



Frailty Index As A Predictive Tool For Poor Outcomes After Ventral Hernia Repair – Systematic Review and Meta-Analysis

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INTRODUCTION

Frailty, characterized by reduced physiologic reserve and heightened vulnerability to surgical stress, has emerged as a key predictor of adverse postoperative outcomes. The modified 5-factor frailty index (mFI-5) offers a simplified yet validated framework for quantifying frailty in clinical practice. While its predictive utility is established in multiple surgical specialties, its role in ventral hernia repair (VHR) has not been comprehensively synthesized. This systematic review and meta-analysis evaluated the association between frailty, as measured by mFI-5, and postoperative outcomes in elective VHR.

mFI-5 SCORE =

+1	DIABETES	
+1	HYPERTENSION	
+1	CONGESTIVE HEART FAILURE	
+1	CHRONIC OBSTRUCTIVE PULMONARY DISEASE	
+1	NON-INDEPENDENT FUNCTIONAL STATUS	

SCORING INTERPRETATION



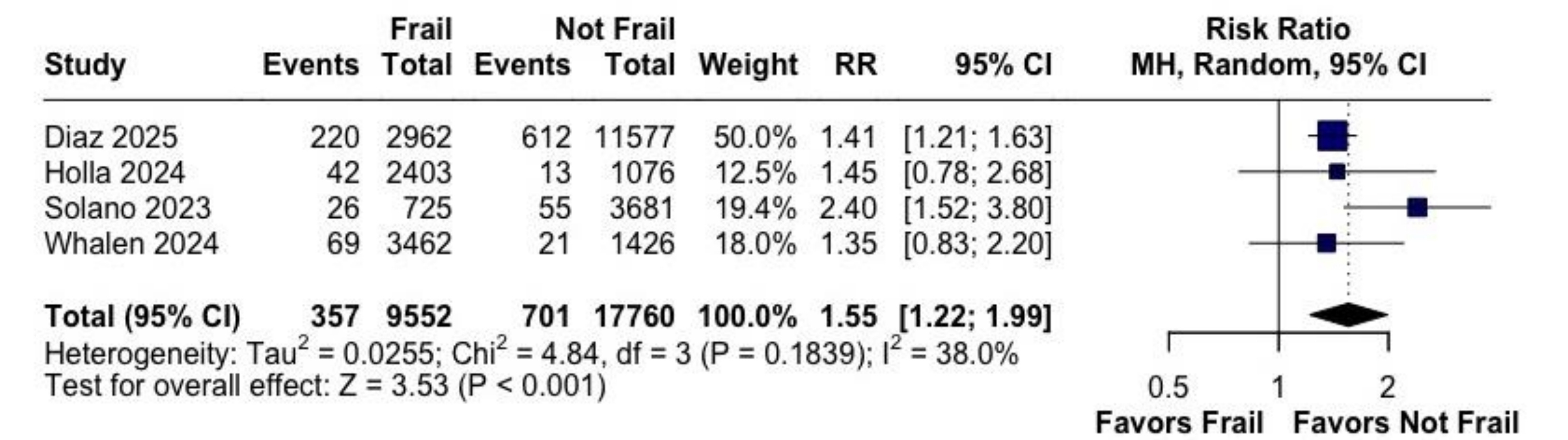
MATERIALS AND METHODS

Following PRISMA guidelines, the authors searched PubMed, EMBASE, LILACS, and Cochrane databases through April 2025. Adult patients undergoing elective VHR were included if outcomes were stratified by mFI-5 frailty status. Data on demographics, hernia characteristics, complications, readmissions, reoperations, length of stay (LOS), and mortality were extracted. Random-effects meta-analyses assessed pooled risk ratios (RR) for key outcomes. Study quality and risk of bias were evaluated using ROBINS-I.

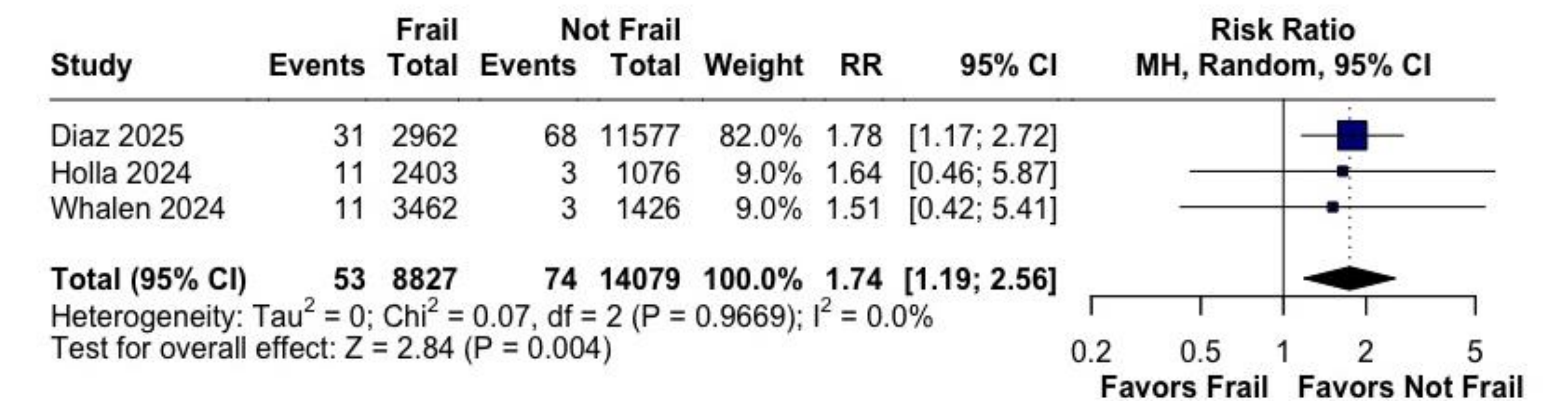
RESULTS

Four studies were included in the final analysis, representing 27,312 patients (17,760 non-frail, 9,552 frail). Frail patients were older, more comorbid, and more likely to have larger hernias. Meta-analysis demonstrated that frailty was significantly associated with higher 30-day reoperation (RR 1.55; 95% CI 1.22–1.99; $p < 0.001$) and mortality (RR 1.74; 95% CI 1.19–2.56; $p = 0.004$), though absolute mortality rates remained low ($< 1\%$), questioning the clinical significance of these findings. LOS was consistently longer in frail patients. No significant differences were found in pooled rates of surgical site infections or readmissions. Recurrence was only reported in the studies when it was a cause of 30-day reoperation.

30-Day Reoperation



30-Day Mortality



CONCLUSION

The mFI-5 is a pragmatic and validated tool for stratifying risk in VHR, a mostly physiologic, rather than procedural, risk marker. Its incorporation into standard practice can enhance perioperative counseling, optimize patient selection, and inform resource planning, ultimately supporting safer, more personalized hernia care. Future research should refine composite risk models and explore interventions to mitigate frailty-related risks while maintaining the functional benefits of repair.