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The Prevalence of Frailty Using Three Different Frailty Measurements in Two Finnish Cohorts Born Before and After the Second World War --Manuscript Draft--

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Abstract:	<p>Objective</p> <p>To study the prevalence of frailty and its relationship to mortality in cohorts born before and after the Second World War using three different frailty measures.</p> <p>Methods</p> <p>Cross-sectional data from two cohorts born in 1935 (n=593) and 1945 (n=714) were studied for frailty at the mean age of 70.7 (SD 1.8) years. Frailty was measured using the Frailty Phenotype (FP), the Frail Scale (FS) and the 74-item Frailty Index (FI>0.21 denoted frailty). Information on socioeconomic factors was obtained via a study questionnaire and the data on mortality were obtained from the Population Information System.</p> <p>Results</p> <p>The prevalence of frailty by FI was more common in the older 1935 cohort than in the 1945 cohort (p<0.001). The percentage of robust subjects was higher in both sexes in the 1945 cohort using both FI and FS. After adjusting for sociodemographic factors, the difference in the prevalence of frailty between the cohorts remained significant in women only (OR 1.9 (95% CI 1.3-2.9), p=0.001). The FI classified people as frail more</p>	

	<p>often (30.2% in the 1935 cohort and 17.5% in the 1945 cohort) than the FS (13.1% and 8.8%) or FP (1.8% and 1.6%). Low financial satisfaction was associated significantly with frailty in both sexes. Low level of education was associated with frailty in women and being unmarried or divorced in men. Frailty was associated to increased mortality using all frailty definitions in the 1935 cohort with a longer follow-up time.</p> <p>Conclusions</p> <p>Improved living conditions and health care may have resulted in the lower prevalence of frailty in the 1945 cohort. The present study further strengthens the association between frailty and mortality & poor economic status and frailty. Frailty definitions are in need of further study.</p>
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The Prevalence of Frailty Using Three Different Frailty Measurements in Two Finnish Cohorts Born Before and After the Second World War

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Abstract

Objective: To study the prevalence of frailty and its relationship to mortality in cohorts born before and after the Second World War using three different frailty measures.

Methods: Cross-sectional data from two cohorts born in 1935 (n=593) and 1945 (n=714) were studied for frailty at the mean age of 70.7 (SD 1.8) years. Frailty was measured using the Frailty Phenotype (FP), the Frail Scale (FS) and the 74-item Frailty Index (FI>0.21 denoted frailty). Information on socioeconomic factors was obtained via a study questionnaire and the data on mortality were obtained from the Population Information System.

Results: The prevalence of frailty by FI was more common in the older 1935 cohort than in the 1945 cohort ($p<0.001$). The percentage of robust subjects was higher in both sexes in the 1945 cohort using both FI and FS. After adjusting for sociodemographic factors, the difference in the prevalence of frailty between the cohorts remained significant in women only (OR 1.9 (95% CI 1.3-2.9), $p=0.001$). The FI classified people as frail more often (30.2% in the 1935 cohort and 17.5% in the 1945 cohort) than the FS (13.1% and 8.8%) or FP (1.8% and 1.6%). Low financial satisfaction was associated significantly with frailty in both sexes. Low level of education was associated with frailty in women and being unmarried or divorced in men. Frailty was associated to increased mortality using all frailty definitions in the 1935 cohort with a longer follow-up time.

Conclusions: Improved living conditions and health care may have resulted in the lower prevalence of frailty in the 1945 cohort. The present study further strengthens the association between frailty and mortality & poor economic status and frailty. Frailty definitions are in need of further study.

Introduction

Frailty is a multidimensional state of vulnerability leading to impaired adaptation to external stressors thus predisposing the individual to adverse outcome (1). Despite the importance of frailty, health care professionals often fail to recognize it. This is unfortunate, because frailty is a dynamic condition, possibly reversed by intervention (2).

As there is currently no consensus about the definition of frailty, several methods are used to diagnose it. The most common methods are the phenotype-based classifications described by Fried *et al.* (2001) (3) and Morley *et al.* (2012) (4) and the cumulative deficit model, frailty index (FI), described by Rockwood *et al.* (2007) (5). Phenotype-based models use ability in key areas like mobility to identify frailty (3,4), while the FI incorporates a wider range of health-related measures (6). As the ability of different methods to identify people as frail varies (7), the prevalence of frailty among community dwelling older people has ranged from 4% to 59% in different studies (8).

Previous studies on frailty trajectories have reported conflicting results. In birth cohorts from the United States (9), England (10) China (11) and in the cross-national Survey of Health, Ageing and Retirement in Europe (SHARE) cohort (12), a greater prevalence of frailty has been observed in the more recent cohorts, while in Denmark (13) and Sweden (14) the prevalence of frailty has been reported to decline or stay the same (15) across succeeding cohorts. In these previous studies an improvement of socioeconomical factors and healthcare has been put forward as a potential driver influencing the prevalence of frailty between cohorts.

As the population is ageing worldwide, secular trends of frailty and factors influencing it are of increasing importance. The aim of the present study was to compare the prevalence of frailty and underlining socioeconomic factors in Finnish birth-cohorts born before (1935) and after the Second World War (1945). Three commonly used frailty definitions were compared.

Materials and Methods

Subjects

Using the Population Information System of Finland, we obtained data from two birth cohorts from two Oulu longitudinal research programs. Initially, all non-institutionalized persons born in 1935 and living in the city of Oulu on the first of October 1990 (n=1008) were invited to participate the 1935 cohort and all non-institutionalized persons born in 1945 and residing in Oulu on the first of January 2001 (n=1332) were invited to the 1945 cohort (Wave 1). All living non-institutionalized participants and non-participants of these cohorts were invited to the follow-up visits as described in Figure 1. Data collected from the participants in Wave 3 in the 1935 cohort (n=537) and Wave 2 in the 1945 cohort (n=714) were used in the present study. All subjects gave their written consent, and the Ethical Committee of Northern Ostrobothnia Hospital District approved the study.

Data collection

A postal questionnaire was sent to the participants to collect information on sociodemographic characteristics, exercise, nutrition, weight loss and history of physician-diagnosed diseases. Health related quality of life (HRQoL) was assessed using self-administered instruments 15D (16) and the RAND-36-Item Health Related Survey validated

in the Finnish population (17). Information on economic status was assessed with questions: “Do you have enough money in relation to your needs?” in the 1935 cohort, and “How satisfied are you with your financial status?” in the 1945 cohort. Answers were graded from 1-5 from “not at all enough” to “completely enough money” in the 1935 cohort, and 1-5 from “not at all satisfied” to “very satisfied” with your economic situation in the 1945 cohort. For statistical analyses the level of education was divided into three levels; low (basic education 4 years or less), medium (general upper secondary 4-9 years of education) or high (more than 9 years of education). When analyzing marital status, married and cohabiting persons were combined, as well as single and divorced persons. Widowed persons were in their own category (Table 1).

A trained nurse performed all measurements and checked the questionnaires. Cognitive testing was carried out using selected parts of the Consortium to Establish a Registry for Alzheimer’s Disease (CERAD) neuropsychological battery (18). Height, weight, waist and hip circumferences were measured in light clothing without shoes, and body mass index (BMI) was calculated (kg/m^2). Blood pressure (BP) and heart rate were measured twice at one to two minutes intervals with an OMRON M6 Comfort automatic from the left arm in a seated position after at least 5 minutes rest. The mean of two measurements was used in the analyses. Supine BP and heart rate measurements were taken twice after five minutes of rest and standing BP (sitting if unable to stand) was taken after standing for three minutes. Orthostatic hypotension was calculated based on a fall of ≥ 20 mmHg of the mean systolic BP from sitting to standing. A distance of 10 metres without an acceleration zone was used to measure gait speed. A Jamar handheld dynamometer was used to measure grip strength.

A fasting venous sample was taken for laboratory analyses, which were performed by the Northern Finland Laboratory Centre (NordLab), T113 accredited by the Finnish Accreditation Service (FINAS) according to EN ISO 15189.

Information on deaths of the study subjects was obtained from the Population Information System uphold by the Finnish Digital and Population Data Services Agency. The follow-up continued to the 15th of February 2019. Mortality ascertainment was 100% complete. The mean follow-up time from the latest evaluation to death or to February 15th of 2019 was 11.3 years for the 1935 cohort and 4.8 years for the 1945 cohort.

Frailty definitions

Three common definitions of frailty were used: Frailty Phenotype (FP) (3), phenotypic Frail Scale (4), and FI of accumulative deficits (5). For both FP and FS, subjects meeting three or more of the criteria were considered frail and one or two criteria pre-frail (7). Up to two missing variables were allowed. In the accumulative deficits model ordinal variables were converted to dichotomous variables (19) and FI>0.21 was considered a cut-off point for frailty (20). Frailty prevalence was defined separately for men and women. More detailed description of frailty definitions, variables included in the indexes and their prevalence's are presented in the Supplementary material.

Statistical analyses

Chi-square and Fisher's exact goodness of fit tests were used to analyze the differences in frequencies. The T-test was used to analyze differences in means. The overlap between frailty measures was analyzed and represented by Venn diagrams drawn with BioVenn (21).

Logistic regression was used to analyze associations between socioeconomic factors and the

presence of frailty (FI>0.21) (20). Data are presented using the odds ratios (OR) with 95% confidence intervals (CI). Significance was defined as a two-sided p-value < 0.05.

Analyses were adjusted for cohort and by socioeconomic characteristics (age, education, marital-, and financial status). Men and women were analyzed separately. The mortality rates were analyzed by the Kaplan-Meyer method and the equality over strata conducted by a Log Rank test. A scatter plot of FI (%) by increasing age was generated to evaluate age differences between cohorts. SAS statistical package, version 9.4 (SAS Institute, Inc., Cary, NC, USA) and SPSS Statistics Version 22 for Windows (SPSS, Inc., Chicago, IL) were used for the analyses.

Results

The participation rate in this study was high, 75.1% in the 1935 and 80.5% in the 1945 cohort, respectively (p=0.01). At the time of the analyses, the mean age of participants was 72.4 (SD 0.4) and 68.9 (SD 0.6) years in the 1935 and 1945 cohort, respectively (p<0.001).

The prevalence of frailty varied depending on the frailty instrument used (Table 1). FI increased with increasing age in the 1935 cohort (slope 0.12, p=0.009) but not in the 1945 cohort (p=0.228) (Figure 2). Frailty prevalence defined by FP was low in both men and women and in both cohorts, varying from 1.4% to 2.2% without significant statistical differences between cohorts or genders. The prevalence of frailty by FS was higher in the 1935 than in the 1945 cohort in both women and men, statistically significant in women only (15.6% vs. 9.2%, p=0.010). When FS was used, the prevalence's of robust men and women in

the 1945 cohort were higher than in the 1935 cohort ($p = 0.001$). The mean FI for men was 0.157 (SD 10.1) in the 1935 and 0.124 (SD 9.7) in the 1945 cohort ($p < 0.001$). The mean FI values for women were 0.178 (SD 11.2) and 0.126 (SD 9.4) ($p < 0.001$), respectively (data not shown). Using $FI > 0.21$ as a cut-off point, the prevalence of frailty was significantly higher in the 1935 than in the 1945 cohort in both men (25.3 % vs. 18.3%, $p < 0.001$) and women (33.6% vs. 16.9%, $p < 0.001$) (Table 1).

Differences between the socioeconomic factors between the cohorts are presented in Table 1. Compared with participants in the 1945 cohort, both men and women born in 1935 were more often likely to have had a low level of education ($p < 0.001$). Compared with women born in 1935, significantly more women born in 1945 were unmarried or divorced (26.3% vs. 19.0%, $p = 0.024$). Women born in 1935 were more often unsatisfied with their financial status (7.8% vs. 3.3%, $p = 0.008$) (Table 1).

We analyzed the association of socioeconomic factors on the presence of frailty by FI in both cohorts combined (Table 2). After adjusting for socioeconomic factors, the difference between frailty among cohorts was statistically significant in women only (OR 1.9, 95% CI 1.3-2.9, $p = 0.001$) (Table 2). Frailty was associated to lower satisfaction with economic situation in both sexes. In the adjusted model, low education in women was associated with frailty (OR 1.7, 95% CI 1.0-3.0, $p = 0.050$) (Table 2). Being unmarried or divorced associated significantly with frailty in men (OR 2.6 95% CI 1.3-5.3, $p = 0.010$) but not in women (OR 0.8 95% CI 0.5-1.4, $p = 0.500$). Being widowed was not significantly associated with frailty in the adjusted model.

The overlap in those classified as frail using the three frailty definitions in men and women combined is shown in Figure 3. The FI classified the largest number of participants as frail, 30.2% of the 1935 and 17.5% of the 1945 cohort. The majority of the subjects identified as frail in 1935 with FS (66/72 91.7%) or FP (9/10, 90%) were also considered frail using FI. In 1945 cohort subjects identified as frail with FS (51/61 85%) or FP (9/11 81.8%) were also considered frail using FI. Only 4.8% of subjects in the 1935 cohort and 5.3% in the 1945 cohort were identified as frail using all three frailty measures.

During the follow-up 128 subjects (24.4%) from the 1935 cohort and 21 subjects (3.0%) from the 1945 cohort died. All measures of frailty were associated with an increased risk of dying in the 1935 cohort (Supplementary Figures A, B and C). When comparing men and women separately, the tendency was similar, but the results did not reach statistical significance by FI in women ($p=0.063$) and by FS in men ($p=0.063$). Due to the short follow up time in the 1945 cohort, the numbers of deaths were low and thus meaningful comparison between the robust and frail subjects was not possible using FP and FS.

Discussion

In the present study, the prevalence of frailty was more common in the older 1935 cohort than in the 1945 cohort when FI was used to denote frailty. Also, the percentage of robust subjects was higher in both sexes in the 1945 cohort using both FI and FS. After adjusting for sociodemographic factors, the difference in frailty prevalence between the cohorts remained significant in women only. The FI classified people as frail more often than the FS or FP.

1 Low level of education was associated with frailty in women, being unmarried or divorced in
2 men and low financial satisfaction in both sexes.
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7 In previous studies on community dwelling people aged 65-75 years, the prevalence of frailty
8 has been found to be 3-14.6% when classified using the FP (8) and 5-15% when using the FI
9 (22). The prevalence of frailty has been shown to vary depending on its definition, population,
10 sex and age group, thus the formal comparison is often difficult (8).
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17 In the present study, the prevalence of frailty using FP was lower 1.4-2.2% than previously
18 observed as two components of the FP (low walking speed and weak grip strength) were very
19 rare in the studied population. The older age groups (33% were 75 years or older) included in
20 the Cardiovascular Health Study, where FP was originally defined, can explain their lower
21 grip strength and gait speed (3). It has been shown that lifestyle factors like physical activity
22 during lifetime contribute to old age frailty (23). In Finland most of the population was
23 working in agriculture until the late 1960's. Distances to schools and to services were long
24 and children had to walk or ski to school. This may have influenced their health and physical
25 abilities such as walking skills in later life. Therefore, Fried's original phenotype criteria may
26 have not recognized frailty in our cohorts with sufficient precision.
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46 The participation rate in the present study was higher in the younger 1945 cohort than in the
47 1935 cohort. It must be noted, that the frailest people, especially slow walkers, may not have
48 participated in the study. Thus, the difference between frailty in the 1935 and 1945 cohorts
49 may be even higher than observed in the present study. Population specific reference values
50 of walking speed and grip strength should be preferred in future studies to define frailty,
51 although this criterion makes comparisons between cohorts or of secular trends difficult.
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2 Considering the differences in frailty prevalence in the current study setting, the potential
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4 impact of the Second World War needs to be considered as one of the factors differentiating
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6 the cohorts studied. The 1935 cohort lived their childhood during war between the years
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8 1939-1945. Early life stressful experiences may have been harmful to children's health and
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10 emotional development (24) and they may have predicted physical illnesses (25) and frailty in
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12 later life (26). Participants of the second cohort did not experience the war, but there was still
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14 a lack of economic resources until the 1950s. However, the 1945 cohort has had an
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16 opportunity to enjoy a developing society, modern medicine, better medical care and
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18 education longer than the 1935 cohort, and this may have influenced their health in old age.
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20 The detrimental effects of a high standard of living have reached the studied cohorts relatively
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22 late in life.
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31 In the present study, the prevalence of frailty using the FS and the FI was lower in both men
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33 and women born in 1945 than in 1935. Previous studies have shown contradicting results on
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35 whether latter cohorts have been more frail than the previous ones (9-12). These differences
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37 may be due to ethnical, social and health policy differences at different stages of demographic
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39 transitions in these countries or different type of data (longitudinal versus repeated cross
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41 sectional) (10,12).
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48 In countries where the prevalence of frailty has been observed to decline (Sweden and
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50 Denmark), the cohorts studied have been from 1905-1930 (14,15). These are also countries
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52 with high-quality public healthcare and low socioeconomic inequality (27). In the countries
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54 where the prevalence of frailty has been observed to increase (9,11,12), the studied cohorts
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56 were born later. While they have enjoyed longer the benefits of a developed society, possibly
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enabling the survival of the frail, they have also been exposed longer to western lifestyle, diet and decreased physical activity.

It is also important to evaluate the ability of each frailty measure to predict adverse outcomes (7). In previous studies using any of the three instruments, frail people have been found to have higher mortality than robust individuals (22). In the present study any definition of frailty was associated with mortality, but there were differences in the mortality risk between the sexes. However, the results showed a similar trend in both sexes and would have probably reached statistical significance in a longer follow up.

Although the mean FI has previously been found to be higher in women than in men (30), men have been shown to have an increased mortality rate at each level of FI. This was also observed in the present study. It is unclear why women seem to tolerate deficiencies with lower mortality compared with men (“the male-female-frailty-survival paradox”) (30). There may be several biological factors such as sex differences in co-morbidity and disability, psychosocial factors, such as health care utilization and health behaviours, which explain the difference or delay of mortality in women. Using a 74-item FI, one-third of women were classified as frail, which may have diluted the frailty effect on mortality rates. Also, for a statistical difference between mortality rates in frail and robust women, a longer follow-up may be required.

Association between frailty and lower economic status, lower level of education and being unmarried or divorced have also been observed previously (31, 32). Fewer economic resources may be linked to frailty due to several factors such as poorer nutrition and fewer leisure time activities (31). In the present study, low level of education was associated with

1 frailty only in women and being unmarried or divorced only in men. In the studied
2 population, where traditional gender roles are still in effect, men living alone may have been
3 exposed to poorer nutrition and social isolation more than women, and women with lower
4 levels of education may be more dependent on their spouses, have scarcer economic resources
5 and thus have fewer opportunities to make good lifestyle choices.
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14 The study has limitations that need to be discussed. The follow-up time in the 1945 cohort is
15 still modest thus preventing meaningful comparison of mortality between the cohorts. Due to
16 practical research arrangements, there was a difference in the mean age at examination time,
17 which may have affected the differences between the cohorts. The study has also strengths as
18 it is based on virtually the entire community dwelling population of approximately 70-year-
19 old people born in 1935 or 1945. The response rate was high, indicating high external
20 validity. Furthermore, the study contains a wide range of frailty risk factors in combination
21 making it possible to compare three commonly used frailty tools. This provides further
22 insights to the agreement of different frailty measures.
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41 **Conclusions**

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46 To conclude, the present study indicates, that the prevalence of frailty in Finland is lower in
47 people born in 1945 compared with those born in 1935. This is partly due the age difference
48 between cohorts, but it may also be due to the improved living- and working conditions and
49 the level of health care. Considering the world-wide trends of frailty, western life style, diet,
50 decreasing physical activity and socioeconomical inequality may threaten this decreasing
51 trend in the future. As the population is ageing rapidly, early identification and further study
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of frailty is of increasing importance. Methods used to determine frailty are also in need of future development and study.

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Declaration of interest statement

The authors declare no conflict of interest.

Ethical standard

This study complies with the current laws and ethical standards set for medical research in Finland.

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Appendices

Supplementary material

Table 1. The Prevalence of Frailty and Sociodemographic factors by Gender in Finnish Birth Cohorts

Studied factor	Men					Women					
	1935		1945		p*	1935		1945		p*	
	N	%	N	%		N	%	N	%		
Frailty by Frailty Phenotype											
Robust	132	60.6	182	62.5	0.647	189	60.0	250	62.3	0.523	
Pre-Frail	83	38.1	104	35.7	0.589	119	37.8	145	36.2	0.656	
Frail	3	1.4	5	1.7	0.759	7	2.2	6	1.5	0.470	
Frailty by Frail Scale											
Robust	100	46.1	173	59.5	0.002	132	41.9	218	54.5	0.001	
Pre-Frail	95	43.3	94	32.3	0.011	134	42.5	145	36.2	0.087	
Frail	23	10.6	24	8.3	0.366	49	15.6	37	9.2	0.010	
Frailty by Frailty Index											
Robust	162	74.7	237	81.7	<0.001	204	66.4	330	83.1	<0.001	
Frail	55	25.3	53	18.3	<0.001	103	33.6	67	16.9	<0.001	
Marital Status	Married or Cohabiting	185	87.3	245	85.7	0.607	171	57.0	248	62.7	0.133
	Unmarried or Divorced	15	7.1	29	10.1	0.233	57	19.0	104	26.3	0.024
	Widowed	12	5.7	12	4.2	0.451	72	24.0	44	11.0	<0.001
Level of Education	Primary	168	80.4	154	56.0	<0.001	204	68.0	199	49.0	<0.001
	Intermediate	25	12.0	48	17.5	0.094	53	17.7	100	24.6	0.026
	High	16	7.7	73	26.5	<0.001	43	14.3	107	26.4	<0.001
Financial situation	Not Satisfied	13	6.0	13	4.6	0.474	24	7.8	13	3.3	0.008
	Moderately satisfied	65	30.0	93	32.6	0.522	95	30.7	119	29.8	0.792
	Satisfied	139	64.1	179	62.8	0.774	190	61.5	267	66.9	0.134
Age in years	mean	SD	mean	SD	p*	mean	SD	mean	SD	p*	
	72.4	± 0.4	68.9	± 0.6	<0.001	72.4	± 0.4	68.9	± 0.6	<0.001	

*Note: p=X² test for prevalence differences between cohorts within sex. T-test p-value for mean differences between cohorts within

Table 2. The association of Sociodemographic Factors and Frailty by Frailty Index (FI>0.21)

Sociodemographic factor			All Subjects N	Frail Subjects N (%)	Unadjusted OR (95% CI*)	P	Adjusted OR# (95% CI*)	P
MEN	Frailty among Men	Cohort 1945 (ref)	290	53 (18.3)				
		Cohort 1935	217	55 (25.3)	1.5 (1.0-2.3)	0.055	1.5 (0.9-2.4)	0.128
	Financial situation	Satisfied (ref)	318	48 (15.1)				
		Moderately satisfied	157	47 (29.9)	2.4 (1.5-3.8)	0.000	2.2 (1.4-3.7)	0.001
	Marital Status	Not satisfied	26	12 (46.2)	4.8 (2.1-11.1)	0.000	5.0 (2.0-12.4)	<0.001
		Married or cohabiting (ref)	428	82 (19.2)				
		Not married or divorced	43	16 (37.2)	2.5 (1.3-4.9)	0.007	2.6 (1.3-5.3)	0.010
		Widowed	24	6 (25.0)	1.4 (0.5-3.7)	0.484	1.3 (0.5-3.7)	0.556
	Level of Education	High (ref)	87	11 (12.6)				
		Medium	73	13 (17.8)	1.5 (0.6-3.6)	0.364	1.2 (0.5-2.9)	0.695
		Low	318	77 (24.2)	2.2 (1.1-4.4)	0.023	1.4 (0.7-2.9)	0.352
WOMEN	Frailty among Women	Cohort 1945 (ref)	397	67 (16.9)				
		Cohort 1935	307	103 (33.6)	2.5 (1.7-3.5)	0.000	1.9 (1.3-2.9)	0.001
	Financial situation	Satisfied (ref)	449	76 (16.9)				
		Moderately satisfied	207	71 (34.3)	2.6 (1.8-3.7)	0.000	2.4 (1.6-3.5)	<0.001
	Marital Status	Not satisfied	36	20 (55.6)	6.1 (3.0-12.4)	0.000	4.5 (2.1-9.4)	<0.001
		Married/cohabiting (ref)	407	91 (22.4)				
		Not married/divorced	156	32 (20.5)	0.9 (0.6-1.4)	0.635	0.8 (0.5-1.4)	0.500
		Widowed	112	40 (35.7)	1.9 (1.2-3.0)	0.004	1.5 (0.9-2.4)	0.122
	Level of Education	High (ref)	148	22 (14.9)				
		Medium	146	29 (19.9)	1.4 (0.8-2.6)	0.259	1.2 (0.6-2.3)	0.626
		Low	390	114 (29.2)	2.4 (1.4-3.9)	0.001	1.7 (1.0-3.0)	0.050

OR, odds ratio 95 % confidence interval (95% CI), #= Adjusted for financial situation, marital status and level of education

Figures

Figure 1. Collection of data in Finnish Birth Cohorts

Figure 2. Frailty index by age scatterplot in 1945 and 1935 cohorts

Figure 3: Overlapping cases with three frailty instruments

Figure legend: Overlapping of frail subjects in the 1935 and 1945 cohorts with Frailty Index, Frail Scale and Frailty Phenotype.

Figure 2

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