



## RESEARCH ARTICLE

# Impact of Home Care Interventions on Hospital Readmission Rates in Elderly Patients: A Systematic Review

Abdulaziz Alqarni <sup>1</sup>, Mohammed Senitan <sup>2\*</sup><sup>1</sup>King Fahad Medical City (KFMC)<sup>2</sup>Department of Public Health, Faculty of Health Sciences, Saudi Electronic University

ARTICLE INFO	ABSTRACT
Received: Aug 31, 2024 Accepted: Jan 27, 2025	Hospital readmissions in elderly patients pose significant healthcare challenges, with implications for both costs and patient outcomes. This systematic review evaluates the effectiveness of home care services in reducing hospital readmission rates post-discharge. A comprehensive search of studies published from January 2007 to September 2022 was conducted, focusing on the association between home care interventions and hospital readmissions. Among the 21 studies meeting the inclusion criteria, a variety of home care interventions were analyzed, including transitional care programs and home health visits. Results indicate that home care services, particularly comprehensive transitional care programs, are effective in reducing readmissions in elderly patients. However, the studies varied in quality and sample sizes, highlighting the need for further high-quality research. Conclusively, home care interventions show promise in mitigating hospital readmissions, underscoring the value of comprehensive transitional care and home-based support services. Future research should aim to solidify these findings and explore the cost-effectiveness of these interventions.
<b>Keywords</b> Hospital Readmissions Elderly Patients Home Care Services Transitional Care Programs	
<b>*Corresponding Author:</b> malharbi@seu.edu.sa	

## INTRODUCTION

The global population is experiencing a significant increase in aging individuals, intensifying the demand for healthcare services, especially in managing transitions from hospital to home care for elderly patients (World Health Organization, 2021). This demographic often presents with complex medical conditions, necessitating effective post-discharge strategies to prevent readmissions and support recovery (World Health Organization, 2021). Home care services have become increasingly popular, providing diverse interventions like nursing, medication management, and physical therapy within the patient's home environment, fostering recovery and independence (National Institute on Aging, 2021).

This systematic review aims to evaluate the effectiveness of home care in reducing hospital readmissions post-discharge. Prior studies have indicated that hospital readmissions are a frequent challenge among elderly patients, often leading to escalated healthcare costs and diminished quality of life (Krumholz et al., 2013; Medicare Payment Advisory Commission, 2018). Home care has been associated with improved patient outcomes, reduced costs, and higher satisfaction (Shepperd et al., 2009). However, the evidence is not entirely conclusive, with some studies reporting varied or negligible impacts of home care on readmission rates (Koehler et al., 2013; Anderson et al., 2017).

Addressing these discrepancies, this review will synthesize existing evidence, emphasizing the importance of carefully designed studies in this field. We will include randomized controlled trials and observational studies to assess home care's impact on hospital readmission rates, mortality, functional status, quality of life, healthcare costs, and patient satisfaction.

This research will provide valuable insights for healthcare professionals, policymakers, and patients in making informed decisions about post-discharge care. Understanding the role of home care in reducing hospital readmissions is critical for optimizing healthcare resources and enhancing the quality of patient care.

## 2. MATERIALS AND METHODS

### 2.1 Study Design and Approach

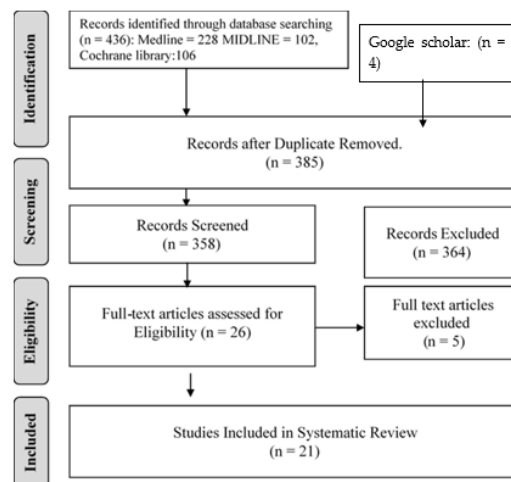
This study adopts a systematic review methodology, aligning with the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines for accuracy and consistency in review process (Page et al., 2021). The goal is to comprehensively synthesize findings from a variety of studies, both observational and experimental, to assess the impact of home health care services on hospital readmission rates.

### 2.2 Search Strategy

A detailed and structured search was conducted in PubMed, MEDLINE, Cochrane Library, and Google Scholar. The search strategy was developed to encompass a broad range of relevant studies, using terms like "home health care services" and "hospital readmission rates." This method ensured the capture of all pertinent studies published from January 2007 to September 2022.

### 2.3 Screening and Selection Process

Following PRISMA guidelines, initial screening was based on titles and abstracts, followed by a full-text review to determine study eligibility (Moher et al., 2009). Figure 1, shows study selection process in which the inclusions criteria were defined to incorporate randomized controlled trials, observational studies, and other relevant designs focusing on the relationship between home health care services and hospital readmission rates. Exclusion criteria were applied to filter out studies that did not meet these specifications, including non-peer-reviewed sources and studies not written in English.



**Figure 1. Study Selection Process**

### 2.4 Quality Appraisal

The Joanna Briggs Institute (JBI) checklist for quantitative studies was employed to assess the quality and validity of the included studies (The Joanna Briggs Institute, 2017). Table 1, shows quality

appraisal of each study against set criteria such as sample definition, exposure measurement, and statistical analysis.

**Table 1. Quality appraisal of selected studies**

Study	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8
Blum & Gottlieb, 2014 [12]	Y	Y	Y	Y	U	U	Y	Y
Burnett et al., 2022 [13]	Y	Y	Y	NA	N	NA	Y	Y
Charles de Mestral et al., 2019 [14]	Y	Y	N	NA	U	U	N	Y
Chen et al., 2016 [15]	Y	Y	Y	Y	N	U	Y	Y
Chen et al., 2018 [16]	Y	Y	Y	Y	Y	U	NA	Y
Cunha Ferré et al., 2019 [17]	Y	Y	U	NA	N	NA	Y	Y
Deo et al., 2021 [18]	Y	Y	Y	Y	Y	Y	U	Y
Dhalla et al., 2014 [19]	Y	U	Y	NA	N	Y	Y	Y
Elliott et al., 2017 [20]	Y	Y	Y	Y	U	U	Y	Y
Glans et al., 2020 [21]	Y	Y	Y	NA	N	N	Y	Y
Iyengar et al., 2007 [22]	U	Y	N	Y	U	U	N	U
Levine et al., 2020 [23]	Y	Y	Y	Y	N	U	Y	Y
Lyth et al., 2021 [24]	Y	Y	Y	Y	Y	U	NA	Y
Schapira et al., 2022 [25]	Y	Y	U	NA	N	Y	Y	Y
Schumacher et al., 2021 [26]	Y	Y	Y	Y	Y	Y	U	Y
Sterling et al., 2020 [27]	Y	U	Y	NA	N	Y	Y	Y
Strano et al., 2019 [28]	Y	Y	Y	Y	N	U	Y	Y
Thomas et al., 2008 [29]	U	Y	Y	Y	Y	U	NA	Y
Tinetti et al., 2012 [30]	Y	Y	U	Y	N	NA	Y	Y
Toles et al., 2014 [31]	Y	Y	Y	Y	Y	Y	U	Y

Vianello et al., 2013 [32]	U	Y	Y	Y	U	U	Y	Y
----------------------------	---	---	---	---	---	---	---	---

Y, Yes, N, NO, U, Unclear, NA, Not Applicable.

<b>Q1: Were the criteria for inclusion in the sample defined?</b>
<b>Q2: Were the study subjects and the setting described in detail?</b>
<b>Q3: Was the exposure measured validly and reliably?</b>
<b>Q4: Were objective, standard criteria used for measurement of the condition?</b>
<b>Q5: Were confounding factors identified?</b>
<b>Q6: Were strategies to deal with confounding factors stated?</b>
<b>Q7: Were the outcomes measured validly and reliably?</b>
<b>Q8: Was appropriate statistical analysis used?</b>

## 2.5 Data Extraction and Analysis

A standardized data extraction form was used to gather relevant information from each study, including study characteristics and outcome measures. A qualitative synthesis approach was adopted for analysis. Thematic analysis was utilized to identify and summarize common patterns and findings related to the impact of home care on hospital readmission rates.

## 2.6 Study Selection Flowchart

The study selection process, from initial database searching to final study inclusion, was visually summarized in a flowchart as per PRISMA guidelines, providing a clear and transparent overview of the selection process.

## 3. RESULTS

As indicated in Table 2, This table presents a detailed summary of research studies, ranging from 2007 to 2022, examining the impact of home-based care on patient outcomes, particularly focusing on readmission rates, mortality, and quality of life. The studies employ a variety of designs, predominantly randomized controlled trials, alongside retrospective and observational studies, reflecting a comprehensive methodological approach. The exposure to different home care interventions such as telemonitoring, nursing, and post-discharge care underscores the multifaceted nature of these treatments. The outcomes, primarily centered on hospital readmissions and mortality rates, are critical indicators of the effectiveness of home-based care. Notably, these studies encompass a diverse participant demographic, including heart failure patients, older adults, and post-surgery patients, highlighting the broad applicability and relevance of home care interventions across different patient groups. The geographical diversity and the temporal span of these studies further contribute to the generalizability and robustness of the findings, underlining the significant role of home-based care in enhancing patient outcomes and healthcare delivery.

**Table 2. Characteristics of Included Studies:**

Study	Study design	Exposure of interest	Outcome of interest	Type of the participants
(Blum & Gottlieb, 2014)	Randomized controlled trial	Home telemonitoring	30-day readmissions, mortality, and health-related quality of life	Community-dwelling heart failure patients
(Burnett et al. 2022)	Retrospective comparative study	Home health care	Readmissions, and costs following total knee arthroplasty.	Medicare-aged patients

<b>(Charles de Mestral et al. 2019)</b>	Observational cohort study	Home care nursing	Emergency department visits and hospital readmission	Elective vascular surgery patients
<b>(Chen et al. 2016)</b>	Randomized controlled trial	Home care model	Hospital readmission rate	Stroke patients in China
<b>(Chen et al. 2018)</b>	Randomized prospective trial.	Home-based cardiac rehabilitation	Hospital readmission rates	Chronic heart failure patients
<b>(Cunha Ferré et al. 2019)</b>	Retrospective cohort study	Hospital discharge with home care services.	Risk factors for 72-hour hospital readmission	Older adults who received home care services after hospital discharge in Argentina
<b>(Deo et al. 2021)</b>	retrospective propensity-matched analysis.	Receiving home health care (HHC) after coronary artery bypass grafting (CABG) surgery.	30-day readmission rate after CABG.	Home care coronary artery bypass grafting patients
<b>(Dhalla et al. 2014)</b>	Randomized controlled trial	Postdischarge home care	Readmission or death for high-risk patients within 30 days of discharge.	High-risk patients
<b>(Elliott et al. 2017)</b>	Randomized controlled trial	Pharmacogenetic profiling with a clinical decision support tool for home care patients	Number of re-hospitalization of polypharmacy home health patients	Polypharmacy home health care patients
<b>(Glans et al. 2020)</b>	Retrospective comparative study	Risk factors for hospital readmission after discharged to home care	Readmission to hospital within 30 days of discharge to home care.	Older adults
<b>(Iyengar et al. 2007)</b>	Prospective observational study	Targeted early rehabilitation at home	Readmission rates and complications for rehabilitation at home	Total hip and knee joint replacement patients
<b>(Levine et al., 2020)</b>	Randomized controlled trial.	Acute care at home	Impact on rehospitalization rates	selected acute conditions.
<b>(Lyth et al., 2021)</b>	Randomized controlled trial.	Home care telemonitoring intervention	Measuring the number of rehospitalizations rate	(COPD) and (HF) Patients

<b>(Schapira et al., 2022)</b>	Randomized controlled trial.	Geriatric co-management combined with an interdisciplinary home care intervention	30-day hospital readmission rate within the first 6 months after discharge	frail older patients in Argentina
<b>(Schumacher et al., 2021)</b>	Retrospective cohort study	Home care nursing visits	Same-day readmission and ED emergency department (ED) visits	home care patients in Ontario
<b>(Sterling et al., 2020)</b>	Retrospective cohort study	The exposure of interest is receiving home health care (HHC) after hospitalization for heart failure (HF).	The outcomes of interest are readmission rates and mortality rates within 30 and 90 days after discharge.	Heart failure patients
<b>(Strano et al., 2019)</b>	Randomized controlled study.	Home healthcare visits	30-day hospital readmission rates for heart failure patients	Heart failure patients
<b>(Thomas et al., 2008)</b>	Prospective cohort study	Early discharge to home care after hip arthroplasty	Hospital readmission rates.	Hip arthroplasty patients
<b>(Tinetti et al., 2012)</b>	Quasi experimental	Restorative care model of home care, based on principles adapted from geriatric medicine, nursing, rehabilitation, goal attainment, chronic care management, and behavioral change theory.	Hospital readmissions rate	Older adults
<b>(Toles et al., 2014)</b>	Retrospective cohort study	Discharge to home care after receiving post-acute care in skilled nursing facilities (SNFs).	Hospital readmissions rate	aged 65 years and old
<b>(Vianello et al., 2013)</b>	randomized controlled trial	"Hospital at home" for neuromuscular disease patients	Hospital readmission rates.	Neuromuscular disease patients

Table 3 shows a comprehensive view of collection of studies of home care interventions, demonstrating varying impacts on patient outcomes like readmission rates, mortality, and healthcare costs. For instance, studies like Blum & Gottlieb (2014) and Chen et al. (2016) highlight the positive effects of home telemonitoring and modified home care models, showing reduced hospitalizations and improved patient management. In contrast, Burnett et al. (2022) report increased costs without reduction in readmissions following home health care. Participant diversity across these studies, ranging from a few dozens to over a hundred thousand, covers various conditions, from heart failure to post-surgery care. Intriguingly, while interventions like home-based cardiac rehabilitation and geriatric co-management exhibit reduced readmission rates, others indicate an increase in readmissions and mortality, as noted in Sterling et al. (2020). These findings collectively emphasize the complexity of home care effectiveness, suggesting that specific components of care, patient profiles, and healthcare contexts significantly influence outcomes, indicating a need for tailored home care strategies to enhance patient care and system efficiency.

**Table 3. Summary of Findings.**

<b>Study</b>	<b>Exposure</b>	<b>Outcome</b>	<b>No.of participants</b>	<b>Main Finding</b>
<b>(Blum &amp; Gottlieb, 2014)</b>	Home telemonitoring	30-day readmissions, mortality, health-related quality of life	N=204	The main finding of the study is that telemonitoring decreased hospitalizations, improved symptoms, or improved mortality in patients. Although there was a decrease in 30-day readmission rates during the first year.
<b>(Burnett et al., 2022)</b>	Home health care	Readmissions, costs following total knee arthroplasty	N=185,444	home health services do not provide value as they are associated with significantly increased costs and do not lower the rates of complications, emergency room visits, or readmissions following TKA.
<b>(Charles de Mestral et al., 2019)</b>	Home care nursing	Emergency department visits, hospital readmission	N=23,617	The main finding of the study is that home care nursing after vascular surgery

				is associated with a lower likelihood of emergency department (ED) visits and hospital readmissions within 30 days of discharge.
<b>(Chen et al., 2016)</b>	Home care model	Hospital readmission rate	N=341	Modified home care model in China for first-time stroke survivors was associated with several positive outcomes. The intervention group, receiving modified home care, had a shorter length of acute hospitalization, higher medication compliance, better ability to perform daily activities, and a lower rate of stroke-related re-hospitalization compared to the historical control group receiving routine care.
<b>(Chen et al., 2018)</b>	Home-based cardiac rehabilitation	Hospital readmission rate	N=37	home-based cardiac rehabilitation in patients with chronic heart failure (HF) resulted in significant improvements in exercise capacity, quality of life (QOL), and a reduction in the rate of



				readmission within 90 days.
<b>(Cunha Ferré et al., 2019)</b>	Hospital discharge with home care services.	Risk factors for 72-hour hospital readmission	N=4,990	53% of the unplanned emergency room visits within 72 hours after hospital discharge to Home care services resulted in hospital readmissions, and low functionality, age over 83 years old, and/or PU increase the likelihood for early readmission of patients who are discharged with HCS and visit the ED within 72 hours.
<b>(Deo et al., 2021)</b>	Receiving home health care (HHC) after coronary artery bypass grafting (CABG) surgery.	30-day readmission rate after CABG.	N=204,184	HHC after coronary artery bypass surgery is associated with lower rates of early readmission. After adjusting for various clinical factors, patients who received HHC had a significantly lower odds of readmission compared to those who did not receive HHC.
<b>(Dhalla et al., 2014)</b>	Post discharge home care	Readmission or death for high-risk patients within 30 days of discharge.	N=1923	The study found no statistically significant difference between the home care and virtual ward and usual care groups for the primary

				or secondary outcomes at any of the follow-up periods.
<b>(Elliott et al., 2017)</b>	Pharmacogenetic profiling with a clinical decision support tool for home care patients	Number of re-hospitalization of polypharmacy home health patients	N=110	The study found a relative risk reduction of 35% in re-hospitalizations and 42% in ED visits at 60 days following enrollment in the pharmacogenetic profiling group compared to the control group for home care patients.
<b>(Glans et al., 2020)</b>	Risk factors for hospital readmission	Hospital readmission	N=720	Patients with higher Charlson Co-morbidity Index, excessive polypharmacy, living in the community with home care, longer length of stay (5 days or longer), being discharged on a Friday, or from a surgical unit had increased odds of being readmitted to the hospital within 30 days of discharge.
<b>(Iyengar et al., 2007)</b>	Targeted early rehabilitation at home	Readmission rates and complications for rehabilitation at home	N=220	Resulted in reduced hospital stay without an increase in complication rates, and brought significant savings to the healthcare system without an increase in readmission rates.

<b>(Levine et al., 2020)</b>	Acute care at home	Impact on rehospitalization rates	N=91	Substitutive home hospitalization reduced the cost of the acute care episode by 38% compared to usual hospital care. Home patients had lower readmission rates within 30 days.
<b>(Lyth et al., 2021)</b>	Home care telemonitoring intervention	Measuring the number of rehospitalizations rate	N=94	The implementation of a telemonitoring system, the Health Diary, combined with a specialized hospital-based home care (HBHC) unit significantly reduced the number of hospitalizations total healthcare costs. The number of hospitalizations and hospitalization costs were significantly reduced for both groups. This intervention effectively decreased the need for hospital care without increasing total healthcare costs.
<b>(Schapira et al., 2022)</b>	Geriatric co-management combined with an interdisciplinary home care intervention	30-day hospital readmission rate within the first 6 months after discharge	N=360	Geriatric co-management of frail older patients during hospitalization combined with an

				interdisciplinary transitional care intervention reduced 30-day hospital readmissions and emergency visits 6 months after discharge.
<b>(Schumacher et al., 2021)</b>	Home care nursing visits	Same-day readmission and ED emergency department (ED) visits	N=11,840	The study found that the risk for home care patients to visit the ED on the same day as a nursing visit was much higher among patients with a urinary catheter.
<b>(Sterling et al., 2020)</b>	The exposure of interest is receiving home health care (HHC) after hospitalization for heart failure (HF).	The outcomes of interest are readmission rates and mortality rates within 30 and 90 days after discharge.	N=95,531	The main finding of the study is that the use of home health care (HHC) after HF hospitalization increased. However, receiving HHC was associated with a higher risk of readmissions and mortality within 30 and 90 days after discharge. The study suggests that further research is needed to determine whether these findings reflect appropriate healthcare use.
<b>(Strano et al., 2019)</b>	Home healthcare visits	30-day hospital readmission rates for heart failure patients	N=67	The timing of home healthcare visits did not affect hospital readmission rates. However, adherence to weight

				monitoring, fluid restriction, and medication administration improved with home care visits. Also focusing on these activities during home healthcare visits may help decrease hospital readmissions.
<b>(Thomas et al., 2008)</b>	Early discharge to home care after hip arthroplasty	Hospital readmission rates.	N=138	The readmission rate within 6 weeks of discharge from the ward to home care was 4% in the series studied. Only 1 patient (<1%) was readmitted.
<b>(Tinetti et al., 2012)</b>	Restorative care model of home care	Hospital readmissions rate	N=770	individuals who received the restorative care model of home care had a lower rate of hospital readmission (13.2%) compared to those who received usual care (17.6%). The restorative care group was 32% less likely to be readmitted than the usual care group.
<b>(Toles et al., 2014)</b>	Discharge to home care after receiving post-acute care in skilled nursing facilities (SNFs).	Hospital readmissions rate	N=55,980	After SNF-to-home discharge, 22.1% of older adults had an episode of acute-care use within 30 days, including 7.25% with an ED visit without hospitalization and 14.8% with a

				rehospitalization; 37.5 % of older adults had their first acute-care within 90 days.
<b>(Vianello et al., 2013)</b>	"Hospital at home" for neuromuscular disease patients	"Hospital at home" for neuromuscular disease patients	N=59	The main finding of the study was that hospital-at-home is an effective alternative to hospital admission for selected neuromuscular disease (NMD) patients with respiratory tract infections. There were no significant differences in treatment failure, time to recovery, or mortality at 3 months between the hospital-at-home group and the in-patient hospital care group. Additionally, the total and daily direct cost of patient healthcare was significantly lower for the patients who were successfully treated at home compared to those who were hospitalized.

#### 4. DISCUSSION

Home care interventions have shown a significant impact on patient outcomes, particularly concerning readmission rates, mortality, and healthcare costs. The analysis of the included studies reveals a multifaceted view of the impact of home care and home health care services on patient outcomes, particularly in terms of hospital readmission rates. The various forms of home care in the studies ranging from home care telemonitoring to home care nursing visits and "hospital at home" models—reflect the diversity of approaches in managing patients' health in a home setting.

In most of the studies, home care services were associated with positive outcomes, including reduced readmission rates, decreased healthcare costs, and improved patient well-being. For example, home telemonitoring in the two studies was found to decrease hospitalizations and improve symptoms in heart failure patients (Blum and Gottlieb, 2014; Lyth et al., 2021). Home-based cardiac rehabilitation study and the "hospital at home" model similarly resulted in improved patient outcomes. These findings contribute to a growing body of evidence suggesting that home care services can be an effective component of patient care, particularly for chronic conditions that require ongoing management (Chen et al., 2016; Vianello et al., 2013).

However, not all studies reported beneficial outcomes with home care services. For example, Retrospective comparative study of home care found that home health services were associated with increased costs and did not lower readmission rates following total knee arthroplasty (Chen et al. 2018). Similarly, other study about the exposure of interest is receiving home health care (HHC) after hospitalization for heart failure (HF) found that receiving home health care after heart failure hospitalization was associated with higher readmission and mortality rates. These contrasting findings highlight the complexity of the home care domain and underscore the importance of tailoring home care services to the specific needs and contexts of patients (Sterling et al., 2020).

The wide array of home health care services reviewed, "hospital at home" models, had varied impacts on patient outcomes. In several studies, these services were positively correlated with beneficial outcomes, such as decreased hospital readmissions, lower healthcare costs, and improved patient well-being (Blum and Gottlieb, 2014; Chen et al., 2016; Lyth et al., 2021; Vianello et al., 2013). However, it's essential to recognize that not all studies echoed these positive findings. Some studies reported no substantial reduction in readmission rates, or even higher readmission and mortality rates (Burnett et al., 2022; Sterling et al., 2020). These conflicting results highlight the complexity of home health care and its differential effects on diverse patient populations, underscoring the necessity for customized, context-specific care plans.

Our findings stress the importance of broadening the range of outcome measures beyond readmission rates to capture the holistic impact of home health care services. Future studies should consider including outcome measures such as patient-reported outcomes, functional status, and quality of life (Chen et al., 2016; Lyth et al., 2021).

The positive outcomes observed in many studies suggest that home care can play a vital role in modern healthcare systems, particularly given the aging population and the prevalence of chronic diseases. However, the limitations of these studies, including varied designs, heterogeneous patient populations, and the primary focus on readmission rates, must be acknowledged. This diversity in methodologies and metrics makes it challenging to generalize findings across different healthcare systems and cultural contexts.

However, the studies that found negative outcomes associated with home care services highlight that these services are not universally beneficial and underscore the need for careful patient selection and service customization. Home care services should be tailored to the specific needs of the patient, taking into consideration their health status, living situation, and personal preferences. Furthermore, additional support, such as caregiver education and health technology, might be needed to optimize the outcomes of home care services.

The limitations of the current body of research must also be considered. First, the studies reviewed used various designs, ranging from randomized controlled trials to observational and retrospective studies, each with its inherent limitations. For instance, observational studies cannot infer causality, while retrospective studies may be subject to bias due to the retrospective nature of data collection.

Second, the heterogeneity in the types of home care services studied, the patient populations targeted, and the outcomes measured makes it challenging to draw definitive conclusions. The different healthcare systems and cultural contexts in which the studies were conducted might also influence the generalizability of the results.

Third, many studies relied on readmission rates as the primary outcome, which, while a critical indicator of healthcare quality, does not capture the full spectrum of patient outcomes. Future studies might consider including other metrics, such as patient-reported outcomes, functional status, and quality of life.

Future studies should aim to identify the specific conditions and patient profiles under which home care interventions are most effective. There is a need for research that delves into understanding the mechanisms by which home care impacts patient outcomes. Moreover, expanding outcome measures beyond readmission rates and mortality to include patient-reported outcomes and quality of life metrics would provide a more comprehensive understanding of the effectiveness of home care interventions.

Addressing the primary objective of this research—to understand the impact of home health care services on hospital readmission rates—our study presents valuable insights that may inform future healthcare delivery strategies (Blum and Gottlieb, 2014; Chen et al., 2016; Lyth et al., 2021; Vianello et al., 2013). Overall, while home health care services show considerable potential in enhancing patient outcomes and healthcare cost-effectiveness, more research is required to identify the specific conditions under which these services are most effective (Blum and Gottlieb, 2014; Lyth et al., 2021). Future research should also aim to understand the mechanisms by which home health care services influence patient outcomes, thereby informing the design of more effective and patient-centric home care models (Chen et al., 2016; Vianello et al., 2013).

In summary, while home care services hold promise in improving patient outcomes and reducing healthcare costs, more research is needed to identify the specific contexts and conditions in which these services are most beneficial. Future studies should also aim to elucidate the mechanisms by which home care services influence patient outcomes to inform the design of more effective home care models.

## 5. CONCLUSIONS

This review underscores the significant potential of home care and home health care services in positively impacting patient outcomes, particularly by reducing hospital readmission rates. Many studies indicate that well-designed home care interventions, like telemonitoring and post-discharge care, can effectively lower readmissions, which are crucial given their link to increased morbidity and healthcare costs. These findings highlight the viability of home care as a strategy for managing health conditions and aiding recovery post-discharge. However, not all results are uniformly positive, with some instances of home care services correlating with higher readmissions and costs, emphasizing the need for tailored approaches based on patient characteristics and service context. The potential of home care in mitigating the burden on healthcare systems, especially with the aging population and chronic diseases on the rise, positions it as a valuable component of healthcare policy and practice. Although promising, further research is essential to refine home care models to effectively cater to diverse patient needs and continuously enhance healthcare delivery and patient outcomes.

**Author Contributions:** “Conceptualization, A.A.; methodology, A.A. and M.S; software, A.A. and M.S; validation, A.A. and M.S; formal analysis, A.A. and M.S; investigation, A. A; resources, A.A. and M.S.; data curation, A.A. and M.S; writing—original draft preparation, A. A; writing, review and editing, A.A. and M.S; visualization, A.A. and M.S; supervision, A.A. and M.S; project administration, A.A. and M.S.; and M.A. All authors have read and agreed to the published version of the manuscript.”

**Funding:** This research received no external funding

**Institutional Review Board Statement:** Not applicable

**Informed Consent Statement:** Not applicable

**Data Availability Statement:** Data were extracted from published sources.

**Conflicts of Interest:** The authors declare that they have no competing interests.



## REFERENCES

- Anderson, L., Sharp, G. A., Norton, R. J., Dalal, H., Dean, S. G., Jolly, K., Cowie, A., Zawada, A., & Taylor, R. S. (2017). Home-based versus center-based cardiac rehabilitation. *Cochrane Database of Systematic Reviews*, 2017(10). <https://doi.org/10.1002/14651858.CD007130.pub4>
- Blum, K., & Gottlieb, S. S. (2014). The Effect of a Randomized Trial of Home Telemonitoring on Medical Costs, 30-Day Readmissions, Mortality, and Health-Related Quality of Life in a Cohort of Community-Dwelling Heart Failure Patients. *Journal of Cardiac Failure*, 20(7), 513–521. <https://doi.org/10.1016/j.cardfail.2014.04.016>.
- Burnett, R. A., Mestyaneck, C. E., Courtney, P. M., & Della Valle, C. J. (2022). Home Health Care in Medicare-Aged Patients is Associated with Increased Early Emergency Visits, Readmissions, and Costs Following Total Knee Arthroplasty. *The Journal of Arthroplasty*, 37(8S), S771-S776.e1. <https://doi.org/10.1016/j.arth.2021.09.025>
- Charles de Mestral, Ahmed Kayssi, Mohammed Al-Omran, Konrad Salata, Mohamad Anas Hussain, & Graham Roche-Nagle. (2019). Home care nursing after elective vascular surgery: An opportunity to reduce emergency department visits and hospital readmission. *BMJ Quality & Safety*, 28(11), 901. <https://doi.org/10.1136/bmjqs-2018-009161>
- Chen, L., Sit, J. W.-H., & Shen, X. (2016). Quasi-experimental evaluation of a home care model for patients with stroke in China. *Disability and Rehabilitation*, 38(23), 2271–2276. <https://doi.org/10.3109/09638288.2015.1123305>
- Chen, Y.-W., Wang, C.-Y., Lai, Y.-H., Liao, Y.-C., Wen, Y.-K., Chang, S.-T., Huang, J.-L., & Wu, T.-J. (2018). Home-based cardiac rehabilitation improves quality of life, aerobic capacity, and readmission rates in patients with chronic heart failure. *Medicine*, 97(4), e9629. <https://doi.org/10.1097/MD.00000000000009629>
- Cunha Ferré, M. F., Gallo Acosta, C. M., Dawidowski, A. R., Senillosa, M. B., Scozzafava, S. M., & Saimovici, J. M. (2019). 72-hour hospital readmission of older people after hospital discharge with home care services. *Home Health Care Services Quarterly*, 38(3), 153–161. <https://doi.org/10.1080/01621424.2019.1616024>
- Deo, S. V., Sharma, V., Altarabsheh, S. E., Raza, S., Wilson, B., Elgudin, Y., & Cmolik, B. (2021). Home health care visits may reduce the need for early readmission after coronary artery bypass grafting. *The Journal of Thoracic and Cardiovascular Surgery*, 162(6), 1732-1739.e4. <https://doi.org/10.1016/j.jtcvs.2020.02.037>
- Dhalla, I. A., O'Brien, T., Morra, D., Thorpe, K. E., Wong, B. M., Mehta, R., Frost, D. W., Abrams, H., Ko, F., Van Rooyen, P., Bell, C. M., Gruneir, A., Lewis, G. H., Daub, S., Anderson, G. M., Hawker, G. A., Rochon, P. A., & Laupacis, A. (2014). Effect of a Post discharge Virtual Ward on Readmission or Death for High-Risk Patients: A Randomized Clinical Trial. *JAMA*, 312(13), 1305. <https://doi.org/10.1001/jama.2014.11492>
- Elliott, L. S., Henderson, J. C., Neradilek, M. B., Moyer, N. A., Ashcraft, K. C., & Thirumaran, R. K. (2017). Clinical impact of pharmacokinetic profiling with a clinical decision support tool in polypharmacy home health patients: A prospective pilot randomized controlled trial. *PLOS ONE*, 12(2), e0170905. <https://doi.org/10.1371/journal.pone.0170905>.
- Glans, M., Kragh Ekstam, A., Jakobsson, U., Bondesson, Å., & Midlöv, P. (2020). Risk factors for hospital readmission in older adults within 30 days of discharge – a comparative retrospective study. *BMC Geriatrics*, 20(1), 467. <https://doi.org/10.1186/s12877-020-01867-3>.
- Iyengar, K. P., Nadkarni, J. B., Ivanovic, N., & Mahale, A. (2007). Targeted early rehabilitation at home after total hip and knee joint replacement: Does it work? *Disability and Rehabilitation*, 29(6), 495–502. <https://doi.org/10.1080/09638280600841471>
- Koehler, B. E., Richter, K. M., Youngblood, L., Cohen, B. A., Prengler, I. D., Cheng, D., & Masica, A. L. (2013). Reduction of 30-day post discharge hospital readmission or emergency department (ED) visit rates in high-risk elderly medical patients through delivery of a targeted care bundle. *Journal of Hospital Medicine*, 4(4), 211–218. <https://doi.org/10.1002/jhm.427>
- Krumholz, H. M., Merrill, A. R., Schone, E. M., Schreiner, G. C., Chen, J., Bradley, E. H., Wang, Y., Wang, Y., Lin, Z., Straube, B. M., Rapp, M. T., Normand, S.-L. T., & Drye, E. E. (2013). Patterns of

- Hospital Performance in Acute Myocardial Infarction and Heart Failure 30-Day Mortality and Readmission. *Circulation: Cardiovascular Quality and Outcomes*, 2(5), 407–413. <https://doi.org/10.1161/CIRCOUTCOMES.109.883256>
- Levine, D. M., Ouchi, K., Blanchfield, B., Saenz, A., Burke, K., Paz, M., Diamond, K., Pu, C. T., & Schnipper, J. L. (2020). Hospital-Level Care at Home for Acutely Ill Adults: A Randomized Controlled Trial. *Annals of Internal Medicine*, 172(2), 77–85. <https://doi.org/10.7326/M19-0600>
- Lyth, J., Lind, L., Persson, H. L., & Wiréhn, A.-B. (2021). Can a telemonitoring system lead to decreased hospitalization in elderly patients? *Journal of Telemedicine and Telecare*, 27(1), 46–53. <https://doi.org/10.1177/1357633X19858178>
- Medicare Payment Advisory Commission. (2018). Report to the Congress: Medicare and the health care delivery system. Retrieved from [http://www.medpac.gov/docs/default-source/reports/jun18\\_entirereport\\_sec.pdf](http://www.medpac.gov/docs/default-source/reports/jun18_entirereport_sec.pdf)
- Moher D, Liberati A, Tetzlaff J, Altman DG; PRISMA Group. "Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement." *BMJ*. 2009 Jul 21;339: b2535. doi: 10.1136/bmj.b2535.
- National Institute on Aging. (2021). What Are Home Health Care Services? Available at: <https://www.nia.nih.gov/health/what-are-home-health-care-services>.
- Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. (2021). The PRISMA 2020 statement: An updated guideline for reporting systematic reviews. *PLoS Med* 18 (3): e1003583. <https://doi.org/10.1371/journal.pmed.1003583>. Published: March 29, 2021.
- Schumacher, C., Jones, A., & Costa, A. P. (2021). Home Care Nursing Visits and Same-Day Emergency Department Use: Which Patients Are Most at Risk? *Canadian Journal of Nursing Research*, 53(4), 376–383. <https://doi.org/10.1177/0844562120949426>
- Shepperd, S., Doll, H., Angus, R. M., Clarke, M. J., Iliffe, S., Kalra, L., Ricauda, N. A., Tibaldi, V., & Wilson, A. D. (2009). Avoiding hospital admission through provision of hospital care at home: A systematic review and meta-analysis of individual patient data. *Canadian Medical Association Journal*, 180(2), 175–182. <https://doi.org/10.1503/cmaj.081491>.
- Sterling, M. R., Kern, L. M., Safford, M. M., Jones, C. D., Feldman, P. H., Fonarow, G. C., Sheng, S., Matsouaka, R. A., DeVore, A. D., Lytle, B., Xu, H., Allen, L. A., Deswal, A., Yancy, C. W., & Albert, N. M. (2020). Home Health Care Use and Post-Discharge Outcomes After Heart Failure Hospitalizations. *JACC. Heart Failure*, 8(12), 1038–1049. <https://doi.org/10.1016/j.jchf.2020.06.009>
- Strano, A., Briggs, A., Powell, N., Brockman, J., Taylor, J., Butler, A., Soendker, M., Upschulte, S., Long, E., Wills, R., & Ward-Smith, P. (2019). Home Healthcare Visits Following Hospital Discharge: Does the Timing of Visits Affect 30-Day Hospital Readmission Rates for Heart Failure Patients? *Home Healthcare Now*, 37(3), 152–157. <https://doi.org/10.1097/NHH.0000000000000740>.
- The Joanna Briggs Institute Critical Appraisal tools for use in JBI Systematic Reviews (2017): Checklist for Systematic Reviews and Research Syntheses. Available at: [https://jbi.global/sites/default/files/2019-05/JBI Critical Appraisal-Checklist for Systematic Reviews2017 0.pdf](https://jbi.global/sites/default/files/2019-05/JBI%20Critical%20Appraisal-Checklist%20for%20Systematic%20Reviews%202017%200.pdf).
- Thomas, G., Faisal, M., Young, S., Asson, R., Ritson, M., & Bawale, R. (2008). Early discharge after hip arthroplasty with home support: Experience at a UK District General Hospital. *Hip International: The Journal of Clinical and Experimental Research on Hip Pathology and Therapy*, 18(4), 294–300. <https://doi.org/10.1177/112070000801800405>
- Tinetti, M. E., Charpentier, P., Gottschalk, M., & Baker, D. I. (2012). Effect of a Restorative Model of Post Hospital Home Care on Hospital Readmissions. *Journal of the American Geriatrics Society*, 60(8), 1521–1526. <https://doi.org/10.1111/j.1532-5415.2012.04060.x>
- Toles, M., Anderson, R. A., Massing, M., Naylor, M. D., Jackson, E., Peacock-Hinton, S., & Colón-Emeric, C. (2014). Restarting the Cycle: Incidence and Predictors of First Acute Care Use After Nursing Home Discharge. *Journal of the American Geriatrics Society*, 62(1), 79–85. <https://doi.org/10.1111/jgs.12602>

- Vianello, A., Savoia, F., Pipitone, E., Nordio, B., Gallina, G., Paladini, L., Concas, A., Arcaro, G., Gallan, F., & Pegoraro, E. (2013). "Hospital at home" for neuromuscular disease patients with respiratory tract infection: A pilot study. *Respiratory Care*, 58(12), 2061–2068. <https://doi.org/10.4187/respcare.02501>
- World Health Organization. (2021). Ageing and health. Available at: <https://www.who.int/news-room/fact-sheets/detail/ageing-and-health>.
- World Health Organization. (2021). Decade of Healthy Ageing 2021 – 2030. Available at: <https://www.who.int/initiatives/decade-of-healthy-ageing>.