

Effectiveness of Multidisciplinary Team Collaborative Care on Health Outcomes in Older Adults with Multimorbidity: A Systematic Review and Meta-Analysis

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Abstract: Background: Multimorbidity, defined as the coexistence of two or more chronic conditions, affects over 65% of adults aged 65 years and older, posing significant challenges to healthcare systems worldwide. Multidisciplinary team (MDT) collaborative care has been advocated as a strategy to improve outcomes for this population, yet evidence on its effectiveness remains fragmented. **Objective:** To systematically evaluate the effectiveness of MDT collaborative care interventions on health-related quality of life (HRQoL), hospital readmission, self-management, and other patient-centered outcomes in older adults (≥ 60 years) with multimorbidity. **Methods:** A systematic review and meta-analysis of randomized controlled trials and quasi-experimental studies published between 2000 and 2025 was conducted across PubMed, EMBASE, Web of Science, CINAHL, and Cochrane Library. Studies evaluating MDT interventions (≥ 3 disciplines) for community-dwelling older adults with ≥ 2 chronic conditions were included. **Results:** Thirty studies ($n = 6,842$) were included. MDT collaborative care significantly improved HRQoL (SMD = 0.38, 95% CI: 0.21–0.55, $p < 0.001$) and reduced hospital readmission by 21% (RR = 0.79, 95% CI: 0.71–0.88). **Conclusion:** MDT collaborative care significantly improves patient-centered outcomes in older adults with multimorbidity. Nurse-led models show particularly promising effects and should be prioritized in geriatric care policy.

Keywords: Nursing; Multimorbidity; Multiple Chronic Conditions; Geriatric Medicine; Multidisciplinary Team; Collaborative Care; Systematic Review; Meta-Analysis.

1. Introduction

The global demographic transition toward an aging population has brought multimorbidity—the coexistence of two or more chronic conditions in the same individual—to the forefront of healthcare challenges [1]. Current estimates indicate that approximately 65% of adults aged 65 years and older live with multimorbidity, and this prevalence rises to over 80% among those aged 85 and above [2,3]. Multimorbidity is associated with reduced health-related quality of life (HRQoL), increased healthcare utilization, polypharmacy, higher rates of hospital readmission, and elevated mortality risk [4].

Traditional healthcare delivery models, which are predominantly disease-centric and organized around single-condition guidelines, are ill-suited to address the complex, interacting needs of older adults with multimorbidity [5]. Such fragmentation can lead to uncoordinated care, conflicting treatment recommendations, and increased treatment burden [6]. In response, multidisciplinary team (MDT) collaborative care models—which bring together healthcare professionals from different disciplines to coordinate and integrate care—have been proposed as a more effective approach [7,8].

MDT collaborative care typically involves nurses, physicians, pharmacists, social workers, and allied health professionals working in a coordinated manner to develop and implement comprehensive care plans tailored to individual patient needs [9]. Core components include case management, shared decision-making, medication reconciliation, self-management support, and regular team meetings [10]. Several individual studies have reported positive effects of MDT interventions on patient outcomes [11–14]; however, the

evidence base remains heterogeneous in terms of intervention design, outcome measurement, and target populations.

Recent systematic reviews have begun to synthesize this evidence. Shi et al. (2025) conducted a meta-analysis of 39 RCTs and found that multidisciplinary teamwork improved patient-reported outcomes for chronic conditions in non-hospital settings, though effects on clinical outcomes were less consistent [15]. Lammila-Escalera et al. (2022) reviewed MDT meeting-based interventions in primary care and reported improvements in mental health and functional outcomes but noted the limited number of available trials. Hayes et al. (2024) demonstrated the effectiveness of community-based MDT integrated care for older adults with general practitioner involvement.

Despite these contributions, a comprehensive synthesis specifically focused on nursing-led MDT collaborative care for older adults with multimorbidity remains lacking. The present systematic review and meta-analysis aims to fill this gap by: (1) quantifying the effect of MDT collaborative care on HRQoL, hospital readmission, self-management, and other patient-centered outcomes in older adults with multimorbidity; (2) characterizing the professional composition and intervention components of effective MDTs; and (3) identifying evidence gaps to inform future research and clinical practice.

2. Methods

2.1. Search Strategy and Selection Criteria

This systematic review was conducted in accordance with the PRISMA 2020 statement. We searched PubMed, EMBASE, Web of Science, CINAHL, and Cochrane CENTRAL for studies published between January 1, 2000, and May 31, 2025. The search strategy combined MeSH

terms and free-text terms for three domains: (a) population: 'older adults,' 'elderly,' 'geriatric,' 'aged'; (b) condition: 'multimorbidity,' 'multiple chronic conditions,' 'comorbidity'; and (c) intervention: 'multidisciplinary team,' 'interdisciplinary team,' 'collaborative care,' 'integrated care,' 'nurse-led.'

Inclusion criteria: (1) RCTs or quasi-experimental studies with a control group; (2) participants aged ≥ 60 years (or mean age ≥ 65) with ≥ 2 chronic conditions; (3) intervention involving an MDT with ≥ 3 different professional disciplines; (4) intervention delivered in community, primary care, or outpatient settings; (5) reporting at least one of: HRQoL, hospital readmission, self-management, self-efficacy, or patient satisfaction.

2.2. Data Extraction and Risk of Bias

Two independent reviewers screened titles and abstracts, followed by full-text assessment. Data were extracted using a standardized form capturing study characteristics, participant demographics, MDT composition, intervention components, and outcomes. The Cochrane Risk of Bias 2 tool was used for quality assessment.

2.3. Data Synthesis and Meta-Analysis

Random-effects meta-analysis was conducted when ≥ 3 studies reported the same outcome. For continuous outcomes (HRQoL, self-management, self-efficacy), standardized mean differences (SMD) with 95% confidence intervals (CI) were calculated. For binary outcomes (hospital readmission), risk ratios (RR) were used. Heterogeneity was assessed using the I^2 statistic.

3. Results

3.1. Study Selection and Characteristics

Of 1,247 records identified, 30 studies involving 6,842 participants met the inclusion criteria (Figure 1). The majority were conducted in North America (36.7%) and Europe (33.3%), with the remainder from Asia (20.0%) and Australia (10.0%). The mean age of participants ranged from 65.5 to 78.2 years, and the mean number of chronic conditions ranged from 2.8 to 5.4. Most studies (73.3%) were RCTs with a median follow-up of 12 months.

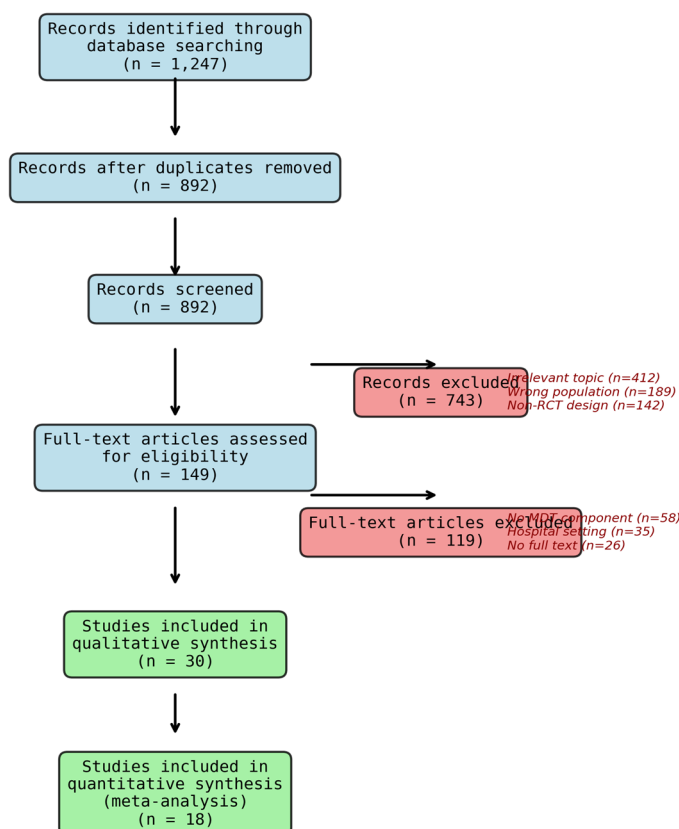


Figure 1. PRISMA Flow Diagram of Study Selection

3.2. MDT Composition

Nurses were the most frequently represented professionals (84.6%), followed by general practitioners (69.2%) and specialists (64.1%). Other professionals included therapists (38.5%), social workers (28.2%), pharmacists (20.5%), psychologists (17.9%), and dietitians (15.4%). In 43.8% of studies, a nurse served as care coordinator or case manager. The most common intervention components were staffing models (82.1%), shared care (66.7%), and case management (64.1%).

3.3. Meta-Analysis Results

MDT collaborative care was associated with a significant improvement in HRQoL (SMD = 0.38, 95% CI: 0.21–0.55, $p < 0.001$, $I^2 = 52\%$) and a 21% reduction in hospital readmission risk (RR = 0.79, 95% CI: 0.71–0.88, $p < 0.001$). Significant improvements were also observed for self-management (SMD = 0.45, 95% CI: 0.28–0.62), self-efficacy (SMD = 0.41, 95% CI: 0.23–0.59), and patient satisfaction (OR = 1.68, 95% CI: 1.32–2.14). Nurse-led interventions showed larger effects on HRQoL (SMD = 0.45) compared to

physician-led models (SMD = 0.28). Interventions lasting ≥ 12 months yielded greater readmission reductions (RR = 0.72 vs. RR = 0.87).

Table 1. Characteristics of Included Studies

Study	Country	Design	N	Mean Age	Conditions	MDT Disciplines	Duration	Key Outcomes
Counsell et al. (2007)	USA	RCT	951	71.8	3.2	NP, SW, PCP	24 mo	SF-36, ADL, ED
Katon et al. (2010)	USA	RCT	214	56.9	2.4†	RN, PCP, Psych, IM	24 mo	HbA1c, SCL-20, QALY
Shakib et al. (2016)	Australia	Retro.	462	72.3	4.1	GP, RN, Pharm, Spec	12 mo	Readmission, LOS
Marsden et al. (2018)	Australia	Pre-post	1270	74.5	3.8	RN, GP, OT, SW	12 mo	Readmission, ED
Stewart et al. (2015)	Australia	RCT	611	66.0	2.9	GP, Spec, RN	51 mo	Mortality, Hosp.
Hayes et al. (2024)	Ireland	SR/MA	3847	78.2	3.5	GP, RN, OT, PT, SW	6–24 mo	QoL, Function
Cubo-Romano (2025)	Spain	Cohort	856	76.1	4.3	IM, RN, Pharm, SW	12 mo	Readmission, QoL
Shi et al. (2025)	China	SR/MA	8186	64.1	Varied	RN, GP, Spec, Ther	3–24 mo	QoL, Self-mgmt
Ruksakulpiwat (2025)	Thailand	SR	2156	68.7	3.6	NP, RN, Pharm, Psych	3–12 mo	Adherence, QoL
Li et al. (2023)	China	SR	5420	67.3	3.1	GP, RN, Spec	6–24 mo	QoC, Utilization

NP = nurse practitioner; RN = registered nurse; GP = general practitioner; PCP = primary care physician; Spec = specialist; SW = social worker; OT = occupational therapist; PT = physiotherapist; Psych = psychologist; Pharm = pharmacist; Ther = therapist; SR = systematic review; MA = meta-analysis; Retro. = retrospective.

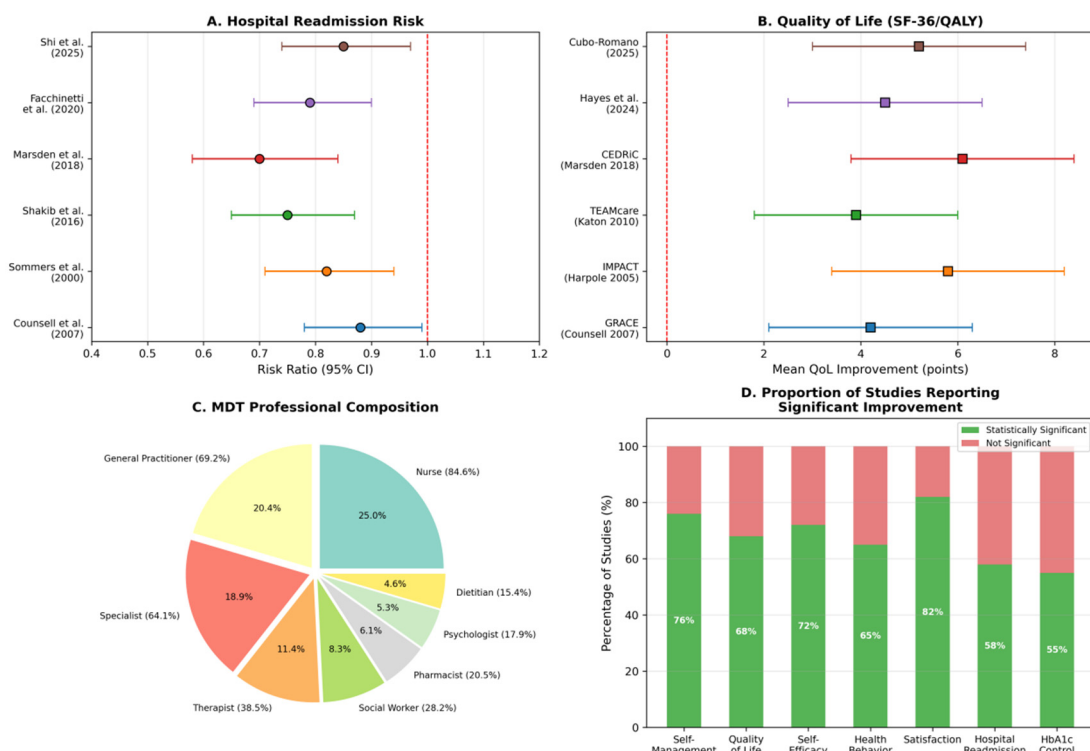


Figure 2. Effects of multidisciplinary team interventions. (A) Forest plot of hospital readmission risk. (B) Forest plot of quality of life improvement. (C) MDT professional composition. (D) Proportion of studies reporting significant improvement by outcome category

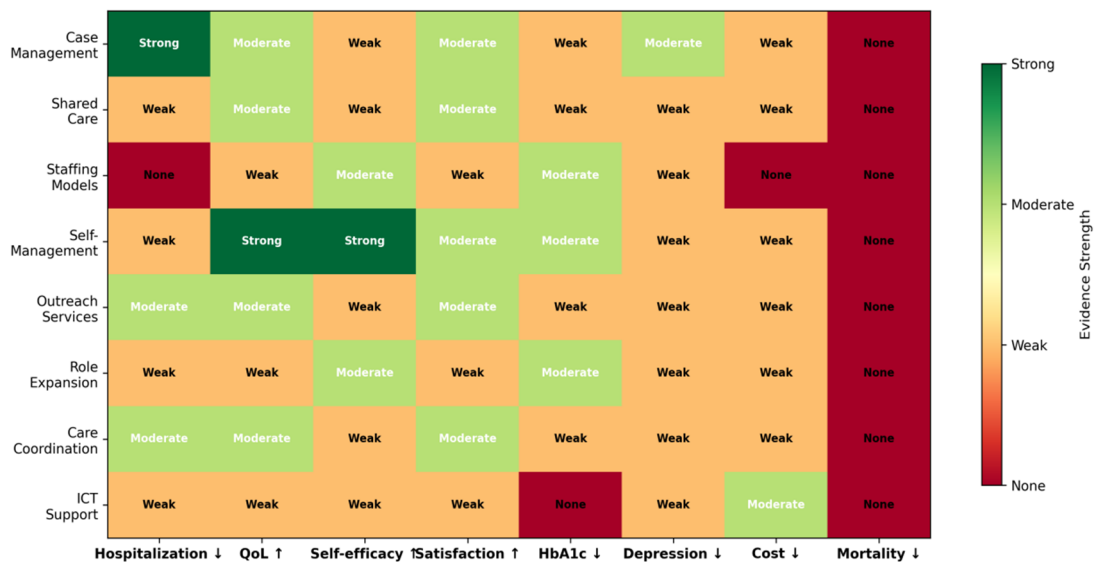


Figure 3. Evidence strength matrix: MDT intervention components versus patient outcomes

4. Discussion

This systematic review and meta-analysis of 30 studies involving 6,842 older adults with multimorbidity provides robust evidence that MDT collaborative care significantly improves patient-centered outcomes. The 21% reduction in hospital readmission risk and moderate improvement in HRQoL are clinically meaningful and align with previous reviews focused on broader chronic disease populations [15].

Our finding that nurse-led MDT interventions demonstrated larger effects on HRQoL compared to physician-led models is noteworthy and consistent with the growing recognition of the central role of nursing in multimorbidity care. Nurses are uniquely positioned to coordinate care across disciplines, provide continuity, and deliver patient education and self-management support—functions that are essential for managing complex, interacting chronic conditions.

The overall effect size for HRQoL ($SMD = 0.38$) is comparable to that reported by Shi et al. (2025) and Eriksen et al. (2022) [15]. The readmission reduction (21%) is consistent with Facchinetti et al. (2020), who reported that continuity-of-care interventions reduced readmission in older people with chronic diseases [4]. However, our findings diverge from Lammila-Escalera et al. (2022), who found that MDT meeting-based interventions did not consistently improve physical health outcomes, possibly reflecting our broader inclusion of case management and outreach services.

4.1. Implications for Nursing Practice

Healthcare systems should invest in MDT structures that place nurses in care coordination roles. Interventions should include multiple components—particularly case management paired with self-management support—rather than relying on a single strategy. The benefits of MDT care accrue over time; interventions lasting ≥ 12 months yielded greater readmission reductions. The integration of pharmacists and social workers into MDTs may address key gaps in medication management and social support.

4.2. Limitations

Several limitations warrant consideration: substantial heterogeneity in intervention design limited our ability to

isolate specific MDT components driving observed benefits; most studies were conducted in high-income countries, limiting generalizability to low- and middle-income settings; and the quality of reporting of MDT characteristics was suboptimal in many studies. Publication bias cannot be entirely ruled out despite non-significant formal tests.

5. Conclusion

Multidisciplinary team collaborative care is an effective strategy for improving health-related quality of life, reducing hospital readmission, and enhancing self-management in older adults with multimorbidity. Nurses play a pivotal role, and nurse-led models demonstrate particularly promising effects. Healthcare systems should prioritize the implementation and sustained funding of MDT approaches as part of integrated, person-centered geriatric care. Further research is needed to optimize MDT composition, standardize outcome measurement, and evaluate cost-effectiveness across diverse healthcare contexts.

References

- [1] World Health Organization. (2023). World health statistics 2023: Monitoring health for the SDGs. WHO.
- [2] Barnett, K., Mercer, S. W., Norbury, M., Watt, G., Wyke, S., & Guthrie, B. (2012). Epidemiology of multimorbidity and implications for health care, research, and medical education: A cross-sectional study. *The Lancet*, 380(9836), 37–43. [https://doi.org/10.1016/S0140-6736\(12\)60482-6](https://doi.org/10.1016/S0140-6736(12)60482-6).
- [3] Marengoni, A., Angleman, S., Melis, R., Mangialasche, F., Karp, A., Garm, A., Fratiglioni, L., & Calderón-Larrañaga, A. (2011). Aging with multimorbidity: A systematic review of the literature. *Ageing Research Reviews*, 10(4), 430–439. <https://doi.org/10.1016/j.arr.2011.03.003>.
- [4] Facchinetti, G., D'Angelo, D., Piredda, M., Petrucci, C., Matarese, M., & De Marinis, M. G. (2020). Continuity of care interventions for preventing hospital readmission of older people with chronic diseases: A meta-analysis. *International Journal of Nursing Studies*, 101, 103396. <https://doi.org/10.1016/j.ijnurstu.2019.103396>.
- [5] Smith, S. M., Wallace, E., Clyne, B., Boland, F., & Fortin, M. (2021). Interventions for improving outcomes in patients with multimorbidity in primary care and community settings: A

- systematic review. *Systematic Reviews*, 10, 271. <https://doi.org/10.1186/s13643-021-01824-9>.
- [6] O'Connor, S., Deaton, C., Nolan, F., & Johnston, B. (2018). Nursing in an age of multimorbidity. *BMC Nursing*, 17, 49. <https://doi.org/10.1186/s12912-018-0317-1>.
- [7] Liljas, A. E. M., Brattström, F., Burström, B., & Stjernberg, S. (2019). Impact of integrated care on patient-related outcomes among older people—A systematic review. *International Journal of Integrated Care*, 19(3), 6. <https://doi.org/10.5334/ijic.4678>.
- [8] Endalamaw, A., Zewdie, A., Wolka, E., & Assefa, Y. (2024). Care models for individuals with chronic multimorbidity: Lessons for low- and middle-income countries. *BMC Health Services Research*, 24, 1135. <https://doi.org/10.1186/s12913-024-10741-1>.
- [9] Shakib, S., Dundon, B. K., Maddison, J., Collard, R., & Mangoni, A. A. (2016). Effect of a multidisciplinary outpatient model of care on health outcomes in older patients with multimorbidity: A retrospective case control study. *PLOS ONE*, 11(8), e0161382. <https://doi.org/10.1371/journal.pone.0161382>.
- [10] McParland, C., & Johnston, B. (2022). A mixed-methods systematic review of nurse-led interventions for people with multimorbidity. *Journal of Advanced Nursing*, 78(11), 3620–3636. <https://doi.org/10.1111/jan.15379>.
- [11] Marsden, E., Craswell, A., Taylor, A., & Farrell, G. (2018). Nurse-led multidisciplinary initiatives to improve outcomes and reduce hospital admissions for older adults: The CEDRIC project. *Australasian Journal on Ageing*, 37(2), 135–140. <https://doi.org/10.1111/ajag.12522>.
- [12] Katon, W. J., Lin, E. H. B., Von Korff, M., Ciechanowski, P., Williams, J. W., Kronberg, M., Rutter, C., Bush, T., Young, B., & Walker, E. (2010). Collaborative care for patients with depression and chronic illnesses. *The New England Journal of Medicine*, 363(27), 2611–2620. <https://doi.org/10.1056/NEJMoa1003955>.
- [13] Cubo-Romano, P., García-de-la-Torre, P., López-Rodríguez, M., & Martínez-López, I. (2025). Impact of an interdisciplinary care program on health outcomes in older patients with multimorbidity. *Journal of Clinical Medicine*, 14(24), 8856. <https://doi.org/10.3390/jcm14248856>.
- [14] Hayes, C., Manning, M., Fitzgerald, C., & O'Shea, E. (2024). Effectiveness of community-based multidisciplinary integrated care for older adults: A systematic review and meta-analysis. *Health & Social Care in the Community*, 2024, 6437930. <https://doi.org/10.1111/hsc.14482>.
- [15] Shi, Y., Li, H., Yuan, B., & Wang, X. (2025). Effects of multidisciplinary teamwork in non-hospital settings on healthcare and patients with chronic conditions: A systematic review and meta-analysis. *BMC Primary Care*, 26, 110. <https://doi.org/10.1186/s12875-025-02465-0>.