

STUDY PROTOCOL

Screening Tools for Patient Frailty in the Emergency and Urgent Care Setting: A Protocol for a Systematic Review

Antonio Bonacaro¹, Alessandra Pedroni¹, Alessio Brichese¹, Francesca Gulino¹, Giorgio Cardamone¹, Lara Filippini¹, Maria Pia Motola¹, Elisa La Malfa¹, Maria Bertuol¹, Giuseppe Stirparo²

¹Department of Medicine and Surgery, University of Parma, Italy

²SIMED - Società Italiana Di Medicina e Divulgazione Scientifica

Correspondence to:

Elisa La Malfa RN, MSN, Research Fellow

Department of Medicine and Surgery, University of Parma

Via Antonio Gramsci, 14

43125 Parma, ITALY

Email: elisa.lamalfa@unipr.it

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Abstract

Background: Overcrowding in emergency departments (EDs) is a significant issue, leading to longer wait times and poor clinical outcomes, particularly affecting the elderly population. Elderly patients often visit EDs due to multiple chronic conditions and are at higher risk for hospitalization and adverse health outcomes. Frailty, an age-related condition characterized by increased vulnerability to health complications, plays a major role in this issue. Early identification of frailty can improve care and reduce ED congestion. Furthermore, boarding in the corridor, where patients, especially elderly ones, wait in hallways due to a lack of available beds, worsens overcrowding and impacts patient safety and care. **Aim:** This study aims to identify clinical scales for the rapid assessment of frailty in elderly patients, focusing on tools that can be integrated into daily ED workflows. Early frailty identification is key for improving clinical outcomes, reducing hospitalizations and mortality, and addressing the negative effects of corridor boarding. **Materials and Methods:** A systematic literature review was conducted to explore validated frailty scales suitable for emergency care settings. The PICO method was used to define the research question. Studies focusing on frailty assessment in aged patients admitted to Eds were analysed. A comprehensive search was conducted in PubMed, Embase, and Scopus with keywords like “frailty,” “emergency department,” and “screening.” **Results:** Several frailty scales, including the Timed Up and Go (TUG), FRAIL Scale, and Clinical Frailty Scale (CFS), were identified

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as applicable in emergency settings. The Clinical Frailty Scale and Tilburg Frailty Indicator stood out for their simplicity and clinical utility. Boarding in the corridor was found to exacerbate the risks for frail patients, delaying care and leading to worse outcomes. **Conclusion:** Implementing a structured frailty screening system in EDs is essential to improve care, reduce hospitalizations, and address the challenges of overcrowding and corridor boarding.

Keywords: Frailty, Emergency Medical Services, Urgent Care, Geriatrics, Nurses, Aged

Introduction

Overcrowding in emergency departments (EDs) has become a major concern for healthcare facilities, resulting in longer wait times and poor clinical outcomes [1]. This issue, which affects public health and emergency care quality, has gained national attention, leading to urgent calls for reform [2]. The problem is compounded by the rising number of elderly patients, a significant portion of “frequent users” of emergency services. These patients, often seeking care for multiple chronic conditions, contribute to ED congestion [3]. Limited access to primary care and continuity of care are identified as key drivers of this issue. In Italy, individuals aged 65 and older represent about 20% of the population, with projections indicating that this will increase to 33.2% by 2050. Frequent ED users, who visit four or more times a year, are generally older and have a higher risk of hospitalization compared to younger patients [2,4]. The rise in chronic diseases, combined with increased frailty, contributes to the growing number of ED visits. The clinical needs of elderly patients presenting to EDs are substantially different from those of younger adults [5]. Many elderly patients suffer from acute or subacute illnesses, often accompanied by functional and/or cognitive decline. Additionally, these patients often have complex social care needs [6], requiring multidimensional assessments to improve care for this population, which indirectly benefits the entire population.

Frailty, a progressive decline associated with aging, increases vulnerability to stress and negative health outcomes [7]. The World Health Organization defines frailty as an age-related, multifactorial condition characterized

by heightened vulnerability to adverse events and a reduction in intrinsic capacity, leading to a higher risk of hospitalization, disability, and death [8]. This decline in physiological reserves results in increased vulnerability to negative health effects such as falls, dependency, hospitalizations, and mortality [9].

Although physical frailty is widely studied, it also encompasses cognitive and psychosocial factors, which interact with each other and the external environment, defining frailty in specific contexts. Frailty differs from multimorbidity, the presence of multiple diseases, and disability, which refers to difficulties in performing daily activities. Fragile individuals often have multiple comorbidities that increase the risk of frailty and disability, creating a cycle of worsening health [7]. This complexity complicates the integration of frailty into clinical practice, as evidenced by the high number of severe triage codes in elderly patients, which heightens the risk of poor health outcomes in emergency situations [2].

Emergency care for the elderly requires more resources than for younger patients. Identifying frail elderly individuals and assessing their risk is crucial for providing appropriate care and guiding clinical decision-making [9]. While frailty has a conceptual definition, an operational definition is needed to better identify and measure frailty in clinical settings [7].

Several models for assessing frailty exist, including the Phenotypic Model, the Deficit Model, and the Integrated Model [9]. The “Phenotypic Model” identifies frail individuals based on measurable physical capabilities such as weight loss, strength, fatigue, walking speed, and physical activity. While objective, it does not account for cognitive or social factors. The “Deficit Model” focuses on the number of health issues or diseases across various domains, including cognitive disorders, which are particularly relevant for the elderly. The “Integrated Model” adopts a comprehensive approach, incorporating social and psychological factors.

More functional tools, like the Clinical Frailty Scale, offer a simpler method for frailty assessment. This 9-step tool classifies frailty and functional impairments, aiding in risk stratification during emergency triage and directing patients to appropriate geriatric care. Other screening tools, such as the Geriatric Risk Profile and the Tilburg Frailty Indicator, also assist in early frailty identification and intervention

in emergency settings. Frailty and mobility assessment tools for the elderly include the Timed Up and Go (TUG) test, the FRAIL Scale, the Edmonton Frail Scale (EFS), and the Clinical Frailty Scale (CFS). The choice of tool depends on the context and objective, with some better suited for pre-frailty detection, while others predict long-term mortality. After identifying frail individuals, a comprehensive geriatric evaluation is advised to develop coordinated treatment and follow-up plans, considered the “gold standard” for frailty management.

Screening for cognitive decline, functional difficulties, and home care needs upon ED arrival is crucial to ensure appropriate care and guide discharge planning [2]. Elderly patients in the ED often present with both medical and social needs. Despite two-thirds of them being unable to perform at least one daily activity, functional and psychosocial decline is rarely recognized during emergency visits [10]. Patients with non-medical issues, such as social isolation, should be informed about community services. Case managers focusing on high-needs patients and providing structured follow-up can reduce ED visits and hospital admissions.

A more integrated healthcare system, with better monitoring for at-risk elderly individuals and prioritization of frailty assessment in care planning, is necessary to reduce ED overcrowding [11].

However, the main issue remains the lack of primary care facilities for post-acute care and tools that ensure continuity of care.

The COVID-19 pandemic highlighted the urgency of reforming the healthcare system, particularly the integration of hospital and community services. The strain on EDs during the pandemic, exacerbated by a surge in COVID-19 cases, has underscored the need for well-structured community-based care networks to reduce ED overcrowding and improve chronic disease and frailty management among the elderly.

In conclusion, the COVID-19 pandemic has emphasized the need for a healthcare system capable of preventing disease exacerbations and effectively managing resources at the community level. Prioritizing frailty identification and developing tools to screen elderly patients before ED visits will allow early detection and the application of appropriate territorial care strategies, improving overall healthcare quality and reducing ED congestion.

AIM

The aim of this study is to identify a valid and effective tool for the rapid identification of frail elderly patients upon admission to Emergency Departments (EDs). The study seeks to evaluate the effectiveness of various frailty scales in different clinical settings enabling targeted and personalized care planning, promoting the adoption of validated tools that can be used not only in Emergency Departments but also in community-based and pre-hospital services. Early identification of frailty in elderly patients is essential for improving clinical outcomes and reducing the risks associated with negative health consequences such as frequent hospitalizations, permanent disability, and increased mortality. Timely frailty assessment ensures that frail patients receive appropriate and personalized support based on their health status.

The study also aims to raise awareness among healthcare professionals about frailty as a critical factor in clinical decision-making, advocating for the development of more inclusive and preventive healthcare policies. Finally, this research aspires to contribute to the dissemination of scientific knowledge regarding the importance of early frailty identification and the adoption of clinical strategies tailored to meet the specific needs of this vulnerable population, with the goal of improving patient management and alleviating the phenomena of overcrowding and boarding in Emergency Departments.

METHODS

Study Design

Systematic Review The systematic review was not registered in PROSPERO because the authors opted to follow an alternative approach to protocol documentation and dissemination, such as publishing the protocol in a peer-reviewed journal. This decision was made to align with the review’s specific objectives and the preferences of the research team

Search Strategy

Authors performed the PICO method (see [Table 1](#)) to structure the research question (foreground question). This method relates four key elements: Population, Intervention, Comparison, and Outcome, in order to

identify a valid tool for the early identification of frail patients presenting to Emergency Departments (EDs).

P (Patient/Population) refers to geriatric patients over 75 years of age, who suffer from a complex clinical condition of “frailty” (insert reference), accessing emergency care and requiring multidisciplinary management.

I (Intervention) refers to the identification and use of validated scales for measuring frailty in the target population. These tools are already present in the literature and are used in international healthcare settings. Their application would allow for the early recognition of the patient’s clinical condition, supporting healthcare providers.

C (Comparison) involves comparing the target population, for whom validated tools for early frailty identification are applied, with a group of patients for whom these scales are not used (control group). Through this comparison, the effectiveness of these scales in defining appropriate interventions can be assessed, with the aim of reducing inappropriate ED visits and the associated phenomena

of overcrowding in healthcare facilities (e.g., boarding, aggression, etc.).

O (Outcome) refers to importance of implementing an effective screening tool for frail patients, particularly in Emergency Department settings, through the use of validated scales. This could lead to directing patients to alternative pathways such as outpatient follow-up programs, referrals to social and welfare services, home care, or rehabilitation facilities, thereby reducing the burden on emergency services. Additionally, it would support the development of personalized care plans, benefiting both patients and the multidisciplinary teams involved.

This approach aims to promote integrated and sustainable healthcare, addressing the specific needs of the elderly population. Moreover, these findings could contribute to the development of new guidelines for managing elderly patients in emergency settings, improving not only clinical outcomes but also the sustainability of the healthcare system. In conclusion, by using validated frailty scales, the goal is to enhance the management of elderly patients in the pre-hospital phase.

TABLE 1 - PICO Definition

P (Patient/Population)	Geriatric patients in the emergency-urgency context, with particular reference to emergency department settings.
I (Intervention)	Research and administration of validated scales defining the concept of frailty.
C (Comparison)	No administration of validated scales.
O (Outcome)	Screening fragile patients through the use of validated scales.

The project was structured in several phases:

- Definition of “key terms” and literature search for the most recent evidence regarding the presence of assessment scales for patient frailty.
- Selection of literature articles.
- Reading and analysis of the articles with the creation and use of a summary table.

To conduct the literature search, the databases PubMed,

Embase, and Scopus were consulted using the key terms: “frailty”, “emergency department”, “assessment”, “scale”, “score”, “index”, “hospital”, “emergency care”, “emergency service”, “emergency ward”, “emergency health service”, “first aid department”, “evaluation”, “diagnostic scale”, “screening”.

The search string has been adapted to the Thesaurus of each consulted database for the investigation.

Specifically, the search string included the use of the following terms and Boolean operators:

Inclusion and Exclusion Criteria

The studies to be included or excluded from the research were selected based on predefined eligibility criteria.

In particular, the inclusion criteria for the studies were:

- All studies related to the reference population: geriatric patients aged 75 years or older;
- All studies regarding scales/tools defining the concept of frailty;
- All studies related to the healthcare setting of Emergency and Urgency services and out-of-hospital settings (ER/118).

The exclusion criteria, on the other hand, included:

- All studies related to adult patients under 75 years of age;
- All studies referring to a population of oncology patients;
- All studies referring to a population of patients with a recent episode of trauma and/or related to orthopedic care;
- Studies referring to geriatric assessment including CGA (to be specified further);
- All articles dealing with tools/scales that do not concern the identification of frail patients.

Data extract and statistical analysis

Articles were identified through strings from Pubmed, Scopus and Embase. They were subsequently uploaded to RAYYAN software. The identified articles were extracted and entered into the portal through successive stages of: double-blind reading of the article titles and abstracts, was performed by two researchers, discarding those not relevant to the research; full-text reading, was performed by a researcher of the remaining articles and inclusion of those aligned with the research objective; resolving conflicts and analysing the articles.

The research strategy was reported as a supplementary material.

The selected articles will be analysed through the development of a summary table to extract key information, including author, title, publication date, country of study, objective, research design, sample,

interventions, type of training, type of evaluation, effectiveness of interventions, and outcomes.

Document Archiving

The Investigator is responsible for the archiving and storage of essential study documents before, during, and after the completion or termination of the study, in accordance with current regulations and GCP guidelines. The results of the study will be made available within 24 months of the conclusion of the systematic review through publication in an indexed scientific journal.

Expected results

The expected results of this study aim to identify an effective and reliable tool for the rapid identification of frail elderly patients upon their admission to Emergency Departments (EDs). By evaluating the effectiveness of different frailty scales in various clinical settings, the study seeks to determine which tools are most suitable for enabling targeted, personalized care planning. This could promote the adoption of validated frailty assessment tools not only within Emergency Departments but also in community-based and pre-hospital services.

Additionally, the study is expected to demonstrate how early identification of frailty in elderly patients can significantly improve clinical outcomes, reduce the risks associated with frequent hospitalizations, prevent permanent disabilities, and decrease mortality rates. The timely assessment of frailty is anticipated to ensure that frail patients receive appropriate, individualized care, tailored to their specific health needs.

Another key result is the increased awareness of healthcare professionals regarding frailty as a critical determinant in clinical decision-making. This study aims to advocate for the development of more inclusive and preventive healthcare policies that address frailty as a central component of care. Ultimately, the research aspires to contribute to the dissemination of scientific knowledge about frailty, encouraging the adoption of clinical strategies that are specifically designed to meet the needs of vulnerable elderly populations. The findings are expected to support improved patient management and help mitigate issues such as overcrowding and boarding in Emergency Departments.

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SUPPLEMENTARY MATERIAL: RESEARCH STRATEGY

PUBMED:

((“Emergency Service, Hospital”[Mesh] AND “Frailty”[Mesh] AND (“Geriatric Assessment”[Mesh] OR “Physical Functional Performance”)) OR (“Emergency Room” OR “emergency department” OR “ER” OR “Emergency Unit” OR “Emergency service” OR “emergency ward” OR “First Aid Department” OR “emergency care” OR “Emergency Health Service” OR “ED” OR “emergency admission” OR “emergency clinic”) AND (“assessment” OR “evaluation” OR “scale” OR “index” OR “scoring system” OR “screening” OR “tool” OR “diagnostic scale”) AND (“frail” OR “fragilit”))

SCOPUS:

(“Emergency ward/exp AND frailty/exp AND (physical performance/exp OR ‘geriatric assessment’/exp)) OR ((“Emergency Room”:ti,ab OR “emergency department”:ti,ab OR “ER”:ti,ab OR “Emergency Unit”:ti,ab OR “Emergency service”:ti,ab OR “emergency ward”:ti,ab OR “First Aid Department”:ti,ab OR “emergency care”:ti,ab OR “Emergency Health Service”:ti,ab OR “ED”:ti,ab OR “emergency admission”:ti,ab OR “emergency clinic”:ti,ab) AND (“assessment”:ti,ab OR “evaluation”:ti,ab OR “scale”:ti,ab OR “index”:ti,ab OR “scoring system”:ti,ab OR “screening”:ti,ab OR “tool”:ti,ab OR “diagnostic scale”:ti,ab) AND (“frail”:ti,ab OR “fragilit”:ti,ab))

EMBASE:

(INDEXTERMS (“Emergency Service”) AND INDEXTERMS (“Frailty”) AND (INDEXTERMS (“Geriatric assessment”) OR INDEXTERMS (“Physical functional performance”))) OR (TITLE-ABS (“Emergency Room”) OR (TITLE-ABS (“Emergency Room”) OR TITLE-ABS (“emergency department”) OR TITLE-ABS (“ER”) OR TITLE-ABS (“Emergency Unit”) OR TITLE-ABS (“Emergency service”) OR TITLE-ABS (“emergency ward”) OR TITLE-ABS (“First Aid Department”) OR TITLE-ABS (“emergency care”) OR TITLE-ABS (“Emergency Health Service”) OR TITLE-ABS (“ED”) OR TITLE-ABS (“emergency admission”) OR TITLE-ABS (“emergency clinic”))AND (TITLE-ABS (“assessment”) OR TITLE-ABS (“evaluation”) OR TITLE-ABS (“scale”) OR TITLE-ABS (“index”) OR TITLE-ABS (“scoring system”) OR TITLE-ABS (“screening”) OR TITLE-ABS (“tool”) OR TITLE-ABS (“diagnostic scale”)) AND (TITLE-ABS (“frail”) OR TITLE-ABS (“fragilit”)))