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Exploring the connection between frailty and cardiovascular diseases

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ABSTRACT

This study explores the significant correlation between frailty and an elevated risk of mortality in COVID-19 patients, suggesting that increased frailty screening could enhance disease management and optimize resource distribution. An analysis of peer-reviewed papers on frailty and cardiovascular diseases (CVD) over a ten-year period reveals a peak of 4480 articles from September 2021 to September 2022. The literature review conducted on frailty and CVD highlights the high prevalence of frailty in older adults with CVD and its role as a predictor of cardiovascular death. The study suggests that frailty can inform treatment decisions, offering more personalized care. However, standardizing frailty assessment in clinical practice and trials is needed. The impact of frailty on coronary artery disease, peripheral artery disease, and atrial fibrillation requires further research. The study also discusses the increasing global burden of CVD among older adults due to aging populations and improved care. It highlights the challenges posed by older age, multiple comorbidities, polypharmacy, frailty, and adverse noncardiovascular outcomes. The review focuses on geriatric conditions that significantly impacted health status, quality of life, and overall prognosis. The study concludes that frailty significantly increases the risk of CVD events and major adverse cardiovascular events in older adults without prior CVD. Screening for frailty could help identify those at higher risk and facilitate targeted preventive measures.

Dear Editor,

A study of the association between frailty and cardiovascular diseases was performed by reviewing literature obtained from the US National Library of Medicine. This study explores the significant correlation between frailty and an elevated risk of mortality in COVID-19 patients, suggesting that increased frailty screening could enhance disease management and optimize resource distribution. An analysis of peer-reviewed papers on frailty and cardiovascular diseases (CVD) over a ten-year period reveals a peak of 4480 articles from September 2021 to September 2022. The literature review conducted on frailty and CVD highlights the high prevalence of frailty in older adults with CVD and its role as a predictor of cardiovascular death. The study suggests that frailty can inform treatment decisions, offering more personalized care. However, standardizing frailty assessment in clinical practice and trials is needed. The impact of frailty on coronary artery disease, peripheral artery disease, and atrial fibrillation requires further research. The study also discusses the increasing global burden of CVD among older adults due to aging populations and improved care. It highlights the challenges posed by older age, multiple comorbidities, polypharmacy, frailty, and adverse noncardiovascular outcomes. The review focuses on geriatric conditions that significantly impacted health status, quality of life, and overall prognosis. The study concludes that frailty significantly increases the risk of CVD events and major adverse cardiovascular events in older adults without prior CVD. Screening for frailty could help identify those at higher risk and facilitate targeted preventive measures.

Yang et al. revealed a significant correlation between frailty and an elevated risk of mortality from all causes in COVID-19 patients (Yang et al., 2021). They concluded that focusing more on frailty screening could enhance disease management and optimize resource distribution

among COVID-19 patients (Yang et al., 2021). This study explores the connection between frailty and cardiovascular diseases. Initially, an analysis was conducted on the trends in the number of peer-reviewed papers on frailty and cardiovascular diseases (CVD) per year available in the National Library of Medicine over a ten-year period, spanning from September 19, 2013 to September 19, 2023. Fig. 1 shows the trends of articles from 2014 to 2023 with a peak of 4480 articles from September 2021 to September 2022. A literature review was conducted on frailty and CVD.

Lie et al. found that frailty significantly increased the risk of CVD and mortality in older adults (Liu et al., 2022). This association remained significant even after adjusting for depression, cognitive impairment, and blood biomarkers. The findings suggested that interventions targeting pre-frailty and early frailty could potentially reduce the burden of CVD (Liu et al., 2022).

The review highlighted the high prevalence of frailty in older adults with CVD and its role as a predictor of cardiovascular death (Ko et al., 2023). It suggested that frailty can inform treatment decisions, offering more personalized care. However, standardizing frailty assessment in clinical practice and trials is needed (Ko et al., 2023).

Frailty, a syndrome in older age, significantly impacted health status outcomes in various cardiovascular conditions (Nguyen & Arnold, 2023). In heart failure, frail patients experienced severe health status impairments but showed notable improvements with interventions. In valvular heart disease, frailty increased the risk of poor health status outcomes post-procedure. Treatment should not be withheld due to frailty alone, as health status improvements may reverse it. The impact of frailty on coronary artery disease, peripheral artery disease, and atrial fibrillation requires further research (Nguyen & Arnold, 2023).

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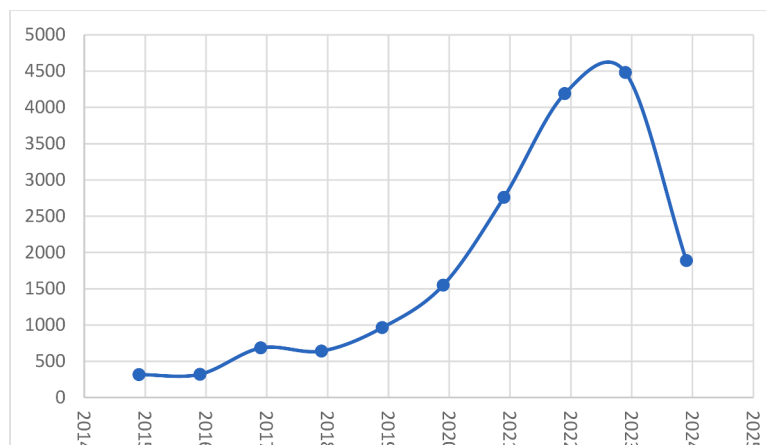


Fig. 1. The number of articles on frailty and cardiovascular diseases in National Library of Medicine from Sept. 19, 2013 to Sept. 19, 2023.

Chen et al. found that physical frailty was associated with an increased incidence of CVD (Chen et al., 2023). Adherence to ideal cardiovascular health (CVH) behaviors and factors significantly reduced CVD risk, even in frail individuals. The highest CVD risk was observed in frail individuals with poor CVH (Chen et al., 2023).

Cao et al. revealed that frailty, even in its early stages, was associated with an increased risk of CVD and type 2 diabetes mellitus among long-term cancer survivors (Cao et al., 2023). The findings suggested that routine monitoring and interventions for frailty may help prevent these comorbidities and improve quality of life (Cao et al., 2023).

The review discussed the increasing global burden of CVD among older adults due to aging populations and improved care (Aïdoud et al., 2023). It highlighted the challenges posed by older age, multiple comorbidities, polypharmacy, frailty, and adverse noncardiovascular outcomes. The review focuses on geriatric conditions that significantly impacted health status, quality of life, and overall prognosis (Aïdoud et al., 2023).

Ekram et al. found that frailty significantly increased the risk of CVD events and major adverse cardiovascular events in older adults without prior CVD (Ekram et al., 2023). Screening for frailty could help identify those at higher risk and facilitate targeted preventive measures (Ekram et al., 2023).

Chen et al. found a positive association between frailty and chronic heart failure (CHF) (Chen et al., 2023). Factors such as being male, having an annual family income over \$20,000, or having normal hemoglobin levels were linked to a lower likelihood of frailty in CHF patients. Frailty was strongly associated with all-cause death in these patients (Chen et al., 2023).

Damluji et al. found that the simultaneous development of frailty and cognitive impairment in older adults without a history of coronary artery disease significantly increased the risk of adverse cardiovascular outcomes, including death (Damluji et al., 2023). This risk was higher than when each syndrome developed alone. Early detection of these conditions was crucial for assessing cardiovascular risk in older populations (Damluji et al., 2023).

Frailty and cardiovascular disease often coexist, especially in the elderly population, and their relationship is complex and bidirectional (Ramonfaur et al., 2023). Frailty and cardiovascular disease (CVD) are intricately linked through several biological mechanisms. Both conditions share common pathophysiological underpinnings, such as inflammation and neurohormonal dysregulation (Bul et al., 2022). They also share risk factors, including hypertension, diabetes, obesity, sedentary behavior, and tobacco use (Nguyen & Arnold, 2023). Cardiovascular diseases can lead to decreased physical activity, increased physical deconditioning, and reduced functional capacity, all of which contribute to frailty (Schoeb et al., 2022). Additionally, poor nutrition is a risk factor that can exacerbate both CVD and frailty (Capurso, 2023).

These mechanisms highlight the complex interplay between frailty and CVD, where each condition can worsen the other, leading to a cycle of deteriorating health. Understanding these relationships is crucial for developing effective interventions. These mechanisms suggest a complex interplay between frailty and CVD, where each can exacerbate the other, leading to a cycle of declining health. However, more research is needed to fully understand these relationships and develop effective interventions.

He et al. investigated the link between changes in frailty status and cardiovascular disease (CVD) risk, using data from three cohorts (He et al., 2024). They found that robust individuals who became frail had increased CVD risks, while frail individuals who recovered to robust or pre-frail status had decreased CVD risks. Their study concluded that changes in frailty status are associated with different CVD risks, with frailty progression increasing risk and frailty recovery decreasing it.

This study underscored the significant correlation between frailty and an elevated risk of mortality in COVID-19 patients, advocating for increased frailty screening to enhance disease management and optimize resource distribution. The research also delved into the connection between frailty and cardiovascular diseases (CVD), revealing a high prevalence of frailty in older adults with CVD and its role as a predictor of cardiovascular death. The study suggested that frailty can inform treatment decisions, offering more personalized care. However, it calls for standardizing frailty assessment in clinical practice and trials. The impact of frailty on coronary artery disease, peripheral artery disease, and atrial fibrillation was highlighted as an area requiring further research. The study also discussed the increasing global burden of CVD among older adults due to aging populations and improved care, and the challenges posed by older age, multiple comorbidities, polypharmacy, frailty, and adverse noncardiovascular outcomes. The review focused on geriatric conditions that significantly impact health status, quality of life, and overall prognosis. The study concluded that frailty significantly increases the risk of CVD events and major adverse cardiovascular events in older adults without prior CVD. Screening for frailty could help identify those at higher risk and facilitate targeted preventive measures. This comprehensive review provided valuable insights into the role of frailty in disease outcomes and the potential benefits of frailty screening in disease management.

Declaration of generative AI and AI-assisted technologies in the writing process

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Yoshiyasu Takefuji: Writing – review & editing, Writing – original draft, Validation, Investigation, Conceptualization.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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