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Elements of integrated care approaches for older people:

A review of reviews

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Integrated care, care coordination, multidisciplinary, implementation, older adults, ageing.

Abstract

Objective

The World Health Organization (WHO) recently proposed an Integrated Care for Older People (ICOPE) approach to guide health systems and services in better supporting functional ability of older people. A knowledge gap remains in the key elements of integrated care approaches used in health and social care delivery systems for older populations. The objective of this review was to identify and describe the key elements of integrated care models for elderly people that have been reported in the literature.

Design

Review of reviews using a systematic search method.

Methods

A systematic search was performed in MEDLINE and the Cochrane database in June 2017. Reviews of interventions aimed at care integration at the clinical (micro), organisational/service (meso), or health system (macro) levels for people aged ≥60 years were included. Non-Cochrane reviews published before 2015 were excluded. Reviews were assessed for quality using the AMSTAR 1 tool.

Results

Fifteen reviews (11 systematic reviews, of which 6 were Cochrane reviews) were included, representing 219 primary studies. Three reviews (20%) included only randomised controlled trials (RCTs), while ten reviews (65%) included both RCTs and non-RCTs. The region where the largest number of primary studies originated was North-America (n=89, 47.6%), followed by Europe (n=60, 32.1%) and Oceania (n=31, 16.6%). Eleven (73%) reviews focused on clinical 'micro' and organisational 'meso' integration strategies. The most commonly reported elements of integrated care models were multidisciplinary teams, comprehensive assessment, and case management. Nurses, physiotherapists, general practitioners and social

workers were the most commonly reported service providers. Methodologic quality was variable (AMSTAR scores: 1-11). Seven (47%) reviews were scored as high quality (AMSTAR score ≥8).

Conclusion

Evidence of elements of integrated care for older people focus particularly on micro clinical integration processes, while there is a relative lack of information regarding the meso organisational, and macro system-level integration strategies.

Strengths and limitations of the study

- This review used a systematic search method to identify reviews of integrated care interventions for older adults and represents a component of a broader program of work being undertaken by the World Health Organization (WHO).
- A single author responsible for screening and quality appraisal may have introduced rater some bias.

Background

Health and demographic profiles of the global population are changing rapidly. In particular, life expectancy is increasing and fertility rates are decreasing (1). These changing health profiles are culminating in rapid population ageing – from 2015 to 2050, the proportion of the global population aged 60 years and over will nearly double (2). While increased life expectancy may be a worthy aspiration, older people are not necessarily experiencing functional ability with longevity; that is *Healthy Ageing* (2). An increasing proportion of the global burden of disease is now attributed to non-communicable physical, sensory and cognitive impairments; increasing the disability burden experienced by older people (1). Further, older people commonly experience multi-morbidity, particularly those who are socioeconomically disadvantaged (3-5).

Rapid population ageing coupled with an increasing proportion of older people with significant loses in capacity and long-term complex conditions creates major challenges for health systems, which have been historically designed to provide episodic and curative healthcare. This historical approach to healthcare no longer aligns with the current and future needs of the population. The *World Report on Ageing and Health* and subsequent *Global Strategy and Action Plan on Ageing and Health* advocate for major reforms to health and long-term care systems to support healthy ageing (2, 6). Such reforms are critical and urgent in order to achieve the goals of the UN Sustainable Development Agenda, in particular the SDG 3 for health and wellbeing, which the foundation is universal health coverage. WHO recommends that health and social care services should be targeted towards preventing and managing declines in intrinsic capacity and improving functional ability in older people, rather than supporting a siloed and often disjointed approach to management of individual health conditions (7).

WHO defines integrated care as "services that are managed and delivered so that people receive a continuum of health promotion, disease prevention, diagnosis, treatment, disease-management, rehabilitation and palliative care services, coordinated across the different levels and sites of care within and beyond the health sector, and according to their needs throughout the life course" (8). Accordingly, integrated care strategies can target different levels of service provision: clinical (micro) level, service/organisational (meso) level, or system (macro) level (7, 9). Integration of health and social care is widely advocated as a way to improve the management and outcomes for the increasing numbers of older people with varying health needs (10-17). However, the evidence for strategies to achieve care integration across micro, meso and macro levels remains limited (9, 18-21). The *WHO Framework on Integrated People-Centred Health Services*, provides a whole-of-system roadmap for policy-makers to drive health system and service reform to better support integrated care and health across the life course by optimising the way services are designed, funded, managed and delivered (8, 16). In the context of providing integrated care for older people specifically, WHO has proposed the *Integrated Care for Older People* (ICOPE) approach to inform the application of the *Framework on Integrated People-Centred Health Services* in the context of older people and bridge the gap between what is presumed to be best practice care for older people and emerging evidence (2). The ICOPE approach supports providing health and social care services by promoting governance and integrated service models that maintain or prevent avoidable declines in older people's intrinsic capacity and functional ability. To achieve this, WHO suggests that systems and services need to be organised, co-ordinated and delivered around the preferences, needs and goals older people, rather than the structural needs of services themselves (7). Specifically, the WHO ICOPE approach recommends comprehensive assessments and integrated care plans; shared decision-making and goal setting; support for self-management; multidisciplinary teams; unified information or data-sharing systems;

community linkages or integration; and supportive leadership, governance and financing mechanisms..

While there has been an increasing focus on developing and evaluating integrated care models across the life course at different levels of the health system (22) and the establishment of a taxonomy of elements for implementing integrated care (23), there is currently a knowledge gap regarding the requisite elements of integrated care approaches that address the needs of older people. This knowledge gap hinders the implementation of the WHO ICOPE approach and the evaluation of its effectiveness, particularly the transferability of any recommendations concerning how to improve outcomes of older people across care settings and geographies. Recognising the heterogeneity in integrated care interventions, there is a need to better understand the components of contemporary integrated care approaches (24-26).

The aim of this review was to conduct a review of reviews evaluating integrated care interventions for older people. The review did not seek to synthesise outcomes of integrated care approaches, but rather to identify and appraise the types of integrated care approaches reported in the literature and their intrinsic elements, in people aged ≥60 years in any setting or level of the health and long-term care system. Here, we refer to an 'element' as a discrete component of an integrated care intervention. The evidence review formed part of a larger program of work to identify elements and reach global consensus on key elements for implementation of the ICOPE approach (see: http://www.who.int/ageing/health-systems/icope/icope-consultation/en/).

Methods

Context for the evidence review

An initial phase of evidence synthesis was undertaken by WHO in 2014. A detailed review of the literature (from 2000 to 2014) on health and social care needs of older people and responsiveness of health and long-term care systems are summarised in the *World Report on Ageing and Health* (2). Subsequently, a steering group, with international experts on integrated care, was established to produce background papers on essential micro and meso-level elements on integrated health and social care services (7). In 2016, a face-to-face meeting with experts was organised in Japan as preparatory work for the G7 summit. In this meeting, experts reviewed the evidence synthesised in the background papers and recommended three core micro-level elements for implementing the WHO ICOPE approach: 1) one assessment - every older people should undergo comprehensive assessments; 2) one goal - optimising functional ability; and 3) one care plan - care plans should be shared among all providers (7). The experts also recommended that the implementation of these core micro-level elements required support from meso and macro-level factors. Therefore, a second wave of evidence review (the current review) was performed to identify essential elements of integrated care models that would enable implementation of the WHO ICOPE approach.

Design

A review of reviews using systematic search methods was conducted under pre-defined criteria established by the authors and reported using the Preferred Reporting Items for Review and Meta-Analyses (PRISMA) guidelines (27).

Search strategy

A systematic search was performed in MEDLINE via Ovid and the Cochrane database in June 2017. Non-Cochrane reviews published before 2015 were excluded to identify only recent reviews (and therefore contemporary evidence) and maximise the likely quality of the

included reviews (28). Searches were limited to reviews only and used Medical Subject Headings (MeSH) terms and specific key words relevant to integrated care (e.g. care coordination, collaborative care, transmural care, multidisciplinary care) (29) and older populations (e.g. aging, elderly, frail elderly) (23). Full search strategies are included in Supplementary file 1. Grey literature sources were not included in the search strategy.

Eligibility

Reviews were selected if they included studies that: 1) evaluated integrated care strategies at the micro, meso, or macro levels; 2) targeted older people (≥ 60 years); 3) were published in a peer-reviewed journal in English; and 4) used one of the review designs (e.g. systematic, meta-analysis, rapid, qualitative) as described by Grant and Booth (30). Reviews were excluded if they focused on an intervention, e.g. self-management support, but without any coordinated care activity among care-givers.

Selection and data extraction

Review selection, assessment against eligibility criteria, and quality assessment were performed by one reviewer (PPV) using Covidence systematic review software. Data extraction was performed initially by a one author (PPV). Titles and abstracts of the search yield were screened and full-texts of potentially relevant papers were reviewed against eligibility. Data were extracted using a standardized data extraction form. The following information was collected from eligible reviews: year of publication, review methodology (aim, review design and design of its included studies, number of primary studies included, number of databases searched, method of quality appraisal and analysis); characteristics of included reviews (number of included participants, type of participants, and countries/regions), intervention characteristics (study population, type of providers, type of

integrated care intervention(s), and elements of the interventions), and type of outcome measures reported. Thereafter, a second author (AMB) screened the extracted information for accuracy.

Quality assessment

Methodological quality of included reviews were appraised using the Assessment of Multiple Systematic Reviews (AMSTAR 1) tool (31). One researcher (PV) assessed the quality of the included reviews.

Data synthesis and analysis

A narrative synthesis was used for reporting, owing to the heterogeneity of study designs, interventions and outcome measures reported across the primary studies. For each included review, details about the type of integrated care intervention, specific elements of the intervention, and outcome measures were reported. The Rainbow Model of Integrated Care and associated taxonomy of key elements for implementation of integrated care approaches were used as the coding frame for the type of interventions and their elements (9, 23). After completing the primary data analysis we then considered alignment of the coded elements within the strategies of the *WHO Framework on integrated people-centred health services* (8, 16). All other review-related characteristics were narratively synthesised for comparison across reviews, to highlight common findings.

Results

Study selection

Overall the search yielded 1,645 citations, of which 1,462 were screened at the title and abstract level with 107 considered as potentially relevant and underwent full-text screening

for inclusion. Ninety-two articles were subsequently excluded, resulting in a total of 15 reviews to be included (Figure 1).

Characteristics of the included reviews

The characteristics of the 15 included reviews as shown in Table 1. Reviews were published between 2005 and 2016, and included 11 (73%) systematic reviews (32-42), of which six incorporated meta-analyses or meta-synthesis (34-37, 39, 40) and six were Cochrane reviews, and four non-systematic reviews (43-46). Three reviews (20%) included only randomised controlled trials (RCTs) (32, 36, 38), while ten reviews (65%) included both RCTs and non-RCTs (33-35, 40-42, 44-47). Collectively, the reviews included 219 primary studies from 222 papers, with the number of primary studies included in reviews ranging from 2 to 36, and the number of participants from 811 to 22,502. The number of participants in 6 reviews could not be determined (39, 41, 43-46). The region where the largest number of primary studies originated was North America (n=89, 47.6%), followed by Europe (n=60, 32.1%) and Oceania (n=31, 16.6%). The most common countries were the United States (n=60, 32.1%), Canada (n=29, 15.5%), Australia (n=28, 15%) and the United Kingdom (n=25, 13.4%).

Integrated care interventions and their elements

The types of integrated care interventions are summarised in Table 2. Most reviews reported on a combination of interventions that were clinically (micro-level) or professionally (meso-level) focussed (n=11, 73%). Only one review reported on a combination of an organisational/service (meso) and system (macro) level integrated care interventions (41). The reported interventions were all multifaceted, with most containing two or more discrete elements that consistently featured case management and multidisciplinary planning and/or care delivery. The most commonly reported elements of the integrated care models reported

in reviews were multidisciplinary team care (n=11, 73%), comprehensive assessment (n=11, 73%), case management (n=5, 33%), systematic risk factor screening (n=5, 33%), patient education (n=4, 27%), professional education (n=4, 27%), home visits (n=4, 27%), and medication review (n=4, 27%). These most common elements aligned with strategies of the *WHO Framework on integrated people-centred health services*, including: i) creating and enabling environment; ii) co-ordinating services within and across sectors; and iii) re-orienting the model of care. Across the included reviews, the following care providers were frequently represented in the integrated care interventions: nurses (n=12, 80%), physiotherapists (n=10, 67%), general practitioners (n=9, 60%), and social workers (n=9, 60%). The majority of included reviews reported on hospitalisation (n=11, 73%), physical functioning (e.g. self-reported activities of daily living, dependence etc.) (n=9, 60%), cost and resource utilisation (n=7, 47%), and mortality (n=7, 47%) as outcomes of the intervention(s).

Methodological quality

The overall methodological quality of the included reviews is summarised in Figure 2. The overall median (IQR) score was 7 (6.5), compared with 9 (7.5) among systematic reviews and 4.5 (3.25) among non-systematic reviews. Seven reviews (47%), all systematic reviews, were of high quality (AMSTAR 1 score ≥ 8). While most reviews reported study characteristics, undertook a comprehensive search, and identified possible conflicts of interest; non-systematic reviews scored poorly across other AMSTAR 1 domains.

Discussion

We sought to review the elements of integrated care approaches for older people, not the comparative effectiveness of these elements, which was the focus if an earlier review in the context of managing multi-morbidity in primary care (48). This review identified 15 reviews of largely moderate to high quality, with evidence derived from high-income settings where governance and delivery of healthcare operates under various publicly and privately funded models. Among the reviews included, the integrated care interventions reported in primary studies were largely multifaceted with the majority of specific elements targeting clinical (micro) level integration strategies for older people, consistent with the results of earlier reviews (11, 48). Notably, we only identified one review considering macro-level integration strategies (41), and this review aligned with a broader range of components of the WHO *Framework on integrated people-centred health services.*

Multidisciplinary team care, comprehensive assessment, and case management were the most common elements identified across the integrated care interventions; consistent with the WHO ICOPE approach. These specific elements are also suggested to be the most effective for integrated care approaches that target management of multi-morbidity (48). Interprofessional education and patient education were less commonly identified as explicit features, although it may be that education was implicit in other elements, such as self-management. While some reviews identified self-management as an element of the intervention, this was not widespread, tending to reflect a service-focussed approach to integrated care interventions. Outcomes of integrated care interventions predominantly focused on hospitalisation, physical functioning and mortality among older people.

Overall, we observed a relative low proportion of organisational (meso) and system (macro) level integration interventions (and therefore elements) in the reviews. The emphasis on micro-level is consistent with findings on models of care generally (11, 18, 20, 22, 48, 49). This most likely reflects the complexity in tackling whole-of-system issues, both in terms of implementation and measurement complexity, resulting in a one-dimensional focus to integrated care interventions (50). Support for research or evaluation activities that target organisational/service and system-level integration strategies is, therefore, also important and should be undertaken in partnership with stakeholders at all levels of the health system (49). The underlying assumption is that a significant impact on clinical, quality of care, and economic outcomes requires various multiple interacting interventions targeted at multiple clinical, professional, organisational, and system levels (18). The WHO *Framework on integrated people-centred health services* provides important guidance in this area (8, 16). Until the existing evidence base is supplemented by a volume of new data measuring the effect of clinical (micro), service/organisational (meso), and system (macro) level integration interventions across different contexts, strong conclusions to support the design of specific, multi-level integrated care approaches is limited.

We also observed a reduced emphasis on outcomes that consider patients' experiences of care (e.g. satisfaction, quality of care) and constructs or tools that characterise functional ability. Whereas these outcomes are person-centred, the outcomes reported in most reviews tended to be service or system-centred, reflecting the historical orientation of health systems/services and measurement, which has not been person-focussed. This observation outlines the need to orient interventions and measurement to better reflect person-centred outcomes (PROMs) and experiences of care (PREMs) to support innovation in person-centred approaches to care

planning and delivery (51), which is the key focus of the WHO approach to healthy ageing and achieving efficient and sustainable health and long-term care systems (2).

Building multidisciplinary workforce capacity to better deliver integrated care models and meet the needs of older people is a key recommendation of the WHO *World Report on Ageing and Health* (2) and consistent with emerging evidence for delivering integrated care for older people with complex health needs (52). In this review, interventions were most commonly directed towards building capacity in nurses, physiotherapists, general practitioners and social workers. These diverse discipline foci highlight the importance of addressing health and social care needs, dealing with whole-of-health and addressing multi-morbidity, and in particular maintaining a strong focus on enabling physical and mental capacity.

The quality of the evidence offered in the included reviews was variable. Unsurprisingly, systematic reviews were rated as much higher quality than non-systematic reviews. We elected to include all review types in order to synthesise a wide body of literature concerning the reported elements of integrated care models, rather than just limiting our search to RCTs in systematic reviews. We used the AMSTAR 1 critical appraisal tool to assess overall methodological quality of the included reviews. While AMSTAR 1 is currently the most commonly used tool, we acknowledge that AMSTAR 2 has recently been released and may be more appropriate for quality appraisal in future reviews that include non-randomised trials (53), although users' experiences with this modified tool remains uncertain. AMSTAR 1 is limited in its application to assessing risk of bias, which is addressed by AMSTAR 2 and the new ROBIS tool (54)

As most existing studies focus on interventions aimed at coordinating care at the clinical (micro) level, additional longitudinal cross-sectoral research and program evaluation could help to identify the effectiveness of interventions targeted at a wider range of clinical, professional, organisational, and system levels of care (9, 18, 20). Given the disproportionate focus on micro-level strategies to date, there is a need for a greater focus on meso- and macro-level strategies to achieve integrated care. While the current review provides evidence for elements of integrated care approaches, it is now important to link these elements with outcomes in different settings, given the critical importance of setting or context in determining outcomes and sustainable implementation (18, 55). In particular, interventions that integrate health and social care are needed to better understand how services and systems can better respond to the holistic needs of older people. A more extensive web of evidence is needed for low and middle-income settings (17).

This review adopted a pragmatic approach to identify and synthesise recent overview evidence about the elements of integrated care models for older people, building on an existing taxonomy and Rainbow Model of Integrated Care (9, 23). Although the search period was limited to recent reviews for non-Cochrane reviews and to two databases without grey literature searches, which may have resulted in some relevant reviews and recent primary studies not being included, a systematic search method was used to identify recent reviews and a quality appraisal undertaken (29). Only one reviewer was responsible for screening and quality appraisal represents a possible rater bias. Given that non-systematic reviews were also included, the quality of these evidence sources was lower and important characterising data for the primary studies were often incompletely reported. The majority of the evidence included was sourced from high-income countries and the transferability of the findings may not be relevant to low and middle-income settings.

Conclusion

This review is the first to synthesise review evidence for integrated care interventions for older people. Our findings show that integrated care strategies for older people focus particularly on micro clinical processes and there is a relative lack of evidence regarding meso and macro-level integration strategies. Key elements of existing models include multidisciplinary team care, comprehensive assessment, and case management. This evidence can help to inform the design of integrated care interventions for older people and inform the implementation of the WHO ICOPE approach.

Figure legends

Figure 1: Flowchart of search outcomes and study selection

Figure 2: Summary of AMSTAR 1 quality appraisal scores for 11 systematic reviews (A) and 4 non-systematic reviews (B).

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List of abbreviations

RCT: Randomised Control Trial; PRISMA: Preferred Reporting Items for Review and Meta-Analyses; HRQoL: Health-related quality of life.

Declarations

Ethical approval and consent to participate

Not required

Consent for publication

Not applicable

Competing interests

Not applicable

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Authors' contributions

JAT, PPV and IAdC conceived the study. PPV designed the methods and undertook the search, appraisal, extraction and reporting of the data, with a subset performed by AMB. AMB and PPV drafted the manuscript, and all the authors revised it for intellectual content. All authors read and approved the final manuscript. The views expressed in this paper are those of the authors and do not necessarily reflect the views of WHO.

Data sharing

No additional data are available

Transparency

The authors affirm that the manuscript is an honest, accurate, and transparent account of the study being reported; no important aspects of the study have been omitted.

Table 1. Characteristics of included reviews (n=15)

Review (year)	Aim	Review design (design of included studies)	No. of primary studies included	Timeframe of primary studies	Countries where primary studies were undertaken (n*)	Regions where primary studies were undertaken (n*)	Total no. of participants in primary studies	Number of databases searched	Search terms provided	Languages restrictions	Quality or bias assessment	Evidence synthesis
Alldred et al (2016) (32)	To assess the effect of interventions to optimise medicines prescribing for older people living in care homes	Systematic review (RCTs)	12	1994-2015	Australia (3); Canada (1); Finland (1); Israel (1); The Netherlands (1); New Zealand (1); Spain (1); Sweden (1); UK (2); and USA (1)	Europe (6); Middle East (1); North America (2); Oceania (4)	10953	6	Yes	No	Cochrane collaboration's risk of bias tool; and GRADE	Narrative and tabular
Berthelsen and Kristensson (2015) (33)	To describe the content and effects of case management interventions for informal caregivers of older adults	Systematic review (RCTs and non-RCTs)	7	1997-2011	Finland (2); The Netherlands (1); and USA (4)	Europe (3); and North America (4)	6956	3	Yes	NS	GRADE	Narrative and tabular
Brown et al (2015) (34)	To assess the effectiveness of day hospitals for older people in preventing death, disability, institutionalisation and improving subjective health status.	Systematic review and meta-analysis (RCTs and non-RCTs)	16	1962-2008	Australia (1); Canada (1); Finland (1); Hong Kong (1); New Zealand (1); UK (8) and USA (3)	Asia (1); Europe (9); North America (4); and Oceania (2)	3689	23	Yes	No	Cochrane collaboration's risk of bias tool; and GRADE	Narrative and tabular
Cochrane et al (2016) (35)	To assess the effects of home-care rehabilitation services for maintaining and improving the functional independence of older adults	Systematic review and meta-analysis (RCTs and non-RCTs)	2	2013-2015	Australia (1); Norway (1)	Europe (1); Oceania (1)	811	9	Yes	No	Cochrane collaboration's risk of bias tool; and GRADE	Narrative and tabular
Costa-de Lima et al (2015) (43)	To search the literature for multi-professional, cost-effective intervention programs for elderly people in primary care settings	Literature review (NS)	32	1993-2012	NS	NS	NS	10	Yes	Yes	None	Narrative and tabular
Deschodt et al (2016) (44)	To explore the structure and processes of interdisciplinary geriatric consultation teams	Scoping review (RCTs and non-RCTs)	25	1983-2013	Belgium (1); Canada (2); France (3); Germany (1); The Netherlands (1); Taiwan (1); UK (2); and USA (14)	Asia (1); Europe (8); North America (16);	NS	3	Yes	Yes	None	Narrative and tabular

Review (year)	Aim	Review design	No. of primary	Timeframe of primary	Countries where primary studies	Regions where	Total no. of	Numbe r of	Search terms	Languages restrictions	Quality or bias	Evidence synthesis
Ellis et al (2011) (36)	To asses the effectiveness of comprehensive geriatric assessment in hospital for older adults admitted as an emergency.	Systematic review and meta-analysis (RCTs)	22	1984 -2007	Australia (1); Canada (4); Germany (1); Norway (1); Sweden (1); and USA (13)	Europe (3); North America (17); and Oceania (1)	10315	6	Yes	NS	Cochrane collaboration's risk of bias tool	Narrative and tabular
Fan et al (2015) (45)	To review the effectiveness of interventions targeting the elderly population in reducing emergency department utilisation	Literature review (RCTs and non-RCTs)	36	1993-2013	Australia (9): Canada (8); France (1); Italy (1); Singapore (1); UK (1); and USA (15)	Asia (1); Europe (3); North America (23); and Oceania (9)	NS	5 s	Yes	Yes	Assessment tool developed by the Effective Public Health Practice Project	Narrative and tabular
Frank and Wilson (2015) (46)	To review Canadian models of care for frail seniors provided in primary care settings	Overview (RCTs and non-RCTs)	6	2006-2015	Canada (6)	North America (6)	NS	2	No	NS	None	Narrative
Handoll et al (2009) (37)	To assess the effects of multidisciplinary rehabilitation for older patients with proximal fracture that has been surgically repaired.	Systematic review and meta-analysis (RCTs and non-RCTs)	13	1986-2008	Australia (3); Canada (1); Spain (1); Sweden (2); Taiwan (1); and UK (4)	Asia (1); Europe (7); North America (1); Oceania (3)	2498	6	Yes	No	Cochrane collaboration's risk of bias tool	Narrative and tabular
Hickman et al (2015) (38)	To identify multidisciplinary team interventions to optimise health outcomes for older people in acute care settings	Systematic review (RCTs)	6	2005-2014	Australia (1); Belgium (1); France (1); Finland (1); Spain (1); and Taiwan (1)	Asia (1); Europe (4); and Oceania (1)	1558	3	Yes	Yes	None	Narrative and tabular
Ke et al (2015) (39)	To explore nurses' views regarding implementing advance care planning for older people	Systematic review and meta-synthesis of qualitative evidence	18	1993-2013	Australia (2); Canada (2); New Zealand (1); South Africa (1); Switzerland (1); UK (7); and USA (4)	Africa (1); Europe (8); North America (6); and Oceania (3)	NS	4	Yes	Yes	None	Narrative and tabular
Lowthian et al (2015) (40)	To examine the effectiveness of emergency department community transition strategies	Systematic review and meta-analysis (RCTs and non-RCTs)	11 papers concerning 9 studies	1996-2013	Australia (6); Canada (4); Hong Kong (1); Scotland (1); and Singapore (1)	Asia (2); Europe (1); North America (4); Oceania (6)	22502	3	Yes	No	Cochrane collaboration's risk of bias tool	Narrative and tabular
McClure et al (2005) (41)	To assess the effectiveness of population-based interventions for reducing fall-related injuries among older people.	Systematic review. (RCTs and non-RCTs)	6	1996-2006	Australia (1); Denmark (1); Norway (1); Sweden (2); Taiwan (1)	Asia (1): Europe (4); Oceania (1)	NS	9	Yes	No	Checklist of the Cochrane EPOC review group	Narrative and tabular
Phelan et al (2015) (42)	To search for intervention strategies that have any measurable effect on acute-care hospitalizations among community-dwelling adults with	Systematic review (RCTs and non-RCTs)	10 papers concerning 9 studies	2002 - 2010	Finland (1); The Netherlands (1); UK (1); and USA (6)	Europe (3); and North America (6)	1332	9	Yes	Yes	None	Narrative and tabular

Review (year)	Aim	Review design	No. of primary	Timeframe of primary	Countries where primary studies	Regions where	Total no. of	Numbe r of	Search terms	Languages restrictions	Quality or bias	Evidence synthesis
	dementia											

* n: number of studies may not sum to the number of primary included, as primary studies may have been undertaken in more than one country.
Abbreviation: RCT, Randomised Controlled Trial(s); GRADE, Grades of Recommendations, Assessment, Development and Evaluation; EPOC, Cochrane Effective Practice and Organisation of Care Review Group; NS, not stated

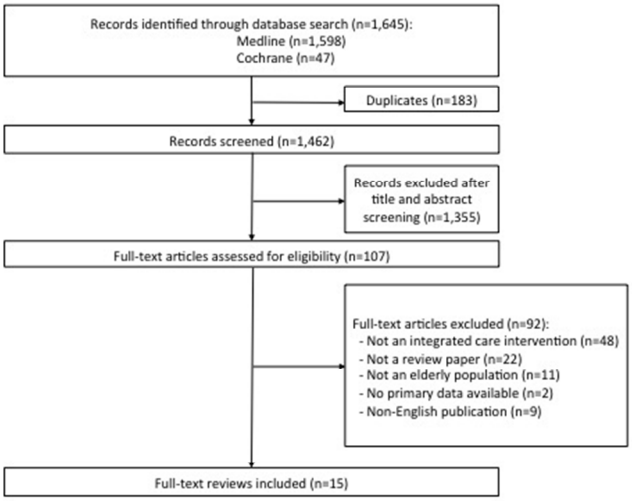
Table 2. Summary of elements of the integrated care models reported across reviews

Review (year)	Study population(s) and (setting)	Health system level of intervention(s) reported	Type(s) of integrated care intervention(s)	Key care or service elements within integrated care intervention(s) (n*)	Disciplines providers included												Description of control(s)	Outcome(s) reported
					NU	GT	PH	GP	PA	PT	OT	DT	PS	SW	MS	OS		
Alldred et al (2016) (32)	People aged ≥ 65 years (living in care homes)	Professional (meso) level	Case management; and Multidisciplinary team care	Medication review (10); Multidisciplinary team (4); Professional education (5); Clinical information management (1)	•	•	•	•	•							•	Usual care (by general practitioner)	Mortality; Hospitalisation; Adverse drug events; HRQoL; and Cost and resource utilisation
Berthelsen and Kristensson (2015) (33)	Informal caregivers to people aged > 65 years (community care settings)	Clinical (micro) level	Case management; Individual multidisciplinary care plan; and Self-management	Case management (4); and Patient education (3)	•					•	•					•	Usual care	Quality of care; Physical functioning; and Psychological functioning
Brown et al (2015) (34)	People aged ≥ 60 years (receiving medical care in medical day hospitals)	Clinical (micro) level; and professional (meso) level	Individual multidisciplinary care plan; and Multidisciplinary team care	Multidisciplinary team (7); Comprehensive assessment (5)	•	•				•	•	•	•	•		•	No comprehensive care; Domiciliary care; or comprehensive care	Mortality; Cost and resource utilisation; Patient satisfaction; Physical functioning
Cochrane et al (2016) (35)	People aged ≥ 65 years (living in own home)	Clinical (micro) level	Patient education; Information provision to clients; Individual multidisciplinary care plan; and Self-management	Medication review (1); Comprehensive assessment (1); and Case management(1);						•	•						Usual care (standard home care)	Mortality; Hospitalisation; HRQoL; Cost and resource utilisation; and Physical functioning
Costa-de Lima et al (2015) (43)	People aged ≥ 60 years (community-dwelling people receiving care in primary care settings)	Clinical (micro) level; and professional (meso) level	Case management; Multidisciplinary care team; Individual multidisciplinary care plan; and Inter-professional education	Case management; Multidisciplinary team; Comprehensive assessment; Systematic risk screening; Home visits; Medication review; Patient education; and Professional education;	•	•	•	•	•	•		•		•	•		NS	Mortality; Hospitalisation; Patient satisfaction; and Physical functioning
Deschodt et al (2016) (44)	Geriatric patients aged ≥ 60 years (within hospital settings – medical, surgical and intensive care units and emergency departments)	Clinical (micro) level; and professional (meso) level	Case management; Individual multidisciplinary care plan; and Multidisciplinary team care	Comprehensive assessment; Systematic risk screening; and Multidisciplinary team	•	•	•			•	•	•		•			NS	Physical functioning; Psychological functioning; and Social functioning

Review (year)	Study population(s) and (setting)	Health system level of	Type(s) of integrated care intervention(s)	Key care or service elements within integrated	Disciplines providers included	Description of control(s)	Outcome(s) reported
Ellis et al (2011) (36)	People aged ≥ 65 years (admitted to hospital)	Clinical (micro) level; and professional (meso) level	Case management; Individual multidisciplinary care plan; and Multidisciplinary team care	Comprehensive assessment (22); Multidisciplinary team (22); and Discharge planning (4)	• • • • • • • • • •	Usual care	Mortality; Hospitalisation; Cost and resource utilisation; Physical functioning; and Psychological functioning
Fan et al (2015) (45)	People aged ≥ 60 years (community based [home or outpatients] and hospital based [emergency department or hospital ward])	Clinical (micro) level; and professional (meso) level	Case management; Individual multidisciplinary care plan; Multidisciplinary team care	Multidisciplinary team (20); Systematic risk screening (16); Comprehensive assessment (16); and Discharge planning (15);	• • • • • •	NS	Hospitalisation; and Cost and resource utilisation
Frank and Wilson (2015) (46)	People aged ≥ 64 years (community-based care)	Clinical (micro) level; and professional (meso) level	Case management; Individual multidisciplinary care plan; Multidisciplinary team care	Case management (2); Comprehensive assessment (2); Multidisciplinary team (3); Systematic risk screening (1); and Discharge planning (1)	• • • • •	NS	Hospitalisation; Quality of care; and Cost and resource utilisation
Handoll et al (2009) (37)	People aged ≥ 50 years with surgically repaired proximal femur fracture (inpatient, home and ambulatory care)	Clinical (micro) level; and professional (meso) level	Case management; Individual multidisciplinary care plan; and Multidisciplinary team care	Comprehensive assessment (6); Multidisciplinary team (12); Discharge planning (9); and Home visits (2)	• • • • • • • • • • •	Usual care	Mortality; Hospitalisation; and Adverse events; and Physical functioning
Hickman et al (2015) (38)	People aged ≥ 65 years (acute care inpatient setting)	Clinical (micro) level; and professional (meso) level	Case management; Individual multidisciplinary care plan; Self-management; and Multidisciplinary team care	Comprehensive assessment (4); Multidisciplinary team (6); Discharge planning (4); Medication review (1); Patient education (1)	• • • • • • • • •	NS	Hospitalisation; Adverse events; HRQoL; and Physical functioning
Ke et al (2015) (39)	Nurses caring for older people (hospital, community-based serves and facility-based services)	Clinical (micro) level; and professional (meso) level	Centrality of client needs; Patient education; Interaction between professional and client; Active client participation; Multidisciplinary team care	Patient education; and Professional education	• • • • •	NA	NS
Lowthian et al (2015) (40)	People aged ≥ 65 years (emergency department)	Clinical (micro) level; and professional (meso) level	Case management; Individual multidisciplinary care plan; and Multidisciplinary team care	Comprehensive assessment (7); Multidisciplinary team (1); Discharge planning (8); and Systematic risk screening (3)		Usual care	Hospitalisation; and Physical functioning

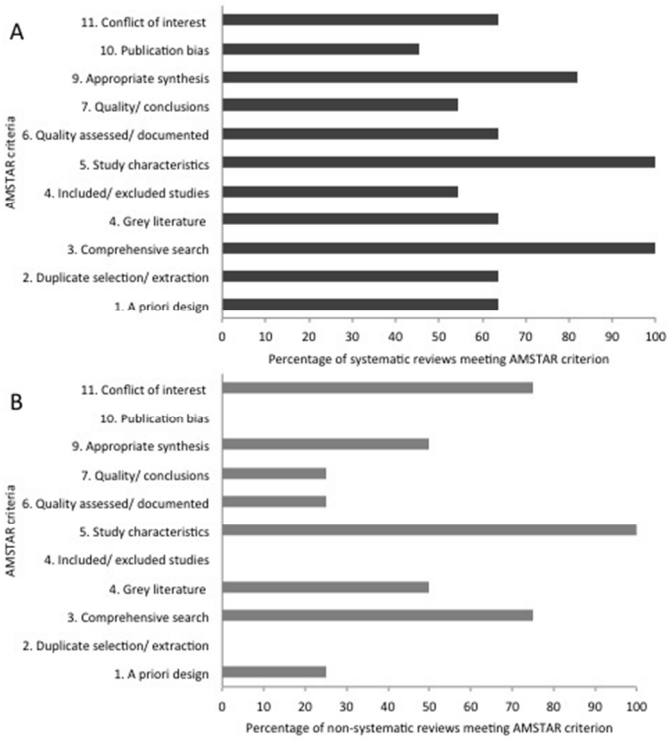
Review (year)	Study population(s) and (setting)	Health system level of	Type(s) of integrated care intervention(s)	Key care or service elements within integrated	Disciplines providers included			Description of control(s)	Outcome(s) reported
McClure et al (2005) (41)	People aged ≥ 65 years (population-based in a community)	Organisational (meso); and system (macro) level	Social value creation; Stakeholder management; Inter-organisational governance; and Population needs assessment	Population-health interventions (5); Policy interventions (1); Professional education (1); and Home visits (3)	•	•	•	Similar population	Mortality; Hospitalisation; Adverse events; and Cost and resource utilisation
Phelan et al (2015) (42)	People aged ≥ 55 years with dementia (community dwelling)	Clinical (micro) level; and professional (meso) level	Case management; Multidisciplinary team care; Individual multidisciplinary care plan; and Inter-professional education	Case management (4); Multidisciplinary team (4); Comprehensive assessment (4); Home visits (1); and Inter-professional education (1)				NS	Hospitalisation

* n: number of studies is reported where stated by the review authors. Not all reviews reported the number of primary studies that include specific care or service elements
Abbreviation: NU, Nurse; GT, Geriatrician; PH, Physician; GP, General Practitioner; PA, Pharmacist; PT, Physiotherapist; OT, Occupational therapist; DT, Dietician; PS, Psychologist; SW, Social worker; MS, Medical specialist; OS, Other staff, NS, not stated; NA, not applicable; HRQoL, Health Related Quality of Life



Flowchart of search outcomes and study selection

254x142mm (72 x 72 DPI)



Summary of AMSTAR 1 quality appraisal scores for 11 systematic reviews (A) and 4 non-systematic reviews (B)

254x190mm (72 x 72 DPI)

Supplementary file 1. Electronic search strategies

Table 1. Search strategy for Medline

MEDLINE	1	exp Aged/
	2	exp Frail Elderly/
	3	(elder* or old people or older people or old adult* or old person* or older adult* or older person* or senior* or aging person* or ageing person* or aging adult*).tw.
	4	(old adj5 people).tw.
	5	5. or/1-4
	6	exp "Delivery of Health Care, Integrated"/
	7	((integrated or coordinated or co-ordinated or comprehensive or collaborative or transmural or continuity or interdisciplinar* or multidisciplinar*) adj5 (health* or care* or delivery or system*)).tw.
	8	exp Managed Care Programs/
	9	((interdisciplin* or multidisciplin*) adj5 care plan).tw.
	10	"accountable care organi#ation*".tw.
	11	"health maintenance organi#ation*".tw.
	12	((care management or managed care) adj5 (program* or plan* or team* or clinic* or delivery or system*)).tw.
	13	managed care.tw.
	14	(insurance adj5 (case management or disease management)).tw.
	15	exp Patient Care Planning/
	16	Patient Care Management/
	17	Disease Management/
	18	case management.tw.
	19	(disease management adj5 (program* or plan* or team* or clinic* or delivery or system*)).tw.
	20	Critical Pathways/
	21	((critical pathway* or clinical pathway* or clinical follow-up) adj5 (team* or clinic* or plan* or program* or care or health* or delivery or system*)).tw.
	22	Comprehensive Health Care/
	23	((integrated or coordinated or co-ordinated) adj5 (care or clinic* or care team* or care plan*)).tw.
	24	((interdisciplin* or multidisciplin*) adj5 (team* or clinic* or plan* or program* or care or health* or delivery or system*)).tw.
	25	Continuity of Patient Care/
	26	(continuity of care adj5 (program* or plan* or team* or clinic* or delivery or system*)).tw.
	27	Patient-Centered Care/
	28	((patient-centered or patient-centred) adj5 (team* or clinic* or plan* or program* or care or health* or delivery or system*)).tw.
	29	Patient Care Team/
	30	Community Networks/
	31	Community Health Planning/
	32	((community care or community health) adj5 (program* or clinic* or plan* or team* or delivery or system*)).tw.
	33	exp Self Care/
	34	((self-care or self-management) adj5 (program* or clinic* or plan* or team* or delivery or system*)).tw.
	35	or/6-34
	36	and/5,35
	37	review.ab.
	38	review.pt.
	39	meta-analysis.ab.
	40	meta-analysis.pt.
	41	meta-analysis.ti.
	42	or/37-41
	43	letter.pt.
	44	comment.pt.
	45	editorial.pt.
	46	or/43-45
	47	42 not 46
	48	36 and 47

Table 2. Search strategy for Cochrane Library

COCHRANE	1	MeSH descriptor: [Aged] explode all trees
	2	MeSH descriptor: [Frail Elderly] explode all trees
	3	(elder* or old people or older people or old adult* or old person* or older adult* or older person* or senior* or aging person* or ageing person* or aging adult*):ti,ab,kw
	4	(old next (people)):ti,ab,kw
	5	{or #1-#4}
	6	MeSH descriptor: [Delivery of Health Care, Integrated] explode all trees
	7	MeSH descriptor: [Managed Care Programs] explode all trees
	8	MeSH descriptor: [Self Care] explode all trees
	9	((integrated or coordinated or co-ordinated or comprehensive or collaborative or transamural or continuity) near/5 (health* or care* or delivery or system* or team* or clinic* or plan* or program*)):ti,ab,kw
	10	"managed care":ti,ab,kw
	11	"case management":ti,ab,kw
	12	"disease management":ti,ab,kw
	13	(accountable next care next organi*ation):ti,ab,kw
	14	(health next maintenance next organi*ation):ti,ab,kw
	15	((care next management) near/5 (program* or plan* or team* or clinic* or delivery or system*)):ti,ab,kw
	16	(community next (care or health or network*)):ti,ab,kw
	17	"health care planning":ti,ab,kw
	18	(critical next pathway*):ti,ab,kw
	19	(clinical next pathway*):ti,ab,kw
	20	(("clinical follow-up") near/5 (team* or clinic* or plan* or program* or care or health* or delivery or system*)) ti,ab,kw
	21	(("patient-centered" or "patient-centred") near/5 (team* or clinic* or plan* or program* or care or health* or delivery or system*)):ti,ab,kw
	22	("patient care" next (team* or clinic* or plan* or program* or care or health* or delivery or system* or manage*)):ti,ab,kw
	23	"patient decision-making":ti,ab,kw
	24	(("self-management" or "self-care") near/5 (program* or clinic* or plan* or team* or delivery or system*)):ti,ab,kw
	25	{or #6-#24}
	26	{and #5, #25} in Review

BMJ Open

Elements of integrated care approaches for older people: A review of reviews

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Elements of integrated care approaches for older people:

A review of reviews

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Key words
Integrated care, care coordination, multidisciplinary, implementation, older adults, ageing.

Abstract

Objective

The World Health Organization (WHO) recently proposed an Integrated Care for Older People (ICOPE) approach to guide health systems and services in better supporting functional ability of older people. A knowledge gap remains in the key elements of integrated care approaches used in health and social care delivery systems for older populations. The objective of this review was to identify and describe the key elements of integrated care models for elderly people reported in the literature.

Design

Review of reviews using a systematic search method.

Methods

A systematic search was performed in MEDLINE and the Cochrane database in June 2017. Reviews of interventions aimed at care integration at the clinical (micro), organisational/service (meso), or health system (macro) levels for people aged ≥60 years were included. Non-Cochrane reviews published before 2015 were excluded. Reviews were assessed for quality using the AMSTAR 1 tool.

Results

Fifteen reviews (11 systematic reviews, of which 6 were Cochrane reviews) were included, representing 219 primary studies. Three reviews (20%) included only randomised controlled trials (RCTs), while ten reviews (65%) included both RCTs and non-RCTs. The region where the largest number of primary studies originated was North-America (n=89, 47.6%), followed by Europe (n=60, 32.1%) and Oceania (n=31, 16.6%). Eleven (73%) reviews focused on clinical 'micro' and organisational 'meso' care integration strategies. The most commonly reported elements of integrated care models were multidisciplinary teams, comprehensive assessment, and case management. Nurses, physiotherapists, general practitioners and social

workers were the most commonly reported service providers. Methodologic quality was variable (AMSTAR scores: 1-11). Seven (47%) reviews were scored as high quality (AMSTAR score ≥8).

Conclusion

Evidence of elements of integrated care for older people focus particularly on micro clinical care integration processes, while there is a relative lack of information regarding the meso organisational, and macro system-level care integration strategies.

Strengths and limitations of the study

- While existing reviews summarise evidence for effectiveness of integrated care approaches, this review of reviews summarised evidence on the elements (components) of integrated care interventions for older adults, providing important data to inform implementation activities.
- This review used a systematic search method to identify reviews of integrated care interventions for older adults and represents a component of a broader program of work being undertaken by the World Health Organization (WHO) to support implementation of the WHO Integrated Care for Older People (ICOPE) approach.
- A single author responsible for screening and quality appraisal may have introduced rater some bias.

Background

Health and demographic profiles of the global population are changing rapidly. In particular, life expectancy is increasing and fertility rates are decreasing (1). These changing health profiles are culminating in rapid population ageing – from 2015 to 2050, the proportion of the global population aged 60 years and over will nearly double (2). While increased life expectancy may be a worthy aspiration, older people are not necessarily experiencing functional ability with longevity; that is *Healthy Ageing* (2). An increasing proportion of the global burden of disease is now attributed to non-communicable physical, sensory and cognitive impairments; increasing the disability burden experienced by older people (1). Further, older people commonly experience multi-morbidity, particularly those who are socioeconomically disadvantaged (3-5).

Rapid population ageing coupled with an increasing proportion of older people with significant loses in intrinsic capacity and long-term complex conditions creates major challenges for health systems, which have been historically designed to provide episodic and curative healthcare (6, 7). This historical approach to healthcare no longer aligns with the current and future needs of the population. The *World Report on Ageing and Health* and subsequent *Global Strategy and Action Plan on Ageing and Health* advocate for major reforms to health and long-term care systems to support *healthy ageing* (2, 8). Such reforms are critical and urgent in order to achieve the goals of the UN Sustainable Development Agenda, in particular the SDG 3 for health and wellbeing, which the foundation is universal health coverage. WHO recommends that health and social care services should be targeted towards preventing and managing declines in intrinsic capacity and improving functional ability in older people, rather than supporting a siloed and often disjointed approach to management of individual health conditions (6).

WHO defines integrated care as "services that are managed and delivered so that people receive a continuum of health promotion, disease prevention, diagnosis, treatment, disease-management, rehabilitation and palliative care services, coordinated across the different levels and sites of care within and beyond the health sector, and according to their needs throughout the life course" (9). Accordingly, integrated care strategies can target different levels of service provision: clinical (micro) level, service/organisational (meso) level, or system (macro) level (6, 10). Integration of health and social care is widely advocated as a way to improve person-centred and system-centred outcomes for the increasing numbers of older people with varying and sometimes complex health needs (11-18). However, the evidence for strategies to achieve care integration across micro, meso and macro levels remains limited (10, 19-22). The *WHO Framework on Integrated People-Centred Health Services*, provides a whole-of-system roadmap for policy-makers to drive health system and service reform to better support integrated care and health across the life course by optimising the way services are designed, funded, managed and delivered (9, 17). In the context of providing integrated care for older people specifically, WHO has proposed the *Integrated Care for Older People* (ICOPE) approach to inform the application of the *Framework on Integrated People-Centred Health Services* in the context of older people and bridge the gap between what is presumed to be best practice care for older people and emerging evidence (2). The ICOPE approach supports providing health and social care services by promoting governance and integrated service models that maintain or prevent avoidable declines in older people's intrinsic capacity and functional ability. To achieve this, WHO suggests that systems and services need to be organised, co-ordinated and delivered around the preferences, needs and goals of older people, rather than the structural needs of services themselves (6). Specifically, the WHO ICOPE approach recommends comprehensive assessments and integrated care plans; shared decision-making and goal setting; support for self-management; multidisciplinary teams;

unified information or data-sharing systems; community linkages or integration; and supportive leadership, governance and financing mechanisms.

While there has been an increasing focus on developing and evaluating integrated care models across the life course at different levels of the health system (23) and the establishment of a taxonomy of elements for implementing integrated care (24), there is currently a knowledge gap regarding the requisite elements of integrated care approaches that address the needs of older people. This knowledge gap hinders the implementation of the WHO ICOPE approach and the evaluation of its effectiveness, particularly the transferability of any recommendations concerning how to improve outcomes of older people across care settings and geographies. Recognising the heterogeneity in integrated care interventions, there is a need to better understand the components of contemporary integrated care approaches (25-27).

WHO has approached this knowledge gap over the last four years through a phased program of work to define and refine the ICOPE approach as a means to ultimately support its implementation in health and social care systems. An initial phase of evidence synthesis was undertaken by WHO in 2014 where a detailed review of the literature (from 2000 to 2014) on health and social care needs of older people and responsiveness of health and long-term care systems was undertaken and summarised in the *World Report on Ageing and Health* (2). Subsequently, a steering group, with international experts on integrated care, was established to produce background papers on essential micro and meso-level elements on integrated health and social care services (6). In 2016, a face-to-face meeting with experts was organised in Japan as preparatory work for the G7 summit. In this meeting, experts reviewed the evidence synthesised in the background papers and recommended three core micro-level elements for implementing the WHO ICOPE approach: 1) one assessment - every older people should undergo comprehensive assessments; 2) one goal - optimising functional ability; and 3) one care plan - care plans should be shared among all providers (6). The

experts also recommended that the implementation of these core micro-level elements required support from meso and macro-level factors. Therefore, a second wave of evidence review (the current review) was performed to identify essential elements of integrated care models that would enable implementation of the WHO ICOPE approach.

The aim of this review was to conduct a review of reviews evaluating integrated care interventions for older people. The review did not seek to synthesise outcomes of integrated care approaches, but rather to identify and appraise the types of integrated care approaches reported in the literature and their intrinsic elements, in people aged ≥60 years in any setting or level of the health and long-term care system. Here, we refer to an 'element' as a discrete component of an integrated care intervention. The evidence review formed part of a larger program of work to identify elements and reach global consensus on key elements for implementation of the ICOPE approach (see: http://www.who.int/ageing/health-systems/icope/icope-consultation/en/).

Methods

Design

A review of reviews using systematic search methods was conducted under pre-defined criteria established by the authors and reported using the Preferred Reporting Items for Review and Meta-Analyses (PRISMA) guidelines (28). A PRISMA checklist has been included (refer to Supplementary file 1). No protocol paper was developed.

Patient and Public Involvement

While this review focuses on patient-centred care, patients were not involved in planning or conduct of the review.

Search strategy

A systematic search was performed in MEDLINE via Ovid and the Cochrane database in June 2017. MEDLINE was searched from 1 January 2015 to 1 June 2017 and Cochrane was searched from inception by PPV. Non-Cochrane reviews published before 2015 were excluded to identify only recent reviews (and therefore contemporary evidence) and maximise the likely quality of the included reviews (29). Searches were limited to reviews only and used Medical Subject Headings (MeSH) terms and specific key words relevant to integrated care (e.g. care coordination, collaborative care, transmural care, multidisciplinary care) (30) and older populations (e.g. aging, elderly, frail elderly) (24). Full search strategies are included in Supplementary file 2. Grey literature sources were not included in the search strategy.

Eligibility

Reviews were selected if they included studies that: 1) evaluated integrated care strategies at the micro, meso, or macro levels; 2) targeted older people (≥ 60 years); 3) were published in a peer-reviewed journal in English; and 4) used one of the review designs (e.g. systematic, meta-analysis, rapid, qualitative) as described by Grant and Booth (31). Reviews were

excluded if they focused on an intervention, e.g. self-management support, but without any coordinated care activity among care-providers. Here, we refer to 'care-providers' as any paid or unpaid (e.g. family) person who provides health or social care to an older person.

Selection and data extraction

Review selection, assessment against eligibility criteria, and quality assessment were performed by one reviewer (PPV) using Covidence systematic review software. Data extraction was performed initially by one author (PPV). Titles and abstracts of the search yield were screened and full-texts of potentially relevant papers were reviewed against eligibility criteria. Data were extracted using a standardized data extraction form. The following information was collected from eligible reviews: year of publication, review methodology (aim, review design and design of its included studies, number of primary studies included, number of databases searched, method of quality appraisal and analysis); characteristics of included reviews (number of included participants, type of participants, and countries/regions), intervention characteristics (study population, type of provider(s) included, type of integrated care intervention(s), and elements of the interventions), and type of outcome measures reported. Thereafter, a second author (AMB) screened the extracted information for accuracy.

Quality assessment

Methodological quality of included reviews were appraised using the Assessment of Multiple Systematic Reviews (AMSTAR 1) tool (32). One researcher (PPV) assessed the quality of the included reviews.

Data synthesis and analysis

A narrative synthesis was used for reporting, owing to the heterogeneity of study designs, interventions and outcome measures reported across the primary studies. For each included review, details about the type of integrated care intervention, specific elements of the intervention, and outcome measures were reported by PPV and verified by AMB. The Rainbow Model of Integrated Care and associated taxonomy of key elements for implementation of integrated care approaches were used as the coding frame for the type of interventions and their elements (10, 24). After completing the primary data analysis reviewers (AMB, JAT, IAC) then considered alignment of the coded elements within the strategies of the *WHO Framework on integrated people-centred health services* (9, 17). All other review-related characteristics were narratively synthesised for comparison across reviews, to highlight common findings.

Results

Review selection

Overall the search yielded 1,645 citations, of which 1,462 were screened at the title and abstract level with 107 considered as potentially relevant and underwent full-text screening for inclusion. Ninety-two articles were subsequently excluded, resulting in a total of 15 reviews to be included (Figure 1).

Characteristics of the included reviews

Types of reviews

The characteristics of the 15 included reviews as shown in Table 1. Reviews were published between 2005 and 2016, and included 11 (73%) systematic reviews (33-43), of which six incorporated meta-analyses or meta-synthesis (35-38, 40, 41) and six were Cochrane reviews, and four non-systematic reviews (44-47). Three reviews (20%) included only randomised controlled trials (RCTs) (33, 37, 39), while ten reviews (65%) included both RCTs and non-RCTs (34-36, 41-43, 45-48).

Samples in included reviews

Collectively, the reviews included 219 primary studies from 222 papers, with the number of primary studies included in reviews ranging from 2 to 36, and the number of participants from 811 to 22,502. The number of participants in 6 reviews could not be determined (40, 42, 44-47).

Geographic regions of primary studies

The region where the largest number of primary studies originated was North America (n=89, 47.6%), followed by Europe (n=60, 32.1%) and Oceania (n=31, 16.6%). The most common countries were the United States (n=60, 32.1%), Canada (n=29, 15.5%), Australia (n=28, 15%) and the United Kingdom (n=25, 13.4%).

Integrated care interventions and their elements

The types of integrated care interventions are summarised in Table 2. Most reviews reported on a combination of interventions that were clinically (micro-level) or professionally (meso-level) focussed (n=11, 73%). Only one review reported on a combination of an organisational/service (meso) and system (macro) level integrated care intervention (42). The reported interventions were all multifaceted, with most containing two or more discrete elements that consistently featured case management and multidisciplinary planning and/or care delivery. The most commonly reported elements of the integrated care models reported were multidisciplinary team care (n=11, 73%), comprehensive assessment (n=11, 73%), case management (n=5, 33%), systematic risk factor screening (n=5, 33%), patient education (n=4, 27%), professional education (n=4, 27%), home visits (n=4, 27%), and medication review (n=4, 27%). These eight most common elements aligned with strategies of the *WHO Framework on integrated people-centred health services*, including: i) creating and enabling environment; ii) co-ordinating services within and across sectors; and iii) re-orienting the model of care. Across the included reviews, the following care providers were frequently represented in the integrated care interventions: nurses (n=12, 80%), physiotherapists (n=10, 67%), general practitioners (n=9, 60%), and social workers (n=9, 60%). The majority of included reviews reported on hospitalisation (n=11, 73%), physical functioning (e.g. self-reported activities of daily living, dependence etc.) (n=9, 60%), cost and resource utilisation (n=7, 47%), and mortality (n=7, 47%) as outcomes of the intervention(s).

Methodological quality

The overall methodological quality of the included reviews is summarised in Figure 2. The overall median (IQR) AMSTAR 1 score was 7 (6.5), compared with 9 (7.5) among systematic reviews and 4.5 (3.25) among non-systematic reviews. Seven reviews (47%), all systematic

reviews, were of high quality (AMSTAR 1 score ≥ 8). While most reviews reported study characteristics, undertook a comprehensive search, and identified possible conflicts of interest; non-systematic reviews scored poorly across other AMSTAR 1 domains.

Discussion

We sought to review the elements of integrated care approaches for older people, not the comparative effectiveness of these elements, which was the focus of an earlier review in the context of managing multi-morbidity in primary care (49). Our review identified 15 reviews where quality scores were mostly moderate to high. The evidence was derived from high-income settings where governance and delivery of healthcare operates under various publicly and privately funded models. Among the reviews included, the integrated care interventions reported in primary studies were largely multifaceted with the majority of specific elements targeting clinical (micro)-level integration strategies for older people, consistent with the results of earlier reviews (12, 49). Notably, we only identified one review considering macro-level integration strategies (42), and this review aligned with a broader range of components of the WHO *Framework on integrated people-centred health services.*

Multidisciplinary team care, comprehensive assessment, and case management were the most common elements identified across the integrated care interventions; consistent with the WHO ICOPE approach. These specific elements are also suggested to be the most effective for integrated care approaches that target management of multi-morbidity (49). Interprofessional education and patient education were less commonly identified as explicit elements, although it may be that education was implicit in other elements, such as self-management. While some reviews identified self-management as an element of the intervention, this was not widespread, tending to reflect a service-focussed approach to integrated care interventions. Outcomes of integrated care interventions predominantly focused on hospitalisation, physical functioning and mortality among older people.

Overall, we observed a relative low proportion of organisational (meso)- and system (macro)-level integration interventions (and therefore elements), compared with micro-level interventions, in the included reviews. The emphasis on the micro-level is consistent with findings on studies of development and implementation of models of care generally (12, 19, 21, 23, 49, 50). This disproportionate micro-level emphasis most likely reflects the complexity in tackling whole-of-system issues (i.e. from the micro-level through to the macro-level), both in terms of implementation and measurement complexity, resulting in a one-dimensional focus to integrated care interventions and their evaluation (51). Health and/or social care system change or reemphasis requires targeted interventions at multiple levels – micro, meso and macro (52). While a disproportionate focus at one level may lead to change and efficiency at that level, it will most likely not be sustained in a broader system, without due consideration of inter-level interactions. In the context of evaluation, micro-level research or evaluation activities are generally simpler to conduct and procure funding. Conversely, system (macro)-level interventions that focus on policy and systems are inherently more complex and represent and emerging area of evaluation science and the establishment of guiding organisations such as the Alliance for Health Policy and Systems Research at WHO. Support for research or evaluation activities that target organisational/service and system-level integration strategies is important and should be undertaken in partnership with stakeholders at all levels of the health system (50, 52). The underlying assumption is that a significant impact on clinical, quality of care, and economic outcomes requires various multiple interacting interventions targeted at multiple clinical, professional, organisational, and system levels (19). The WHO *Framework on integrated people-centred health services* provides important guidance in this area (9, 17). Until the existing evidence base is supplemented by a volume of new data measuring the effect of clinical (micro)-, service/organisational (meso)-, and system (macro)-level integration

interventions across different contexts, definitive conclusions to support the design of specific, multi-level integrated care approaches is limited.

We also observed less emphasis on outcomes that consider patients' experiences of care (e.g. satisfaction, quality of care) and constructs or tools that characterise functional ability. Whereas these outcomes are person-centred, the outcomes reported in most reviews tended to be service or system-centred, reflecting the historical orientation of health systems/services and measurement, which has not been person-focussed. This observation outlines the need to orient interventions and measurement to better reflect person-centred outcomes (PROMs) and experiences of care (PREMs) to support innovation in person-centred approaches to care planning and delivery (53), which is the key focus of the WHO approach to healthy ageing and achieving efficient and sustainable health and long-term care systems (2).

Building multidisciplinary workforce capacity to better deliver integrated care models and meet the needs of older people is a key recommendation of the WHO *World Report on Ageing and Health* (2) and consistent with emerging evidence for delivering integrated care for older people with complex health needs (54). In this review, interventions were most commonly directed towards building capacity in nurses, physiotherapists, general practitioners and social workers to deliver integrated care. These discipline foci highlight the importance of addressing health and social care needs, dealing with whole-of-health and addressing multi-morbidity, and in particular maintaining a strong focus on enabling physical and mental capacity which reflect key domains of intrinsic capacity (2). The breadth of the health and social care workforce disciplines included in integrated care interventions also points to the need for requisite knowledge and skills across a workforce to deliver integrated health and social care (6, 55) and a need to broaden the membership of care teams in some settings (56).

In particular, a contemporary understanding of integrated care practices is needed, which supports communication and shared care and responsibility across health and social care providers as well as the knowledge and skills to work with, and refer to, community services which may include the non-government and unpaid sectors. Developing capacity in the workforce to meet these emerging knowledge and skills demands will require targeted interdisciplinary professional development for the current and emerging workforce, as well as systems to support integrated care practices (6, 57).

Methodological considerations

The quality of the evidence offered in the included reviews was variable. Unsurprisingly, systematic reviews were rated as much higher quality than non-systematic reviews. We elected to include all review types in order to synthesise a wide body of literature concerning the reported elements of integrated care models, rather than just limiting our search to RCTs in systematic reviews. We used the AMSTAR 1 critical appraisal tool to assess overall methodological quality of the included reviews. While AMSTAR 1 is currently the most commonly used tool, we acknowledge that AMSTAR 2 has recently been released and may be more appropriate for quality appraisal in future reviews that include non-randomised trials (58), although users' experiences with this modified tool remains uncertain. AMSTAR 1 is limited in its application to assessing risk of bias, which is addressed by AMSTAR 2 and the new ROBIS tool (59)

Future directions

As most existing studies focus on interventions aimed at coordinating care at the clinical (micro)-level, additional longitudinal cross-sectoral research and program evaluation could help to identify the effectiveness of interventions targeted at a wider range of clinical,

professional, organisational, and system levels of care (10, 19, 21). Given the disproportionate focus on micro-level strategies to date, there is a need for a greater focus on meso- and macro-level strategies to achieve implementation of integrated care at scale. While the current review provides evidence for elements of integrated care approaches, it is now important to link these elements with outcomes in different settings, given the critical importance of 'setting' or 'context' in determining outcomes and sustainable implementation (19, 52). In particular, interventions that integrate health and social care are needed to better understand how services and systems can better respond to the holistic needs of older people. A more extensive web of evidence is needed for low and middle-income settings (18).

Strengths and limitations

This review adopted a pragmatic approach to identify and synthesise recent overview evidence about the elements of integrated care models for older people, building on an existing taxonomy and Rainbow Model of Integrated Care (10, 24). The approach aligns with the principles of undertaking rapid reviews for strengthening health policy and systems (60). The strength of this approach to evidence synthesis is that is includes a broader of web of evidence than would otherwise be available from a systematic review of primary studies within the same time period. Our review is also unique in the context that the focus of the review was to synthesise evidence for the elements of integrated care interventions, not the comparative effectiveness of the interventions themselves. An overview of elements for effective integrated care models is critical to informing implementation of integrated care approaches at scale. Although the search period was limited to recent reviews for non-Cochrane reviews and to two databases without grey literature searches, which may have resulted in some relevant reviews and recent primary studies not being included, a systematic search method was used to identify recent reviews and a quality appraisal undertaken (30). A

single reviewer being responsible for screening and quality appraisal represents a possible rater bias, although in rapid reviews this practice is more common (60). Our review team was multidisciplinary, including content and methods experts. Given that non-systematic reviews were also included, the quality of these evidence sources was lower and important characterising data for the primary studies were often incompletely reported. Nonetheless, we did not exclude reviews on the basis of quality or design, since our aim was not to report comparative effectiveness. This *a priori* design decision provided an 'all in' approach to evidence synthesis, ensuring that the maximum breadth of evidence reported in the literature was included. This approach is important in providing data to inform implementation activities in health systems (52, 61). The majority of the evidence included was sourced from high-income countries and the transferability of the findings may not be relevant to low and middle-income settings.

Conclusion

This review is the first to synthesise review evidence for integrated care interventions for older people. Our findings show that integrated care strategies for older people focus particularly on micro clinical processes and there is a relative lack of evidence regarding meso- and macro-level integration strategies. Key elements of existing models include multidisciplinary team care, comprehensive assessment, and case management. This evidence can help to inform the design of integrated care interventions for older people and inform the implementation of the WHO ICOPE approach.

Figure legends

Figure 1: Flowchart of search outcomes and study selection.

Figure 2: Summary of AMSTAR 1 quality appraisal scores for 11 systematic reviews (A) and 4 non-systematic reviews (B).

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List of abbreviations

RCT: Randomised Control Trial; PRISMA: Preferred Reporting Items for Review and Meta-Analyses; HRQoL: Health-related quality of life.

Declarations

Ethical approval and consent to participate

Not required

Consent for publication

Not applicable

Competing interests

Not applicable

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Authors' contributions

JAT, PPV and IAdC conceived the study. PPV designed the methods and undertook the search, appraisal, extraction and reporting of the data, with a subset performed by AMB. AMB and PPV drafted the manuscript, and all the authors revised it for intellectual content. All authors read and approved the final manuscript. The views expressed in this paper are those of the authors and do not necessarily reflect the views of WHO.

Data sharing

No additional data are available

Transparency

The authors affirm that the manuscript is an honest, accurate, and transparent account of the study being reported; no important aspects of the study have been omitted.

Table 1. Characteristics of included reviews (n=15)

Review (year)	Aim	Review design (design of included studies)	No. of primary studies included	Timeframe of primary studies	Countries where primary studies were undertaken (n*)	Regions where primary studies were undertaken (n*)	Total no. of participants in primary studies	Number of databases searched	Search terms provided	Languages restrictions	Quality or bias assessment	Evidence synthesis
Alldred et al (2016) (33)	To assess the effect of interventions to optimise medicines prescribing for older people living in care homes	Systematic review (RCTs)	12	1994-2015	Australia (3); Canada (1); Finland (1); Israel (1); The Netherlands (1); New Zealand (1); Spain (1); Sweden (1); UK (2); and USA (1)	Europe (6); Middle East (1); North America (2); Oceania (4)	10953	6	Yes	No	Cochrane collaboration's risk of bias tool; and GRADE	Narrative and tabular
Berthelsen and Kristensson (2015) (34)	To describe the content and effects of case management interventions for informal caregivers of older adults	Systematic review (RCTs and non-RCTs)	7	1997-2011	Finland (2); The Netherlands (1); and USA (4)	Europe (3); and North America (4)	6956	3	Yes	NS	GRADE	Narrative and tabular
Brown et al (2015) (35)	To assess the effectiveness of day hospitals for older people in preventing death, disability, institutionalisation and improving subjective health status.	Systematic review and meta-analysis (RCTs and non-RCTs)	16	1962-2008	Australia (1); Canada (1); Finland (1); Hong Kong (1); New Zealand (1); UK (8) and USA (3)	Asia (1); Europe (9); North America (4); and Oceania (2)	3689	23	Yes	No	Cochrane collaboration's risk of bias tool; and GRADE	Narrative and tabular
Cochrane et al (2016) (36)	To assess the effects of home-care rehabilitation services for maintaining and improving the functional independence of older adults	Systematic review and meta-analysis (RCTs and non-RCTs)	2	2013-2015	Australia (1); Norway (1)	Europe (1); Oceania (1)	811	9	Yes	No	Cochrane collaboration's risk of bias tool; and GRADE	Narrative and tabular
Costa-de Lima et al (2015) (44)	To search the literature for multi-professional, cost-effective intervention programs for elderly people in primary care settings	Literature review (NS)	32	1993-2012	NS	NS	NS	10	Yes	Yes	None	Narrative and tabular
Deschodt et al (2016) (45)	To explore the structure and processes of interdisciplinary geriatric consultation teams	Scoping review (RCTs and non-RCTs)	25	1983-2013	Belgium (1); Canada (2); France (3); Germany (1); The Netherlands (1); Taiwan (1); UK (2); and USA (14)	Asia (1); Europe (8); North America (16);	NS	3	Yes	Yes	None	Narrative and tabular

Review (year)	Aim	Review design	No. of primary	Timeframe of primary	Countries where primary studies	Regions where	Total no. of	Numbe r of	Search terms	Languages restrictions	Quality or bias	Evidence synthesis
Ellis et al (2011) (37)	To asses the effectiveness of comprehensive geriatric assessment in hospital for older adults admitted as an emergency.	Systematic review and meta-analysis (RCTs)	22	1984 -2007	Australia (1); Canada (4); Germany (1); Norway (1); Sweden (1); and USA (13)	Europe (3); North America (17); and Oceania (1)	10315	6	Yes	NS	Cochrane collaboration's risk of bias tool	Narrative and tabular
Fan et al (2015) (46)	To review the effectiveness of interventions targeting the elderly population in reducing emergency department utilisation	Literature review (RCTs and non-RCTs)	36	1993-2013	Australia (9): Canada (8); France (1); Italy (1); Singapore (1); UK (1); and USA (15)	Asia (1); Europe (3); North America (23); and Oceania (9)	NS	5 s	Yes	Yes	Assessment tool developed by the Effective Public Health Practice Project	Narrative and tabular
Frank and Wilson (2015) (47)	To review Canadian models of care for frail seniors provided in primary care settings	Overview (RCTs and non-RCTs)	6	2006-2015	Canada (6)	North America (6)	NS	2	No	NS	None	Narrative
Handoll et al (2009) (38)	To assess the effects of multidisciplinary rehabilitation for older patients with proximal fracture that has been surgically repaired.	Systematic review and meta-analysis (RCTs and non-RCTs)	13	1986-2008	Australia (3); Canada (1); Spain (1); Sweden (2); Taiwan (1); and UK (4)	Asia (1); Europe (7); North America (1); Oceania (3)	2498	6	Yes	No	Cochrane collaboration's risk of bias tool	Narrative and tabular
Hickman et al (2015) (39)	To identify multidisciplinary team interventions to optimise health outcomes for older people in acute care settings	Systematic review (RCTs)	6	2005-2014	Australia (1); Belgium (1); France (1); Finland (1); Spain (1); and Taiwan (1)	Asia (1); Europe (4); and Oceania (1)	1558	3	Yes	Yes	None	Narrative and tabular
Ke et al (2015) (40)	To explore nurses' views regarding implementing advance care planning for older people	Systematic review and meta-synthesis of qualitative evidence	18	1993-2013	Australia (2); Canada (2); New Zealand (1); South Africa (1); Switzerland (1); UK (7); and USA (4)	Africa (1); Europe (8); North America (6); and Oceania (3)	NS	4	Yes	Yes	None	Narrative and tabular
Lowthian et al (2015) (41)	To examine the effectiveness of emergency department community transition strategies	Systematic review and meta-analysis (RCTs and non-RCTs)	11 papers concerning 9 studies	1996-2013	Australia (6); Canada (4); Hong Kong (1); Scotland (1); and Singapore (1)	Asia (2); Europe (1); North America (4); Oceania (6)	22502	3	Yes	No	Cochrane collaboration's risk of bias tool	Narrative and tabular
McClure et al (2005) (42)	To assess the effectiveness of population-based interventions for reducing fall-related injuries among older people.	Systematic review. (RCTs and non-RCTs)	6	1996-2006	Australia (1); Denmark (1); Norway (1); Sweden (2); Taiwan (1)	Asia (1): Europe (4); Oceania (1)	NS	9	Yes	No	Checklist of the Cochrane EPOC review group	Narrative and tabular
Phelan et al (2015) (43)	To search for intervention strategies that have any measurable effect on acute-care hospitalizations among community-dwelling adults with	Systematic review (RCTs and non-RCTs)	10 papers concerning 9 studies	2002 - 2010	Finland (1); The Netherlands (1); UK (1); and USA (6)	Europe (3); and North America (6)	1332	9	Yes	Yes	None	Narrative and tabular

Review (year)	Aim	Review design	No. of primary	Timeframe of primary	Countries where primary studies	Regions where	Total no. of	Numbe r of	Search terms	Languages restrictions	Quality or bias	Evidence synthesis
	dementia											

* n: number of studies may not sum to the number of primary included, as primary studies may have been undertaken in more than one country.
Abbreviation: RCT, Randomised Controlled Trial(s); GRADE, Grades of Recommendations, Assessment, Development and Evaluation; EPOC, Cochrane Effective Practice and Organisation of Care Review Group; NS, not stated

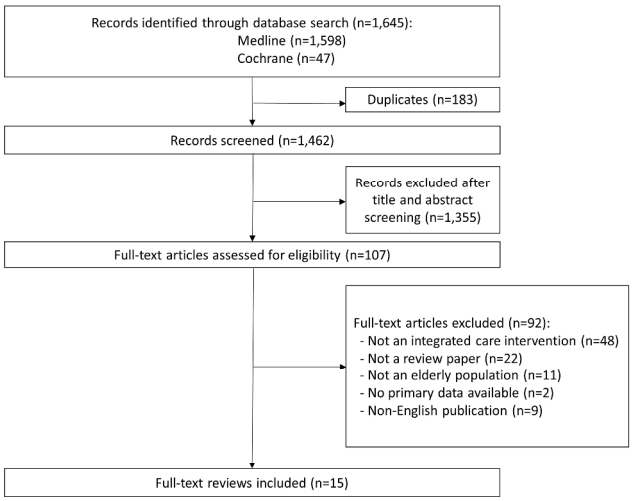
Table 2. Summary of elements of the integrated care models reported across reviews

Review (year)	Study population(s) and (setting)	Health system level of intervention(s) reported	Type(s) of integrated care intervention(s)	Key care or service elements within integrated care intervention(s) (n*)	Disciplines providers included												Description of control(s)	Outcome(s) reported
					NU	GT	PH	GP	PA	PT	OT	DT	PS	SW	MS	OS		
Alldred et al (2016) (33)	People aged ≥ 65 years (living in care homes)	Professional (meso) level	Case management; and Multidisciplinary team care	Medication review (10); Multidisciplinary team (4); Professional education (5); Clinical information management (1)	•	•	•	•	•							•	Usual care (by general practitioner)	Mortality; Hospitalisation; Adverse drug events; HRQoL; and Cost and resource utilisation
Berthelsen and Kristensson (2015) (34)	Informal caregivers to people aged > 65 years (community care settings)	Clinical (micro) level	Case management; Individual multidisciplinary care plan; and Self-management	Case management (4); and Patient education (3)	•					•	•					•	Usual care	Quality of care; Physical functioning; and Psychological functioning
Brown et al (2015) (35)	People aged ≥ 60 years (receiving medical care in medical day hospitals)	Clinical (micro) level; and professional (meso) level	Individual multidisciplinary care plan; and Multidisciplinary team care	Multidisciplinary team (7); Comprehensive assessment (5)	•	•				•	•	•	•	•		•	No comprehensive care; Domiciliary care; or comprehensive care	Mortality; Cost and resource utilisation; Patient satisfaction; Physical functioning
Cochrane et al (2016) (36)	People aged ≥ 65 years (living in own home)	Clinical (micro) level	Patient education; Information provision to clients; Individual multidisciplinary care plan; and Self-management	Medication review (1); Comprehensive assessment (1); and Case management(1);						•	•						Usual care (standard home care)	Mortality; Hospitalisation; HRQoL; Cost and resource utilisation; and Physical functioning
Costa-de Lima et al (2015) (44)	People aged ≥ 60 years (community-dwelling people receiving care in primary care settings)	Clinical (micro) level; and professional (meso) level	Case management; Multidisciplinary care team; Individual multidisciplinary care plan; and Inter-professional education	Case management; Multidisciplinary team; Comprehensive assessment; Systematic risk screening; Home visits; Medication review; Patient education; and Professional education;	•	•	•	•	•	•		•		•	•		NS	Mortality; Hospitalisation; Patient satisfaction; and Physical functioning
Deschodt et al (2016) (45)	Geriatric patients aged ≥ 60 years (within hospital settings – medical, surgical and intensive care units and emergency departments)	Clinical (micro) level; and professional (meso) level	Case management; Individual multidisciplinary care plan; and Multidisciplinary team care	Comprehensive assessment; Systematic risk screening; and Multidisciplinary team	•	•	•			•	•	•		•			NS	Physical functioning; Psychological functioning; and Social functioning

Review (year)	Study population(s) and (setting)	Health system level of	Type(s) of integrated care intervention(s)	Key care or service elements within integrated	Disciplines providers included	Description of control(s)	Outcome(s) reported
Ellis et al (2011) (37)	People aged ≥ 65 years (admitted to hospital)	Clinical (micro) level; and professional (meso) level	Case management; Individual multidisciplinary care plan; and Multidisciplinary team care	Comprehensive assessment (22); Multidisciplinary team (22); and Discharge planning (4)	• • • • • • • • • •	Usual care	Mortality; Hospitalisation; Cost and resource utilisation; Physical functioning; and Psychological functioning
Fan et al (2015) (46)	People aged ≥ 60 years (community based [home or outpatients] and hospital based [emergency department or hospital ward])	Clinical (micro) level; and professional (meso) level	Case management; Individual multidisciplinary care plan; Multidisciplinary team care	Multidisciplinary team (20); Systematic risk screening (16); Comprehensive assessment (16); and Discharge planning (15);	• • • • • •	NS	Hospitalisation; and Cost and resource utilisation
Frank and Wilson (2015) (47)	People aged ≥ 64 years (community-based care)	Clinical (micro) level; and professional (meso) level	Case management; Individual multidisciplinary care plan; Multidisciplinary team care	Case management (2); Comprehensive assessment (2); Multidisciplinary team (3); Systematic risk screening (1); and Discharge planning (1)	• • • • •	NS	Hospitalisation; Quality of care; and Cost and resource utilisation
Handoll et al (2009) (38)	People aged ≥ 50 years with surgically repaired proximal femur fracture (inpatient, home and ambulatory care)	Clinical (micro) level; and professional (meso) level	Case management; Individual multidisciplinary care plan; and Multidisciplinary team care	Comprehensive assessment (6); Multidisciplinary team (12); Discharge planning (9); and Home visits (2)	• • • • • • • • • • •	Usual care	Mortality; Hospitalisation; and Adverse events; and Physical functioning
Hickman et al (2015) (39)	People aged ≥ 65 years (acute care inpatient setting)	Clinical (micro) level; and professional (meso) level	Case management; Individual multidisciplinary care plan; Self-management; and Multidisciplinary team care	Comprehensive assessment (4); Multidisciplinary team (6); Discharge planning (4); Medication review (1); Patient education (1)	• • • • • • • • •	NS	Hospitalisation; Adverse events; HRQoL; and Physical functioning
Ke et al (2015) (40)	Nurses caring for older people (hospital, community-based serves and facility-based services)	Clinical (micro) level; and professional (meso) level	Centrality of client needs; Patient education; Interaction between professional and client; Active client participation; Multidisciplinary team care	Patient education; and Professional education	• • • • •	NA	NS
Lowthian et al (2015) (41)	People aged ≥ 65 years (emergency department)	Clinical (micro) level; and professional (meso) level	Case management; Individual multidisciplinary care plan; and Multidisciplinary team care	Comprehensive assessment (7); Multidisciplinary team (1); Discharge planning (8); and Systematic risk screening (3)		Usual care	Hospitalisation; and Physical functioning

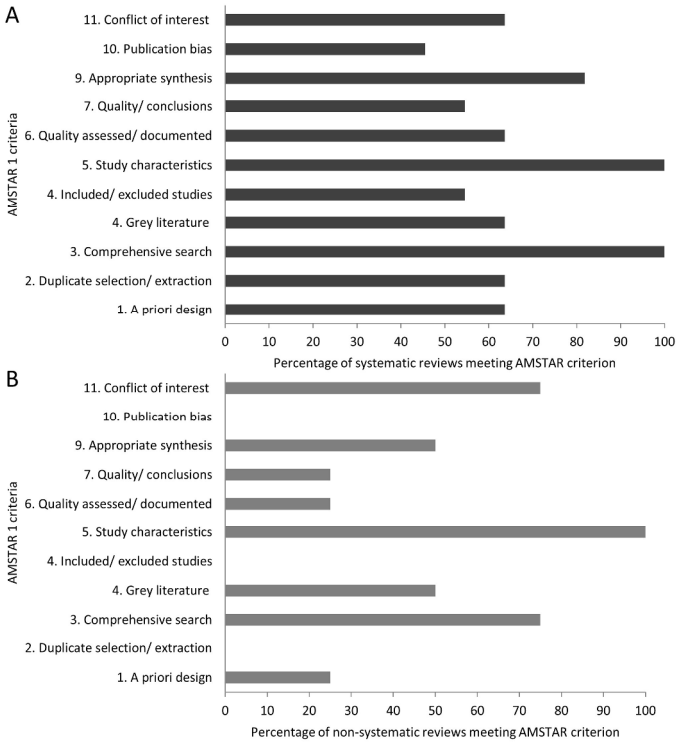
Review (year)	Study population(s) and (setting)	Health system level of	Type(s) of integrated care intervention(s)	Key care or service elements within integrated	Disciplines providers included	Description of control(s)	Outcome(s) reported
McClure et al (2005) (42)	People aged ≥ 65 years (population-based in a community)	Organisational (meso); and system (macro) level	Social value creation; Stakeholder management; Inter-organisational governance; and Population needs assessment	Population-health interventions (5); Policy interventions (1); Professional education (1); and Home visits (3)	• • •	Similar population	Mortality; Hospitalisation; Adverse events; and Cost and resource utilisation
Phelan et al (2015) (43)	People aged ≥ 55 years with dementia (community dwelling)	Clinical (micro) level; and professional (meso) level	Case management; Multidisciplinary team care; Individual multidisciplinary care plan; and Inter-professional education	Case management (4); Multidisciplinary team (4); Comprehensive assessment (4); Home visits (1); and Inter-professional education (1)		NS	Hospitalisation

* n: number of studies is reported where stated by the review authors. Not all reviews reported the number of primary studies that include specific care or service elements
Abbreviation: NU, Nurse; GT, Geriatrician; PH, Physician; GP, General Practitioner; PA, Pharmacist; PT, Physiotherapist; OT, Occupational therapist; DT, Dietician; PS, Psychologist; SW, Social worker; MS, Medical specialist; OS, Other staff, NS, not stated; NA, not applicable; HRQoL, Health Related Quality of Life



Flowchart of search outcomes and study selection.

338x190mm (300 x 300 DPI)



Summary of AMSTAR 1 quality appraisal scores for 11 systematic reviews (A) and 4 non-systematic reviews (B).

254x190mm (300 x 300 DPI)

PRISMA 2009 Checklist: Supplementary File 1

Section/topic	#	Checklist item	Reported on page #
TITLE			
Title	1	Identify the report as a systematic review, meta-analysis, or both.	1
ABSTRACT			
Structured summary	2	Provide a structured summary including, as applicable: background; objectives; data sources; study eligibility criteria, participants, and interventions; study appraisal and synthesis methods; results; limitations; conclusions and implications of key findings; systematic review registration number.	2
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of what is already known.	5-8
Objectives	4	Provide an explicit statement of questions being addressed with reference to participants, interventions, comparisons, outcomes, and study design (PICOS).	8
METHODS			
Protocol and registration	5	Indicate if a review protocol exists, if and where it can be accessed (e.g., Web address), and, if available, provide registration information including registration number.	9
Eligibility criteria	6	Specify study characteristics (e.g., PICOS, length of follow-up) and report characteristics (e.g., years considered, language, publication status) used as criteria for eligibility, giving rationale.	9
Information sources	7	Describe all information sources (e.g., databases with dates of coverage, contact with study authors to identify additional studies) in the search and date last searched.	9
Search	8	Present full electronic search strategy for at least one database, including any limits used, such that it could be repeated.	Sup file 2
Study selection	9	State the process for selecting studies (i.e., screening, eligibility, included in systematic review, and, if applicable, included in the meta-analysis).	10
Data collection process	10	Describe method of data extraction from reports (e.g., piloted forms, independently, in duplicate) and any processes for obtaining and confirming data from investigators.	10
Data items	11	List and define all variables for which data were sought (e.g., PICOS, funding sources) and any assumptions and simplifications made.	10
Risk of bias in individual studies	12	Describe methods used for assessing risk of bias of individual studies (including specification of whether this was done at the study or outcome level), and how this information is to be used in any data synthesis.	10
Summary measures	13	State the principal summary measures (e.g., risk ratio, difference in means).	n/a
Synthesis of results	14	Describe the methods of handling data and combining results of studies, if done, including measures of consistency (e.g., I^2) for each meta-analysis.	10-11

PRISMA 2009 Checklist: Supplementary File 1

Section/topic	#	Checklist item	Reported on page
Risk of bias across studies	15	Specify any assessment of risk of bias that may affect the cumulative evidence (e.g., publication bias, selective reporting within studies).	n/a
Additional analyses	16	Describe methods of additional analyses (e.g., sensitivity or subgroup analyses, meta-regression), if done, indicating which were pre-specified.	n/a
RESULTS			
Study selection	17	Give numbers of studies screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally with a flow diagram.	12 and Fig 1
Study characteristics	18	For each study, present characteristics for which data were extracted (e.g., study size, PICOS, follow-up period) and provide the citations.	Table
Risk of bias within studies	19	Present data on risk of bias of each study and, if available, any outcome level assessment (see item 12).	13-14 and Figure
Results of individual studies	20	For all outcomes considered (benefits or harms), present, for each study: (a) simple summary data for each intervention group (b) effect estimates and confidence intervals, ideally with a forest plot.	12-13 and Table
Synthesis of results	21	Present results of each meta-analysis done, including confidence intervals and measures of consistency.	n/a
Risk of bias across studies	22	Present results of any assessment of risk of bias across studies (see Item 15).	n/a
Additional analysis	23	Give results of additional analyses, if done (e.g., sensitivity or subgroup analyses, meta-regression [see Item 16]).	n/a
DISCUSSION			
Summary of evidence	24	Summarize the main findings including the strength of evidence for each main outcome; consider their relevance to key groups (e.g., healthcare providers, users, and policy makers).	15
Limitations	25	Discuss limitations at study and outcome level (e.g., risk of bias), and at review-level (e.g., incomplete retrieval of identified research, reporting bias).	19-20
Conclusions	26	Provide a general interpretation of the results in the context of other evidence, and implications for future research.	20
FUNDING			
Funding	27	Describe sources of funding for the systematic review and other support (e.g., supply of data); role of funders for the systematic review.	29

From: Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group (2009). Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement. PLoS Med 6(7): e10000 doi:10.1371/journal.pmed1000097

Supplementary file 2. Electronic search strategies

Table 1. Search strategy for Medline

MEDLINE	1	exp Aged/
	2	exp Frail Elderly/
	3	(elder* or old people or older people or old adult* or old person* or older adult* or older person* or senior* or aging person* or ageing person* or aging adult*).tw.
	4	(old adj5 people).tw.
	5	5. or/1-4
	6	exp "Delivery of Health Care, Integrated"/
	7	((integrated or coordinated or co-ordinated or comprehensive or collaborative or transmural or continuity or interdisciplinar* or multidisciplinar*) adj5 (health* or care* or delivery or system*)).tw.
	8	exp Managed Care Programs/
	9	((interdisciplin* or multidisciplin*) adj5 care plan).tw.
	10	"accountable care organi#ation*".tw.
	11	"health maintenance organi#ation*".tw.
	12	((care management or managed care) adj5 (program* or plan* or team* or clinic* or delivery or system*)).tw.
	13	managed care.tw.
	14	(insurance adj5 (case management or disease management)).tw.
	15	exp Patient Care Planning/
	16	Patient Care Management/
	17	Disease Management/
	18	case management.tw.
	19	(disease management adj5 (program* or plan* or team* or clinic* or delivery or system*)).tw.
	20	Critical Pathways/
	21	((critical pathway* or clinical pathway* or clinical follow-up) adj5 (team* or clinic* or plan* or program* or care or health* or delivery or system*)).tw.
	22	Comprehensive Health Care/
	23	((integrated or coordinated or co-ordinated) adj5 (care or clinic* or care team* or care plan*)).tw.
	24	((interdisciplin* or multidisciplin*) adj5 (team* or clinic* or plan* or program* or care or health* or delivery or system*)).tw.
	25	Continuity of Patient Care/
	26	(continuity of care adj5 (program* or plan* or team* or clinic* or delivery or system*)).tw.
	27	Patient-Centered Care/
	28	((patient-centered or patient-centred) adj5 (team* or clinic* or plan* or program* or care or health* or delivery or system*)).tw.
	29	Patient Care Team/
	30	Community Networks/
	31	Community Health Planning/
	32	((community care or community health) adj5 (program* or clinic* or plan* or team* or delivery or system*)).tw.
	33	exp Self Care/
	34	((self-care or self-management) adj5 (program* or clinic* or plan* or team* or delivery or system*)).tw.
	35	or/6-34
	36	and/5,35
	37	review.ab.
	38	review.pt.
	39	meta-analysis.ab.
	40	meta-analysis.pt.
	41	meta-analysis.ti.
	42	or/37-41
	43	letter.pt.
	44	comment.pt.
	45	editorial.pt.
	46	or/43-45
	47	42 not 46
	48	36 and 47

Table 2. Search strategy for Cochrane Library

COCHRANE	1	MeSH descriptor: [Aged] explode all trees
	2	MeSH descriptor: [Frail Elderly] explode all trees
	3	(elder* or old people or older people or old adult* or old person* or older adult* or older person* or senior* or aging person* or ageing person* or aging adult*):ti,ab,kw
	4	(old next (people)):ti,ab,kw
	5	{or #1-#4}
	6	MeSH descriptor: [Delivery of Health Care, Integrated] explode all trees
	7	MeSH descriptor: [Managed Care Programs] explode all trees
	8	MeSH descriptor: [Self Care] explode all trees
	9	((integrated or coordinated or co-ordinated or comprehensive or collaborative or transamural or continuity) near/5 (health* or care* or delivery or system* or team* or clinic* or plan* or program*)):ti,ab,kw
	10	"managed care":ti,ab,kw
	11	"case management":ti,ab,kw
	12	"disease management":ti,ab,kw
	13	(accountable next care next organi*ation):ti,ab,kw
	14	(health next maintenance next organi*ation):ti,ab,kw
	15	((care next management) near/5 (program* or plan* or team* or clinic* or delivery or system*)):ti,ab,kw
	16	(community next (care or health or network*)):ti,ab,kw
	17	"health care planning":ti,ab,kw
	18	(critical next pathway*):ti,ab,kw
	19	(clinical next pathway*):ti,ab,kw
	20	(("clinical follow-up") near/5 (team* or clinic* or plan* or program* or care or health* or delivery or system*)) ti,ab,kw
	21	(("patient-centered" or "patient-centred") near/5 (team* or clinic* or plan* or program* or care or health* or delivery or system*)):ti,ab,kw
	22	("patient care" next (team* or clinic* or plan* or program* or care or health* or delivery or system* or manage*)):ti,ab,kw
	23	"patient decision-making":ti,ab,kw
	24	(("self-management" or "self-care") near/5 (program* or clinic* or plan* or team* or delivery or system*)):ti,ab,kw
	25	{or #6-#24}
	26	{and #5, #25} in Review