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Benefits of Complex Interventions for People with Multiple Long-term Conditions and Older Adults

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Executive summary

The UK population is rapidly ageing. By 2040, it is projected that one in seven people will be aged 75 years and over.[1] There is much to celebrate in people living longer, but as a result, more people are now living with multiple long-term conditions (MLTCs), which are associated with poor health outcomes and frequent use of hospital and other care. The number of people with ≥4 long-term conditions is projected to nearly double by 2035.[2] The Chief Medical Officer's Annual Report 2023[3] identifies an urgent need to develop, evaluate, and implement effective and sustainable models of care to improve quality of life and promote independence in these groups.

The literature on interventions in this context is complicated because interventions with the same name often vary in terms of components (e.g., Comprehensive Geriatric Assessment (CGA) varies in what individual or team delivers it) and interventions with different names often use the same or similar components (e.g., Discharge Planning and CGA both usually start with a holistic assessment). The UK National Institute for Health and Care Excellence has specifically highlighted the need for further evidence on the use of 'holistic assessment and intervention', reflecting that this is the most common core component of complex interventions in this field.[4]

This brief summarises key findings and policy implications from our recent evidence syntheses [5,6] examining the effectiveness of complex interventions which have holistic needs assessment as a core intervention component. We find that overall evidence of holistic assessment-based complex interventions is inconsistent across types of intervention, settings, and outcomes, but that there is good evidence of benefit on several (but not all) outcomes examined for three models of care in particular settings and populations:

- Comprehensive Geriatric Assessment in hospital inpatients (a specialist service for an easy-to-identify group);
- Patient-Centred Medical Homes for people with MLTC (a wholesale redesign of primary care with potentially wider benefits but likely more complicated to implement);
- Community-based complex interventions involving holistic assessment and care planning for older adults (a new specialist or primary care service working alongside existing primary care).

These interventions share both holistic assessment and a focus on the individual (rather than on particular conditions) as core elements, but they represent different approaches to improving outcomes. We suggest that before designing and implementing similar interventions, health and social care improvers need to:

- Carefully consider local circumstances and needs and which outcomes are most important to stakeholders;
- Pay careful attention to how patients are identified and selected for an intervention;
- Clearly define the nature of the team which will deliver an intervention and the roles and responsibilities of multidisciplinary team members;
- Build trust, and facilitate inter-professional communication between professionals involved in a holistic assessment and development of care plans;
- Ensure that protected time and necessary resources are available to deliver an intervention;
- Consider how to best share information across services.

[1]GOV.UK (2016). Future of an Ageing Population.
[2]Kingston et al. (2018). Projections of multi-morbidity in the older population in England to 2035: estimates from the Population Ageing and Care Simulation model.
[3]Whitty (2023). Chief Medical Officer's Annual Report 2023: Health in an Ageing Society.
[4]NICE (2016). Multimorbidity: clinical assessment and management.
[5]Arakelyan et al. (2023). Effectiveness of holistic assessment-based interventions for adults with multiple long-term conditions and frailty.
[6]Ho et al. (2023). Complex interventions for improving independent living and quality of life amongst community-dwelling older adults.

The Problem

Our population is ageing rapidly, contributing to a steady increase in the number of people who have multiple long-term conditions (MLTC, also known as multimorbidity). Over 60% of UK older adults (aged >65 years) are affected by MLTCs,[7] putting them at an increased risk of poor health outcomes, including lower quality of life, functional decline, unscheduled hospital (re)admissions, adverse drug events, and premature death.[8] MLTCs are socially patterned: the effects are worse in people from less affluent communities who develop MLTC at younger ages and experience a higher burden from both illness and treatment.[9]

Existing healthcare services are hospital-centric and largely organised around single-disease care. Services are fragmented and challenging to navigate, and often poorly aligned with the needs of people with MLTCs. Improving the way MLTCs are managed is a policy priority, and work is underway to develop new models of care to improve health outcomes and reduce the risk of adverse events in this population.

Several systematic reviews have evaluated the effectiveness of various 'new' models of care. These reviews often include underlying studies based on how researchers name their interventions. However, interventions with the same name vary considerably in terms of their components. Equally, interventions with different names often share core components. Previous reviews may therefore provide an incomplete picture of intervention effectiveness.

Holistic assessment-based complex interventions are those which start by systematically determining individuals' medical, psychological, social, and functional capabilities and needs to develop a personalised care plan and follow-up. Comprehensive Geriatric Assessment (CGA) is such an intervention, and CGA has been judged effective in older people admitted to the hospital.[10] However, it is unclear if similar complex interventions are effective in adults with MLTCs or older adults in the community.

Box 1. Methods

Systematic reviewing involves a comprehensive evaluation of multiple research studies, whereas umbrella reviews summarise evidence from multiple systematic reviews. Our reviews followed standard methodological and reporting guidelines for umbrella reviews and systematic reviews. The protocols were registered with PROSPERO (CRD42022363217[11] and CRD42021274017).

We systematically searched key databases for evidence evaluating the effectiveness of various complex interventions (irrespective of the name) in people with MLTCs (defined as ≥2 long-term health conditions), frailty (defined as a frailty phenotype, or using a frailty deficits model, or validated frailty index/measure) and community-dwelling older adults (defined as living independently at home (including in extra-care housing but excluding care/nursing home residents) regardless of the need for care assistance) across various settings.

The key outcomes of interest were quality of life, physical and cognitive function, mortality, unscheduled hospital admission, unscheduled care attendance, living at home and nursing home admission.

We assessed the evidence for methodological quality using relevant checklists and used the GRADE principles for the assessment of the overall quality of evidence for key health outcomes.

What we did

We conducted systematic evidence syntheses to comprehensively evaluate the benefits of complex interventions with holistic needs assessment at their heart. We first carried out an *umbrella review* of interventions in people with MLTCs (aged ≥18 years) and frailty, and subsequently a *systematic review* of primary research on interventions in older adults in the community (see Box 1 for methods).

[7]Barnett et al. (2012). Epidemiology of multimorbidity and implications for health care, research, and medical education: a cross-sectional study.
[8]Soley-Bori et al. (2021). Impact of multimorbidity on healthcare costs and utilisation: a systematic review of the UK literature.
[9]Schiøtz et al. (2017). Social disparities in the prevalence of multimorbidity–A register-based population study.
[10]Ellis et al. (2017) Comprehensive geriatric assessment for older adults admitted to hospital.
[11]Arakelyan et al. (2023). Effectiveness of holistic assessment–based interventions in improving outcomes in adults with MLTCs and/or frailty: umbrella review protocol.

Umbrella review findings

Box 2 summarises findings from meta-analyses of holistic assessment-based complex interventions. For detailed findings see published reviews.[5, 6]

Evidence of the effectiveness of holistic assessment-based interventions in people with MLTCs and frailty was inconsistent across types of intervention, settings (community, hospital and both), and outcomes.

The best quality of evidence of effectiveness in people with MLTCs and frailty was for two models of care, i.e., Comprehensive Geriatric Assessment (CGA) and Patient-Centred Medical Homes (PCMH). There was good evidence that hospital CGA interventions had beneficial effects on nursing home admissions, and keeping patients alive and in their own homes (Box 2). However, hospital CGA did NOT reduce mortality or improve physical function.

Patient-centred medical home models were effective in improving quality of life, mental health, self-management, and reducing hospital admissions.

There was some weak evidence that community CGA reduced hospital admission and that continuity of care interventions and CGA across the hospital-community interface improved quality of life.

Systematic review findings

Community complex interventions targeting a heterogeneous population of older adults increased the likelihood of older adults living at home (Risk Ratio (RR) 1.05; 95% CI 1.00–1.10), reduced mortality (RR 0.86; 95% CI 0.77–0.96), and improved cognitive function (Standardised Mean Difference (SMD) 0.12; 95% CI 0.02–0.22), and activities of daily living (SMD 0.11; 95% CI 0.01–0.21). Although the effect sizes are relatively small, these positive effects were observed over a short period of follow-up and are therefore likely to be clinically important.

There was good evidence that the same interventions had little to no effect on quality of life and nursing home admission. In subgroup analysis, we found significant reductions in nursing home admission when interventions were delivered at home, or with scheduled home/telephone follow-up, or with a self-management component.

Box 2. Summary of findings from meta-analyses for key outcomes

Setting	Complex interventions	Quality of life	Mortality	Alive in home	Physical function	Mental health	Hospital admission	ED re-attendance	Nursing home admission	Living in home
Umbrella review findings										
Hospital	Comprehensive geriatric assessment		-	+	-				+	+
Hospital	Multicomponent interventions							-		
Community	Comprehensive geriatric assessment		-				+		-	
Community	Patient-centred medical home	+				+	+			
Community	Multicomponent interventions	-								
Community & hospital	Transitional care							-		
Community & hospital	Continuity of care/ transitional care	+								
Community & hospital	Comprehensive geriatric assessment	+								
Systematic review findings										
Community	Multicomponent interventions	-	+		+				-	+

+ High-quality evidence of benefit + Low-quality evidence of benefit - High-quality evidence of no benefit

Conclusions

The most convincing evidence of effectiveness was for hospital CGA, PCMH and community interventions involving holistic assessment and care planning on a range of outcomes, but no good evidence for effectiveness of holistic-assessment based interventions in general.

Variability in complex intervention designs means that there is no simple recipe to follow, and health and social care improvers need to carefully consider local context when designing similar interventions.

Implications

Interventions with the best evidence of benefit were:

- Comprehensive Geriatric Assessment for people with MLTCs and frailty in the hospital or recently admitted to the hospital.
- GP-led Patient-Centred Medical Homes for people with MLTCs in the community. This is a wholesale redesign of primary care with potentially wider benefits but is likely more complicated to implement than the other two interventions.
- Community-based interventions built around holistic initial assessment and care plan development for older adults in the community. This is a new specialist or primary care service working alongside existing primary care, but the identification and selection of people to receive the service is more complicated.

There was some variation in which outcomes were improved by these interventions in the different patient groups targeted, but none was clearly superior to the others. The choice of intervention will therefore depend on the local context, including the pattern of existing services and outcomes judged to be local priorities.

Common components of all of these are the assessment of a person's needs in multiple domains of health and the development of tailored care and follow-up plans. We believe that this is the core element of care that needs implementing (although the two full papers provide more detail on the many other intervention components used in varying numbers of studies).

When implementing these interventions, health and social care improvers should therefore:

- Carefully consider local circumstances and needs, and which outcomes are most important to stakeholders;
- Pay careful attention to how patients are identified and selected for intervention. Evidence of how best to identify patients for these interventions is lacking, but varying patient selection may explain some of the variability in trials, and we believe that intervening on unselected inpatients or older adults living at home is unlikely to be sensible;
- Clearly define the nature of the team which will deliver an intervention and the roles and responsibilities of multidisciplinary team members;
- Build trust and facilitate inter-professional communication between professionals involved in holistic needs assessment and development of care plans;
- Ensure that protected time and necessary resources are available to deliver an intervention;
- Consider how to best share information across services.

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