Received: 7 June 2023 | Revised: 20 November 2023 | Accepted: 22 November 2023

DOI: 10.1002/emp2.13084

JACEP OPEN
JOURNAL OF THE AMERICAN COLLEGE OF EMERGENCY PHYSICIANS OPEN
A GLOBAL JOURNAL OF EMERGENCY MEDICINE
WILEY

SYSTEMATIC REVIEW

Geriatrics

Frailty assessment tools in the emergency department: A geriatric emergency department guidelines 2.0 scoping review

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Supervising Editor: Catherine Marco, MD.

Funding information
WestHealth; John A. Hartford Foundation

Abstract

Objective: Given the aging population and growing burden of frailty, we conducted this scoping review to describe the available literature regarding the use and impact of frailty assessment tools in the assessment and care of emergency department (ED) patients older than 60 years.

Methods: A search was made of the available literature using the Covidence system using various search terms. Inclusion criteria comprised peer-reviewed literature focusing on frailty screening tools used for a geriatric population (60+ years of age) presenting to EDs. An additional search of PubMed, EBSCO, and CINAHL for articles published in the last 5 years was conducted toward the end of the review process (January 2023) to search specifically for literature describing interventions for frailty, yielding additional articles for review. Exclusion criteria comprised articles focusing on an age category other than geriatric and care environments outside the emergency care setting.

Results: A total of 135 articles were screened for inclusion and 48 duplicates were removed. Of the 87 remaining articles, 20 were deemed irrelevant, leaving 67 articles for full-text review. Twenty-eight were excluded for not meeting inclusion criteria, leaving 39 full-text studies. Use of frailty screening tools were reported in the triage, care, and discharge decision-making phases of the ED care trajectory, with varying reports of usefulness for clinical decision-making.

Conclusion: The literature reports tools, scales, and instruments for identifying frailty in older patients at ED triage; multiple frailty scores or tools exist with varying levels of utilization. Interventions for frailty directed at the ED environment were scant. Further research is needed to determine the usefulness of frailty identification in the context of emergency care, the effects of care delivery interventions or educational initiatives for front-line medical professionals on patient-oriented outcomes, and to ensure these initiatives are acceptable for patients.

1 | INTRODUCTION

1.1 | Background

The population of persons 65 years and older is expected to double between 2020 and 2050,[1,2] increasing the demand on healthcare systems everywhere, but specifically in emergency departments (EDs).[3] Prevalence of chronic conditions in older persons is leading to a growing frailty burden,[4] with some populations having more than half of older persons being frail.[5] Frailty is characterized by an increased vulnerability to adverse health events and a diminished physiologic reserve, impeding recovery from stressors.[6,7] The National Health and Aging Trends Study suggests that 15% of the older non-nursing home population in the United States is frail, and 45% is prefrail.[8] Frailty is more prevalent at older ages, among women, racial and ethnic minorities, those in supportive residential settings, and persons of lower income. Chronic disease and disability prevalence both increase sharply with frailty; 42% of identified frail older adults were found to have been hospitalized in the previous year, compared to 11% of persons considered robust. Over half of frail persons fell in the previous year.[8]

1.2 | Importance

ED frailty screening was deemed to be so critical in the risk stratification of older persons that the United Kingdom (UK) mandated frailty screening for all older ED patients within 30 min of arrival at all hospitals with a 24-h ED.[9,10] UK ED frailty screening has been shown to be feasible, predict adverse patient outcomes, and guide patient disposition.[11,12] In the United States, no such practice policy has been initiated. Despite the national policy and widespread practice in the United Kingdom, reported variabilities in screening feasibility, screening rate, and availability of frailty services offer challenges to optimal policy implementation.[9–11]

1.3 | Goals of this investigation

We conducted this scoping review to describe the literature regarding the use and impact of frailty assessment tools in the care of ED patients older than 60 years. We aimed to provide a contextualized assessment on both the potential applicability of frailty screening in US EDs and possibilities for future research.

2 | METHODS

2.1 | Design

This review followed the Joanna Briggs Institute's *Guidance for Conducting Systematic Scoping Reviews*.[13] We completed a PRISMA-Scr checklist (Appendix S1).

2.1.1 | Inclusion and exclusion criteria

Inclusion criteria comprised peer-reviewed literature focusing on frailty screening tools used for a geriatric population (60+ years of age) presenting to EDs. Exclusion criteria comprised articles focusing on an age category other than geriatric and care environments outside the emergency care setting.

2.2 | Search strategy

A later search of PubMed, EBSCO, and CINAHL was made to identify literature on possible interventions in the ED setting using the terms "frailty interventions" and "emergency department interventions frailty."

2.3 | Selection of sources of evidence

A search for the PICOT question "Is there evidence for the use of a frailty measure to inform ED care?" was made using the following databases: CENTRAL, CINAHL, Clinical trials.gov, Embase, Google Scholar, MEDLINE, PsycINFO, PubMed, Scopus, Web of Science, World Health Organization (WHO) using the search terms "frailty assessment tools"; "geriatric assessment tools"; "emergency department"; "emergency department triage"; "geriatric triage"; and "frailty screening." We used the Covidence software program (Melbourne, Australia) to search multiple databases for relevant articles that fit the inclusion and exclusion criteria. A general search with no timeline was used.

2.4 | Data extraction process

Two reviewers were assigned to each category section of the literature, with a third reviewer asked to review in case of disagreement. Full text review of articles that met inclusion criteria were reviewed and abstracted by the team in small groups, then synthesized into the final document.

3 | RESULTS

A total of 135 articles were screened for inclusion and 48 duplicates were removed. Of the 87 remaining articles, 20 were deemed irrelevant, leaving 67 articles for full-text review. Twenty-eight were excluded for not meeting inclusion criteria, leaving 39 full-text studies (see Figure 1 and Supplemental Table 1). Use of frailty screening tools were reported in the triage, care, and discharge decision-making phases of the ED care trajectory, with varying reports of usefulness for clinical decision-making.

This process yielded the following conceptual categories: Frailty Assessment Measures; Frailty Screening at Triage; Frailty-Informed

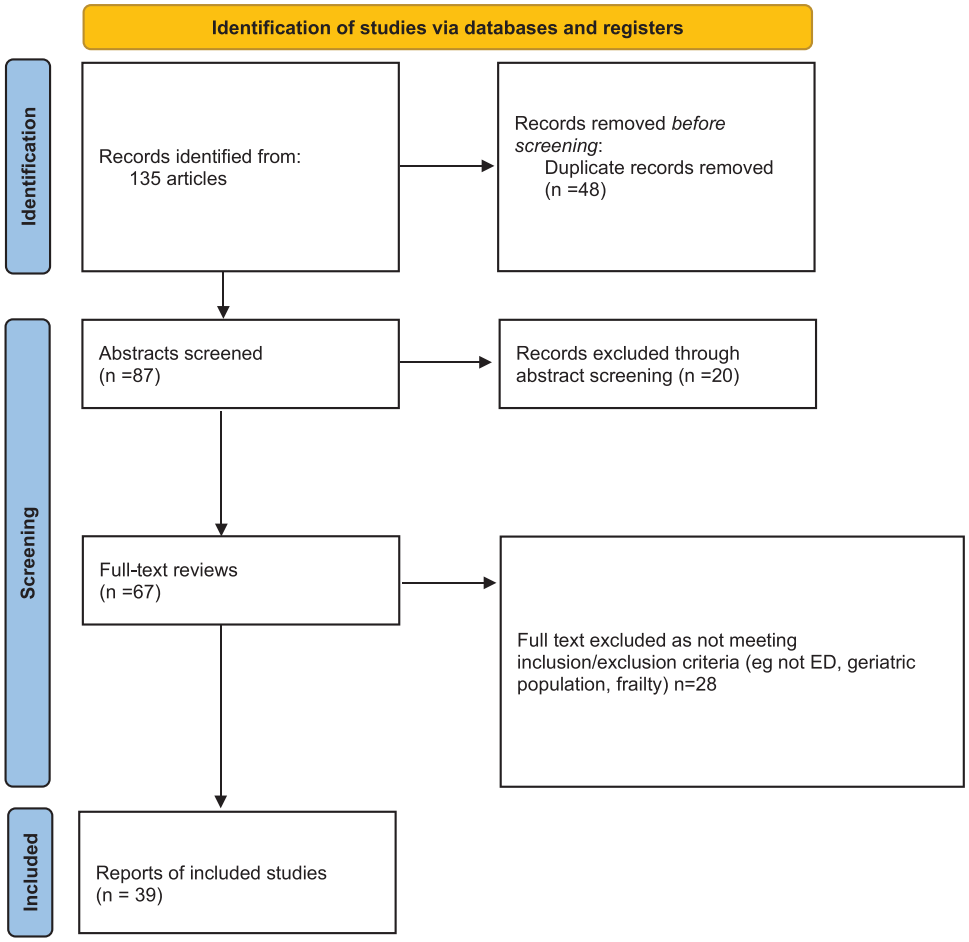

FIGURE 1 PRISMA diagram.

Care; Frailty Informing Outcomes; Frailty as Predictor of Decompensation/Risk; Frailty as Predictor of Adverse Events, and ED Interventions when Frailty is Identified.

3.1 | Frailty assessment measures

Several measures are described in the literature, with varying impacts on different adverse outcomes. A review of 4 frailty measures[14]—Clinical Frailty Scale (CFS), Deficit Accumulation Index, Identification of Seniors at Risk (ISAR), and the Study of Osteoporotic Fracture (SOF) frailty index—in the ED suggested that frailty screening predicted increased risk of hospitalization, nursing home admission, mortality and prolonged hospital length of stay (LOS) after an ED visit. The SOF was the best tool for predicting functional decline. None of the screening tools in this study predicted an ED return visit within 30 days. An Italian study[5] reported that the ISAR predicted ED revisit and frequent ED returns, hospitalizations and 6-month mortality, and showed 94% sensitivity and 63% specificity. A US study[15] reported the CFS-predicted ED visits, ED returns, and hospitalization among ED patients 65 years and older. In addition to increases in health care utilization, associations between frailty measures and person-centered outcomes were reported by a study involving 4 distinct patient populations across 4 Australian EDs using 3 frailty scales: Fried Frailty Criteria, the CFS, and Stable, Unstable, Help to walk, Bedbound (SUHB).[16] All scales showed good predictive discrimination of poor discharge outcomes, including death, poor self-reported health/quality of life, need for community services post-discharge, or revisit to ED after the index hospitalization.[16] However, a comparison of 8 different frailty scales across settings (geriatric units, outpatient clinics, primary care, and nursing homes) in Europe suggested that although interscale agreement was fair, different scales may measure different constructs and should be selected for use based on setting.[17]

3.2 | Using frailty assessment at triage

Possible uses of a valid frailty index or screening tool at the time of triage are to predict admission,[18,19] death within 28 days,[12,18,20] and a need for a more comprehensive geriatric assessment.[12,18] Ng[21] reported that a combination of a triage acuity scale and a triage frailty scale reduced the rate of under triage among older patients. Generally, compliance with geriatric screening is deficient; a Canadian

study found geriatric screening with the ISAR at approximately 50%.[22] Below, we list various frailty scores used for triage in the ED.

- The development of the Frailty Index for ED (FI-ED) comprised the selection of 24 variables from a larger 39-item screening instrument, the emergency department contact assessment (ED-CA), which is used in a wide variety of geriatric settings. The elements of the FI-ED are continuous and clinically relevant and can be pulled from an electronic health record (EHR) to generate a score. It appears useful to predict admission, mortality within 28 days, and the need for a more thorough geriatric-specific consultation. Trialed in patients 65+ years old.[18]
- Self-assessed frailty screening has been explored[23] as a way to increase compliance with initial encounter screening; in a cohort patients whose average age was 75 years, the majority found self-assessment via computer tablet acceptable, whereas those over the age of 85 found this method less acceptable.[23]
- The relationship between FI-ED score and Canadian Triage and Acuity Scale (CTAS) acuity score was explored by Mowbray et al,[19] because the CTAS uses frailty as a modifier in acuity decision-making. Geriatric patients who presented for non-urgent concerns (CTAS 4 and 5) experienced the greatest number of hospitalized patient days of the sample, supporting the use of frailty to "up triage" geriatric patients.
- The use of the CFS at ED triage was examined for associations with important service- and patient-related outcomes for patients 65 years and over.[12] Frailty assessed at ED triage (with the CFS) was associated with adverse outcomes, including increased hospitalization and increased mortality. Its use in ED triage might aid immediate clinical decision-making and service configuration by raising the index of suspicion. A higher frailty score may be useful in directing the patient to inpatient units that could provide a more comprehensive geriatric assessment. The CFS was also used in an Italian ED[20] to assess the relationship between frailty and other factors (comorbidities, cognitive impairment, delirium, severity of disease) and mortality from COVID-19. A hazard ratio of 12.55 for frailty predicted in-hospital death for patients >80 years old. Interrater reliability of the CFS was found to be acceptable in a US study.[24]

3.3 | Frailty-informed care

Identifying frail patients highlights the complexity of this vulnerable population. Traditionally, EDs focus on treating a single pathology rather than address the context of health and social circumstances which predispose a frail older adult to acute illness or injury. In multiple narrative reviews, experts endorse shifting from this narrow delivery of care to the early identification of frailty, recognition of the diagnostic challenge presented by older adults, and creation of a multidisciplinary approach in the ED reinforced by institutional support to allow for timely access and continuity of care through the health system.[25–27]

Frail older adults present to the ED with atypical symptoms, altered physiologic response, comorbidities, and polypharmacy,[26] leading to complex diagnostic and management decisions with increased risk for poor outcomes. For example, severe frailty in sepsis is often under-recognized,[28] yet associated with a mortality rate of 30% at 30 days. Covino et al.[20] demonstrated that frailty (defined by CFS) predicted all-cause in-hospital mortality for COVID-19 patients 80 years and older independent from other known risk factors. Older patients often have different goals of care, with priorities shifting from longevity to functional independence[29]; not understanding this context can lead to under triage, over investigation or inappropriate treatments.[30]

Although frailty is a central tenet of medical care in geriatrics, there is limited uptake in the context of the ED.[22] The barriers to widespread acceptance of frailty-informed practice are likely multifactorial including lack of specific training focused on geriatrics among emergency care professionals.[31–33] One qualitative analysis also found that emergency physicians and nurses reported that they often lacked time to do a frailty assessment, did not want to force patients into categories, and saw frailty identification as "someone else's role."[11] Patients may interpret being labeled as "frail" as a term of separation and dependency; medical professionals should ensure patients understand how the term is being used.[34]

3.4 | Frailty informing outcomes

The association of frailty and adverse outcomes has been studied in various countries using the CFS,[35] SUHB Scale,[36] Frailsafe Screen,[37] Survey of Health, Ageing and Retirement in Europe Frailty Instrument (SHARE-FI),[38] the Frailty Screening Questionnaire (FSQ),[39] and the Frailty Index (pFI).

Evidence is mixed about adverse outcomes associated with frailty evaluated in the ED. A systematic review evaluated geriatric risk screening tools and found that of 5 constructs of frailty evaluated, none increased or decreased the risk of ED return, hospital admission, functional decline, institutionalization, or death.[40] A prospective cohort study in Ireland similarly found that there was no difference in 1-year mortality between ED patients classified as frail and those who were not.[41] Smyth et al.[42] conducted a scoping review on how frailty and ADL impact decisions to transfer patients from nursing homes to the ED and were unable to find any study examining how ADL or frailty were associated with decisions to treat patients while in the ED, whereas several studies in the review found that ADL/frailty were associated with reduced transfers to ED and hospitalization.

However, some studies found associations between frailty and adverse outcomes in older ED patients; a retrospective UK cohort study found that a higher ED triage CFS was associated with increasing readmission and mortality rates.[12] A US study similarly found that higher ED CFS was associated with increased odds of admission at the incident visit and in 30 days.[15] A UK-based ED study using the Frailsafe ED found that a positive screen was a predictor of death and care home admission within 180 days, length of stay >28 days and ED revisit within 30 days.[43] A Chinese study found that frailty based on the FSQ Scale was associated with higher 28-day mortality, ADL dependency, mechanical ventilation, hospital LOS, and ICU

readmissions after discharge.[39] A retrospective Canadian cohort study demonstrated that increasing pFI applied to ED patients was associated with over 2-fold increased mortality and nearly 2-fold increased institutional discharge.[44]

3.5 | Predictors of decompensation/risk

In a study older patients admitted to hospital following angiography or percutaneous transluminal coronary angioplasty, 7 assessment/screening tools were administered to determine which (if any) were useful predictors of cardiac death or all-cause mortality over the next year. The Short Physical Performance Battery (SPPB) predicted both cardiac events and all-cause mortality.[45]

The National Early Warning System (NEWS) was paired with a triage score in Finland, and predicted mortality, hospital admission, admission to a high dependency unit (HDU) or ICU, but not LOS in the ED and ED-readmissions in patients with frailty 75 years or older. Giroux et al[46] conclude that any measure of frailty is useful to predict delirium in ED stays for older adults, and screening for frailty at emergency triage could help ED professionals identify seniors at higher risk of delirium with its attendant risks.

Combining a frailty assessment tool with physiologic data may also be useful. Kabell Nissen and colleagues[47] attempted to determine the predictive capacity of the Frailty adjusted Prognosis in ED tool (FaP-ED), which combines CFS and vital signs with the National Early Warning Score (NEWS). The FaP-ED was more accurate at predicting 30-day mortality than NEWS or CFS alone (area under the receiver operating characteristic = 0.86; 95% confidence interval, 0.83–0.90).

3.6 | Predictors of adverse events (functional decline)

Afilato et al[48] reported that gait speed was associated with repeat ED visits at 6 months and functional decline within 1 month. In another Canadian study, Eagles et al[49] reports that risk of functional decline at 3- and 6-months increases with increasing Timed Up and Go (TUG) times. The relative risk of functional decline at 3 months is 8.9 times greater in those with the highest TUG times—both studies sampled patients who were to be discharged to home after an ED visit. A Canadian study of functional decline at 3 months in patients over 65 years in the ED for minor injuries and slated to be discharged to home found the Aging-CSHA-CFS and the SOF frailty index[50] to be predictive.

3.7 | Interventions when frailty is identified

A systematic mapping review summarizing ED interventions for frail older adults included ED staffing initiatives, changes to the physical space of ED, and care delivery interventions.[51] Some of these interventions were targeted to frail individuals whereas others were designed for the general older adult population. Overall, there was a trend toward decreased hospital admissions, ED LOS, and return visits to the ED.

ED interventions once frailty is identified can involve transferring the care of frail elders to specialized care teams and physical spaces.[51] Conroy et al[52] examined the impact of an Emergency Frailty Unit (EFU). In the EFU, older ED patients were evaluated by a geriatrician via standard protocols and pathways within the main ED. When comparing pre- and post-creation of the EFU, ED admission and readmission rates at 90 days fell among patients 85+, although inpatient LOS increased.

Rapid recognition and intervention by geriatric specialists was studied by Chong et al[53] in a Singapore ED among 100 patients ≥85 years of age. The EDIFY program was developed as a means to potentially avoid acute admissions while providing integrated geriatric interventions at the front-door and was associated with an 81.4% decrease in admission compared to the non-intervention group, with no subsequent differences in re-hospitalization, mortality, or ED revisit over the study period. Early intervention by a Frailty Intervention Team (FIT) team in the ED was associated with a 33% relative increase in rate of discharge home.[54]

Ekermo and colleagues[55] report that 52% of Swedish EDs have nursing care guidelines for frail elders, which include managing physical psychosocial needs during their ED care. Specifically, these care guidelines were aimed at skin and wound management. Other guidelines addressed nutritional needs, activities of daily living, and mobility (fall prevention and ambulation). Psychosocial interventions included managing anxiety, information needs, and reducing confusion. Ekermo et al[55] suggest that nursing guidelines for frail elders address both physical and psychosocial/relational needs.

4 | LIMITATIONS

This frailty scoping review has several limitations. Although a thorough literature search was conducted, important studies may have overlooked if they were not in English or were indexed in databases other than the ones we used. Furthermore, given this was not a systematic review, we did not assess the studies we included for risk of bias or methodological rigor. Finally, the heterogeneity of the studies in terms of health care system, population studied, frailty assessment measure used, and outcomes identified make direct comparisons difficult.

5 | DISCUSSION

Our scoping review reports several tools, scales, and instruments for identifying frailty in older patients at ED triage; multiple frailty scores or tools exist with varying levels of utilization. Commonly used frailty tools had varying degrees of predictive value for identifying health care utilization but are more predictive of disability or increased mortality.

Different tools for frailty assessment have been examined in ED-based studies in Australia, Europe and in North America, and have been shown to identify patients at risk for higher morbidity, mortality, decompensation, and those who would benefit from a more thorough

geriatric assessment. No one tool was reported as universally predictive, suggesting the potential benefit of using multiple frailty tools to achieve a broader risk stratification of an undifferentiated older patient at their health care encounter.

There is limited evidence for the usefulness of frailty scores in the ED as a predictor of decompensation, which can be an important challenge in the ED setting. Frailty-informed care in the ED such as targeted interventions, a modified clinical approach, and systems-level changes can improve patient outcomes in this vulnerable patient population.[53] Current barriers to increased use of frailty as a medical concept in the ED include accurate and efficient detection of frail patients in the ED and high-quality evidence-based interventions specifically addressing the unique care needs of this patient population.[9,15]

Frailty has the potential to inform ED discharge decisions and clinicians may wish to carefully consider decisions to discharge ED patients with frailty, ensuring that discharge aligns with the patient's care priorities. A combined assessment that includes frailty with other known prognostic indicators such as vital signs and comorbidities may be useful for clinical decision-making. Additionally, the presence of frailty could help shape serious illness communication in the ED and may help clinicians set patients' and care partners' expectations about recovery and institutionalization after the ED visit and hospitalization.

From an ED operations standpoint, the ED nursing shortage[56] may potentially reduce ED frailty screening efforts. Current evidence[57] has demonstrated the improvement of care for frail older adults with staffing initiatives, changes to the physical space of ED, or care delivery interventions is associated with improved health care utilization outcomes beyond the physical space and care trajectory of the ED. Specifically, nursing interventions may prove important to prevent in-ED physical or psychological injury.[55]

Further research needs to be done on (1) determining the usefulness of frailty identification in the very specific context of emergency care (identification of physiologic instability and appropriate stabilization); (2) the effects of care delivery interventions or educational initiatives for front-line medical professionals on patient-oriented outcomes, such as mortality and functional decline; and (3) ensuring the feasibility and acceptability of these initiatives for patients.

ACKNOWLEDGMENTS

This work was conducted in part with the generous funding of John A. Hartford and West Health.

CONFLICT OF INTEREST STATEMENT

The authors declare no conflicts of interest.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

How to cite this article: Wolf LA, Lo AX, Serina P, et al. Frailty assessment tools in the emergency department: A geriatric emergency department guidelines 2.0 scoping review. *JACEP Open*. 2024;5:e13084. https://doi.org/10.1002/emp2.13084