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Does the COVID-19 pandemic robustly influence the incidence of frailty?

Dear Editor,

The coronavirus disease (COVID-19) pandemic may lead not only to a higher risk of mortality, but also to a higher frailty incidence among older adults. During this time, the amount of physical activity (PA) for older adults has significantly decreased as compared with before the pandemic.¹⁻⁵ Our latest study found that physical inactivity influenced by avoidance of COVID-19 infection was particularly high in older adults who lived alone and were socially inactive, making them more likely to become frail than older adults who were not living alone or were socially active.⁶ However, this finding was based on an online survey, and it is thus difficult to use an idealized sampling method to investigate the frailty incidence rate. It is therefore not well known whether the incident frailty ratio during the COVID-19 pandemic is higher or lower than that before the pandemic. Given this, the objective of this study was to investigate the new incidence of frailty using the aforementioned data during the pandemic and to compare this with other mail-based survey data collected before the pandemic.

We analysed two types of 1-year follow-up panel surveillance data: an online survey during the COVID-19 pandemic (2020–2021)⁶ and a mail survey before the pandemic (2015–2016). Both surveys included older adults aged ≥65 years, and both excluded

adults who were frail as defined by the Kihon Checklist (KCL) at the baseline survey or who did not respond to the follow-up survey. The number of participants in the online survey and mail survey was 937 and 12 442, respectively. We used the propensity score matching method to create a matched comparison group (non-pandemic group) from the pre-pandemic mail survey with participants for an online survey during the pandemic (pandemic group). We estimated the scores of the pandemic group for each subject using a multivariable logistic regression model and were able to match 937 pairs from the two groups, wherein the subjects had similar demographic characteristics such as age, sex, body mass index, and KCL score. In a 1-year follow-up survey, we measured the new frailty incidence assessed by the KCL as an outcome.⁷

The demographic characteristics were comparable among the two groups, in terms of the mean age (pandemic group: 73.5 ± 5.5 years, non-pandemic group: 73.5 ± 5.4 years), proportion of women (pandemic group: 48.9%, non-pandemic group: 49.5%), and mean BMI (pandemic group: 22.4 ± 2.8, non-pandemic group: 22.5 ± 2.9). Meanwhile, significant differences were observed between the two groups for the total KCL points with group-by-time interaction using two-way analysis of variance (pandemic group: baseline 3.60 ± 1.98, 1-year follow-up: 4.84 ± 2.87; non-pandemic group: baseline 3.60 ± 2.21, 1-year follow-up 4.03 ± 3.30, $F = 40.87$; $P < 0.001$). After the

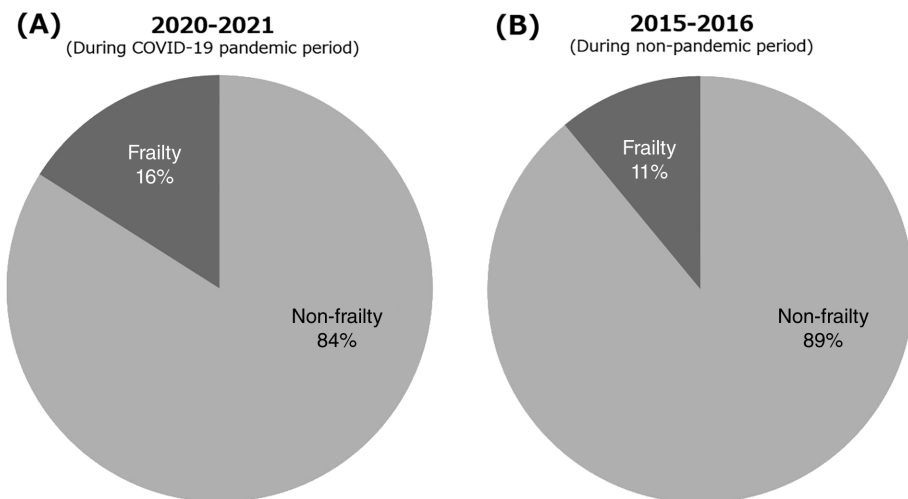


Figure 1 After 1-year follow-up, 16.0% in the pandemic group (a) and 11.0% in the non-pandemic group (b) had new incident frailty. The pandemic group had a significantly higher risk of incident frailty than the non-pandemic group (odds ratio: 1.54, 95% confidence interval: 1.18–2.02).

1-year follow-up, 150 participants (16.0%) in the pandemic group and 103 participants (11.0%) in the non-pandemic group had new incident frailty (Fig. 1), showing a significantly higher risk of incident frailty in the pandemic group than in the non-pandemic group (odds ratio: 1.54, 95% confidence interval: 1.18–2.02).

Current findings suggest that the COVID-19 pandemic has led to a higher risk of incident frailty among non-frail older adults. Changes in total KCL points were 34.5% and 12.1% on 1-year follow-up during the COVID-19 pandemic and non-pandemic period, respectively. In a recent pandemic-related study, including ours, it was indicated that the amount of physical activity was greatly reduced during the COVID-19 pandemic compared with before,^{1–6} with this inactivity having a huge effect on frailty incidence. In the near future, frail older adults are more likely to need nursing care,⁸ and thus more suitable prevention/management strategies for frailty are needed, especially during this pandemic. However, the influence of sampling bias cannot be denied owing to the nature of the online survey, and these findings should be treated only as a guide.

Disclosure statement

None.

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COMMENTS

Frailty and health risk in older people

Dear Editor,

Kuzuya¹ reviewed the relationship between nutritional status and health outcomes with special reference to life stage. The author mentioned that there was a shift in medical attention in older adults from metabolic syndrome to frailty. I suppose that poor nutritional status might be closely related to subsequent risk of health problems and mortality in the elderly. As the author pointed out, the optimal nutritional status of older people cannot be determined. In addition, the relationship between poor nutritional status and frailty might be influenced by many lifestyle and comorbid factors. I want to present some recent information regarding frailty and health risk in older people with special reference to mortality and depression.

First, Ganta *et al.*² conducted a prospective study to examine the health risk of frailty among older veterans, and the adjusted hazard ratio (HR) (95% confidence interval [CI]) of baseline frailty for all-cause mortality was 3.12 (2.87–3.38). Although the level of frailty might be changed during follow-up period, >3-fold increase in mortality risk was observed in older veterans.

Second, Soysal *et al.*³ conducted a meta-analysis to investigate the associations between depression and frailty. The multiple-

adjusted odds ratio (OR) (95% CI) of frailty for depression was 2.64 (1.59–4.37), and the adjusted OR of depression for frailty was significant. Furthermore, pooled OR of depression for incident frailty and pooled OR of frailty for incident depression were both significantly increased. This meta-analysis presented the bi-directional relationship between depression and frailty, and depression and frailty should be analyzed simultaneously to evaluate health risk in older people.

Third, Prina *et al.*⁴ investigated the potential impact of depression on incident frailty in older people living in Latin America. The adjusted HR (95% CI) of depression for developing frailty was 1.59 (1.40–1.80). They stratified the content of frailties, and each dimension of frailty was significantly associated with depression. This information presents that types of frailty should be considered for risk assessment in older people. In addition, ethnic differences of frailty for subsequent health risk should be considered for the analysis.

Finally, Ruiz *et al.*⁵ determined the effects of concurrent frailty and depression on all-cause hospitalizations. The adjusted HR (95% CI) of frailty for hospitalizations was 1.61 (0.95–2.74). In contrast, the adjusted HR (95% CI) of depression for hospitalizations was 1.57 (1.09–2.26). The interaction between depression and frailty with regard to hospitalizations should be