

Supplementary Table 1. The detailed search terms of Web of Science

	Search terms
#1	“multimorbidity” OR “multi-morbidity” OR “multiple morbidity” OR “multiple chronic diseases” OR “multiple chronic illnesses” OR “multiple chronic disorders” OR “chronic conditions” (Topic)
#2	“care” OR “healthcare” OR “health care” OR “management” OR “service” OR “services” OR “model” OR “framework” OR “principle” OR “strategy” OR “element” OR “program” OR “programme” OR “intervention” OR “facilitator” OR “perception” OR “perspective” OR “view” OR “need” OR “demand” OR “experience” OR “barrier” OR “challenge” OR “outcome” OR “adverse event” OR “adverse consequence” OR “cost” OR “utilization” (Topic)
#3	“old” OR “older” OR “oldest” OR “elder” OR “elderly” OR “aged” OR “aging” OR “senior” OR “geriatric” (Topic)
#4	“protocol” (Title)
#5	#1 AND #2 AND #3 NOT #4

All results were limited by study design: review; language: English; publication date: database inception-February 2022.

Supplementary Table 2. Characteristics of included studies (n=20)

Author and year of publication	Country	Aim	Study population and sample size (if applicable)	Methodology	Concept
American Geriatrics Society Expert Panel, 2012	USA	To describe guiding principles for the clinical management of older people with MM.	Older people with MM	Systematic search and review+expert consensus	Clinical management and decision support
Lehnert, 2011	Germany	To investigate the relationship between MCCs and health care utilization and costs for elderly persons with MCCs.	Elderly persons with MCCs	Systematic review (35 primary cross-sectional or longitudinal studies were included; the publication date limitation was database inception-2010)	Healthcare utilization and costs
Pel-Littel, 2021	The Netherlands	To describe barriers and facilitators for shared decision making as experienced by older patients with MCCs, informal caregivers and health professionals.	2990 older patients ≥65 years with more than two chronic conditions, 337 informal caregivers, and 527 health professionals (medical staff, nurses and other	Systematic review (28 quantitative, qualitative, and mix-method studies were included; the publication date limitation was 1980-2019)	Shared decision making

Aggarwal, 2020	UK	To give an up-to-date account of the recognition and management of MM and polypharmacy in the older person.	professionals) Older persons with MM and polypharmacy	Systematic search and review (the publication date limitation was 2003-2020)	Recognition and management of MM and polypharmacy
Tinetti, 2016	USA	To identify modifiable contributors to fragmented and burdensome care; explore approaches that might address these contributors; provide experts' perspectives on challenges to, and opportunities for, addressing these contributors; and identify the core elements for building a feasible, sustainable approach to improve the care and outcomes.	Older adults with MCCs	Literature review+stakeholder discussion	Patient priority, decision making, and healthcare
Sendall, 2016	Australia	To identify the components of the chronic care model required to support healthcare that transitions seamlessly between hospital	Older people ≥65 years with two or more chronic diseases	Systematic search and review (4 primary quantitative studies were included; the publication date limitation	Transition care

		and ambulatory settings.		was database inception-2013)	
Kastner, 2019	Canada	To understand how and why effective multi-chronic disease management interventions influence health outcomes.	Older adults ≥65 years with two or more chronic conditions	Realist review (106 primary quantitative, qualitative, and mixed-method studies were included; the publication date limitation was database inception-2011)	Healthcare
Søgaard, 2021	Denmark	To investigate the effects of patient engagement interventions.	Older patients ≥60 years with two or more coexisting long term conditions	Systematic review (12 primary quantitative observational studies and randomized control studies were included; the publication date limitation was database inception-2020)	Patient engagement and person-centred care (compared with usual care)
Boye, 2019	Denmark	To synthesize how older people with MM experiences integration of health care services and to identify barriers towards continuity of care when multimorbid.	Older people ≥65 years with two or more chronic conditions	Systematic review (9 primary quantitative and qualitative were included; the publication date limitation was database inception-2018)	Integration of health care services
Lupari, 2011	UK	To review available literature on research and service evaluation evidence of nurse-led	Older persons ≥65 years with MCCs and living at home	Systematic review (8 quantitative and qualitative studies, and studies	Nurse-led case management

		case management services targeting older people with MCCs in their own homes.		involving service evaluation frameworks (compared with usual care) were included; the publication date limitation was database inception-2009)	
Yang, 2022	China	To evaluate the effectiveness of interventions to improve medication adherence for community-dwelling older people with MM.	3292 community-dwelling older people ≥60 years with co-occurrence of two or more chronic medical conditions	Systematic review and meta-analysis (9 primary randomized controlled trials and cluster randomized controlled trials were included; the publication date limitation was database inception-2020)	Medication adherence (compared with usual care or any other control interventions)
Eriksen, 2020	Denmark	To synthesize qualitative studies exploring medication-related experiences of polypharmacy among patients with MM.	Multimorbid patients with an average years of 60.	Systematic review (13 primary qualitative studies were included; the publication date limitation was database inception-2020)	Medication-related experience
The American Geriatrics Society Expert Panel, 2016	USA	To provide the evidence base to support a definition of person-centered care and its essential elements.	Older adults with MCCs and/or functional limitations.	Systematic search and review+ environmental scan+qualitative interviews+expert consensus	Person-centered care

Butterworth, 2019	UK	To assess the effects of interventions for older patients with MM aiming to involve them in decision-making about their health care during primary care consultations.	1879 older patients with MM	Systematic review (3 primary randomized controlled trials were included; the publication date limitation was database inception-2018)	Patient involvement in decision making (compared to usual care)
Lun, 2021	Singapore	To identify prescribing guidelines that are available for older adults with MM and to identify cross-cutting themes used in these guidelines.	Older adults ≥ 65 years in outpatient setting with two or more chronic conditions	Scoping review (61 guidelines and tools were included; the publication date limitation was 1998-2019)	Prescription management
Lee, 2020	Singapore	To identify the intervention elements that have been adopted to reduce potential inappropriate prescribing in the outpatient setting and determine the behaviour change wheel intervention functions performed by each of the identified intervention elements.	Older adults ≥ 65 years in outpatient setting with two or more chronic conditions and polypharmacy	Scoping review (80 primary studies were included; the publication date limitation was 1998-2019)	Prescription management
Kastner, 2018	Canada	To identify effective MM interventions	12579 older adults ≥ 65 years	Systematic review and meta-analysis	Healthcare

		compared with a control or usual care strategy for older adults.	have two or more high-burden chronic conditions	(25 primary randomized controlled trials; the publication date limitation was 1990-2017)	(compared to usual control or usual care)
Lavan, 2016	Ireland	To examine prescribing errors in the multimorbid older population, and propose potentially feasible strategies to address them.	Older people ≥60 years with two or more concurrent chronic medical conditions	Literature review	Prescription management
Kim, 2016	USA	To provide guidance to cardiologists and general practitioners about evaluation and management of older adults with cardiovascular diseases and MM.	Older adults with cardiovascular diseases and other chronic condition(s)	Literature review	Patient-centred care
Ouellet, 2018	USA	To provide a reasoned approach to medication prescribing and deprescribing decisions for older adults with MCCs, which aims to achieve clinical outcomes that matter most to each individual patient.	Older adults ≥65 years with MCCs	Literature review	Decision-making about prescription

Abbreviations: MM: multimorbidity; USA: the United States; MCCs: multiple chronic conditions; UK: the United Kingdom