

Evaluating the Effectiveness of the 30-Second Chair Stand Test as an ED Screening Tool for Elderly Fall Risk Assessment.

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Background

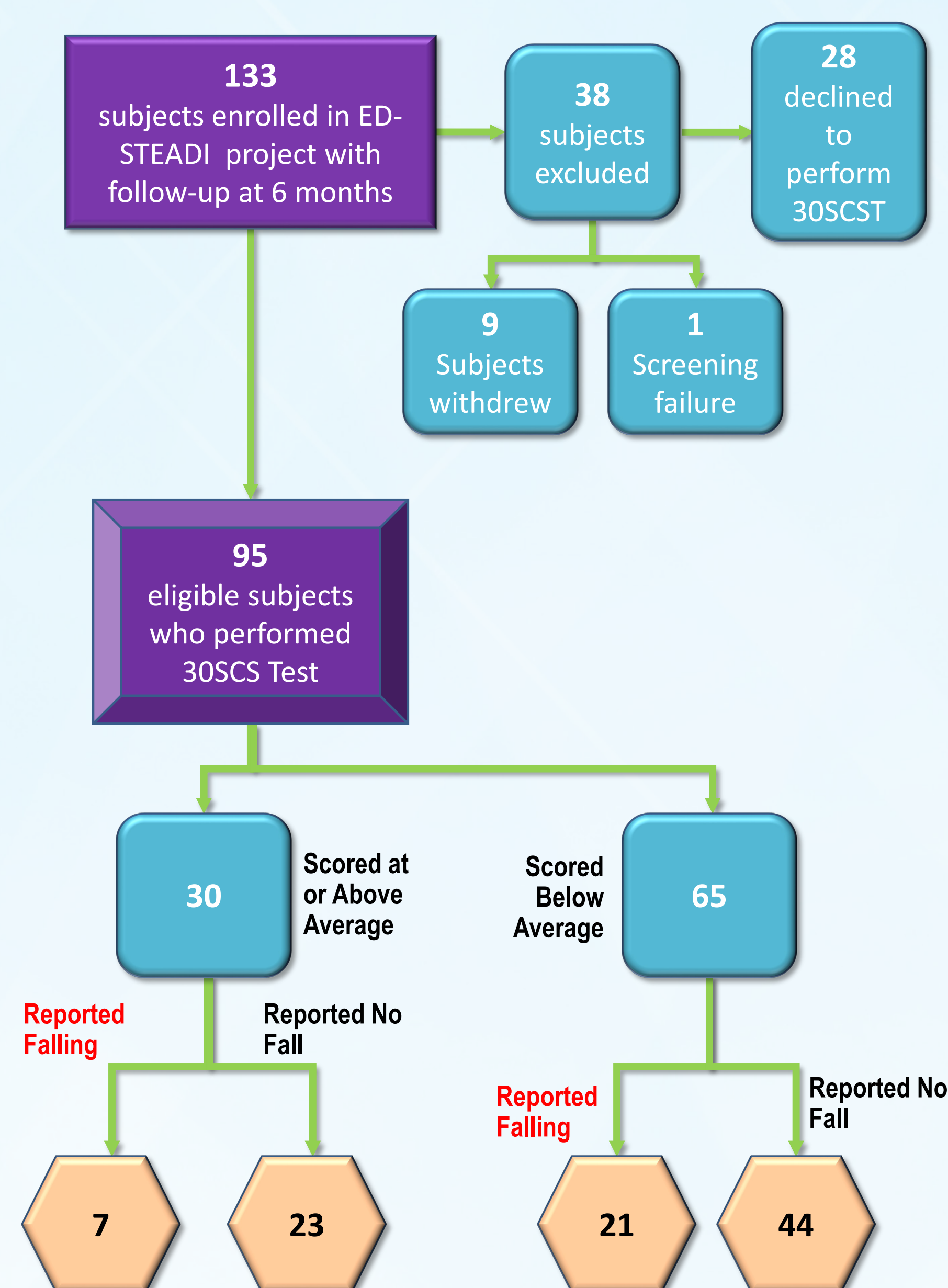
- One quarter of adults 65+ will fall each year and these unintentional falls account for 13.5% of ED visits.
- The US Public Health Service has estimated that two thirds of deaths due to falls are potentially preventable. For this reason, the Center for Disease Control established validated elderly fall risk assessment tools to aid bedside decisions regarding the elderly presenting for fall.
- These tools were made available to providers, but never previously used in the ED setting. One such tool is the 30 Second Chair Stand Test (30SCS Test)
- The 30SCS Test is a CDC validated screening tool used by providers to identify elderly patients ≥ 65 years old who may be at increased mechanical fall risk, but it has never been administered in the ED setting.
- As a secondary analysis of an ongoing prospective ED trial, this study addresses whether the 30SCS Test is an effective screening tool for elderly patients in the ED setting.

Methods

- This study evaluated one part of an ongoing IRB-approved prospective cohort study called ED-STEADI that was conducted at Lehigh Valley Health Network-Cedar Crest which is a Level 1 trauma center in Allentown, Pennsylvania with approximately 90,000 annual visits. Participant eligibility was determined based if he/she met all of the following criteria:
 - Age ≥ 65
 - English-speaking
 - Competent and able to give consent
 - Reported falling, worrying about falling, or feeling unsteady on their feet within last year,
 - Being discharged home to a location other than nursing home, group or personal care facility, or a family member's home
- After obtaining informed consent, subjects were asked to perform the 30 Second Chair Stand test evaluating their lower extremity strength and endurance. Subjects were asked to do the following for a timed 30 seconds:
 - Sit in the center of chair with a 17" back without their backs touching the chair
 - Keep their backs straight with arms crossed over their chest and feet flat on floor
 - Stand up as straight as possible and then sit back down until their behind touches seat
 - Results were recorded and compared to age-specific ranges to determine if they were below average or at or above average.
- Subjects received follow-up phone calls at 6 weeks, 3 months and 6 months asking to report any falls.
- Interim analysis was done using Pearson's chi-square and confidence level set to 95%.

Results

- 133 subjects were enrolled at the time of this interim analysis. 38 were excluded as described in flowchart
- 95 subjects were included for analysis
- 95.7% subjects were Caucasian
- 54.7% were female
- Average age of 74.6 years.
- 28 of 95 subjects fell within 6 months: 13 were male and 15 were female.
- 65/95 (68.4%) performed below average on 30SCS Test
- Of those scoring below average, 32.3% fell.
- Of the 30 subjects who scored at or above average, 7 reported falling (23.3%)
- Sensitivity and specificity were 75.0% and 34.3% respectively ($p = 0.373$).
- Scoring below average on the Chair Test had a positive predictive value of 32.3% and a negative predictive value of 76.7%
- Odds ratio of 1.568; Relative risk = 1.385
- Of the 28 subjects who declined participation, 60.7% declined due to pain and 14.3% declined due to weakness or fatigue.
- 21.4% who declined to participate also ended up falling within 6 months.



Discussion

- This study examined the effectiveness of using the 30SCS in the ED as a reliable elderly fall risk assessment tool. Determining useful screening modalities in this setting is of interest to prevent morbidity and mortality. As a relatively sensitive test, the 30SCS test provides some utility in the ED, but its reliability would benefit if used in conjunction with other validated fall prevention tests.
- Potential Study Limitations:**
 - Study enrollment team biases when recruiting study participants (i.e. reluctance to recruit infectious participants)
 - Sample size limits statistical significance
 - Population skewed with mostly Caucasian participants; may not be representative of entire population
 - Use of other mobility tests (TUG) may cause subject fatigue or disinterest in performing another mobility test
 - Subject physical status in ED is often suboptimal, skewing results as subject may be fatigued, ill, or disoriented
 - Time involvement to set up and perform 30 Second Chair Stand Test in ED setting without established incentives for providers

Conclusions

- This interim analysis of the 30-SCS Test used in this small study population at one clinical site may have utility in the ED setting. With test sensitivity and specificity at 75% and 34.3% respectively, the 30 SCS Test would be improved if used in conjunction with other tests such as TUG or 4-Stage Balance Test. Further exploration into why subjects declined to participate may uncover deeper insight into important reasons related to fall risk.
- Greater awareness of fall risk screening tools in the ED setting may increase use but consideration of reimbursement may be warranted.

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