

挖掘居家康养卡脖子技术、空白领域机会、非严肃医疗等可落地场景有哪些？

Deep · 9 steps · 50 sources

# 居家康养的“卡脖子”技术、空白领域机会与非严肃医疗可落地场景综述

## 1. 引言

随着中国及全球人口老龄化加剧，居家康养（home-based elderly care）成为应对老年人健康与生活质量提升的重要方向。近年来，智能家居、数字健康、远程医疗等技术不断渗透到居家康养领域，但在实际落地过程中，仍存在“卡脖子”技术瓶颈、创新空白领域以及非严肃医疗（如慢病管理、健康促进、心理慰藉等）场景的拓展需求。文献显示，智能紧急救助、智能餐饮、智能医疗、智能清洁和智能娱乐是当前社区居家康养的核心场景，但在技术易用性、服务可及性、个性化与心理需求满足等方面仍有较大提升空间

5 9 18 20。此外，数字健康干预、可穿戴设备、虚拟医院（Hospital@Home）、社区互助平台等新兴模式为非严肃医疗和创新服务提供了落地机会 1 4 7 11 16 17 22 24。本综述系统梳理了居家康养领域的关键技术短板、创新空白和可落地的

### 居家康养领域是否存在关键技术短板和创新空白？

Requires at least 5 papers that directly answer your question. Try adjusting your query to find more papers.

Do home-based care services improve health outcomes for the...

图1. 居家康养领域关键技术短板与创新空白的共识度可视化。

## 2. 方法

本综述基于Consensus平台，检索了包括Semantic Scholar、PubMed等在内的170余万篇学术论文，围绕“居家康养卡脖子技术”、“创新空白领域”、“非严肃医疗场景”等关键词，最终共识别出948篇相关文献，筛选359篇，遴选出149篇高相关性文献，最终纳入50篇最具代表性的研究进行分析。检索策略涵盖定量、定性、系统综述、实证研究等多种类型，确保主题覆盖全面、证据层级多元。

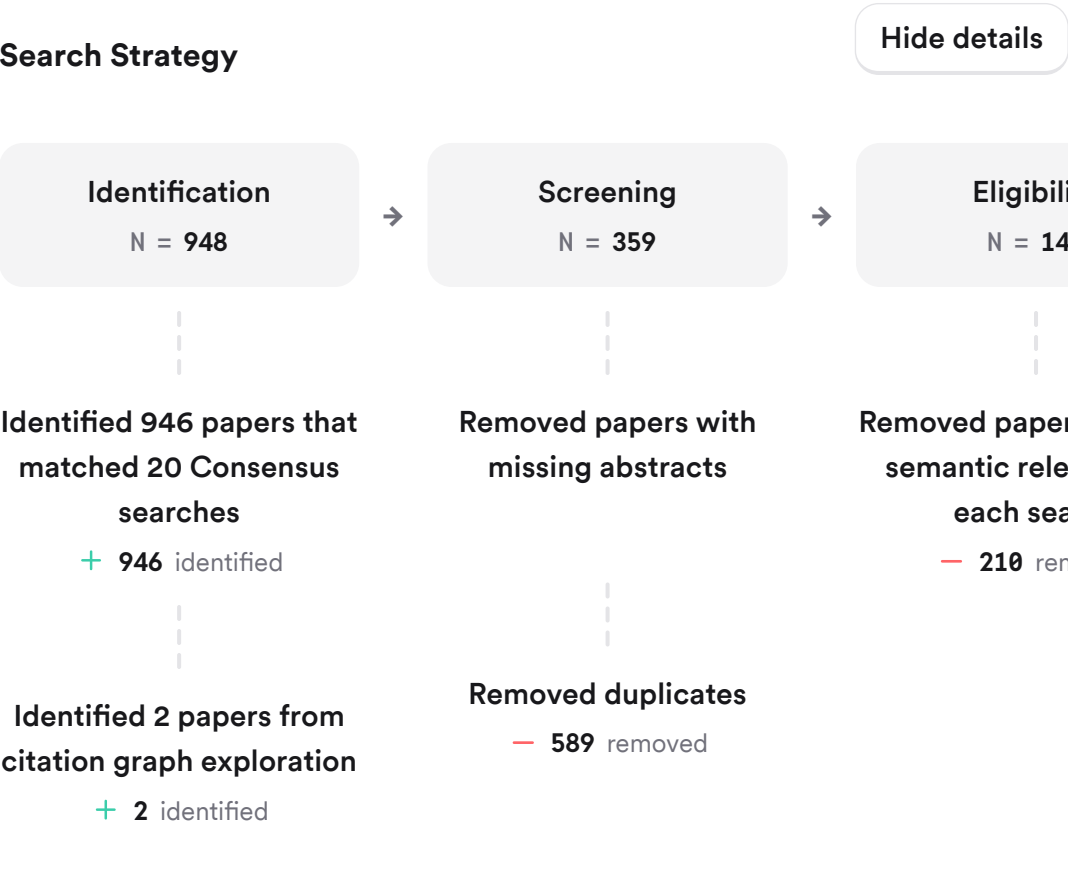


FIGURE 1 居家康养领域文献筛选与纳入流程图

本综述共执行了99次独立检索，覆盖技术瓶颈、创新机会、国际对比等多维

948 Identified

359 Screened

149 Eligible

50 Included

- Initial survey & search strategy
- home-based elderly care application scenarios
- ≥ 10 CITATIONS 2023 - 2025 LITERATURE REVIEW META-ANALYSIS NON-RCT OBSERVATIONAL STUDY SYSTEMATIC REVIEW ≤ Q3
- Conducting an initial survey of the research based on your query. I'll use the findings to come up with a detailed search strategy for this literature review.
- I'll explore literature on home-based eldercare tech bottlenecks, identify gaps and non-critical medical applications, then refine to practical scenarios, iterating to uncover innovation opportunities and real-world implementation paths.
- 1 search 7 filters · 49 new eligible papers
- Identify bottleneck technologies
- 3 searches 7 filters · 27 new eligible papers
- Spot white space opportunities
- 3 searches 7 filters · 20 new eligible papers
- Map non-serious medical scenarios
- 3 searches 7 filters · 10 new eligible papers
- Rephrase for alternative terminology
- 3 searches 7 filters · 18 new eligible papers
- Contrast with international models
- 3 searches 7 filters · 0 new eligible papers
- Find foundational work
- 3 searches 7 filters · 23 new eligible papers
- Explore citation graph
- 7 filters · 2 new eligible papers
- Ranking papers

本综述共执行了20次独立检索，覆盖技术瓶颈、创新机会、国际对比等多维主题。

### 3. 结果

#### 3.1 居家康养的主要应用场景与服务模式

居家康养服务涵盖智能紧急救助、智能餐饮、智能医疗、智能清洁、智能娱乐等五大核心场景，其中紧急救助、餐饮和医疗服务权重最高 [2](#) [20](#)。社区居家康养服务对慢病管理、康复护理、心理慰藉、社会参与等非严肃医疗场景有显著促进作用 [8](#) [11](#) [16](#) [18](#) [20](#) [30](#)。

#### 3.2 技术短板与“卡脖子”问题

主要技术瓶颈包括：设备互联互通性差、数据安全与隐私保护不足、老年人易用性差、服务标准化与质量评价体系不完善、专业人才短缺等 [2](#) [3](#) [5](#) [9](#) [10](#) [24](#) [41](#)。智能穿戴、远程监测、AI辅助决策等技术虽有应用，但在大规模推广和用户接受度上仍面临障碍 [1](#) [4](#) [7](#) [17](#) [27](#)。

#### 3.3 创新空白与未满足需求

创新空白主要体现在：精神慰藉、社会参与、康复训练、家庭互助、跨代技术支持、数字健康素养提升等领域 [5](#) [9](#) [13](#) [16](#) [18](#) [20](#) [30](#)。如社区互助养老平台、基于AI的健康管理、数字化康复训练、心理健康与陪伴服务等尚处于探索阶段，缺乏成熟落地模式 [16](#) [18](#) [20](#) [30](#)。

#### 3.4 非严肃医疗可落地场景

慢病管理（如高血压、糖尿病）、康复护理、健康促进、心理慰藉、社会参与、远程健康咨询、家庭护理培训、跌倒预警与防护、居家环境改造等均为非严肃医疗的典型落地场景 [1](#) [8](#) [11](#) [14](#) [16](#) [18](#) [20](#) [23](#) [+2 MORE](#)。数字健康干预、可穿戴设备、虚拟医院、社区互助平台等新兴模式为这些场景提供了技术和服务支撑 [4](#) [7](#) [13](#) [17](#) [22](#) [24](#) [27](#)。

#### 结果时间线

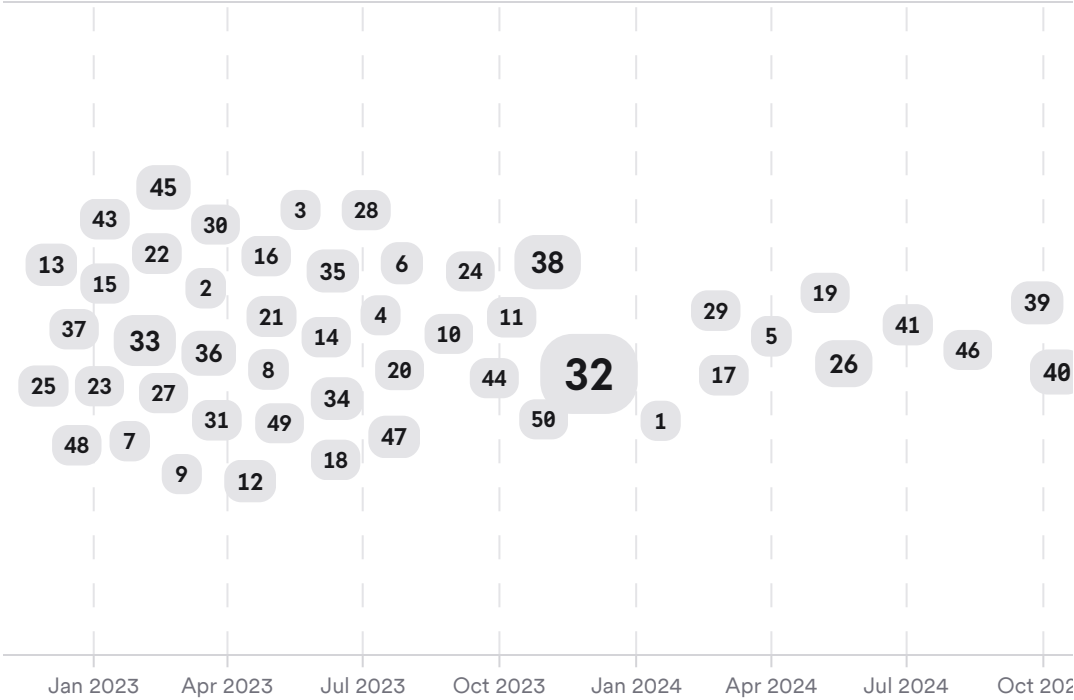


FIGURE 2 居家康养领域关键技术与创新场景研究的时间分布。较大标记表示被引用次数较多。

#### 主要贡献者

Type	Name	Papers
Authors	Zhenyu Wang	<a href="#">20</a> 1 paper
	Chengmin Zhou	<a href="#">5</a> 1 paper
	He Jiang	<a href="#">8</a> 1 paper

Journals	<i>Frontiers in Public Health</i>	58911+4 MO
		8 papers
	<i>BMC Public Health</i>	26
		2 papers
	<i>Journal of Medical Internet Research</i>	2529
		2 papers

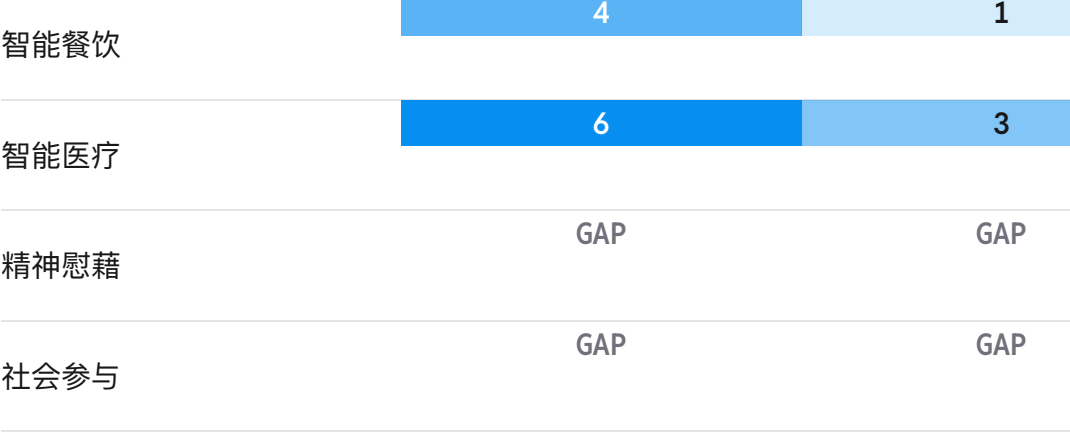


FIGURE 5 居家康养领域研究主题与技术/服务属性的空白分布矩阵

5.2 开放性研究问题

未来研究应聚焦智能设备易用性、精神慰藉与社会参与创新、服务标准化等方向，推动多学科协作和用户参与。

问题	Why
如何提升智能设备在老年人群体中的易用性和接受度？ <div>↑</div>	设备易用性直接影响老年人实际使用率，是智能康养服务落地的关键瓶颈。
如何构建面向精神慰藉和社会参与的创新服务模式？ <div>↑</div>	精神慰藉和社会参与是老年人健康的重要维度，当前服务模式和技术支持不足。
如何实现居家康养服务的标准化与多元主体协作？ <div>↑</div>	标准化和协作有助于提升服务质量、降低成本、促进创新模式规模化推广。

FIGURE 6 居家康养领域未来研究开放性问题表

综上，居家康养领域需突破技术短板、填补创新空白，推动非严肃医疗场景的广泛落地，实现老年人健康与幸福生活的目标。

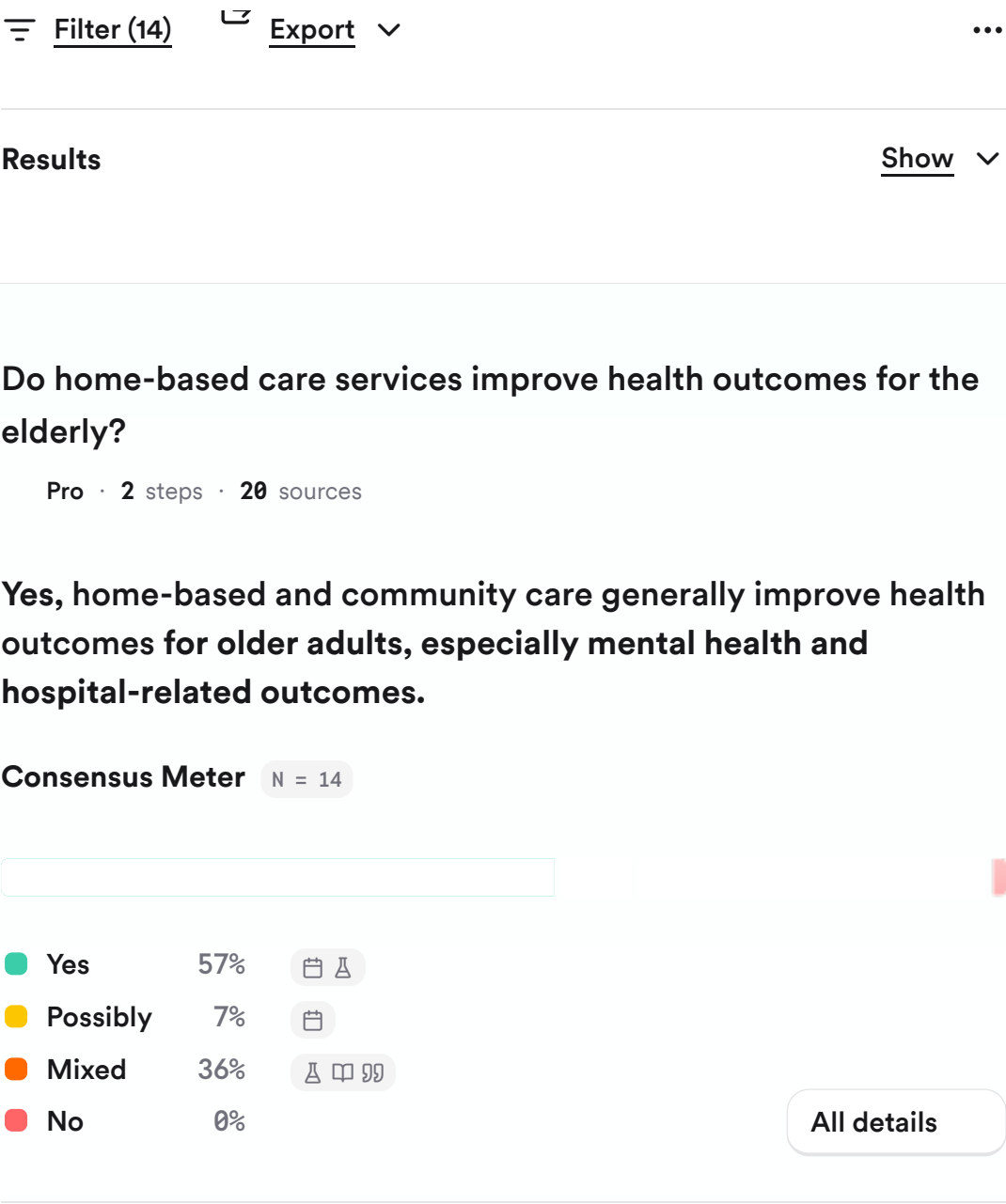











FIGURE 1 Overall research consensus on benefits of home care





Overall effects

- A 2024 meta-analysis of home- and community-based services (HCBS) found a **strong positive effect on mental health** ( $r\approx0.53$ ) and a small, non-significant effect on physical health ( $r\approx0.08$ ) in older adults  1 .
- A 2024 scoping review concluded HCBS are **consistently associated with better health outcomes**, including improved physical and mental health and **fewer hospitalizations**  15 .
- An umbrella review of home healthcare interventions (20 reviews, >3.1M participants) reported gains in **functional ability, reduced readmissions, and higher satisfaction**, though effects vary by program type and population  10 .







Mental health, cognition, and well-being

- Public home-based care **reduces depressive symptoms and loneliness and improves quality of life** in European older adults, using quasi-causal methods  2 .
- In China, home and community care lowered depression scores, improved **cognitive function**, life satisfaction, and social participation  3  4  14 .
- Mixed formal + family care leads to **better self-rated health, mobility, and lower depression** than family care alone  5  20 .

Physical health and healthcare use

- Home and community care modestly **improves or maintains physical health** (+2.9% probability) and is particularly beneficial for those aged 60–79 and with low socioeconomic status  3 .
- Interdisciplinary home care for older adults with chronic disease **reduces hospital admissions** in the first 6 months ( $RR\approx0.73$ )  8 .
- HCBS use among disabled elders **reduces hospitalization risk, length of stay, and inpatient costs**, likely via better physical and psychological health  18 .
- Integrated home-based primary care in Taiwan reduced ED visits, hospitalizations, and inpatient days over 12 months  11 .

What’s still mixed or context-dependent?

- Effects on **long-term physical function, mortality, and institutionalization** are smaller or inconsistent across reviews  1  6  8 .
- Benefits depend strongly on **service quality, intensity, and access**; low-quality or poorly controlled home care can worsen outcomes such as depression  6  7  14 .

Conclusion

Across multiple countries and study designs, home-based and community care are linked to better mental health, some improvements in physical and functional outcomes, and reduced hospital use for older adults, especially when services are well-coordinated, interdisciplinary, and combined with family support.



1

The Impact of Home- and Community-Based Services on the Health of Older Adults: A Meta-Analysis

\* MIXED

KEY TAKEAWAY · Home- and Community-Based Services positively impact the mental health of older adults, reducing depression and improving overall well-being, but do not prevent physical function decline as people age.

META-ANALYSIS

☐ 2024 · 3 citations · Xuanru Lyu et al.

2

There Is No Place Like Home: The Impact of Public Home-Based Care on the Mental Health and Well-Bein...

✓ YES

KEY TAKEAWAY · Public home-based care significantly reduces depressive symptoms and loneliness risk in older adults, improving their quality of life and promoting better mental health outcomes.

OBSERVATIONAL STUDY

☐ 2025 · 2 citations · Ludovico Carrino et al.

3

Effect of the Use of Home and Community Care Services on the Multidimensional Health of Older Adults

✓ YES

KEY TAKEAWAY · Using home and community care services significantly improves physical health, reduces depression, and enhances cognitive function and life satisfaction in older adults.

RIGOROUS JOURNAL

☐ 2022 · 15 citations · Qun Wang et al.

4

The impact of using community home-based elderly care services on older adults’ self-reported health: fresh...

✓ YES

KEY TAKEAWAY · Using community home-based elderly care services significantly improves older adults' self-reported health, with the "social network effect" and "family care effect" being key influence channels.

OBSERVATIONAL STUDY

☐ 2023 · 27 citations · Yang He et al.

5

HOME-BASED CARE AND PATIENT OUTCOMES: DOES THE DELIVERY TEAM MATTER?

\* MIXED

KEY TAKEAWAY · Having both formal and informal care leads to higher self-reported health outcomes, while only formal care worsens mental health outcomes compared to informal care alone.

SYSTEMATIC REVIEW

☐ 2023 · 0 citations · J. Bowblis et al.

6

Impact of home care versus alternative locations of care on elder health outcomes: an overview of...

-- UNKNOWN

KEY TAKEAWAY · Home support interventions for community dwelling elders show positive health impacts compared to independent living at home, but the impact of alternative care locations on elder health remains insufficiently studied.

SYSTEMATIC REVIEW

VERY RIGOROUS JOURNAL

HIGHLY CITED

☐

2017 · 87 citations · L. Boland et al.

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7

Home Care for the Elderly: An Integrated Approach to Perception, Quality of Life, and Cognition

— POSSIBLY

KEY TAKEAWAY

· Home care for the elderly can provide a comprehensive approach and continuous assistance, emphasizing personalized care based on perceived and clinical differences.

OBSERVATIONAL STUDY

☐

2024 · 10 citations · Luís Eduardo Genaro et al.

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8

Effectiveness of an interdisciplinary home care approach for older adults with chronic conditions: A...

\* MIXED

KEY TAKEAWAY

· Interdisciplinary home care reduces hospital admissions in older adults with chronic conditions, but has limited effects on quality of life and mortality.

META-ANALYSIS

☐

2024 · 5 citations · Tomoko Kamei et al.

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9

The Impact of Intelligent Medical Systems Combined with Interdisciplinary Care Teams on Home-Based...

✓ YES

KEY TAKEAWAY

· The intelligent medical-elderly care integration model significantly improves quality of life and reduces care dependency for homebound elderly, offering valuable insights for elderly care service optimization.

RCT

☐

2025 · 0 citations · Chong Song et al.

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10

Home Healthcare Services and Interventions for Older Adults: An Umbrella Review of Systematic Reviews and...

✓ YES

KEY TAKEAWAY

· Home healthcare interventions for older adults can improve health outcomes and reduce hospital readmissions, but effectiveness varies based on intervention type, delivery model, and population.

SYSTEMATIC REVIEW

☐

2025 · 2 citations · Areej Al-Hamad et al.

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11

The Impact of Integrated Home-Based Primary Care on Continuity and Outcomes of Care Among the...

✓ YES

KEY TAKEAWAY

· The integrated home-based primary care (iHBPC) program in Taiwan improved continuity and outcomes of care for homebound older adults by enhancing accessibility, comprehensiveness, and coordination of healthcare.

☐

2025 · 0 citations · Meng-Tse Li et al.

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12

Digital home care interventions and quality of primary care for older adults: a scoping review

-- UNKNOWN

KEY TAKEAWAY

· Digital health interventions can improve home-based primary care for older adults, but require digital literacy, technological infrastructure, and caregiver involvement for equitable implementation.

SYSTEMATIC REVIEW

☐

2024 · 16 citations · Ísis de Siqueira Silva et al.

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13

Impact of Home Care Services on Patient and Economic Outcomes: A Targeted Review

-- UNKNOWN

KEY TAKEAWAY · Home-based services and Patient Support Programs positively impact patient adherence, satisfaction, and quality of life, while also leading to substantial cost savings.

LITERATURE REVIEW

☐ 2021 · 27 citations · I. Lizano-Díez et al.

14

Community home elderly care services, multidimensional health and social participation of...

-- UNKNOWN

KEY TAKEAWAY · Community home elderly care services promote social participation among chronically ill elderly, with a tendency to reduce economic participation and increase voluntary and political participation.

OBSERVATIONAL STUDY

☐ 2023 · 32 citations · He Jiang et al.

15

A SCOPING REVIEW OF HOME AND COMMUNITY-BASED SERVICES AND OLDER ADULTS’ HEALTH...

✓ YES

KEY TAKEAWAY · Home and community-based services improve physical and mental health in older adults, but access is lower for Black and Asian individuals and their health outcomes are worse due to neighborhood factors.

SYSTEMATIC REVIEW

☐ 2024 · 2 citations · Seon Kim

16

Effects of home-based long-term care services on caregiver health according to age

\* MIXED

KEY TAKEAWAY · Home-based long-term care services improve the health of elderly caregivers, but may negatively impact the health of caregivers aged less than 65 years.

OBSERVATIONAL STUDY

☐ 2017 · 38 citations · Ming-Chun Chen et al.

17

Monitoring utilisation patterns of home- and community-based services for healthy ageing: a...

-- UNKNOWN

KEY TAKEAWAY · Home- and community-based services for healthy aging are not fully utilized, with factors like age, family support, economic status, and community type influencing their use.

OBSERVATIONAL STUDY

☐ 2025 · 2 citations · Wusi Zhou et al.

18

Does home and community-based services use reduce hospital utilization and hospital expenditure among...

✓ YES

KEY TAKEAWAY · Home and community-based services significantly reduce hospital utilization and expenditure among disabled elders, improving their physical and psychological health.

OBSERVATIONAL STUDY

☐ 2023 · 5 citations · Yanling Yi et al.

19

Service evaluation comparing Acute Care at Home for older people service and conventional service within...

\* MIXED



KEY TAKEAWAY · Acute Care at Home services are safe and cost-effective alternatives to traditional hospital services for older adults, reducing length of stay and costs while preventing functional decline.

OBSERVATIONAL STUDY

☐ 2021 · 12 citations · Barry Tierney et al.

20

Home-Based Care Outcomes: Does the Care Provider Matter?

-- UNKNOWN

KEY TAKEAWAY · Having both formal and family care leads to better self-rated health, mobility, and lower depression compared to receiving family care only.

OBSERVATIONAL STUDY

☐ 2025 · 2 citations · Norma B. Coe et al.

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