

Title: Frailty significantly increases the risk of fractures among middle-aged and older people

Citation: Chen KW, Chang SF, Lin PL. Frailty as a Predictor of Future Fracture in Older Adults: A Systematic Review and Meta-Analysis. *Worldviews Evid Based Nurs.* 2017 Apr 27. doi: 10.1111/wvn.12222.

Commentary

Implications for practice and research

- All health care providers including professional nurses who take care of older people should be aware of and prepared for increased risks of fractures according to frailty.
- Future research should be focused on developing evidence-based interventions to reduce fracture risks in frail older people.

Context

Older people are a heterogeneous population that often has multiple medical problems, disabilities and comorbidities with different patterns and severity. It is therefore challenging to provide optimal care for older patients and meet their health care needs. The term, frailty, has gained increasing attention and interest from health care providers and researchers. It has emerged as a significant concept to assess overall health status of older people. Because frailty involves age-related deficit accumulation and depleted physiological reserve across multiple body systems, frail individuals are at higher risks of morbidity and mortality as well as other various negative health outcomes than fit robust individuals.¹⁾ Although several prospective cohort studies have examined frailty as a predictor of future fractures in the literature, the findings are mixed and inconclusive. In this systematic review and meta-analysis study, Chen and colleagues focused on the association of frailty, especially various degrees of frailty, with fracture risk among middle-aged and older populations.

Methods

The authors conducted a systematic review of the literature using PubMed, Ovid, MEDLINE, CINAHL and the Cochrane Library for studies published before December 2015, excluding reviews, letters, book chapters, dissertations and theses. It is not clear whether a detailed protocol was developed a priori and whether the protocol was registered and made publicly available. Regarding the systematic review, it is not clear whether Medical Subject Heading (MeSH) terms were used in addition to the text terms and whether additional functions, such as language restriction or explosion function, were used. It is important to attempt maximising the possibility to identify all relevant studies. Although the authors hand-searched the reference lists of relevant articles, they could further have conducted a forward citation tracking and contacted experts in the frailty research fields for additional studies. Neither the inclusion nor exclusion criteria mentioned what population was targeted (e.g. community-dwelling, hospitalised or institutionalised). Two reviewers independently screened and selected the studies and discrepancy was resolved by the third reviewer. The study quality was assessed using three tools. A random-effect model was used to synthesize summary estimates by combining hazard ratios from the included studies. Heterogeneity and publication bias were also examined.

Findings

The systematic search of the literature identified 1552 studies, among which five studies providing hazard ratios of fracture risks according to three levels of frailty (frail, prefrail and robust) were selected. The five studies followed 103,783 middle-aged and older people for a mean period of 1.8 years with 2,960 fracture cases. A random-effects meta-analysis showed

that frailty was significantly associated with increased risk of subsequent fracture in a dose-response manner. Compared with those who were robust, those who were frail and prefrail were at 67% (5 studies: summary hazard ratio =1.67, 95% confidence interval=1.46-1.91) and 30% (5 studies: summary hazard ratio=1.30, 95% confidence interval=1.20-1.41) increased risks of fracture, respectively. Those who were frail were at 28% increased risks of fracture than those who were prefrail (5 studies: summary hazard ratio=1.28, 95% confidence interval=1.16-1.40). Heterogeneity across studies in all meta-analyses was low to moderate ($I^2=0-39.8\%$). The subgroup and sensitivity analyses made little change in the association between frailty and fracture risks. There was no evidence of publication bias in funnel plots and Egger test.

Commentary

Given its prevalence and significance in care for older people, all health care providers including professional nurses who take care of older people should understand frailty and its implications and consequences. This study by Chen and colleagues provided the pooled evidence that frailty is a significant risk factor of fractures among middle-aged and older people. It is of note that the fracture risk increases as the degree of frailty increases: frail individuals had the highest fracture risks followed by prefrail individuals. This means people are already predisposed to increased fracture risks when they enter into early stage of frailty. Therefore, as authors mentioned, the early detection of frail or prefrail individuals should be prioritised because it would facilitate proactive and preventive nursing care and intervention programs, leading to prevention of unnecessary morbidity and mortality, such as fractures, by frailty.

After identifying frail older people, it is essential to provide timely and effective supports and treatments in order to reduce fracture risks. Although there has been no consensus reached regarding what interventions are best to address frailty, exercise, protein supplementation, vitamin D or decreasing polypharmacy have been suggested as potential treatments.²⁾ Future research should be focused on developing and validating evidence-based interventions to reduce fracture risks in frailty older people.

References

- 1) Clegg A et al Frailty in elderly people. *Lancet* 2013;**381**:752-762.
- 2) Morley JE et al Frailty consensus: a call to action. *J Am Med Dir Assoc* 2013;**14**:392-397.

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