Does multimorbidity increase the risk of malnutrition, frailty and sarcopenia in adults with cancer? Insights from the UK Biobank

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AIM: Malnutrition, sarcopenia and frailty are distinct, albeit inter-related conditions, associated with adverse outcomes in cancer. Multimorbidity, the co-occurrence of multiple long-term conditions, affects up to 90% of people with cancer. This study investigated the relationship between multimorbidity and malnutrition, sarcopenia and frailty in adults with cancer in the UK Biobank.

METHODS

ASSESSMENT OF MALNUTRITION

Global Leadership Initiative on Malnutrition (GLIM) criteria

Phenotypic criteria: 1) self-reported weight loss; 2) low BMI; 3) low ALST/BMI* estimated from BIA* derived FFM* (mild-moderate: <0.64 F, <0.94 M, severe: <0.55 F, <0.84 M)
Etiologic criteria (inflammation from CRP* >5 mg/L)

ASSESSMENT OF SARCOPENIA

European Working Group on Sarcopenia in Older People criteria (version 2)

Probable sarcopenia (low grip strength <27kg M, <16kg F)
Sarcopenia (low grip strength & low ALST/BMI* <0.84, M<0.55 F)

ASSESSMENT OF FRAILTY

Fried Frailty criteria

1) self-reported weight loss; 2) self- reported exhaustion; 3) low physical activity from IPAQ*; 4) self-reported walking pace; and 5) low grip strength (adjusted for sex and BMI* per cut-offs specified in the criteria)
Pre-frailty (1 OR 2 criteria met); Frailty (>3 criteria met)

MULTI-MORBIDITY AND DATA ANALYSIS

Multimorbidity:
Defined as presence of two long-term conditions
Statistical analysis:
Logistic regression models fitted to estimate the odds of malnutrition, sarcopenia and frailty according to multimorbidity. Adjusted for age, sex, time since cancer diagnosis, smoking, alcohol use.

RESULTS

4122 participants aged mean (SD) 59.8 (7.1) years were included. Prevalence of malnutrition, sarcopenia and frailty was 11.1%, 6.9% and 51.2%, respectively. Overall, 80% of malnourished, 74% of sarcopenic and 71.5% of pre-frail/frail participants had multimorbidity. The prevalence of malnutrition, sarcopenia and frailty all increased with increasing multimorbidity (Figure 1).
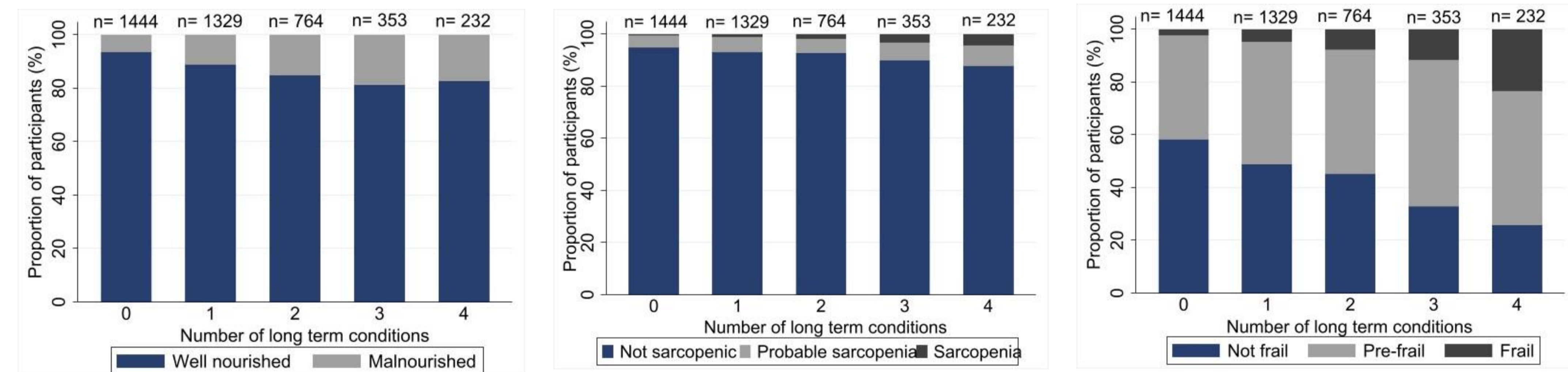

Figure 1: Prevalence of malnutrition, sarcopenia, and frailty by number of long-term conditions

Presence of multimorbidity (including cancer diagnosis): **1.72 ↑** odds of **malnutrition** | **1.43 ↑** odds of **pre-(frailty)**
Presence of multimorbidity (excluding cancer diagnosis): **2.41 ↑** odds of **malnutrition** | **2.03 ↑** odds of **pre-(frailty)**
No significant association between multimorbidity and sarcopenia

Conclusion

In adults with cancer, multimorbidity increased the odds of having malnutrition and pre-frailty/frailty but not sarcopenia. The presence of multimorbidity should be considered a risk factor for these conditions and evaluated during nutrition screening and assessment to support risk stratification in clinical practice.

*Abbreviations: ALST, appendicular lean soft tissue; BIA, bioelectrical impedance; IPAQ, international physical activity questionnaire; CRP, C-reactive protein; BMI, body mass index; FFM, fat-free mass

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