The Journal of Nutrition, Health and Aging 29 (2025) 100503

Contents lists available at ScienceDirect

The Journal of Nutrition, Health and Aging

journal homepage: www.elsevier.com/locate/jnha

Original Article

# Transition to retirement impact on food consumption frequency: results from a longitudinal analysis within the Survey of Health, Ageing and Retirement in Europe (SHARE)

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ARTICLE INFO

*Keywords:*
SHARE data
Retirement
Aged
Diet
Nutrition
Life course transitions
Longitudinal studies

ABSTRACT

*Objectives:* It has been suggested that major life course transitions, such as retirement, can greatly impact lifestyles. However, the evidence is scant and inconclusive, especially with reference to the effects on dietary habits. We investigated the long-term effects of retirement on the frequency of food consumption using data from the Survey of Health, Ageing, and Retirement in Europe (SHARE).

*Design and participants:* We used data from a SHARE-based cohort, including European individuals from 28 countries aged 50 and older who were employed at baseline and retired during follow-up time (2004–2020).

*Measurements:* Dietary habits were assessed through self-reported frequencies of consumption for fruit and vegetables, dairy products, meat and fish, legumes and eggs. A dietary score (dichotomised as ≥5 or <5) was also estimated. Generalised estimating equation models calculated relative risks (RR) of daily (for fruit, vegetables and dairy products) and 3−6 times per week (for meat, fish, legumes and eggs) consumptions before and after retirement, adjusting for selected variables.

*Results:* The cohort included 8,998 individuals with a mean follow-up time of 9 years. Baseline daily consumption frequencies were 73.7% for fruit and vegetables and 65.9% for dairy products, while 3−6 times per week frequencies were 39.8% for meat and fish and 26.1% for legumes and eggs. An increase in 3−6 times a week consumption of meat and fish (RR 1.07, 95% CI 1.01–1.13) and legumes and eggs (RR 1.09, 95% CI 1.01–1.17) was observed 10 or more years post-retirement. Daily consumption of fruit and vegetables, and dairy products remained stable. The RR of a dietary score ≥5 post-retirement was 1.11 (95% CI 1.06–1.16, 10 or more years after).

*Conclusions:* Retirement positively appears to influence overall dietary habits, particularly by improving the consumption frequency of protein-rich foods, while the stability in fruit, vegetables, and dairy consumption suggests that well-established habits persist despite life transitions.



## 1. Introduction

As we progress through life, our dietary habits and nutritional choices play a fundamental role in shaping our health trajectories. Diet has been widely recognised as a vital determinant of health outcomes across the lifespan, including the ageing process [1]. Adherence to dietary patterns, such as the Mediterranean diet, has garnered attention for its potential to mitigate the risks of chronic diseases and promote overall well-being [2,3]. However, the potential perils of unhealthy dietary choices loom large, as they are associated with the development of non-communicable diseases, impairments in cognitive function, and increased mortality rates [4]. The complex interplay of these life course dietary trajectories

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http://doi.org/10.1016/j.jnha.2025.100503
Received 6 December 2024; Received in revised form 28 January 2025; Accepted 28 January 2025
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becomes even more intricate in correspondence with crucial life events [5].

Retirement marks a profound and multifaceted life transition, with the potential to usher in a series of changes that extend beyond economic adjustments. Retirement introduces a shift in lifestyle dynamics, which may encompass alterations in daily practices, social interactions, and behaviours, including dietary habits [6–8]. Moreover, retirement offers individuals a unique opportunity to reconfigure their routines, potentially changing also nutritional choices.

The influence of retirement on dietary habits is shaped by a multitude of factors, including physiological and behavioural adjustments [9], social dynamics, economic constraints, and deeply ingrained cultural and familial traditions [10]. The interplay of these factors contributes to food choices and consumption patterns [11]. This complexity further magnifies the challenges encountered when attempting to comprehensively study the dynamics of dietary habits before and after retirement. The transition to retirement disrupts the balance of these influences, potentially leading to changes in eating patterns that are difficult to predict or categorise within a predefined framework.

Therefore, despite the centrality of dietary habits in shaping our health trajectories, the literature on the impact of retirement on these behaviours remains sparse and somewhat inconclusive [12]. Only a limited number of longitudinal studies have explored the dynamics of food consumption frequencies before and after retirement [13–18]. They present heterogeneous findings, underscoring the absence of a clear association pattern between retirement and dietary behaviours. While some studies suggest a decline in the consumption of healthful nutrients upon retirement [17], others find no changes in dietary nutrients intake [14,19]. Conversely, certain investigations report a shift towards healthier food habits upon retirement for specific demographic subgroups [13].

In previous studies on the impact of retirement on selected health outcomes, we reported that the transition to retirement affects health behaviours [7,20], potentially triggering or modifying dietary habits, too. Adopting the same design and methodology used, in light of the intricate nature of the diet, this study aims to bridge the existing gaps in the literature by conducting a longitudinal analysis within the Survey of Health, Ageing, and Retirement in Europe (SHARE) [21]. Considering the recent European dietary recommendations [22,23], by examining the long-term trajectories of dietary habits before and after retirement, the study intends to clarify the shifts in food choices during this life transition [24,25]. Ultimately, by understanding the extent of dietary changes during the transition to retirement, we could inform effective interventions to promote healthier diets and enhance retirees' quality of life [26].

## 2. Methods

### 2.1. Study design and data source

As done before [7,20], using individual-level data from SHARE, we designed a longitudinal cohort study to explore the effects of retirement on dietary habits. The SHARE project collects extensive cross-sectional and longitudinal data on individuals aged 50 and older from 27 European countries and Israel, gathered in biennial waves since 2004. Using standardised computer-assisted personal interviewing (CAPI), it covers various domains such as health, socioeconomic status, and family environment, ensuring rigorous data quality for reliable cross-national comparisons. Details regarding the SHARE protocol, study design, and study-related information are available from previous publications [21,27].

### 2.2. Data linkage

Following the methodology previously adopted [7,20], we performed a record-linkage procedure to merge individual-level data from waves 1 to 8 [28–34], encompassing the period from 2004 to 2020. The presence of a key variable (i.e., "mergeid") facilitated the consistent and unique identification of all participants across the waves. Thus, we merged three publicly available datasets for each wave, which contained information on sociodemographic characteristics (DN module), behavioural aspects (BR module), and job and pension variables (EP module). To obtain harmonised data on education, occupation, and health, we incorporated three additional databases known as the "generated variables" (i.e., the "gv isced", "gv isco", and "gv health" databases). As a result, we built a cohort of individuals aged 50 years or older who were employed at baseline and retired during follow-up (i.e., subjects interviewed in at least two waves).

### 2.3. Variables of interest

The exposure under investigation was the temporal proximity to retirement, measured in years, which was calculated by determining the difference between the year of retirement and the year of the interview. Time before and after retirement was divided into seven periods: 10 years or more, 9-5 years, 4-1 year before retirement, the year of retirement (referred to as Time 0), 1–4 years, 5–9 years, and 10 years or more after retirement. The year of retirement served as the reference category for comparative analysis.

As previously done [35,36], we assessed the self-reported frequencies of fruit and vegetables consumption, meat and fish consumption, legumes and eggs consumption, and dairy consumption as the main outcomes based on the questions available in waves 4, 5, 6, 7 and 8. The questions were "In a regular week, how often do you consume a serving of fruit or vegetables?", "In a regular week, how often do you eat meat, fish or poultry?", "In a regular week, how often do you have a serving of legumes, beans or eggs?" and "In a regular week, how often do you have a serving of dairy products such as a glass of milk, cheese in a sandwich, a cup of yoghurt or a can of a high protein supplement?", respectively. The possible answers were "Every day", "3−6 times a week", "Twice a week", "Once a week", and "Less than once a week". We derived as a primary outcome a dichotomous variable identifying a daily consumption frequency for fruit and vegetables and dairy products (i.e., "Every day" as the answer) and an almost daily consumption frequency for meat and fish, and legumes and eggs, (i.e., "3−6 times a week" as the answer), in line with other research studies [37–41].

To obtain an overall measure of food consumption, we built an *a priori*-defined dietary score by attributing points to each answer to the question about food item consumption frequency: 2 points were attributed to the answers "Every day" for fruit and vegetables, and for dairy products, and to "3−6 times a week" for meat and fish, and for legumes and eggs; 1 point was ascribed to the answers "3−6 times a week" for fruit and vegetables, and for dairy products, and to "Twice a week" and "Once a week" for meat and fish, and for legumes and eggs. Zero points were attributed to all the other possible answers. The final score was then computed by summing all the points obtained for each food item, resulting in a score variable ranging from 0 to 8. As a secondary outcome, we treated it as a dichotomous variable with values higher or equal to the median value at baseline considered healthier.

Based on the accumulated evidence on the topic [7,18,20], we selected the following covariates: sex, age at baseline, current body mass index (BMI), geographical area [42], marital status at baseline, education [43], occupation at baseline [44] and the current presence of at least one chronic disease. Specifically, education and occupation were adopted as reliable proxies of socioeconomic status, as done in other studies on retirement [18,45].

### 2.4. Statistical analysis

We estimated relative risks (RR) and corresponding 95% confidence intervals (CI) for the study's outcomes separately at different time intervals (in years) before and after retirement (retirement year as

reference category) through generalised estimating equation (GEE) models for repeated measures [46]. We set binomial distribution and log link function and specified an exchangeable within-subject correlation [47]. This allowed us to account for the repeated measures collected for each survey participant during the different waves. The GEE models incorporated a set of covariates, including sex, age (continuous), geographical area, marital status, educational level, and occupation as baseline covariates, as well as BMI categories and the presence of at least one chronic disease (yes vs no) as time-varying covariates.

Furthermore, on the basis of the available conceptual frameworks on retirement and its health implications [48–50], we carried out stratified analyses for each outcome, considering the following variables: sex, age group, marital status, geographical area, educational level, occupation type (non-manual and manual workers), and age at retirement (i.e., equal to or less than and higher than the country-specific median age of retirement). We assessed heterogeneity across strata by comparing the quasi-likelihood information criterion (QIC) of GEE models with and without interaction terms for each study outcome and strata variable. The model with the lowest QIC value was considered the best-fitting one. In addition, we checked out the CI's overlap between strata estimates [51].

All statistical analyses were performed using the software SAS version 9.4 and R Studio version 4.1.1 for figures.

## 3. Results

The study cohort selection, including detailed inclusion and exclusion criteria, is reported in Fig. 1. From a total of 139,620 subjects included in at least one SHARE wave, we selected a cohort of 8,998 subjects aged 50 and older who declared being employed at baseline (i.e., those already retired at the first interview were excluded) and retired during follow-up (maximum follow-up of 16 years, median of 9 years). The distribution of the study cohort according to the main baseline characteristics is reported in Table 1.

At baseline, 73.7% of the study participants consumed fruit and vegetables every day, 65.9% consumed dairy products every day, 26.1% consumed legumes and eggs 3−6 times per week, and 39.8% consumed meat and fish 3−6 times per week. The mean overall dietary score was 5.3, and the median was 5. Forty-three per cent of the study population scored above the median. Notably, 5.8% of the cohort achieved the highest possible score of 8.

The trajectories of the frequency of food items consumption before and after retirement are illustrated in Fig. 2. Daily consumption of fruit and vegetables remained relatively stable before and after retirement. Similarly, daily dairy products consumption exhibited minimal and no changes. In contrast, the frequency of 3−6 times per week meat and fish consumption increased after retirement, from a RR of 0.89 (95% CI 0.83 −0.96) 10 or more years before retirement to 1.07 (95% CI 1.01–1.13) 10 or more years after retirement. Similarly, 3−6 times per week consumption of legumes and eggs showed an upward trend post-retirement, with a RR of 0.85 (95% CI 0.76−0.95) 10 or more years before retirement and 1.09 (95% CI 1.01–1.17) 10 or more years after retirement.

Increases in the considered outcomes after retirement were reported in selected subgroups of the study population (Supplementary Figures S1-S28). With reference to daily fruit and vegetables consumption, considering 10 or more years after retirement, RRs were: 1.05 (95% CI 1.02–1.09) among men; 1.17 (95% CI 1.11–1.24) among individuals from Eastern Europe; 1.07 (95% CI 1.03–1.11) among manual workers; and 1.10 (95% CI 1.04–1.17) among individuals with low education. No evident patterns were observed for daily dairy products consumption.

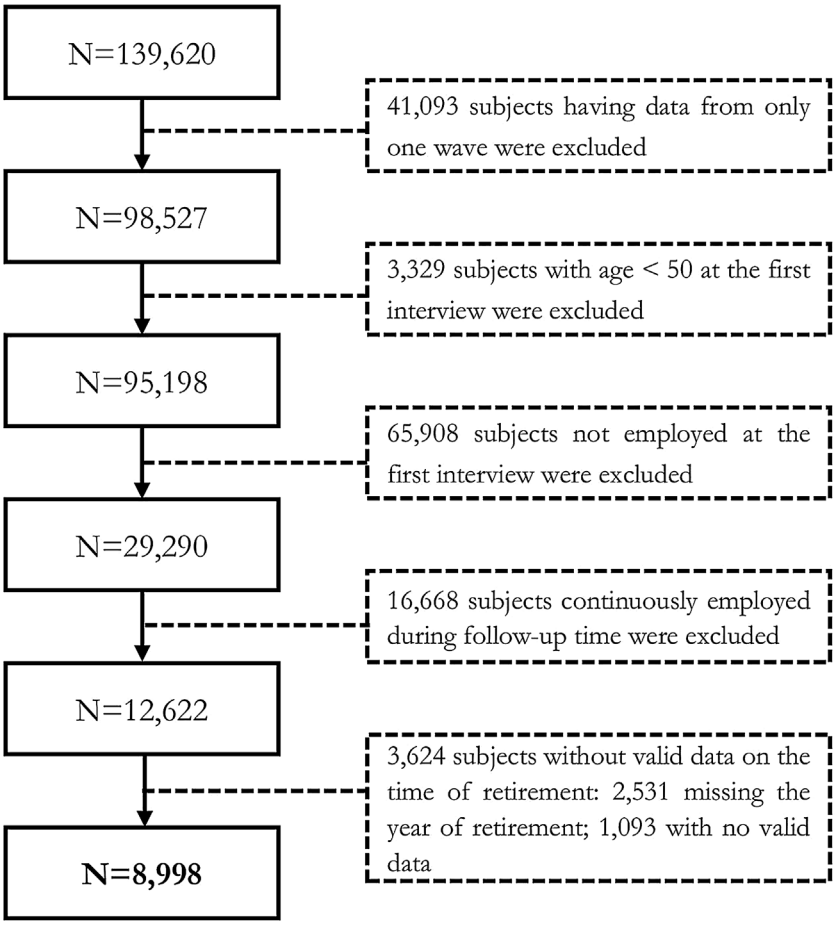


**Fig. 1.** Flowchart of the study population selection process.

**Table 1**
Distribution of the overall study population aged 50 or more (n = 8,998) according to European geographical area and selected baseline characteristics, 2004–2020.

| | N | % |
|---|---|---|
| **Geographical area** | | |
| Northern Europe | 1626 | 18.1 |
| Western Europe | 3738 | 41.5 |
| Southern Europe | 1480 | 16.5 |
| Eastern Europe | 1880 | 20.9 |
| Israel | 274 | 3.0 |
| **Sex** | | |
| Male | 4797 | 53.3 |
| Female | 4201 | 46.7 |
| **Age group** | | |
| 50−54 | 2504 | 27.8 |
| 55−59 | 3831 | 42.6 |
| ≥60 (max: 83) | 2663 | 29.6 |
| **Educational level (ISCED)** | | |
| Low (0−1) | 1044 | 11.6 |
| Intermediate (2−4) | 5102 | 56.7 |
| High (5−6) | 2787 | 31.0 |
| *Missing* | *65* | *0.7* |
| **Marital status** | | |
| Married/registered partnership | 7127 | 79.2 |
| Divorced/widowed | 1229 | 13.7 |
| Never married | 532 | 5.9 |
| *Missing* | *110* | *1.2* |
| **Occupation (ISCO categories)** | | |
| Managers | 944 | 10.5 |
| Professionals | 1397 | 15.5 |
| Technicians and associate professionals | 1230 | 13.7 |
| Clerical support workers | 1209 | 13.4 |
| Services and sales workers | 1223 | 13.6 |
| Skilled agricultural, forestry and fishery workers | 341 | 3.8 |
| Craft and related trades workers | 872 | 9.7 |
| Plant and machine operators and assemblers | 483 | 5.4 |
| Elementary occupations | 715 | 7.9 |
| Armed forces | 88 | 1.0 |
| *Missing* | *496* | *5.5* |
| **Age at retirement** | | |
| Less or equal than country-specific median | 3738 | 41.5 |
| Greater than country-specific median | 5260 | 58.5 |
| **Fruit and vegetables consumption** | | |
| Twice a week/once a week/less than once a week | 628 | 7.0 |
| 3−6 times a week | 1501 | 16.7 |
| Every day | 6635 | 73.7 |
| *Missing* | *234* | *2.6* |
| **Dairy products consumption** | | |
| Twice a week/once a week/less than once a week | 1256 | 14.0 |
| 3−6 times a week | 1574 | 17.5 |
| Every day | 5932 | 65.9 |
| *Missing* | *236* | *2.6* |
| **Legumes and eggs consumption** | | |
| Every day/less than once a week | 2125 | 23.6 |
| Twice a week/once a week | 4289 | 47.7 |
| 3−6 times a week | 2350 | 26.1 |
| *Missing* | *234* | *2.6* |
| **Meat and fish consumption** | | |
| Every day/less than once a week | 3750 | 41.6 |
| Twice a week/once a week | 1437 | 16.0 |
| 3−6 times a week | 3578 | 39.8 |
| *Missing* | *233* | *2.6* |
| **Dietary score** | | |
| 0 | 26 | 0.3 |
| 1 | 67 | 0.7 |
| 2 | 258 | 2.9 |
| 3 | 652 | 7.2 |
| 4 | 1736 | 19.3 |
| 5 | 2154 | 23.9 |
| 6 | 2098 | 23.3 |
| 7 | 1249 | 13.9 |
| 8 | 525 | 5.8 |
| *Missing* | *233* | *2.6* |

With reference to 3−6 times per week meat and fish consumption, considering 5–9 years after retirement, RRs were: 1.07 (95% CI 1.02–1.13) among men; 1.06 (95% CI 1.01–1.12) among women; 1.10 (95% CI 1.03–1.18) among individuals aged 50−54 at baseline; 1.12 (95% CI 1.03–1.21) among individuals from Eastern Europe; 1.07 (95% CI 1.03–1.12) among married individuals; 1.10 (95% CI 1.05–1.15) among individuals with intermediate education; 1.09 (95% CI 1.04–1.13) among non-manual workers and 1.13 (95% CI 1.06–1.19) among individuals who retired at or below the country-specific median retirement age. For 3−6 times per week legumes and eggs consumption after retirement, 5–9 years after retirement, RRs were: 1.11 (95% CI 1.03–1.20) among women; 1.16 (95% CI 1.05–1.27) among individuals aged 60 years or more at baseline; 1.12 (95% CI 1.02–1.22) among individuals from Western Europe; 1.09 (95% CI 1.02–1.17) among individuals with intermediate education; 1.13 (95% CI 1.02–1.25) among manual workers; and 1.10 (95% CI 1.09–1.17) among individuals who retired at or below the country-specific median retirement age. Considering 10 or more years after retirement, RRs were: 1.39 (95% CI 1.10–1.76) among individuals from Eastern Europe; 1.16 (95% CI 1.01–1.32) among individuals from Northern Europe; 1.13 (95% CI 1.06–1.16) among married individuals; 1.14 (95% CI 1.01–1.30) among individuals with high education; and 1.14 (95% CI 1.03–1.26) among individuals who retired above the country-specific median retirement age.

The trajectories of the dietary score ≥5 (i.e., equal or higher to the median value in our sample) before and after retirement are illustrated in Fig. 3. The overall dietary score showed an improvement post-retirement. The probability of a score ≥5 increases from a RR of 0.84 (95% CI 0.78−0.90) 10 or more years before retirement to 1.11 (95% CI 1.06–1.16) 10 or more years post-retirement. Improvements in the overall dietary score after retirement remained consistent in selected groups of the stratification performed (Supplementary Figures S29-S35). Considering 5–9 years after retirement, RRs were: 1.13 (95% CI 1.06–1.21) among men; 1.11 (95% CI 1.05–1.17) among married individuals; 1.20 (95% CI 1.06–1.36) among individuals with low education; and 1.16 (95% CI 1.06–1.27) among manual workers. Considering 10 or more years after retirement, RRs were: 1.13 (95% CI 1.06–1.20) among individuals aged 60 years or more at baseline; 1.17 (95% CI 1.07–1.29) among individuals from Northern Europe; and 1.34 (95% CI 1.14–1.58) among individuals from Eastern Europe; 1.11 (95% CI 1.06–1.16) among individuals with high education; and 1.14 (95% CI 1.06–1.23) among individuals who retired at or below the country-specific median retirement age.

The models including interaction terms did not highlight differences across strata (see Supplementary Table S1).

## 4. Discussion

This longitudinal study suggests that retirement impacts dietary habits among older adults. The frequency of daily fruit and vegetables consumption and dairy products intake remains relatively stable before and after retirement, indicating consistency in dietary behaviours for these categories. In contrast, we observed an increase in the 3−6 times per week consumption of meat and fish, legumes and eggs post-retirement. The probability of a higher composite dietary score (i.e., ≥5) also augments, indicating a shift towards healthier dietary practices following retirement, particularly in protein-rich foods, as suggested by the most recent guidelines [22,23].

First, the stability in daily fruit and vegetables consumption post-retirement aligns with Helldán et al. [13], a longitudinal study conducted in Finland using data from the Helsinki Health Study cohort including 2,425 participants aged 55–60 years at baseline, with a 5–7-year follow-up conducted in 2007, and Ding et al. [14], a large Australian cohort of more than 23,000 individuals followed for 3 years. They both found minimal changes, suggesting positive and well-established dietary habits

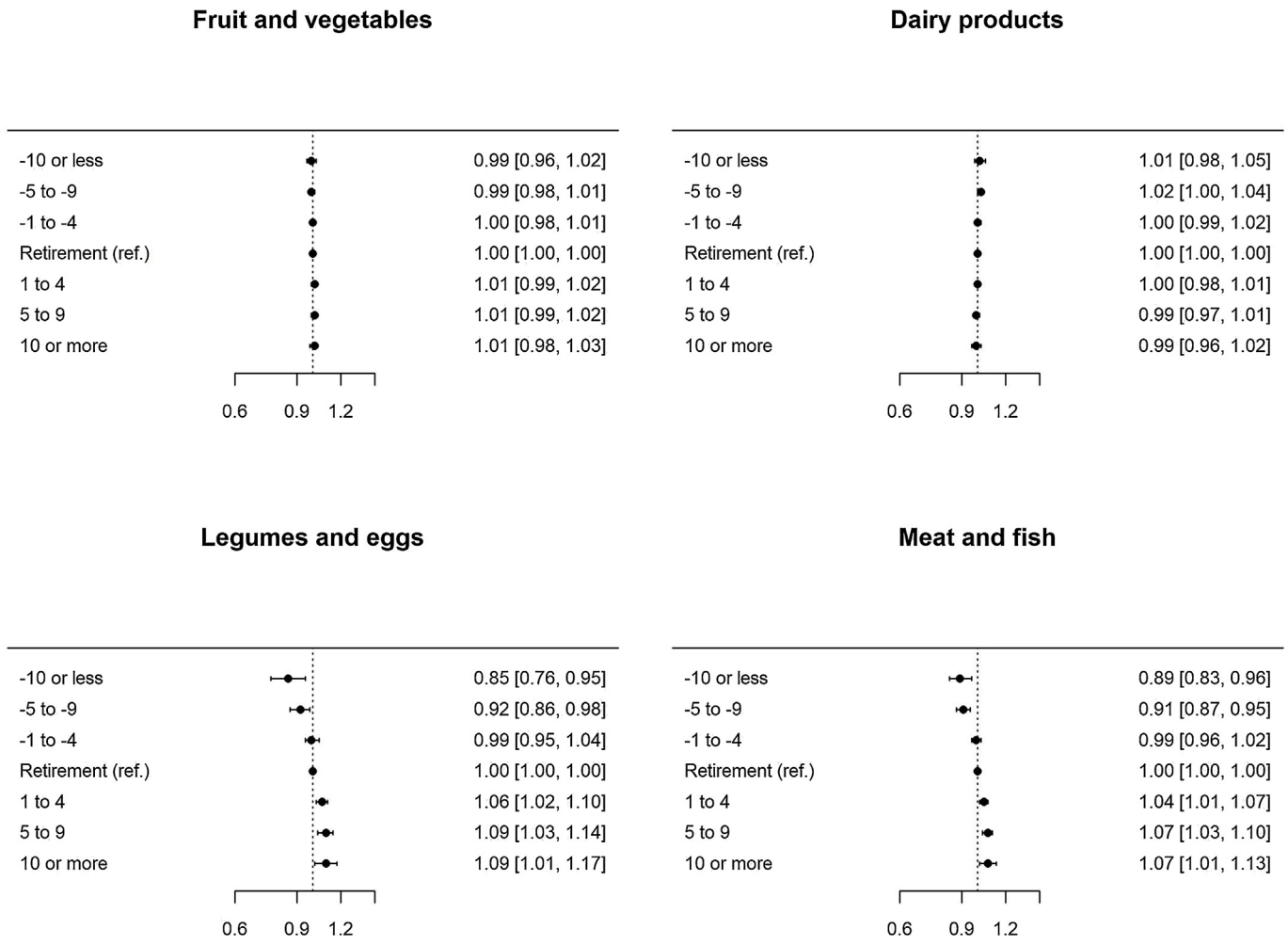


**Fig. 2.** Forest plot of the relative risk (RR*) and corresponding 95% confidence intervals (CIs) for daily consumption of (a) fruit and vegetables, (b) dairy products, and 3-6 times per week consumption of (c) legumes and eggs, and (d) meat and fish, at different times before and after retirement (reference category: the year of retirement). *Estimates were obtained from a generalised estimating equation model for repeated measures, adjusted by sex, age (continuous), geographical area (Northern, Western, Southern, and Eastern Europe), marital status (married/registered partnership, divorced/widowed and never married), educational level (low, intermediate and high), occupation (ISCO major categories) as baseline covariates, and body mass index (BMI) categories (18.5–24.9, 25–29.9, 30 and above) and the presence of at least one chronic disease (yes vs no) as time-varying covariates.

persist despite life transitions. Indeed, more than 70% of the participants in our cohort declare that they consume fruit and vegetables every day at baseline. Similarly, Lagström et al. [18], in the Whitehall II cohort study of British civil servants, noted a resembling trend: while fruit and vegetables intake increased both pre- and post-retirement, the increases were higher in the pre-retirement period than afterwards. This suggests that although dietary improvements may occur around retirement, the intensity of the change often decreases once individuals transition fully into retirement. However, this contrasts with results from Ali-Kovero [15], a 17-year prospective cohort study in Finland with 6,887 participants, and Celidoni [16], using two waves of SHARE data from retirees, who reported declines possibly due to reduced income, social support, and decreased physical activity. This minor difference between previous SHARE-based findings [16] and our results could be attributed to intrinsic dissimilarities in study design and population characteristics (cross-sectional vs multi-wave longitudinal cohort, comparisons between retirees and employed individuals vs individual changes before and after retirement, respectively). At the same time, as emerged from our stratified analyses, Si Hassen [17] et al., with a prospective cohort study in France using data from the NutriNet-Santé study and a 5-year follow-up period on 577 participants, highlighted slight increases among higher-educated groups, with variations also influenced by changes in dining routines and socioeconomic factors [52,53].

Secondly, our study reports no changes in dairy consumption post-retirement, which is different from previous research, which indicated a decrease among low-income retirees, possibly due to reduced financial capacity to purchase nutrient-dense foods like dairy products [17]. The stability in dairy consumption, even across different economic contexts, geographic locations, educational levels, and occupations, may be attributed to deeply ingrained cultural dietary practices, especially in older people, or consistent economic conditions. Lagström hypothesises that the established nature of dairy consumption patterns may contribute to its resilience despite retirement-related lifestyle changes [18].

Thirdly, the increased frequency of 3−6 times per week meat and fish consumption, as well as of legumes and eggs, post-retirement is consistent with several hypotheses and previous studies. This shift might be attributed to the dietary guidelines promoting higher protein intake for older adults, which is crucial for maintaining muscle mass and overall health among older adults [54,55]. Lagström observed an uptick in red meat consumption post-retirement, specifically among women and participants in lower occupational categories, suggesting socioeconomic status influences protein choices [18]. The increase in 3−6 times per week

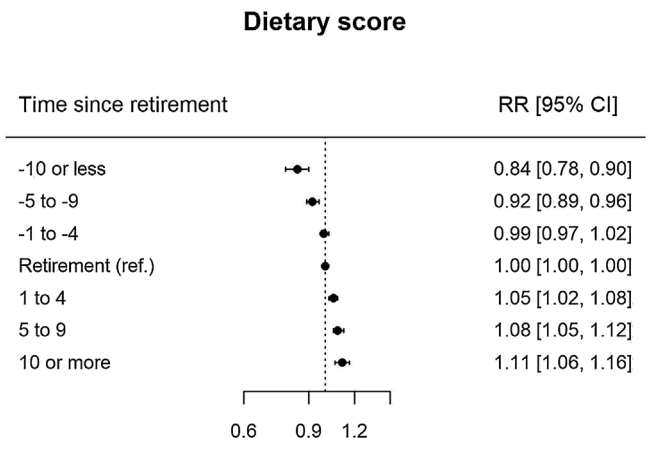


**Fig. 3.** Forest plot of the relative risk (RR*) and corresponding 95% confidence intervals (CIs) for a dietary score ≥5 at different times before and after retirement (reference category: the year of retirement).
*Estimates were obtained from a generalised estimating equation model for repeated measures, adjusted by sex, age (continuous), geographical area ( Northern, Western, Southern, and Eastern Europe), marital status (married/ registered partnership, divorced/widowed and never married), educational level (low, intermediate and high), occupation (ISCO major categories) as baseline covariates, and body mass index (BMI) categories (18.5–24.9, 25–29.9, 30 and above) and the presence of at least one chronic disease (yes vs no) as time-varying covariates.

meat and fish consumption post-retirement also aligns with findings from Si Hassen, observing that retirees have more time to prepare and consume protein-rich foods [17]. Additionally, Ali-Kovero reported men, in particular, increased their intake of fish after retirement, possibly due to more free time and a shift towards healthier eating habits [15]. This increase may be influenced by socioeconomic factors, as economic stability in retirement allows for better dietary choices and higher-quality protein sources [56].

Stratified analyses revealed that men report an increase in meat and fish consumption post-retirement, linked to a more structured daily routine that includes regular meals, consistent with Helldán's results that structured meal patterns contribute to men's healthier dietary habits [13]. Married individuals also improved consumption frequency, likely due to the supportive role of spouses in encouraging healthier eating habits and preparing nutritious meals together. Conklin's systematic review [56] and Lagström's findings [18] found that social support within the household influences adherence to better eating recommendations, as married couples, who report more consistent dietary patterns, might also share responsibilities for meal planning. According to our results, non-manual workers exhibited a greater increase in 3−6 times per week meat and fish consumption compared to manual workers, attributed to their generally higher socioeconomic status [57], consequent better access to diverse and high-quality foods, more health knowledge and a greater inclination towards maintaining healthy lifestyles [16]. In contrast, manual workers, having experienced physically demanding jobs, continue prioritising energy-dense foods out of habit, despite having more time to prepare meals. Higher educational attainment is associated with improved dietary habits post-retirement due to better nutritional knowledge of the health benefits and more financial resources. As Baer et al. pointed out in their systematic review [12], individuals with higher education are more likely to be aware of and adhere to dietary guidelines that emphasise the importance of protein intake for ageing adults. Individuals from Western and Northern Europe show more pronounced improvements in protein-rich food consumption, possibly due to stronger public health policies and higher availability of fresh and healthy food options. Patriota, including 218 newly retired participants from a larger cohort followed between 2009 and 2017 in Switzerland, highlighted the role of regional policies in promoting healthy eating habits, which could explain the regional variations observed [52].

The increase in 3−6 times per week consumption of legumes and eggs post-retirement is supported by Helldán et al.: retirees tend to adopt healthier eating habits due to increased time for meal preparation and a heightened awareness of their health needs [13]. Furthermore, Baer et al. suggested that the increased consumption of these food items could be due to retirees seeking affordable and nutrient-dense food options [12]. Stratified results showed that individuals aged 60 and older at baseline and women report increases in legumes and eggs consumption, which can be attributed to their traditional roles in food preparation. This may also be due to a greater emphasis on protein intake to counteract the natural muscle loss associated with ageing, in line with recent dietary guidelines [22, 52]. Geographical variations were also noted, with individuals from Western Europe showing more evident and lasting improvements in their consumption of legumes and eggs. Moreover, retirees with higher educational levels showed pronounced improvements in their dietary patterns, likely reflecting better health literacy and access to health information. Retirees from non-manual works belonging to these categories showed increases in the consumption of legumes and eggs, reflecting better nutritional knowledge and easier access to these food groups.

Overall, the peak improvement in meat and fish consumption occurs 5–9 years post-retirement, followed by a decline, whereas the 3−6 times per week consumption of legumes and eggs steadily increases, indicating a preference for more affordable, nutritious options.

Last but not least, the improvement in the overall dietary score following retirement summarises the single food category results, even in stratified analyses. Both men and women experienced improvements in their dietary scores after retirement, likely due to increased time for meal preparation and healthier consumption post-retirement [13]. The increase among individuals aged 60 and older at baseline may be attributed to heightened health awareness and prioritisation of healthy eating habits with age [56]. Looking at our data, individuals from Northern and Eastern Europe showed higher improvements in dietary scores, reflecting regional cultural attitudes towards food and the influence of public health initiatives. Married individuals displayed higher dietary scores post-retirement than pre-retirement than those living alone due to social support and shared responsibilities within households [6]. Individuals with high educational levels exhibited more pronounced improvement thanks to better health literacy and resources for implementing dietary changes.

This study has several strengths and limitations. A first strength is the examination of dietary habits through the frequency of consumption of various food items. This approach provides a comprehensive understanding of dietary patterns and their changes in relation to retirement, as previously done in same-methodology analyses exploring the impacts of retirement on selected behavioural risk factors [7]. Additionally, the use of high-quality, standardised individual-level data from SHARE across different countries, with a follow-up period of 16 years, enhances the robustness of our longitudinal analysis and allows for the inclusion of a large, diverse population across multiple waves, enabling a broad examination of trends over time. This follow-up is the most extensive available in the literature, providing insights into long-term trends, thus boosting the generalisability of our findings to high-middle-income countries with generous welfare systems. However, there are several limitations to consider. One notable limitation is that the food item categories in SHARE may not align with those commonly used in nutritional sciences, particularly concerning meat consumption: they provide a general indicator but do not capture nuances such as portion sizes or dietary quality. For instance, given the available questions, we cannot differentiate between weekly meat and fish or legumes and eggs consumption. Considering that guidelines recommend meat consumption no more than twice a week (with red meat limited to once), the low specificity of SHARE's question necessitates caution. Additionally, given the extended timeframe of the study and wide geographical and cultural different contexts, dietary guidelines may have evolved substantially,

particularly regarding meat and dairy recommendations. The reliance on self-reported data introduces risks of information and recall bias, and the absence of a quantitative or semi-quantitative assessment of individual food intakes is another limitation. Lastly, cross-country variations in retirement and nutrition-related policies and traditions may influence individual behaviours and complicate the interpretation of results.

## 5. Conclusions

Retirement offers a critical window for adopting healthier lifestyles, including improved dietary habits [14], and a key opportunity for public health interventions. The overall improvement in protein-rich food consumption highlights the potential for targeted nutritional education that promotes these dietary changes. However, the lack of improvement for other food items underscores the need for specific interventions focused on encouraging balanced diets that include a higher intake of plant-based foods [53]. Public health policies should prioritise dietary literacy campaigns and ensure that retirees have access to affordable, high-quality fruit and vegetables, especially for those in lower-income brackets where economic constraints may limit their dietary choices [56].

The stability of specific dietary habits across retirement suggests that early-life interventions may have long-lasting effects, reinforcing the importance of lifelong dietary education. Further longitudinal studies integrating more granular dietary measures of assessment are necessary to explore how socioeconomic factors, gender, and cultural differences influence post-retirement dietary patterns. There is also a need to explore the long-term health outcomes associated with these changes in food consumption to design more nuanced and effective nutritional interventions. Integrating dietary interventions into broader healthy ageing strategies could reduce the risk of chronic diseases [58], improving both the health span and the quality of life for ageing populations.

In conclusion, retirement marks a critical juncture in the life course where individuals can make meaningful changes even to their dietary habits, potentially contributing to healthier ageing. Through life course epidemiology, this study reinforces the need for sustained and tailored interventions that address dietary behaviours at all stages of life, ensuring that the transition into retirement supports a trajectory towards long-term well-being.

## Ethics approval and consent to participate and for publication

The need for ethics approval and consent to participate in this non-interventional study derived from a secondary analysis of anonymised data was waived.

## Funding

The work of PB is partially supported by a grant from Cariplo Foundation (Grant: Aging and social research 2018: people, places and relations. Project: Pension reforms and spatial-temporal patterns in healthy ageing in Lombardy: quasi-natural experimental analysis of linked health and pension data in comparative Italian and European perspective - n. 2018-0863). This research was supported by EU funding within the NextGenerationEU-MUR PRIN PNRR 2022 (Project no. F53D23011590001, DOUBTS).

## Availability of data and materials

The datasets supporting the conclusions of this study are publicly available from SHARE Research Data Center (https://releases.share-dataportal.eu/) upon request.

## Declaration of competing interest

Each author declares that he or she has no commercial associations (e.g., consultancies, stock ownership, equity interest, patent/licensing arrangement) that might pose a conflict of interest in connection with the submitted article.

## Acknowledgements

This paper uses data from SHARE Waves 1, 2, 3, 4, 5, 6, 7, 8 and 9 (DOIs: 10.6103/SHARE.w1.900, 10.6103/SHARE.w2.900, 10.6103/SHARE.w3.900, 10.6103/SHARE.w4.900, 10.6103/SHARE.w5.900, 10.6103/SHARE.w6.900, 10.6103/SHARE.w6.DBS.100, 10.6103/SHARE.w7.900, 10.6103/SHARE.w8.900, 10.6103/SHARE.w8ca.900, 10.6103/SHARE.w9.900, 10.6103/SHARE.w9ca900, 10.6103/SHARE.HCAP.0) see Börsch-Supan et al. (2013) for methodological details.(1) The SHARE data collection has been funded by the European Commission, DG RTD through FP5 (QLK6-CT-2001-00360), FP6 (SHARE-I3: RII-CT-2006-062193, COMPARE: CIT5-CT-2005-028857, SHARELIFE: CIT4-CT-2006-028812), FP7 (SHARE-PREP: GA N°211909, SHARE-LEAP: GA N°227822, SHARE M4: GA N°261982, DASISH: GA N°283646) and Horizon 2020 (SHARE-DEV3: GA N°676536, SHARE-COHESION: GA N°870628, SERISS: GA N°654221, SSHOC: GA N°823782, SHARE-COVID19: GA N°101015924) and by DG Employment, Social Affairs & Inclusion through VS 2015/0195, VS 2016/0135, VS 2018/0285, VS 2019/0332, VS 2020/0313, SHARE-EUCOV: GA N°101052589 and EUCOVII: GA N°101102412. Additional funding from the German Federal Ministry of Education and Research (01UW1301, 01UW1801, 01UW2202), the Max Planck Society for the Advancement of Science, the U.S. National Institute on Aging (U01_AG09740-13S2, P01_AG005842, P01_AG08291, P30_AG12815, R21_AG025169, Y1-AG-4553-01, IAG_BSR06-11, OGHA_04-064, BSR12-04, R01_AG052527-02, R01_AG056329-02, R01_AG063944, HHSN271201300071C, RA-G052527A) and from various national funding sources is gratefully acknowledged (see www.share-eric.eu).

## Appendix A. Supplementary data

Supplementary material related to this article can be found, in the online version, at doi:https://doi.org/10.1016/j.jnha.2025.100503.

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