

Utility of the Vulnerable Elders Survey-13 (VES-13) in detecting frailty and predicting prognosis in heart failure outpatients

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ABSTRACT

Background Frailty is common and significantly impacts prognosis in heart failure (HF). The Vulnerable Elders Survey-13 (VES-13), widely used in oncogeriatrics and public health, remains unexplored as a frailty screening tool in HF outpatients. In this study, we prospectively evaluated VES-13 against a multimodal screening assessment in detecting frailty and predicting individual risk of adverse prognosis.

Methods Frailty was assessed at the initial visit using both a multimodal approach, incorporating Barthel Index, Older American Resources and Services scale, Pfeiffer Test, abbreviated Geriatric Depression Scale, age > 85 years, lacking support systems, and VES-13. Patients scoring ≥ 3 on VES-13 or meeting at least one multimodal criterion were classified as frail. Endpoints included all-cause mortality, a composite of death or HF hospitalization, and recurrent HF hospitalizations.

Results A total of 301 patients were evaluated. VES-13 identified 40.2% as frail and the multimodal assessment 33.2%. In Cox regression analyses, frailty identified by VES-13 showed greater prognostic significance than the multimodal assessment for all-cause mortality (HR = 3.70 [2.15–6.33], $P < 0.001$ vs. 2.40 [1.46–4.0], $P = 0.001$) and the composite endpoint (HR = 3.13 [2.02–4.84], $P < 0.001$ vs. 1.96 [1.28–2.99], $P = 0.002$). Recurrent HF hospitalizations were four times more frequent in VES-13 frail patients while two times in those identified as frail by the multimodal assessment. Additionally, stratifying patients by VES-13 tertiles provided robust risk differentiation.

Conclusions VES-13, a simple frailty tool, outperformed a comprehensive multimodal assessment and could be easily integrated into routine HF care, highlighting its clinical utility in identifying patients at risk for poor outcomes.

Heart failure (HF), despite significant therapeutic advancements in recent years, continues to be characterized by frequent hospitalizations and a dismal prognosis, particularly among the elderly. This condition often coexists with frailty, which is defined by diminished physiological reserve and an increased susceptibility to external stressors. The presence of frailty in HF illustrates the limitations of using chronological age alone to categorize older adults,

suggesting that a more accurate measure is needed to reflect biological age.^[1] Frailty affects not only the elderly; younger HF patients can also be significantly frail and dependent.^[2–4]

In HF, frailty ranges from functional decline to severe disability and is influenced by factors beyond age, including cognition, social support, nutrition, and comorbidities. HF and frailty share overlapping features, such as deconditioning and reduced exercise tolerance, un-

derscoring frailty's impact on HF management.^[5]

The impact of frailty on mortality and hospitalization in HF is well-established.^[3,6,7] Detecting frailty and dependence can help identify patients who may benefit from a comprehensive geriatric evaluation and targeted interventions that not only address their cardiac condition but also aim to preserve and enhance their functional, cognitive, psychological, and social well-being. Risk stratification based on frailty status in HF patients offers valuable prognostic information and can guide decisions regarding HF treatment and broader management strategies. Despite the growing recognition of frailty as a major public health concern, the optimal approach to its assessment remains unclear. Various frailty assessment scales have been used in recent studies, highlighting the lack of standardization in evaluating this condition.^[2,6]

At our HF clinic, we have been screening for frailty at the initial visit for over two decades, using a multimodal assessment approach in the absence of dedicated HF frailty scores. This assessment includes tools such as the Barthel Index, Older American Resources and Services (OARS) scale, Pfeiffer Test, the abbreviated 4-item Geriatric Depression Scale (GDS), age > 85 years, and the lack of a support system.^[2,4] Our findings show that frailty is prevalent among patients with HF and plays a crucial prognostic role, being significantly linked to decreased survival.^[2-4,7,8]

The Vulnerable Elders Survey13 (VES-13)^[9,10] is a widely recognized frailty screening tool used in various fields, including oncogeriatrics^[11] and community public health.^[12] It is a simple method for identifying older adults, aged 65 and older, who are at an increased risk of death or functional decline. A VES-13 score of ≥ 3 indicates frailty and predicts 5-year functional decline and mortality outcomes among ambulatory care patients. However, to date, it has not been routinely applied in ambulatory HF follow-up. The goal of this study was to compare the VES-13 screening tool with our multimodal assessment in identifying frail individuals at risk for adverse outcomes in the HF clinic.

METHODS

This study was conducted in the HF clinics of a tertiary hospital located in Badalona, Spain. The inclusion period extended from March 2021 to December 2021. Since 2001, nurses from the HF clinic's multidisciplinary

team have been detecting frail individuals at risk of a worse prognosis using a multimodal approach with various geriatric assessment tools during their first visit,^[2-4] as there were no specific simple tools for frailty diagnosis in HF at this moment. Frailty was defined as the presence of at least one of the following conditions: Barthel Index < 90,^[13] OARS scale < 10 in women and < 6 in men,^[14] Pfeiffer Test > 3 $\pm$ 1 (depending on educational level),^[15] ≥ 1 positive response for depression on the abbreviated Yesavage Geriatric Depression Scale (GDS) of 4 items,^[16] age > 85 years, or having nobody to turn to for help. To facilitate patients' access to a multidisciplinary geriatric assessment and intervention, we added the systematic use of VES-13 to screen for frailty in this population during the first visit protocol. VES-13 was selected due to its brevity,^[9-12] validation in community and oncogeriatric settings, and ease of administration by non-clinical staff (it takes only 4-5 min to complete and can be administered face-to-face or by phone). It includes dimensions such as age, self-rated health, limitations in physical function and disability in daily living activities (see Supplementary Material). Frailty was considered present when the VES-13 scored 3 or more points (range 0-10).

To evaluate the prognostic role of frailty, the main endpoints were all-cause mortality, the composite of all-cause death or HF hospitalization and recurrent HF hospitalizations. Furthermore, we evaluated whether the score obtained in VES-13, beyond its applicability using a cut-off point for frailty diagnosis, allows a more accurate stratification of the risk of death and HF hospitalizations, dividing the VES-13 scores into tertiles. HF hospitalizations and fatal events were identified from hospital clinical records and also from emergency rooms and general practitioners' records or by contacting their relatives. Data were verified using the databases of the Catalan and Spanish Health Systems and the Spanish National Death Index (INDEF). The study was performed in compliance with the law protecting personal data. The local ethics committee approved the study (REGI-UNIC registry: PI-18-037). The follow-up period concluded on December 31, 2022.

Statistical Analysis and Data Collection

Continuous variables were expressed as mean $\pm$ SD or median and interquartile range (Q1-Q3), depending on whether data distribution was normal (assessed by normal Q-Q plots); categorical variables were expressed as



percentages. Concordance between VES-13 and multimodal assessment was measured by Cohen's Kappa index. Accepting an alpha risk of 0.05 and a power of 0.8 in a two-tailed test, 272 subjects are necessary to detect as statistically significant a Kappa value of 0.82. It was expected that both observer's percentages of positive results would be 35%. The null hypothesis for Kappa was assumed to be 0.7.

Cox regression analyses were performed for assessing the prognostic role of frailty for each of the main endpoints. Hazard ratios from Cox regression analyses were compared by Wald test. Statistical analyses were performed with SPSS 29 (SPSS Inc., Chicago, IL, USA) and Stata v13.1 software (StataCorp, College Station, Texas, USA).

All patients except one completed every assessment in the multimodal evaluation (two patients in the case of Pfeiffer Test). These patients fulfilled the criteria of frailty just for age or for OARS abnormal scale, so they could be included in the analysis.

RESULTS

A total of 301 patients were evaluated using the two screening modalities: multimodal assessment versus VES-13. The characteristics of the cohort are shown in Table 1. VES-13 identified 121 patients (40.2%) with frailty, while the multimodal assessment detected 100 patients (33.2%). Supplementary Table 1 and Table 2 show differences between frail and non-frail patients according to multimodal assessment and VES-13, respectively. Frail patients were older, with greater prevalence of women and hypertension as a comorbidity, and had a lower prevalence of HF ischemic aetiology. They were also in worse functional class and received less medical treatment with prognostic impact (Supplementary Table 1 and 2). Table 2 shows the characteristics of frail patients according to both frailty diagnostic approaches. Although concordance between VES-13 and the multimodal assessment was 81%, Cohen's Kappa index was 0.60. Cohen's kappa index is a statistic used to measure inter-rater reliability for categorical items. It is considered a more robust measure than simple percent agreement calculation, as it incorporates the possibility of the agreement occurring by chance. Kappa = 0.60 means only moderate agreement. Supplementary Table 3 shows the differences of those patients considered frail only by one of the two approaches. Of note, frail patients only detected by VES-13 were older and with higher

Table 1 Demographic, clinical and therapeutic characteristics of patients.

Age, yrs	69.7 ± 11.8
Male	207 (68.8)
HF duration, months	11 (3–49.5)
LVEF	38.9% ± 13.2%
Etiology	
Ischemic heart disease	127 (42.2%)
Dilated cardiomyopathy	63 (20.9%)
Hypertensive cardiomyopathy	21 (7.0%)
Valvular disease	27 (9.0%)
Amiloidosis	13 (4.3%)
Other	50 (16.6%)
Hypertension	221 (73.4%)
Diabetes	129 (42.9%)
COPD	65 (21.6%)
NYHA class	
I	19 (6.3%)
II	202 (67.1%)
III	79 (26.2%)
IV	1 (0.3%)
HF Treatments (Baseline)	
ACEI or ARB	119 (39.5%)
Beta-blocker	237 (78.7%)
MRA	189 (62.8%)
ARNI	101 (33.6%)
SGLT2i	94 (31.2%)
Loop diuretic	210 (69.8%)
Digoxin	26 (8.6%)
Ivabradine	33 (11.0%)
CRT	14 (4.7%)
ICD	30 (10.0%)
HF Treatments (Follow-up)	
ACEI or ARB	151 (50.2%)
Beta-blocker	267 (88.7%)
MRA	264 (87.7%)
ARNI	179 (59.5%)
SGLT2i	237 (78.7%)
Loop diuretic	254 (84.4%)
Digoxin	48 (15.9%)
Ivabradine	60 (19.9%)
CRT	17 (5.6%)
ICD	35 (11.6%)

Values are presented *n* (%) or mean ± SD. *N* = 301. ACEI: angiotensin-converting enzyme inhibitor; ARB: angiotensin II receptor blocker; ARNI: angiotensin receptor–neprilysin inhibitor; COPD: chronic obstructive pulmonary disease; CRT: cardiac resynchronization therapy; eGFR: estimated glomerular filtration rate; HF: heart failure; ICD: implantable cardioverter-defibrillator; LVEF: left ventricular ejection fraction; MRA: mineralocorticoid receptor antagonist; NYHA: New York Heart Association; SGLT2i: sodium–glucose cotransporter 2 inhibitors.

Table 2 Demographic, clinical and therapeutic characteristics of patients with frailty according to multidimensional assessment and according to VES-13.

	Multimodal assessment N = 100	VES-13 N = 121	P-value
Age, yrs	75.2 ± 11.1	76.3 ± 9.4	0.44
Male	54 (54.0%)	70 (57.9%)	0.57
HF duration, months	9 (3–36)	12 (3–40.5)	0.58
LVEF, %	41.4 ± 14.7	41.5 ± 13.8	0.96
Aetiology			0.90
Ischemic heart disease	37 (37.0%)	47 (38.8%)	
Dilated cardiomyopathy	17 (17.0%)	17 (14.0%)	
Hypertensive cardiomyopathy	11 (11.0%)	11 (9.1%)	
Valvular disease	17 (17.0%)	19 (15.7%)	
Amiloidosis	6 (6.0%)	8 (6.6%)	
Other	12 (12.0%)	19 (15.7%)	
Hypertension	82 (82.0%)	106 (87.6%)	0.25
Diabetes	44 (44.0%)	60 (49.6%)	0.41
COPD	24 (24.0%)	30 (24.8%)	0.89
NYHA class			0.90
I	2 (2.0%)	1 (0.8%)	
II	49 (49.0%)	60 (49.6%)	
III	48 (48.0%)	59 (48.8%)	
IV	1 (1.0%)	1 (0.8%)	
HF treatments (baseline)			
ACEI or ARB	43 (43.0%)	45 (37.2%)	0.38
Beta-blocker	65 (65.0%)	84 (69.4%)	0.49
MRA	57 (57.0%)	70 (57.9%)	0.90
ARNI	19 (19.0%)	33 (27.3%)	0.15
SGLT2i	26 (26.0%)	35 (28.9%)	0.63
Loop diuretic	83 (83.0%)	104 (86.0%)	0.54
Digoxin	10 (10.0%)	12 (9.9%)	0.98
Ivabradine	12 (12.0%)	12 (9.9%)	0.62
CRT	5 (5.0%)	8 (6.6%)	0.61
ICD	6 (6.0%)	9 (7.4%)	0.67
HF treatments (follow-up)			
ACEI or ARB	56 (56.0%)	59 (48.8%)	0.28
Beta-blocker	81 (81.0%)	100 (82.6%)	0.75
MRA	78 (78.0%)	96 (79.3%)	0.81
ARNI	46 (46.0%)	57 (47.1%)	0.87
SGLT2i	64 (64.0%)	80 (66.1%)	0.74
Loop diuretic	91 (91.0%)	116 (95.9%)	0.23
Digoxin	17 (17.0%)	24 (19.8%)	0.59
Ivabradine	19 (19.0%)	22 (18.2%)	0.88
CRT	5 (5.0%)	8 (6.6%)	0.61
ICD	7 (7.0%)	9 (7.4%)	0.90

Values are presented as *n* (%) or mean ± SD. ACEI: angiotensin-converting enzyme inhibitor; ARB: angiotensin II receptor blocker; ARNI: angiotensin receptor-neprilysin inhibitor; COPD: chronic obstructive pulmonary disease; CRT: cardiac resynchronization therapy; eGFR: estimated glomerular filtration rate; HF: heart failure; ICD: implantable cardioverter-defibrillator; LVEF: left ventricular ejection fraction; MRA: mineralocorticoid receptor antagonist; NYHA: New York Heart Association; SGLT2i: sodium-glucose cotransporter 2 inhibitors.



prevalence of hypertension. The main dimensions affected in the multimodal assessment were: Barthel Index < 90 (15.7%) and abbreviated GDS response ≥ 1 (12.3%). Supplementary Table 4 shows the distribution of affected dimensions of the multimodal assessment in frail patients based on the two frailty diagnostic approaches.

During a mean follow-up period of 27.1 ± 10 months, 62 patients (20.6%) died, 39 (13%) had at least one HF hospitalization, and 86 experienced the composite endpoint of all-cause death or HF hospitalization (28.6%). A total of 57 HF hospitalizations were recorded, from one in 29 patients to five in 1 patient.

In Cox regression analyses, frailty detected by VES-13 showed higher numerical prognostic influence than multimodal assessment for all-cause mortality (Hazard ratio (HR) = 3.70, 95% confidence interval (CI): 2.15–6.33, $P < 0.001$ vs. HR = 2.40, 95% CI: 1.46–4.0, $P = 0.001$) and for the composite endpoint (HR = 3.13, 95% CI: 2.02–4.84, $P < 0.001$ vs. HR = 1.96, 95% CI: 1.28–2.99, $P = 0.002$) (Figure 1). Differences between the obtained HR were statistically significant for the composite endpoint ($P = 0.01$),

while it did not reach statistical significance for all-cause death ($P = 0.069$). The higher hazard ratios associated with VES-13 suggest it may be more effective in identifying patients at greatest risk of adverse outcomes.

Patients with frailty showed a higher number of recurrent HF readmissions than those without frailty, four times higher according to VES-13 (16.3/100 patient-years vs. 3.9/100 patient-years, $P < 0.001$) and two times higher according to the multimodal assessment (13/100 patient-years vs. 6.7/100 patient-years, $P = 0.004$) (Figure 2).

Furthermore, we assessed whether the VES-13 score, beyond its use as a cut-off point for frailty diagnosis, provides more accurate risk stratification for mortality and a composite endpoint. The mean VES-13 score was 2.74 ± 2.85 . Tertile 1 corresponded to a VES-13 score of 0 or 1, tertile 2 to a score of 2 or 3, and tertile 3 to a score of 4 or higher. After adjusting for age, sex, LVEF, and ischemic etiology, stratifying VES-13 scores into tertiles allowed for precise risk stratification for both death and the composite endpoint (both $P < 0.001$) (Figure 3). Notably, patients in tertile 3 exhibited a significantly higher

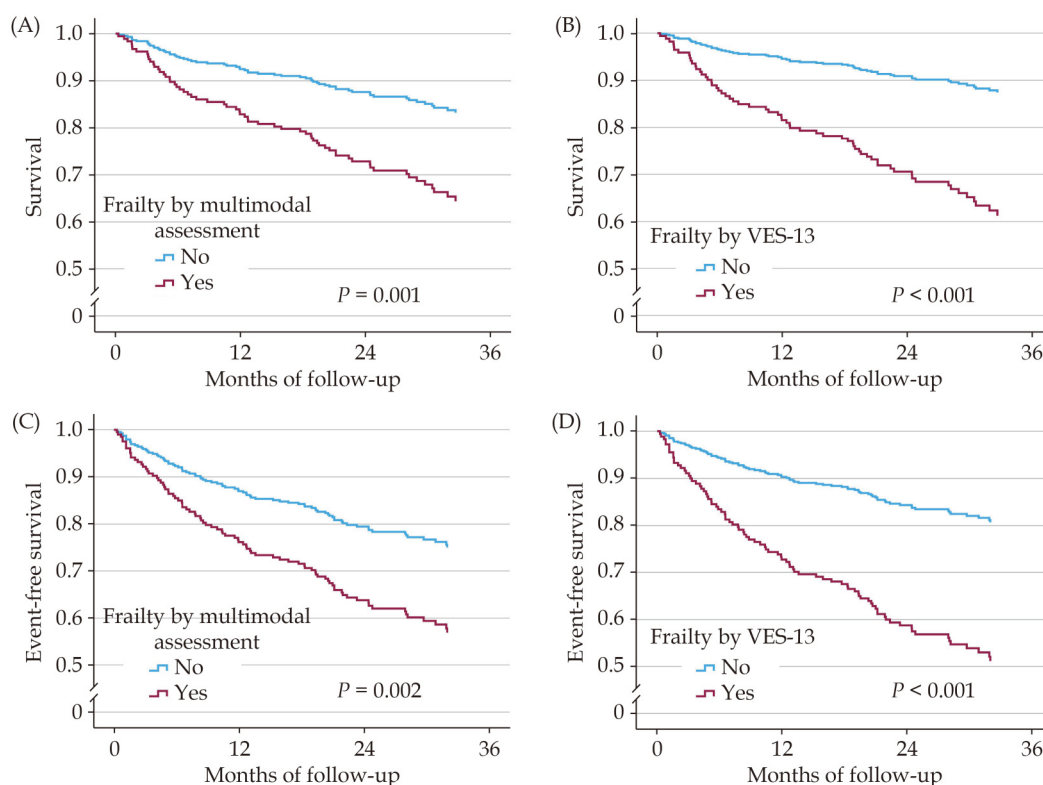


Figure 1 Survival and event-free survival curves based on the presence of frailty. (A): Survival curves for all-cause death according to frailty determined by multimodal assessment; (B): survival curves for all-cause death according to frailty determined by VES-13; (C): event-free survival according to frailty determined by multimodal assessment; (D): event-free survival according to frailty determined by VES-13. Left: frailty determined by multimodal assessment entails double rate of HF hospitalizations; Right: frailty determined by VES-13 entails fourfold rate of HF hospitalizations. HF: heart failure; VES-13: Vulnerable elders survey.

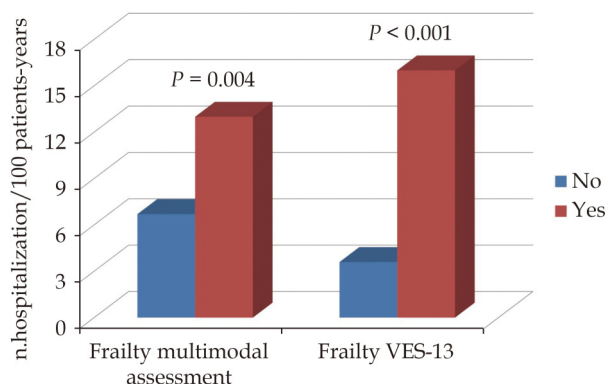
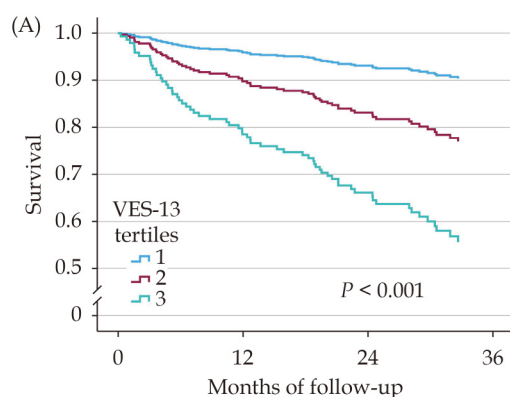


Figure 2 HF recurrent hospitalizations based on the presence of frailty. Left: frailty determined by multimodal assessment entails double rate of HF hospitalizations; Right: frailty determined by VES-13 entails fourfold rate of HF hospitalizations.



risk of death in the adjusted analysis (HR = 5.43, 95% CI: 2.41–12.23, $P < 0.001$) as well as for the composite endpoint (HR = 3.83, 95% CI: 2.05–7.15, $P < 0.001$) compared to patients in tertile 1. Treatments were not included in order not to over-adjust the models. However, in sensitivity analyses the inclusion of angiotensin-converting enzyme inhibitors (ACEI)/ angiotensin II receptor Blockers (ARB), angiotensin receptor-neprilysin inhibitors (ARNI), beta-blockers and mineralocorticoid receptor antagonists (MRA) during follow-up in the Cox models did not change the meaning and direction of the results: HR for all-cause death for patients in tertile 3 was 3.63 (1.57–8.41), $P = 0.003$; and for the composite endpoint 2.93 (1.53–6.52), $P = 0.001$.

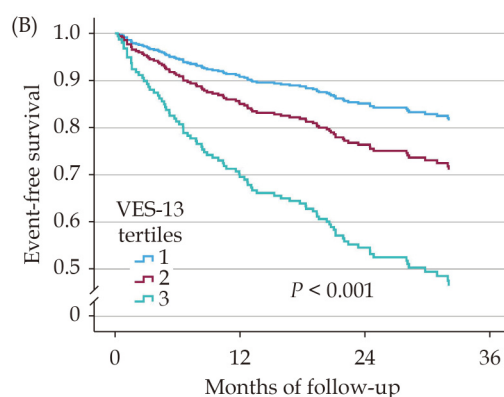


Figure 3 Survival and event-free survival curves based on tertiles of VES-13 score. (A): Survival curves for all-cause death; tertile 2 vs. tertile 1, HR = 2.50, 95% CI: 1.16–5.40, $P = 0.019$; tertile 3 vs. Tertile 1, HR = 5.43, 95% CI 2.41–12.23, $P < 0.001$. (B): Event-free survival; tertile 2 vs. tertile 1, HR = 1.74, 95% CI: 0.96–3.18, $P = 0.069$; tertile 3 vs. tertile 1, HR = 3.83, 95% CI: 2.05–7.15, $P < 0.001$. P -values shown in the figure represent global differences among tertiles.

DISCUSSION

The main findings of our study are twofold. First, VES-13 identified a higher number of frail patients compared to the multimodal assessment which has been used in our clinic for over two decades. While the multimodal approach has been valuable, VES-13 proved to be a more sensitive tool in detecting frailty in patients with HF, potentially capturing frailty earlier or in a different way and highlighting additional at-risk patients who may have been missed with the traditional methods. Second, VES-13 demonstrated superior predictive ability for adverse outcomes. The tool not only detected frailty but also offered more accurate risk stratification for mortality and the composite endpoint. Its ability to categorize patients into meaningful risk groups, with significant associations to both mortality and the composite endpoint, suggests that VES-13 is a more effective tool for guiding

clinical decisions and targeting interventions in patients with HF (Figure 4).

In a cohort of patients in their seventies with ischemic heart failure and systolic dysfunction, predominantly male, the VES-13 identified 121 patients (40.2%) as frail, while the multimodal assessment detected 100 patients (33.2%). These findings suggest that VES-13 may have a higher sensitivity for detecting frailty compared to the multimodal assessment. Although the characteristics of frail patients identified by both methods were largely similar, frail patients detected exclusively by VES-13 were significantly older, with an average age 10 years higher. In contrast, when comparing the results of the individual scales and tests included in the multimodal assessment, no substantial differences were found between frail patients identified by either method. In summary, while the concordance between VES-13 and the multimodal assessment was 81%, the Cohen's Kappa index



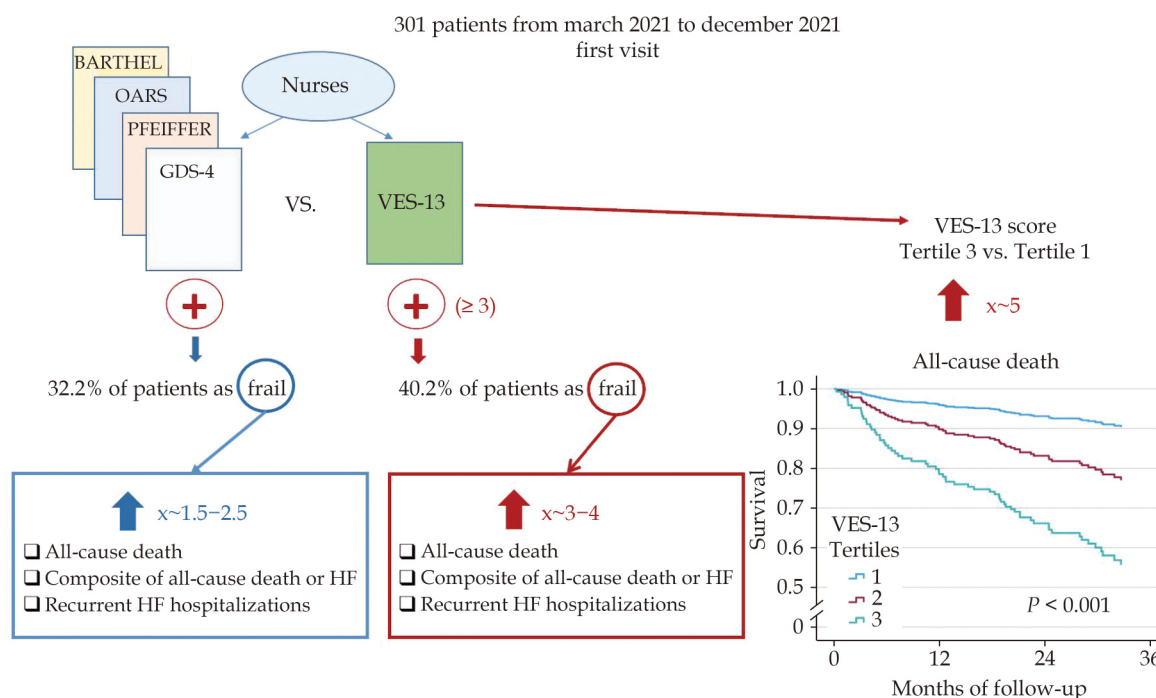


Figure 4 Main results of the study using VES-13 screening tool. Screening patients with VES-13 at first at the HF Unit allowed the detection of a greater number of frail patients than the previously used approach of multimodal assessment and allowed a better risk prediction of worse outcomes. Indeed, beyond the frailty detection the classification of VES-13 scoring allowed a good stratification of patients at the highest risk. VES-13: vulnerable elders survey-13.

was only 0.60, which is below the acceptable threshold of 0.70 for consistent frailty classification.

In terms of prognostic value, frailty detected by VES-13 demonstrated a stronger numerical association with all-cause mortality and the composite endpoint compared to the multimodal assessment. Although the differences in HR were statistically significant only for the composite endpoint, VES-13 appeared to better identify patients at higher risk for poor outcomes. Specifically, patients categorized as frail by VES-13 had four times higher rates of recurrent HF readmissions compared to those without frailty, while frail patients identified by the multimodal assessment had only twice the risk. Moreover, our analysis revealed that the score obtained from VES-13, beyond its use with a single cut-off for frailty diagnosis, provided a more precise risk stratification for both mortality and the composite endpoint when divided into tertiles.

The difference between the two methods may stem from the nature of the tools used. VES-13 is a standardized screening tool that focuses on a single, physical dimension of frailty, providing a more homogenous assessment. In contrast, the multimodal assessment defines frailty through multiple dimensions, incorporating a

range of criteria. Frailty detection through the multimodal approach could be based on functional scales (e.g., Barthel, OARS), mental scales (e.g., Pfeiffer T., GDS-4), or even the availability of a caregiver. While all these dimensions are relevant to frailty, the variability in how frailty is identified could impact the predictive capacity for adverse events. This is because not all frailty dimensions exert the same effect on prognosis or the likelihood of HF complications.

Although VES-13 has been used to detect vulnerability in hospitalized patients with cardiovascular disease and HF, to our knowledge, it has not been employed in HF outpatients.^[17-19] Welch, *et al.*^[17] described how vulnerability detected during HF hospitalization using VES-13 predicted resource consumption in the three months after discharge, with higher vulnerability linked to increased healthcare demand. Specifically, higher vulnerability assessed by VES-13 was associated with readmission for non-cardiovascular causes within the first 90 days post-discharge, but not for cardiovascular causes.^[18] Frailty status in patients with HF can fluctuate over time, influenced by recurrent hospitalizations and the duration of stays. In the inpatient setting, frailty status may be more severe, potentially reducing the accuracy of frailty

measurements for long-term risk assessment, as older cardiovascular patients may experience improved vulnerability between 30 and 90 days after discharge.^[20] In contrast, our study focused on stable ambulatory patients with HF, whose condition had been stable for about one year. Several studies have examined the impact of frailty on HF prognosis using various tools,^[21,22] such as Fried criteria (physical phenotype) and physical function measurements (e.g., gait speed or the Short Physical Performance Battery).^[23–25] Madan, *et al.*^[26] analyzed forty consecutive elderly patients aged ≥ 65 years with advanced HF, assessing frailty using the Fried Frailty Index, which includes hand grip strength, 15-foot walk time, weight loss, physical activity, and exhaustion. They found that 65% of participants were frail, and frailty was associated with the combined primary endpoint of mortality and all-cause hospitalization, as well as non-HF hospitalizations. However, frailty was not associated with HF hospitalizations alone. In contrast, our study specifically focused on recurrent HF hospitalizations and demonstrated a strong prognostic capacity of VES-13 in predicting these events.

In many cases, frailty detection remains more of a research focus than a routine component of clinical care. However, simple frailty screening tools, like G8 and VES-13, which have become widely used to identify frailty in older cancer patients, may be easier to incorporate into daily clinical practice.^[11,27,28] The systematic use of a validated, straightforward screening tool like VES-13 presents an opportunity to integrate frailty screening into routine care in HF clinics globally. Notably, VES-13 not only identifies frail patients but also helps stratify those at higher risk of worse prognosis when the score is divided into tertiles.

Moreover, the routine use of VES-13 could help identify individuals who would benefit from a comprehensive geriatric assessment. Frailty in HF is often reversible or mitigated through interventions such as rehabilitation, improving nutritional status, reducing polypharmacy, or adjusting treatments to better align with individual needs and side effects.^[29] A Comprehensive Geriatric Assessment-based approach could lead to a person-centered, multicomponent intervention plan that addresses physical and cognitive function,^[30–31] nutrition, social issues, and other aspects of daily life. This approach would assist cardiologists and other clinicians in tailoring treatments and interventions to each patient's specific needs. For patients with advanced frailty and

advanced HF, early assessment of palliative care needs is essential as part of a multidimensional care plan.^[26] Therefore, routine frailty assessment should be considered as part of a holistic treatment approach for HF patients, ensuring comprehensive, individualized care.

Considering other frailty scales,^[23–26] VES-13 may overestimate frailty in patients ≥ 85 years. Nevertheless, its role should be understood as that of an initial screening tool to facilitate the early identification of potentially frail patients. In this sense, its main utility lies in selecting candidates who would benefit from a Comprehensive Geriatric Assessment performed by a trained team, which remains the gold standard for frailty evaluation. Indeed, while the VES-13 focuses more on perceived functionality and age, other scales^[23–26] capture broader physical, clinical, and cumulative domains.

Strengths and Limitations of the Study

The strength of this study is highlighted by the comparison of the VES-13 with a multidimensional approach that, over the past two decades, has reliably predicted outcomes and quality of life. As a limitation, we have to acknowledge that the "gold standard" status of the multimodal assessment used in the present study, although largely used since 2001, has not been subjected to statistical validation. The VES-13 proved highly effective in stratifying patients for worse outcomes, despite its simplicity and ease of use. A unique feature of this work is the ability of the VES-13 to do more than just identify frailty; by categorizing VES-13 scores into tertiles, it successfully stratified patients by their risk of adverse outcomes, demonstrating its significant prognostic value in the management of HF.

Our research was focused on outpatients with HF followed in a well-structured multidisciplinary HF clinic. Consequently, the findings may not be broadly applicable to other patient populations or healthcare settings that differ in structure and resources. Other limitations were lack of longitudinal frailty reassessment and potential selection bias in a single-center study.

Conclusion

The VES-13 is simple to administer and proved more effective than traditional multimodal screening methods for identifying and stratifying frailty in HF patients. Implementing VES-13 routinely could standardize geriatric assessments and interventions, improving care for these vulnerable populations.



DECLARATIONS

Ethics Approval and Consent to Participate

The local ethics committee approved the study (REGI-UNIC registry: PI-18-037).

Informed consent was obtained from all subjects.

Availability of Data and Material

Data and material of the study are available from the corresponding author on reasonable request.

Competing Interests

None.

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