

Associations Between Internet Use, Social Integration, and Emotional Well-Being in Older Adults: Evidence from SHARE

Javier Lera^{1,2}, Marina Barreda^{1,2} y David Cantarero-Prieto^{1,2,3}

¹ Department of Economics, University of Cantabria, Santander (Spain).

² Health Economics Research Group, Valdecilla Biomedical Research Institute (IDIVAL), Santander (Spain).

³ Santander Financial Institute - SANFI, University of Cantabria, Santander (Spain).

Objective and contribution

The expansion of population ageing in Europe has renewed attention to emotional well-being in later life, particularly loneliness and depressive symptoms, which are increasingly recognised as key drivers of quality of life among older adults. In parallel, the digital transformation of everyday life has opened new opportunities for social interaction and access to information; however, older adults do not adopt digital tools uniformly, and a persistent digital divide may reinforce pre-existing inequalities in social participation and emotional well-being.

This paper analyses the association between two potentially protective resources—digital connectivity and social integration—and emotional well-being among older adults. Specifically, we study whether recent internet use (use in the last seven days) and a four-level index of social integration (capturing the frequency and diversity of social contacts) are associated with (i) clinically relevant depressive symptomatology, measured through the EURO-D scale and defined as $\text{EURO-D} \geq 4$, and (ii) feelings of loneliness, measured as a binary indicator.

The paper's contribution is threefold. First, it jointly considers digital and social resources in relation to two distinct, though interrelated, forms of emotional distress (loneliness and depressive symptoms), thereby providing a coherent picture of emotional well-being in later life. Second, we explicitly acknowledge that later life is heterogeneous by estimating models separately for three age groups: 65–70, 71–80, and 80+. This stratified approach allows us to explore whether the association between internet use and emotional well-being differs across older age cohorts—an important point given that opportunities for face-to-face interaction, autonomy, and digital skills can change substantially with age. Third, by reporting results as odds ratios from logistic models with robust standard errors, the paper provides comparable effect sizes across outcomes and age groups, and quantifies the protective gradient of social integration in a way that is particularly informative for policy and intervention design.

Methodology

We use data from the Survey of Health, Ageing and Retirement in Europe (SHARE), a biennial survey collecting detailed information on individuals aged 50+ across 28 European countries and Israel. SHARE provides multidimensional information on physical and mental health, socioeconomic status, and social networks, making it suitable for studying the correlates of emotional well-being among older adults.

Dependent variables

The paper uses two binary outcomes capturing emotional well-being: Firstly, depressive symptoms are constructed from the EURO-D scale (12 items). Following Prince et al. (1999) as stated in the manuscript, a score above 4 indicates a clinically relevant risk of depression; therefore, the dependent variable equals 1 if $\text{EURO-D} \geq 4$ and 0 otherwise. Secondly, loneliness is based on a direct SHARE question on how frequently the respondent feels lonely, recoded as 1 if the individual reports feeling lonely and 0 otherwise.

Main explanatory variables

The key variables of interest are:

- **Internet use:** whether the individual used the internet in the last seven days for any purpose (email, information search, social networks, etc.), recoded dichotomously (used vs not used).
- **Social integration:** a composite index reflecting the frequency and diversity of social contact (e.g., visits with family and friends, participation in group/community activities), categorised into **four levels** (1 = low integration; 4 = high integration).

Controls and sample description

The regression models include gender (coded in the manuscript as female), log household income, and a binary indicator of multimorbidity (more than two chronic conditions). Age-group stratification is performed for ages 65–70, 71–80, and 80+. Depending on variable availability, the sample includes roughly 65,000 to 69,000 observations. The prevalence of depressive symptoms (EURO-D ≥ 4) is 0.274 (N = 66,321), and loneliness has a prevalence of 0.475 (N = 68,940). The average age is 70.217 years (SD 9.719). The multimorbidity indicator has a mean of 0.538 (N = 68,744). The social integration index has mean 2.856 (N = 65,458). Internet use is reported in the descriptive table with mean 2.512 on a 1–5 scale (N = 68,719). Finally, satisfaction with social networks is high (mean 0.907; N = 68,940).

Empirical strategy

Given that both dependent variables are binary, we estimate logistic regression (logit) models. The manuscript motivates logit as an appropriate discrete-choice framework that constrains predicted probabilities to lie between 0 and 1. Because logit coefficients are not directly interpretable in probability units, results are reported as odds ratios (OR) with robust standard errors and 95% confidence intervals.

The empirical strategy is intentionally parallel across outcomes: we estimate separate logit models for (i) depression (EURO-D ≥ 4) and (ii) loneliness, and we run these models separately by age group (65–70, 71–80, 80+). This design supports a clear comparison of whether internet non-use and social integration are more strongly associated with loneliness than with depressive symptoms, and whether these associations differ across older cohorts.

Preliminary results

The main results are reported in Table 1 (depression) and Table 2 (loneliness) of the manuscript. Across both outcomes, we observe consistent patterns: (i) a strong protective gradient of social integration, (ii) higher emotional distress among individuals with multimorbidity, and (iii) higher odds of loneliness and depressive symptoms among those who did not use the internet in the last seven days.

Table 1. Main regression results for depression as dependent variable (odds ratios, 95% CI), by age group

Variable	65–70	71–80	80+
Female	1.91*** [1.71–2.14]	1.92*** [1.76–2.10]	1.61*** [1.44–1.81]
Log household income	0.91*** [0.87–0.96]	0.98 [0.94–1.02]	0.92*** [0.87–0.97]
Multimorbidity (≥2 chronic)	2.29*** [2.07–2.55]	2.11*** [1.93–2.30]	2.20*** [1.96–2.48]
Social integration (2) (ref.=1)	0.83** [0.71–0.97]	0.88** [0.79–0.99]	0.71*** [0.63–0.81]
Social integration (3) (ref.=1)	0.65*** [0.54–0.79]	0.64*** [0.55–0.74]	0.53*** [0.44–0.63]
Social integration (4) (ref.=1)	0.64*** [0.54–0.75]	0.65*** [0.58–0.74]	0.69*** [0.58–0.80]
No internet use (ref.=use)	1.17** [1.04–1.31]	1.54*** [1.42–1.68]	1.43*** [1.26–1.62]
N	8,709	12,657	6,797
Log pseudolikelihood	–4,574.022	–7,143.7877	–4,316.5746

Notes: Odds ratios from logistic regressions with robust standard errors. Significance levels: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

Table 2. Main regression results for loneliness as dependent variable (odds ratios, 95% CI), by age group

Variable	65–70	71–80	80+
Female	1.23*** [1.13–1.35]	1.30*** [1.20–1.40]	1.05 [0.94–1.17]
Log household income	0.91*** [0.87–0.95]	0.89*** [0.85–0.93]	0.87*** [0.83–0.92]
Multimorbidity (≥2 chronic)	1.44*** [1.32–1.57]	1.42*** [1.31–1.53]	1.43*** [1.28–1.59]
Social integration (2) (ref.=1)	0.55*** [0.47–0.64]	0.62*** [0.55–0.69]	0.60*** [0.53–0.68]
Social integration (3) (ref.=1)	0.48*** [0.41–0.57]	0.50*** [0.44–0.57]	0.50*** [0.42–0.60]
Social integration (4) (ref.=1)	0.38*** [0.32–0.44]	0.38*** [0.34–0.43]	0.33*** [0.28–0.39]
No internet use (ref.=use)	1.26*** [1.14–1.40]	1.15*** [1.06–1.24]	1.15** [1.03–1.30]
N	8,805	12,859	7,046
Log pseudolikelihood	–5,844.3223	–8,514.2472	–4,407.7018

Notes: Odds ratios from logistic regressions with robust standard errors. Significance levels: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

Interpretation of main patterns

First, social integration is strongly and consistently associated with lower emotional distress. For depression, relative to the lowest integration group (category 1), category 3 is associated with a sizable reduction in the odds of depression across all age groups (OR = 0.65, 0.64, and 0.53). For loneliness, the gradient is even stronger: the highest integration group (category 4) is associated with substantially lower odds of loneliness (OR = 0.38, 0.38, and 0.33 across the three age groups). This steep gradient is consistent with the idea that the frequency and diversity of social contacts can buffer emotional distress in later life, particularly at advanced ages.

Second, recent internet use is significantly related to emotional well-being. Individuals who did not use the internet in the previous seven days show higher odds of depression across all age groups, with the largest association in the 71–80 group (OR = 1.54). For loneliness, internet non-use is also associated with higher odds, with a larger magnitude in ages 65–70 (OR = 1.26) and statistically significant associations in all groups (OR = 1.15–1.26). These patterns indicate that digital connectivity is associated with lower emotional distress even after controlling for socioeconomic position, multimorbidity, and social integration.

Third, multimorbidity is a robust correlate of emotional distress. Having more than two chronic conditions is associated with more than double the odds of depression (OR = 2.11–2.29) and with around 40% higher odds of loneliness (OR = 1.42–1.44). This finding reinforces the relevance of integrated approaches that consider physical and emotional dimensions jointly among older adults.

Finally, socioeconomic position—proxied by household income—shows a protective association, though the pattern differs by outcome and age. Income is consistently protective for loneliness in all age groups (OR = 0.91, 0.89, 0.87). For depression, the association is statistically significant for ages 65–70 and 80+, but not for ages 71–80 in the manuscript's results. Gender differences are also present: being female is associated with higher odds of depression across all age groups and with higher odds of loneliness in the two younger groups (65–70 and 71–80), while not statistically significant in the 80+ loneliness model.

Preliminary conclusions and policy implications

Overall, the results are consistent with the manuscript's narrative that both social integration and digital connectivity are associated with emotional well-being in later life, and that these associations hold even after accounting for socioeconomic and health-related factors. The strong gradient in social integration—especially for loneliness—highlights the potential importance of policies and interventions that foster meaningful social participation among older adults.

The manuscript also emphasizes that digital inclusion may play a relevant role in emotional and social inclusion in later life, as internet non-use is associated with higher odds of both depression and loneliness. In this direction, the text links its policy relevance to the World Health Organization's Decade of Healthy Ageing 2021–2030, highlighting the importance of friendly and accessible digital environments as a condition for healthy ageing.