Services Management. 2013;7(3):76-86.
62. Bull C, Byrnes J, Hettiarachchi R, et al. A systematic review of the validity and reliability of patient-reported experience measures. Health Serv Res. 2019;54(5):1023-35.
63. Matta ACZ, Castañeda MP, León MN, et al. Encuesta Internacional de Indicadores de Salud Referidos por los Pacientes: el protocolo del Estudio PaRIS en España. Revista Española de salud pública. 2023;97.
64. Koster EB, Baars EW, Delnoij DMJ. Patient-reported quality of care in anthroposophic and integrative medicine: A scoping review. Patient Educ Couns. 2020;103(2):276-85.
65. Iheme L, Hirdes JP, Geffen L, et al. Psychometric Properties, Feasibility, and Acceptability of the Self-Reported interRAI Check-Up Assessment. J Am Med Dir Assoc. 2022;23(1):117-21.
66. Gleeson H, Calderon A, Swami V, et al. Systematic review of approaches to using patient experience data for quality improvement in healthcare settings. BMJ Open. 2016;6(8):e011907.

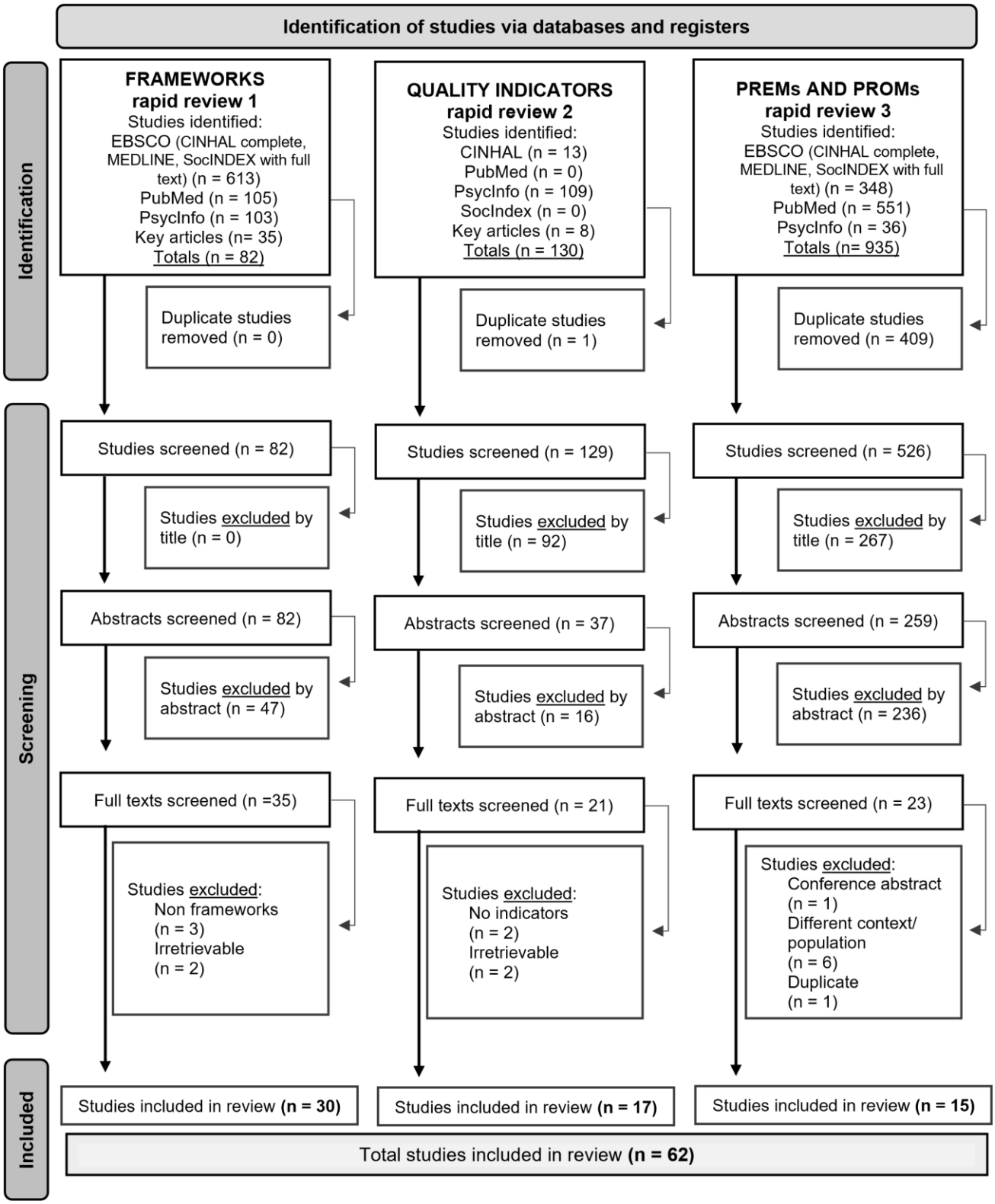
67. Wilson R, Cuthbertson L, Sasaki A, et al. Validation of an Adapted Version of the Veterans RAND 12-Item Health Survey for Older Adults Living in Long-Term Care Homes. Gerontologist. 2023;63(9):1467-77.
68. Malley J, D'Amico F, Fernandez J-L. What is the relationship between the quality of care experience and quality of life outcomes? Some evidence from long-term home care in England. Social Science & Medicine. 2019;243:112635.
69. De Rosis S, Ferrè F, Pennucci F. Including patient-reported measures in performance evaluation systems: Patient contribution in assessing and improving the healthcare systems. The International Journal of Health Planning and Management. 2022;37:144-65.
70. Benson T. Measure what we want: a taxonomy of short generic person-reported outcome and experience measures (PROMs and PREMs). BMJ Open Qual. 2020;9(1).
71. Wilson R, Cuthbertson L, Kazis L, et al. Measuring Health Status in Long-Term Residential Care: Adapting the Veterans RAND 12 Item Health Survey (VR-12(c)). Clin Gerontol. 2022;45(3):562-74.
72. Langendoen-Gort M, Groeneveld L, Prinsen CAC, et al. Patient-reported outcome measures for assessing health-related quality of life in people with type 2 diabetes: A systematic review. Rev Endocr Metab Disord. 2022;23(5):931-77.
73. Taveira A, Macedo AP, Rego N, et al. Assessing equity and quality indicators for older people–Adaptation and validation of the Assessing Care of Vulnerable Elders (ACOVE) checklist for the Portuguese care context. BMC geriatrics. 2022;22(1):561.
74. McGowan J, Straus S, Moher D, et al. Reporting scoping reviews—PRISMA ScR extension. Journal of clinical epidemiology. 2020;123:177-9.
75. Westphaln KK, Regoeczi W, Masotya M, et al. From Arksey and O'Malley and Beyond: Customizations to enhance a team-based, mixed approach to scoping review methodology. MethodsX. 2021;8:101375.
76. Popay J, Roberts H, Sowden A, et al. Guidance on the conduct of narrative synthesis in systematic reviews. A product from the ESRC methods programme Version. 2006;1(1):b92.
77. Carryer J, Weststrate J, Yeung P, et al. Prevalence of key care indicators of pressure injuries, incontinence, malnutrition, and falls among older adults living in nursing homes in New Zealand. Res Nurs Health. 2017;40(6):555-63.
78. Berlowitz DR, Brandeis GH, Morris JN, et al. Deriving a risk-adjustment model for pressure ulcer development using the Minimum Data Set. Journal of the American Geriatrics Society. 2001;49(7):866-71.
79. Hartmann CW, Shwartz M, Zhao SB, et al. Longitudinal Pressure Ulcer Rates After Adoption of Culture Change in Veterans Health Administration Nursing Homes. Journal of the American Geriatrics Society. 2016;64(1):151-5.
80. Arling G, Karon SL, Sainfort F, et al. Risk adjustment of nursing home quality indicators. Gerontologist. 1997;37(6):757-66.
81. Behrendt S, Schwinger A, Tsiasioti C, et al. Pressure ulcer in German Nursing Homes: Quality Assessment Using Claims Data of Statutory Health and Long-Term Care Insurance. Gesundheitswesen. 2020;82:S52-S61.
82. Tannen A, Dietz E, Dassen T, et al. Explaining the national differences in pressure ulcer prevalence between the Netherlands and Germany - adjusted for personal risk factors and institutional quality indicators. Journal of Evaluation in Clinical Practice. 2009;15(1):85-90.
83. Brimelow RE, Wollin JA. The impact of care practices and health demographics on the prevalence of skin tears and pressure injuries in aged care. J Clin Nurs. 2018;27(7-8):1519-28.
84. Favez L, Zúñiga F, Sharma N, et al. Assessing Nursing Homes Quality Indicators' between-Provider Variability and Reliability: A Cross-Sectional Study Using ICCs and Rankability. International Journal of Environmental Research and Public Health. 2020;17(24).
85. Fiscella K, Sanders MR. Racial and Ethnic Disparities in the Quality of Health Care. Annu Rev Public Health. 2016;37:375-94.

Appendices

Appendix A. Review 1 Modified PICO framework and key words guiding the rapid reviews of the literature.

Criteria	**RR1: Quality of life and quality of care frameworks**	**RR2: Quality indicators**	**RR3: PREMs and PROMs**
Population	Older adults in long-term care facilities		
Keywords included:	*older persons, elders, aged, elderly; and care home*, long term care facilities (LTCF), retirement home; nursing home, nursing homes, skilled nursing facility (SNF)*		
Concept	quality of life / quality of care frameworks	quality indicators	PREMs and PROMs
Keywords included:	*frameworks, quality of life, quality of care*	*quality indicators, quality improvement, quality assurance indicators*	Patient reported experience measures, PREMs *Patient reported outcome measures, PROMs*
Context	No limitations (global)		
Keywords	*Not applicable*		

Appendix B: Review 1 PRISMA flow chart



Appendix C: Review 1 Number of studies included by country and rapid review

Country*	**Frame- works**	**Quality indicators**	**PREMs & PROMs**
Australia	4	3	2
Canada	2		3
China	1	1	
Denmark	1		
England	1		1
Germany		3	
Germany & Switzerland	1	1	
India	1		
Ireland		1	
Italy			1
Japan		1	
Korea	1		
Netherlands	1		1
New Zealand			1
Norway		1	
Portugal		1	
South Korea	1		
Spain			1
UK			1
USA	6	1	1
multicountry	4	3	1

*Literature reviews not included

Appendix D: Review 1 Scales included in PREMs and PROMs

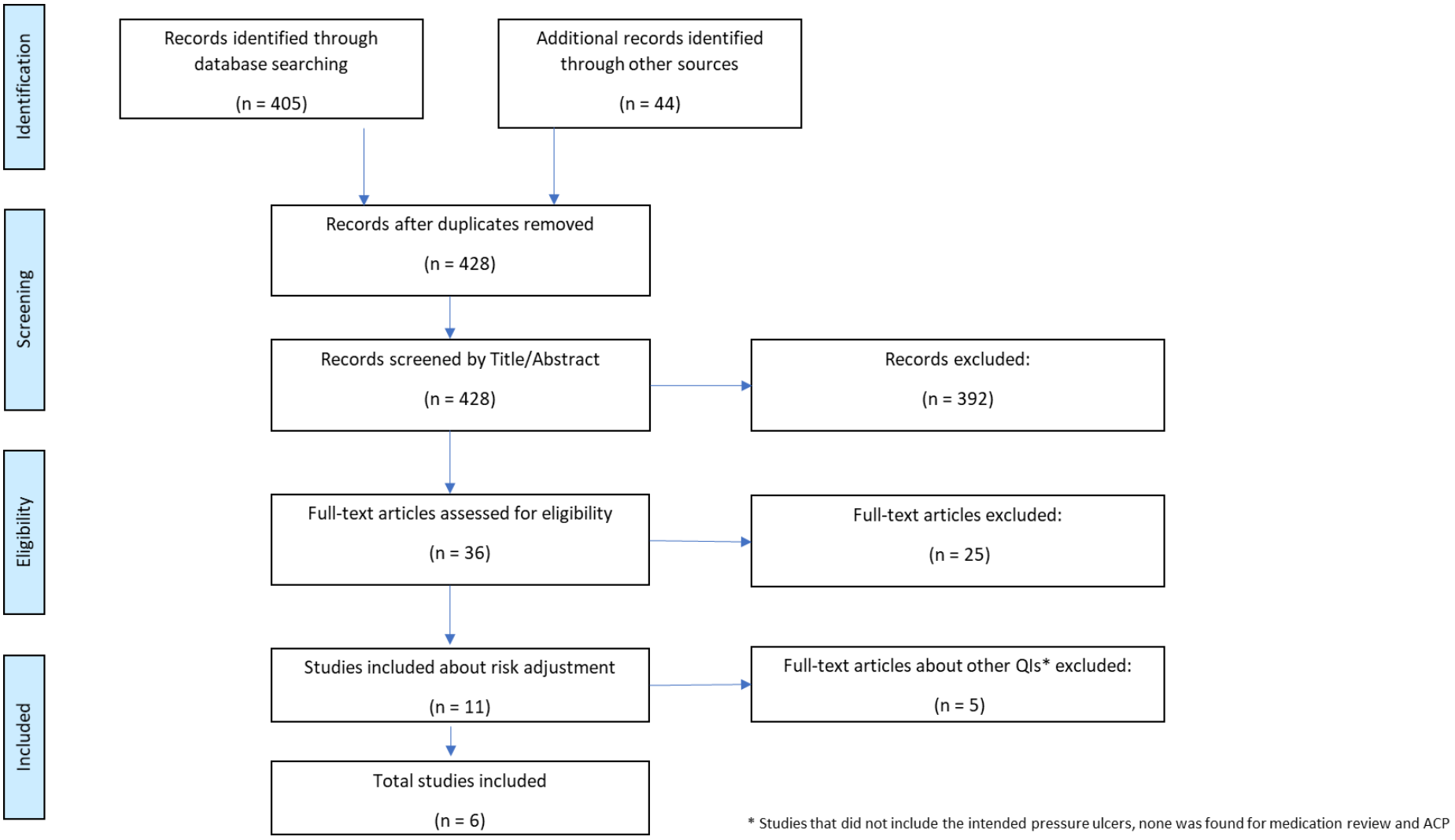
Scales included in PREMs & PROMs
Arizona Integrative Outcome Scale (AIOS)
Arthritis Health Assessment Questionnaire
ASCOT
Berg Balance Scale (BBS)
Columbia Health Medical Services Patient Satisfaction Survey
Consultation and Relational Empathy Measure
COSFI
CQ-Index Anthroposophic Medicine
CQ-Index General Practice
Edmonton Symptom Assessment Scale (ESAS)
EQ-5D-3L
EQ-5D-5L Patient satisfaction score (scale 1-100);
EQ-HWB
Health (PROMIS-10)
Holistic Health Questionnaire
Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS)
Integrative Medicine Outcome Scale (IMOS)
Integrative Medicine Patient Satisfaction Tool
InterRAI
InterRAI CUSR
Life Satisfaction Questionnaire (LSQ)
LTC-QoL
LTRC home setting (LTRC-C)
Measure Yourself Concerns and Wellbeing Questionnaire
Memorial Symptoms Assessment Scale (MSAS)
Parkinson's Disease Questionnaire (PDQ-39)
Patient Activation Measure
Patient Care Monitor EUROPEP
Patient Enablement Index (PEI)
Patient Reported Outcomes Measurement Information System Global
Patient Satisfaction scores (rating 0-10)
Perceived Stress Scale-4
Picker Inpatient Questionnaire
PROMIS-29
PROMIS-Pain Interference 6b
QOL-ACC Quality of life aged care consumers
QOLS-scale
RAI-MDS 2.0
SF-12 (4x) Integrative Medicine Patient Satisfaction Scale (IMPSS)

SF-36 (4x) Patient Satisfaction Index (PSI)
Veterans RAND 12-Item Health Survey (VR-12)
Veterans RAND 36-Item Health Survey (VR-36)

Appendix E: Review 2 Search strings

Search string in Pubmed
"Nursing Homes"[Mesh] OR "Residential Facilities"[Mesh:NoExp] OR "Assisted Living Facilities"[Mesh] OR "Homes for the Aged"[Mesh] OR "Long-Term Care"[Mesh] Nursing Home*[Title/Abstract] OR Care Home*[Title/Abstract] OR Residential Care Facilit*[Title/Abstract] OR Residential Facilit*[Title/Abstract] OR Long-term Residential Care[Title/Abstract] OR long term residential care [Title/Abstract] OR long-term care[Title/Abstract] OR long term care [Title/Abstract] OR home* for the aged[Title/Abstract] **AND**
"Risk Adjustment/classification"[Mesh] OR "Risk Adjustment/standards"[Mesh] OR "Risk Adjustment/statistics and numerical data"[Mesh] OR “risk adjustment*”[Title/Abstract] OR “risk classification*”[Title/Abstract] OR “prognostic model”[Title/Abstract] OR “prediction model”[Title/Abstract] OR “nomogram”[Mesh] **AND**
"Quality Indicators, Health Care"[MeSH Terms] OR "quality indicator*"[Title/Abstract] OR "health quality"[Title/Abstract] OR "care quality"[Title/Abstract] OR "healthcare quality"[Title/Abstract] OR "quality of healthcare"[Title/Abstract] OR "quality of health care"[Title/Abstract] OR "indicator*"[Title/Abstract] Hits: 65
Search string in Embase
"Nursing Homes" OR "Residential Facilities" OR "Assisted Living Facilities" OR "Homes for the Aged" OR "Long-Term Care" OR "Nursing Home" OR "Care Home" OR "care homes" OR "Residential Care Facility" OR "residential care facilities" OR "Residential Facility" OR "Residential Facilities" OR "Long-term Residential Care" OR "long term residential care" OR "long-term care" OR "long term care" OR "home for the aged" OR "homes for the aged" **AND**
"Risk Adjustment" OR "risk classification" OR "risk standards" OR "Risk Adjustments" OR statistics OR "numerical data" OR "prognostic model" OR "prediction model" OR nomogram” **AND**
"Quality Indicators" OR "health quality" OR "care quality" OR "healthcare quality" OR "quality of healthcare" OR "quality of health care" OR indicator OR indicators” Hits: 136
Included studies were searched for ‘similar studies’ within the journal and using Google Scholar.
Grey literature was searched using government health sites in the relevant countries and the Knowledge Exchange database via the Knowledge Exchange website for any documents exploring the themes of quality indicators and risk adjustment.

Appendix F: Review 2 PRISMA flow chart



* Studies that did not include the intended pressure ulcers, none was found for medication review and ACP

Appendix G: Review 2 Table 1 Study characteristics

Author(s)	Year	Title	Methodology	Sample	Quality Indicator (QI)	Variable
Berlowitz, D.D., Brandeis, G. H., Morris, J, N., Ash, A., Anderson, J, J., Kader, B., Moskowitz, M.	2001	Deriving a Risk-Adjustment Model for Pressure Ulcer Development Using the Minimum Data Set	Quantitative, primary data: bivariate associations between potential predictors and outcome of pressure ulcer examined, then chi square tests used to investigate categorical variables.	14,607 people residing in 109 National HealthCare Corporation Nursing Homes in 1997	Pressure ulcers	• Age, Ethnicity, Sex, Independence
Carryer, J., Weststrate, J., Yueng, P., Rodgers, V., Towers, A., Jones, M.	2017	Prevalence of key care indicators of pressure injuries, incontinence, malnutrition, and falls among older adults living in nursing homes in New Zealand	cross-sectional multi-centrepoint prevalence survey. Simple descriptive statistics— means, standard deviations (SD), and percentages—were used to describe scores on the various indicators for each condition.	13 nursing care home facilities in rural and urban New Zealand	**Pressure injuries,** Incontinence, Malnutrition and Falls	• Age, Ethnicity, Sex, level of care dependence, BMI
Arling, G., Karon, S. L., Sainfort, F., Zimmerman, D.R., Ross, R.	1997	Risk Adjustment of Nursing Home Quality Indicators	Cross-sectional multi-centre study with data from the MDS+	MDS data from 834 facilities across 4 US states (Kansas: n = 406, Maine: n = 143, Mississippi: n = 171, South Dakota: n = 114)	Problem behaviour towards others, Bedfastness, incontinence (bladder or bowel), **pressure ulcers,** decline in late loss ADLs, prevalence of antipsychotic use (without psychotic and related conditions)	• High risk/Low risk groups • Cognitive impairment, totally dependent, physical (e.g. quadriplegia) or psychotic condition, weight loss, Terminal prognosis, malnutrition, history of PU, desensitized skin

Hartmann, C., Schwartz, M., Zhao, S., Palmer, J.A., Berlowitz, D.R.	2016	Longitudinal Pressure Ulcer Rates After Adoption of Culture Change in Veterans Health Administration Nursing Homes	Quantitative - Basyesian hierarchical model and risk adjustment model	111 Veteran nursing homes (community living centers)	Pressure ulcers	• Age, Sex, BMI, level of dependence, illness (e.g. cancer, hip fracture, UTI), history of PU • Staffing, staff knowledge, staff cohesion
Tannen, A., Dietz, E., Dassen, T., Halfens, R	2007	Explaining the national differences in pressure ulcer prevalence between the Netherlands and Germany – adjusted for personal risk factors and institutional quality indicators	multi-centred cross-sectional study	NL: 90 nursing homes, 12,049 residents, mean age 81, % female 70.6, % at risk 69.9. DE: 39 nursing homes, 3,530 residents, mean age 83, % female 79, % at risk 66.8.	Pressure ulcers	• Age, gender, Braden Score • Use of prevention and treatment protocols, expert groups, information, training, updating protocols
Behrendt S, Schwinger A, Tsiasioti C, et al.	2020	Qualitätsmessung mit Routinedaten im Pflegeheim am Beispiel Dekubitus	multi-centred cross-sectional study with administration data	3459 nursing homes in Germany with 215863 residents in reference year 2015	Pressure ulcers	• Age, care level, restricted daily competence, restricted mobility, malnutrition, dehydration, Parkinson, diabetes, incontinence

Appendix H: Review 2 Health information systems in countries

Country	Quality indicator reported	Covariates used	Website
Germany	Pressure ulcer	Stratified in group with high and low risk	Qualität und Transparenz in der Pflege (bundesgesundheitsministerium.de)
Canada	Pressure ulcer	Individual Covariates: Age younger than 65 Personal Severity Index (PSI): Subset 1—Diagnoses More dependence in toileting Resource Utilization Group (RUG): Cognitive Impairment Facility-Level Stratification: Case Mix Index (CMI)	Newly Occurring Stage 2 to 4 Pressure Ulcer | CIHI
US	Pressure ulcer	Not specified	Find Healthcare Providers: Compare Care Near You | Medicare
Australia	Pressure ulcer	No risk adjustment	https://www.gen-agedcaredata.gov.au/topics/quality-in-aged-care
New Zealand	Pressure ulcer	Not specified	Analysis and reporting | interRAI
Belgium	Pressure ulcer, ACP	Not specified	Quality indicators for residential care centres | Visualising the quality of care in Flanders (zorgkwaliteit.be)
the Netherlands	Pressure ulcer, medication review, ACP	Not specified	https://www.zorginzicht.nl/ondersteuning/aanleveren-kwaliteitsgegevens-per-sector/verpleeghuiszorg
Norway	Medication review	Not specified	https://www.helsedirektoratet.no/statistikk/kvalitetsindikatorer/kvalitet-og-kvalitetsindikatorer
Sweden	Pressure ulcer	Not specified	https://www.senioralert.se/resultat/publik-rapport/