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Setting the scene: cross-sectional country comparisons of associations between young adult care and education, employment, and health outcomes in Europe

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ABSTRACT

With increasing demand for informal carers, young adults are taking up care of dependent adults. However, early adulthood is the period in which most people invest in human capital and transition to employment. Being neither in employment nor in training (NEET) during this period may have long-term effects, increasing the risk of poor mental health. This study explores data from the third wave of the European Health Survey to better understand the situation of young adult carers (18-29 years old) in Europe. Using multilevel regression models, results indicate that, overall, those who care for dependent adults are more likely to be in NEET status (intensive caring), perceive bad health, and report worse mental health. However, country-level care resources did not affect the gap between carers and non-carers. Hence, cultural differences, or other forms of support, arise as the main role of country differences in the health risks of young adult carers.

Introduction

As Europe faces an aging population, the need for informal caregiving is increasingly becoming a central issue in the debates surrounding intergenerational solidarity (Bengtson & Roberts, 1991). This concept related to the reciprocal exchange of resources, support, and care across generations, faces new challenges as demographic and societal shifts reshape traditional caregiving roles. In this context, young caregivers are arising as a more vulnerable group due to the long-term implications of their care activities (Brimblecombe et al., 2020; Chevrier et al., 2022; Fingerman et al., 2024; Xue et al., 2023). At the same time, significant changes in the labour market and family settings, such as the increased rates of female employment and the weakening of family networks, are turning young adults into carers of dependent relatives (Pope et al., 2022). This shift underscores the importance of analysing the implications of informal caregiving, particularly for young adults, whose educational, employment and health outcomes may be profoundly impacted by these responsibilities. Even though the number of young adult family carers is increasing in some countries and the intensity of their care is also rising, only a few studies have examined the implications of caring on their lives.

Previous studies have demonstrated that care responsibilities, especially those that take time away from the labour market such as caring for family members, have an impact on the chance of being NEET (Not in Education, Employment or Training), particularly for women (Feng et al., 2015; Maguire, 2018). Studies have found that young adult carers tend to express frustration with the challenge of balancing their education and caring tasks, and many end up adjusting their career aspirations to their caring responsibilities, which sometimes limits their options (Hamilton & Adamson, 2013). Other studies pointed out that young adult carers are not only less likely to obtain a university degree and enter employment, but they are also more likely to be unemployed and exit paid employment (Xue et al., 2023).

Regarding health, past studies have found positive and negative aspects of caring during early adulthood (Becker & Becker, 2008; Shifren and Kachorek, 2003). On the positive side, notable effects encompass heightened confidence and inner strength, cultivation of a close and loving relationship with the care recipient (typically a family member), a mature and responsible attitude towards others in society, and being able to transfer caring skills into career and job choices (Dellman-Jenkins & Blankmeyer, 2009; Rentería et al., 2023). However, there are several negative effects, including health problems like stress, depression, and tiredness (Fleitas Alonzo et al., 2022); insufficient time and money; restricted educational and career opportunities; and lack of social recognition. The type and intensity of care play an important role in the way caring impacts the health and wellbeing of young adult carers, because more complex demands of the recipient, as well as more hours devoted to care, can aggravate mental distress (Brimblecombe, 2020; Haugland et al., 2020; Lacey et al., 2023). Nevertheless, most studies cited so far show that the probability of providing care increases among females, confirming that caring activities exacerbate gender gaps in health.

This study conducts a country-comparative empirical analysis in 28 European countries. We aim to assess the relationship between informal caregiving and NEET status, and informal caregiving and health outcomes among young adults (aged 18–29 years). Additionally, we test to what extent these associations vary according to available formal care resources at the country level. This is, however, a cross-sectional approach, due to a lack of country-comparative longitudinal data with care, NEET and health information in this age group, and hence we can only measure associations and cannot prove causality. Although the study uses a cross-sectional approach, it highlights important associations that can inform policy debates on intergenerational solidarity and the growing need for informal care. Furthermore, to reduce the risk of spurious associations, we also include the level of youth unemployment, which may affect the number of young adults available to take up care.

Employment and education outcomes

Much of the previous research on education and employment outcomes for young adult carers is qualitative in nature (Day, 2019; Hamilton & Adamson, 2013; Kettell, 2018). One cross-sectional quantitative study in Australia (Cass et al., 2009) found young adult carers were 7% more likely to have post-secondary education qualifications than non-carers, but acknowledged that this figure was unreliable due to the small sample size (n=62). A recent longitudinal study in the UK showed young adult carers were 38% less likely to obtain a university degree than their peers without a caring role while those caring for 35 hours per week or more were 86% less likely to obtain a degree qualification (Xue et al., 2023). The unpredictable nature of caring may clash with attending lectures and meeting assignment deadlines. Similar constraints can be felt in employment where entry-level positions may not provide the flexibility required. Two longitudinal studies in the UK have found that young adult carers were less likely to enter employment, particularly for those caring in their mid- to late twenties (Brimblecombe et al., 2020; Xue et al., 2023). Here again, intensity is important. The probability of entering employment decreased with weekly hours spent caring; those caring 35+ hours per week were 46% less likely to enter employment, and

those providing care for 20+ hours per week were much more likely to be formally unemployed than their peers who do not provide care (Xue et al., 2023). Taken together these results suggest that young adult carers may be more likely to become NEET, excluded from education, training, and employment opportunities.

Research conducted in the UK has additionally demonstrated that young adult carers tend to be more socioeconomically disadvantaged. Furthermore, female young adult carers tend to care more intensely and for longer durations compared to their male counterparts (Washington et al., 2022), suggesting that gender and socioeconomic differences are likely important factors. Studies in the UK have also shown that associations between care intensity or duration and the risk of entering unemployment are stronger for women than for men (Xue et al., 2023).

Moreover, prior research indicates that the impact of caring during early adulthood on educational and employment outcomes may differ by country context. For example, a longitudinal study comparing the UK and Germany found that while young adult caring correlated with reduced likelihoods of obtaining a university degree or entering employment and an increased likelihood of entering unemployment in both countries, subtle differences emerged. In the UK, the intensity of caring (weekly hours) was more important, whereas in Germany, the duration of caring was more salient (King et al., 2023). Additionally, gender differences were generally stronger in Germany than in the UK in relation to education outcomes, with female young adult carers facing more disadvantages than male young adult carers. Meanwhile, in the UK, caregiving exerted a stronger influence on unemployment for women compared to men (King et al., 2023). More country comparative work is needed to understand these associations in a wider range of contexts.

Health outcomes

Prior research has shown that young adult carers have poorer health, on average, than their peers who are not providing care. For instance, a recent systematic review concluded that young adult carers under 25 years of age reported poorer mental health than their peers who were not providing care (Fleitas Alfonzo et al., 2022; Lacey et al., 2022). Included studies showed that young adult carers reported greater psychological distress, more depressive symptoms, more social anxiety, poorer mental health functioning, and more self-reported mental health illnesses, than their peers. However, only ten previous studies were identified in this review, and most were rated as low quality, with only one study rated as low risk of bias. Concerning global indicators of health, such as self-rated health, young adult carers are more likely to report fair or poor health compared to their peers. For instance, in the UK Household Longitudinal Study, young adult carers reported 1.33 higher odds of fair/poor health compared to non-carers (Washington et al., 2022; Xue et al., 2024).

Previous work on young adult caregiving has shown that the effect of care on health depends on caregiving intensity (usually indicated by the number of hours of care provided per week). For example, an analysis of the Northern Ireland Census data (Tseliou et al., 2018) found that young adult carers caring for 20+ hours per week had 2.5 higher odds (95% CI: 1.70, 3.56) of reporting chronic mental health problems, compared to those reporting no care. This was higher than when reporting 1–19 hours of care provision per week (chronic mental health problems: OR=1.98, 95% CI: 1.51, 2.59).

The relationship between young adult caring and health may likely differ depending on the country-level context, and in particular the different support and societal awareness of young adult caregiving. A recent cross-sectional analysis of the European Social Survey across 21 European countries found that young adult carers (aged 14–18) reported more symptoms of depression compared to non-carers (Gallagher et al., 2021). However, this study did not disaggregate associations by country, nor did they examine associations for young adult carers. To date, there has been a lack of cross-European studies investigating associations between young adult caring and health outcomes, and whether these vary across country-level contexts.

Country-level confounders and potential differences

At the national level, the level of youth unemployment and formal care resources are expected to affect the association between caregiving and employment and health outcomes among young adults.

First, youth unemployment has a great impact on the economic opportunities of young individuals, it influences their likelihood of leaving the parental home (Wiemers, 2014); however, it could also be associated with the probability of assuming caregiving responsibilities for an older adult within the household. Notably, European countries exhibit considerable regional differences in youth unemployment (Pennoni & Bal-Domańska, 2022), potentially delineating country differences in the availability of young individuals to provide care for older dependent family members.

Second, public and long-term care (LTC) services for formal care vary by country. Since many of these services, including the number of LTC beds in institutions and hospitals, the number of LTC workers, cash-for-care benefits, tax credits, and respite care are designed to cover the care needs of the aging population, this may alleviate some of the pressures associated with informal caregiving (Verbakel, 2018). When resources for formal long-term care are generous, as is the case in, for instance, the Nordic countries, it reduces the need for informal caregiving within households as dependent adults may be cared for in institutions. This, then, could reduce the intensity of caregiving in households in Southern and Eastern European countries, and the lack of formal support means that informal care giving plays a more fundamental role in the care of the older population. For these country differences related to the amount of care support provided we will also perform a sensitivity analysis (shown in the appendix) whereby the countries are grouped into three old-age care regimes using latent class analysis (see Van Damme & Spijker, 2023). These classes are characterized by the degree of defamilialization and support for familialism, namely strong defamilialism/ supported familialism (strong DF/SF), moderate DF/SF and familialism by default (FbD). FbD contains most Southern and Eastern European countries and is characterized by little to no state provision and high intergenerational obligations to care for older people. Conversely, in strong DF/SF countries (the Nordic countries and The Netherlands) resources for formal long-term care are generous (both in terms of facilities and general expenditure). Lastly, the moderate DF/SF class mainly contains Western European countries, including the UK and Ireland, as well as Slovenia, and scores especially high on respite care, while their performance on other indicators remains more or less average for both formal and informal institutions.

Data and methods

We use information on 25[1] countries in the third wave of the European Health Interview Survey (EHIS; 2019), as well as information for the UK from the second EHIS wave (2013) and for Spain from their 2011–12 National Health Survey (ENSE).[2] EHIS and ENSE are both cross-sectional surveys that targets population aged 18 and over and live in private households. They compile information on health status, health care use, health determinants, and socio-economic background of the respondents. We restrict our sample to individuals aged 18–29 years old (N=38,011) out of whom 9.4% provided care (N=3,569) regularly. This age group was considered after reviewing previous studies on young adult carers in the UK that defined young adulthood between 14 and 25 years old (see Becker & Becker, 2008; Becker & Sempik, 2018). We extended the age group to 29 years old to reflect the extension of young adulthood in the last few decades (similarly to Fingerman et al., 2024; King et al., 2023) and initiated our definition at 18 years old to include all individual who have completed compulsory education.

Individual-level variables

Our main independent variable is providing unpaid care or assistance to one or more persons suffering from some age-related problem, chronic health condition or infirmity, at least once a week (professional activities excluded). We merge this information with the intensity of the care provided, and the resulting variable has five categories: (1) Not caregiver, (2) Caregiver who provided care for less than 10 hours per week, (3) Caregiver provided between 10 and 20 hours per week, (4) Caregiver provided more than 20 hours/week. In the original variable, 0.29 percent of cases failed to report the number of hours and were dropped from the analysis.

Unfortunately, we do not have information on whether the care is provided within or outside the household, but among those who provided care, we know that 97 percent provided it to a family member.

We have three main dependent variables: NEET status, self-perceived health, and mental health index. NEET identifies those individuals who self-declared themselves as inactive, unemployed, or not studying. It is coded as 1 for those who were in these categories and zero otherwise. Second, self-perceived health ranges from 1 (very good) to 5 (very bad), and we dichotomize it into 1. Fair/poor health (3–5), and 0. Good/very good health (1–2). Finally, the mental health index is built by adding up eight original variables in the survey questionnaire. Respondents were asked to indicate to what extent, from 1 (not at all) to 4 (nearly every day) if they experienced the following situations over the last two weeks: having trouble falling or staying asleep, feeling tired or having little energy, having poor appetite or overeating, feeling bad about yourself and feeling being a failure, having trouble concentrating, and being fidgety or restless. The final index ranges from 8 to 32. 8 corresponds to those respondents who reported 1 (not at all) in all items, and 32 to those who stated 4 (nearly every day) to the eight original items. 1 corresponds. We then re-coded it into 5 cut-off scores[3] which were then dichotomised into 0 for the better scores (1–2) and as 1 for the worse scores (3–5).

In addition, we control for age, sex, highest educational attainment (primary, lower secondary, upper secondary, and tertiary), household type (one-person household, lone parent, couple without children, couple with children, and other types of households), mean number of people living in the household, household income (categorized into quintiles), and place of birth (native-born, EU-born, born outside the EU). Norway does not compile information on place of birth, and we add it in a last category with no information.

Country-level variables

To better explain the differences between countries, we add three macro-aggregate indicators that can help to understand differences in the degree of formal care for elderly people that can alleviate the care burden for young adults and improve employment opportunities.

First, we compute a Long-Term Care index (LTC index) that combines information on three indicators (1) long-term care beds in institutions and hospitals, per 1,000 population aged 65 and over; (2) long-term care workers as a share of the population aged 65 and over; and (3) long-term care public expenditure as a share of gross domestic product (GDP). Each indicator is first standardized over the countries, and hence the values of these four items are averaged per country to represent each country's position with respect to formal long-term care provision. Values of the final standardized index range from −4.39 (Greece) to 6.25 (Norway), being −4.39 the lowest level of long-term resources available and 6.25 the highest. Data is derived from OECD, and refers to years 2016–2018, depending on the indicator.[4] Not every indicator is available for the same year. Macro-indicators need to be lagged in the model to avoid potential endogeneity as there might be potential causal relationships between individuals and the macro-context (Coleman, 1990). In this case, one can think of contexts with higher NEET and poorer mental health probabilities having a lack of care provisions for the older population on the macro-level instead of the macro-context indicators affecting the individual-level dependent variables. To avoid such potential endogeneity,

we included macro-indicators that were lagged two or three years. We include an appendix with detailed information about the construction of the LTC index.

Second, we control for youth unemployment in each country, referring to one year before the survey.[5] In the context of high unemployment, young adults may be more prone to care for dependent family members given their lower chances of finding a job. This indicator is also standardised to be included in the model.

Finally, as a sensitivity test, we also included the three care regimes identified by Van Damme and Spijker (2023) in order to ascertain whether the association between caregiving status/intensity and the outcome variables is moderated by the generosity of the care regime.

Methods

We use multilevel-effects logistic regressions with random intercepts at the country level to account for the nested structure of our data as young adult carers are nested in countries. Country-level random intercepts allow for individuals in the same country to be more similar than those in other countries. Our data fulfil the requirement of a cluster-level sample size above 20 to reliably estimate logistic multilevel regression with context-level variables (Meuleman & Billiet, 2009). In addition, when we include a cross-level interaction in the analysis, and we employ a random coefficient model which allows the explanatory variable to have a different effect for each country. Results are weighted using survey weights provided by Eurostat and included in the EHIS microdata.

We run three multilevel logistic regression analyses to estimate our main outcomes: NEET, fair/poor self-perceived health, and worse mental health scores. For each outcome, we estimate three different models. Model 1 includes the association between the outcome and our main independent variable providing informal care or not, and the intensity of informal care among those who provided care, while controlling for all individual-level variables. Model 2 adds country-level variables, and Model 3 estimates the interaction effect between the caregiving intensity and the LTC index. This shows to what extent the relationship between caregiving and NEET status and health outcomes depends on the degree of formal care resources available in each country. Models 1–3 include all individual-level control variables; however, when we estimate the relationship between NEET and caregiving, we do not include self-perceived health and mental health as control variables because of possible confounding effect between reporting bad health and not being in employment or education, and the other way around when we estimate health outcomes. In addition, in the NEET model we do not include household income as a confounder because NEET people do not receive any income, and hence their household income would always be lower than non-NEET. In order to avoid over-adjustments due to it, and given that we use cross-section data, we do not include this variable in NEET models but keep it in self-perceived and mental health.

All models present the results for men and women combined since separate gender models showed identical patterns for men and women.

Finally, we perform sensitivity analyses to (a) better specify under which conditions the gap between carers and non-carers holds, and (b) to test education as a possible mediator of the association between caregiving and our three main outcomes: NEET, fair/bad self-perceived health, and worse mental health. First, we replace the LTC index for the three care regimes (see appendix, tables A3-A5) to ascertain whether the association between caregiving status/intensity and the outcome variables is moderated by the generosity of the care regime (as a proxy of the degree of defamilialization and support for familialism). Secondly, we test interactions between care intensity and other country-level indicators, including youth unemployment, confidence in health care systems, people's feeling of duty to take care of ill parents and whether the country has a paid leave to care (see appendix, table A1). Lastly, we take out educational attainment in order to establish whether any association between caregiving status and intensity and the probability of being in NEET status, perceiving fair/bad health, and reporting worse mental health is mediated by current educational attainment (see appendix, figures A6-A8 and table A9).

Sample selection and missing data

Eurostat is responsible for collecting and releasing the data. The original sample allows cross-country comparisons and guarantees the random selection of statistical units (individuals) in accordance with the EU regulations.[6]

The original sample contained cases of missing information in two of our study variables: self-rated health and mental health (see appendix, table A10). These cases were dropped from the analysis when studying these two variable outcomes, and hence our analytical sample does not contain them. In the Conclusion section, we discuss the limitations of this methodological decision. We also tested imputations in the data, but this would have added other biases in the interpretation of the results that we aimed to avoid.

Results

Descriptive results

Table 1 reveals important differences in the prevalence of young adult carers in Europe. The highest percentage is found in Iceland (25.8%), and the lowest in Spain (4.4%). Although this may seem counterintuitive, because Spain is a highly familialistic country where families are the main care providers, this result may be explained by self-reporting issues. One interpretation for this could be that people are more likely to be carers in countries where high levels of state support means care is manageable alongside other responsibilities, but when we focus on the intensity, intensive care is more common in countries with less state support.

Regarding gender differences, men and women tend to record a similar prevalence of providing care, although females tend to be slightly more likely to take up care of a dependent adult except in the Czech Republic (7.2% women and 9.7% men), Estonia (6.4% women and 7.6% men), Latvia (7% and 9%), Norway (10.6% and 11%), and Sweden (5.4% and 6.5%). Nonetheless, the differences are rather small.

Being in NEET status is generally higher in Belgium, Greece, Spain, and Ireland. In these countries, the percentage of NEET is above 30% for carers, and above 20% among non-carers, and the difference is statistically significant in all cases (see appendix, table A2).

Similarly, the percentage of young adult carers perceiving bad health and reporting worse mental health is also higher than those young adults who do not take up care of dependent relatives. The gap in self-rated health is particularly high in Belgium (5.5% of non-cares vs. 18.6% of carers), Denmark (15.3% vs. 24.5%), Hungary (12.2% vs. 25.3%), Ireland (5.4% vs. 29.2%), the Netherlands (12.7% vs. 22.9%), Portugal (14.3% vs. 22.4%), Slovenia (18.7% vs. 28.3%), and the UK (8.5% vs. 17.2%). The carers and non-carers gap regarding worse mental health is remarkable in Belgium (5.7% of no-carers vs. 12.5% of carers), Denmark (14.2% of non-carers vs. 24.7% of carers), Estonia (9.7% vs. 12.3%), Latvia (4.4% vs. 10.6%), Luxembourg (11.9% vs. 18.1%), the Netherlands (9.6% vs. 16.9%), Norway (8.2% vs. 15.9%), and in Sweden where we find the largest gap (15% vs. 30.4%).

Finally, there is an educational difference, especially in France (33.3%) and the Nordic countries, where carers seem to be low educated, and the difference with non-carers is statistically significant (31.3% in Denmark, 29% in Finland, and 33.3% in Sweden). The percentage of low-educated carers is also high in Iceland (35.5%) and Norway (36.1%), however in these countries the difference with non-carers is not significant (see appendix A2), and the percentage of low-educated young adults is generally higher than in other countries of the sample.

Table 2 shows the percentage of young adult carers according to the intensity of care. Overall, young adult carers who care usually care for less than 10 hours a week, and only in the UK, Hungary, and Portugal, we find more than 2% of carers devoting more than 20 hours. Again, we find similar percentages between men and women when looking at the intensity of care, but, in general, slightly more women than men report taking up for care (11.9% of women and 9.4% of men). In addition, marginally more women than men tend to record higher percentages of very intense caring (more

Table 1. Descriptive statistics for main individual variables.

Country	Year	% of young adults		N young adults		% Young adults carers		% of young NEET		% of primary and lower secondary education among young adults		Mean number of persons living in the household		% of immigrant-born young adults		Prevalence of fair/bad self-perceived health		Prevalence of worse mental health scores	
		Non-carers	Carers	Non-carers	Carers	Women	Men	Non-carers	Carers	Non-carers	Carers	Non-carers	Carers	Non-carers	Carers	Non-carers	Carers	Non-carers	Carers
AT	2019	90.73	9.27	2,049	244	11.34	7.33	14.74	14.42	11.85	7.31	3.2	3.2	19.2	12.84	8.35	9.19	3.92	4.76
BE		92.64	7.36	1,276	111	8.51	6.29	7.66	11.31	20.07	23.52	3.2	2.02	17.19	13.48	5.46	18.59	5.67	12.51
BG		93.34	6.66	778	51	8.82	4.76	24.35	30.46	20.74	21.74	4.0	3.9	0.25	1.6	3.0	2.12	0.72	No obs*
CZ		91.52	8.48	792	70	7.18	9.7	15.58	17.87	18.14	10.01	3.2	2.6	4.91	No obs*	6.16	3.44	1.54	No obs*
DE	2020	82.82	17.18	1,778	323	19.2	15.38	10.14	9.25	21.31	20.27	2.8	3.01	12.17	10.34	12.5	13.22	9.26	11.07
DK	2019	83.76	16.24	651	129	17.32	15.11	9.01	18.21	14.71	31.26	2.8	3.02	8.77	14.44	15.26	24.53	14.22	24.75
EE		92.96	7.04	566	44	6.42	7.63	14	12.58	23.54	38.78	2.7	3.03	2.08	1.48	15.73	12.46	9.66	12.26
EL		92.56	7.44	682	51	9.29	5.75	23.5	32.4	6.66	3.99	2.8	3.2	7.21	9.06	2.61	9.38	0.22	2.42
ES	2011–12	93.12	6.88	1,935	151	6.99	6.77	23.95	33.39	25.64	25.94	2.5	3.1	10.12	8.23	11.54	13.62	2.30	4.29
FI	2019	89.51	10.49	568	62	10.92	10.07	11.82	13.82	25.10	28.93	2.7	3.2	10.85	4.83	17.66	18.82	11.96	14.47
FR		81.21	18.79	1,656	411	19.69	17.9	12.04	15.73	25.12	33.33	2.7	2.8	9.41	6.42	10.64	12.68	10.04	15.03
HR		85.42	14.58	502	96	18.37	9.61	24.45	25.18	11.78	14.54	4.8	4.8	4.24	2.36	4.8	4.64	1.31	6.86
HU		91.4	8.6	679	67	8.17	8.99	17.58	32.7	19.36	26.18	3.5	3.4	3.07	2.96	12.18	25.33	4.91	3.9
IE		93.82	6.18	725	50	6.16	6.2	31.84	35.91	5.28	4.97	3.1	3.5	23.73	29.17	5.37	29.18	6.01	8.39
IS		74.18	25.82	414	125	25.87	25.77	6.15	9.02	24.17	35.49	3.7	3.4	19.41	10.31	15.2	19.79	11.48	13.9
IT		93.0	7.0	5,377	457	8.01	6.06	24.33	25.43	23.72	17.13	3.03	3.6	12.69	7.53	5.77	6.1	1.89	2.83
LT		91.99	8.01	553	47	6.99	8.97	14.06	21.99	11.01	7.68	3.3	3.7	1.86	No obs*	12.59	13.61	4.43	10.62
LU		92.42	7.58	594	50	7.83	7.34	10.06	5.59	15.06	12.33	3.2	3.1	35.04	13.79	15.83	14.79	11.92	18.12
LV	2019	90.02	9.98	759	79	11.2	8.91	15.7	14.33	21.34	20.74	3.1	3.3	2.71	3.05	15.75	17.01	3.22	4.91
NL		93.64	6.36	1,155	78	7.02	5.71	6.76	5.63	18.7	21.96	3.6	3.3	10.47	9.71	12.67	22.87	9.58	16.95
NO		89.16	10.84	1,237	152	10.63	11.04	7.28	10.05	35.35	36.12	3.1	2.8	No info	No info	13.42	20.2	8.24	15.91
PL		93.88	6.12	2,187	162	7.27	5.02	15.2	21.07	15.01	19.55	3.7	3.6	1.3	No obs*	7.07	14.17	0.99	0.86
PT		93.13	6.87	1,174	89	10.59	3.24	12.49	21.1	20.18	19.64	3.1	3.2	7.91	4.47	14.29	22.42	3.97	6.84
RO		94.3	5.7	1,755	105	7.29	4.26	19.61	21.06	21.82	22.57	3.7	3.7	0.11	No obs*	2.09	1.37	0.39	1.78
SE		93.94	6.06	1,416	94	5.45	6.65	11.87	18.15	23.57	33.3	3.2	3.3	16.76	39.96	18.7	28.31	14.98	30.36
SI		87.58	12.42	1,152	164	13.25	11.64	7.62	9.73	14.39	13.89	3.8	4.1	7.59	6.33	9.35	9.41	8.15	6.54
SK	2013	92.33	7.67	605	49	8.54	6.88	17.62	11.01	14.02	6.57	3.4	3.4	1.03	0.92	5.39	8.5	0.7	3.25
UK		89.75	10.25	1,334	151	12.19	8.27	14.88	26.4	14.09	19.68	3.4	3.2	13.14	12.18	8.54	17.24	4.28	5.6
N				38,011	3,569														

Table 2. Proportion of young adults according to the intensity of care in each of the study countries.

	All young Adults (%)				Women (%)				Men (%)			
	No care	Less than 10	10–20	More than 20	No care	Less than 10	10–20	More than 20	No care	Less than 10	10–20	More than 20
AT	90.73	7.74	0.72	0.81	88.66	9.7	0.82	0.82	92.67	5.9	0.64	0.8
BE	92.64	6.09	0.96	0.31	91.49	7.37	0.7	0.44	93.71	4.9	1.2	0.19
BG	93.34	4.63	1.06	0.78	91.18	5.9	1.06	1.44	95.24	3.51	1.05	0.2
CZ	91.52	7.25	1.09	0.14	92.82	6.49	0.42	0.28	90.3	7.98	1.72	0.0
DE	82.82	12.35	3.47	1.3	80.8	12.24	4.78	2.06	84.62	12.45	2.31	0.62
DK	83.76	14.3	0.83	1.0	82.68	15.46	0.62	1.03	84.89	13.09	1.05	0.97
EE	92.96	5.57	0.77	0.7	93.58	5.44	0.7	0.28	92.37	5.69	0.84	1.1
EL	92.56	4.57	1.2	1.46	90.71	6.44	1.45	1.4	94.25	2.86	0.98	1.51
ES	95.61	2.17	0.73	1.5	94.93	3.26	0.43	1.38	96.27	1.12	1.01	1.61
FI	89.51	8.69	0.77	0.83	89.08	9.16	0.78	0.98	89.93	8.22	0.76	0.68
FR	81.21	16.9	0.7	1.19	80.31	17.29	0.69	1.7	82.1	16.5	0.71	0.69
HR	85.42	8.5	3.2	2.43	81.63	10.45	3.28	3.84	90.39	5.93	3.1	0.58
HU	91.4	6.83	0.61	0.32	91.83	6.02	0.68	0.23	91.01	7.58	0.55	0.41
IE	93.82	4.3	0.6	1.29	93.84	3.95	0.79	1.42	93.8	4.65	0.4	1.15
IS	74.18	21.44	3.89	0.36	74.13	22.31	3.32	0.24	74.23	20.5	4.5	0.5
IT	93.00	4.64	1.1	1.14	91.99	5.08	1.23	1.51	93.94	4.23	0.97	0.8
LT	91.99	7.15	0.68	0.19	93.01	5.89	0.71	0.39	91.03	8.31	0.65	0.0
LU	92.42	4.65	0.91	1.47	92.17	4.94	0.97	1.69	92.66	4.37	0.85	1.26
LV	90.02	8.21	0.88	0.89	88.8	8.59	1.34	1.26	91.09	7.87	0.47	0.57
NL	93.64	5.27	0.7	0.31	92.98	5.84	0.91	0.28	94.29	4.72	0.51	0.34
NO	89.16	8.16	0.79	0.87	89.37	7.82	0.87	1.08	88.96	8.48	0.73	0.67
PL	93.88	3.34	1.26	0.41	92.73	4.06	1.75	0.5	94.98	2.65	0.8	0.33
PT	93.13	4.1	0.37	2.41	89.41	5.75	0.59	4.24	96.76	2.47	0.15	0.62
RO	94.3	4.12	0.63	0.72	92.71	4.25	1.25	1.36	95.74	3.99	0.08	0.13
SE	93.94	3.49	1.15	1.12	94.55	3.18	1.28	1.00	93.35	3.79	1.03	1.24
SI	87.58	9.88	1.26	0.76	86.75	10.31	1.43	1.42	88.36	9.48	1.1	0.13
SK	92.33	6.14	0.5	1.03	91.46	6.37	0.56	1.61	93.12	5.93	0.44	0.52
UK	89.75	6.47	1.45	2.3	87.81	6.88	1.73	3.51	91.73	6.05	1.17	1.05
Total	89.37	7.83	1.40	1.23	88.11	8.28	1.69	1.73	90.56	7.41	1.12	0.75
N	38,011	2,706	410	384	17,167	1,473	227	257	17,041	1,233	183	127

Source: European Health Interview Survey wave 3, UK: wave 2, ES: Encuesta Nacional de Salud 11–12.

than 20 hours/week), especially in Germany (2.1% of females), the UK (3.5%) Hungary (3.8%) and Portugal (4.2%).

Multilevel Analysis

The empty model in Table 3 (Model 0) reveals that NEET status varies between individuals as well as between countries; the intraclass correlation coefficient (0.07) implies that 7 percent of the variance in NEET status can be attributed to the country level, and the remaining 93 percent to the individual level. Model 1 estimates the effect of the intensity of caregiving on NEET controlled for all individual variables. It shows that only those who care intensively (more than 10 hours per week) are more likely to be in NEET status than non-carers. For those caring for less than 10 hours, there is a positive association between providing care and being NEET compared to non-carers, but the estimates do not reach statistical significance at 95% confidence interval. In this model, country-level variance is 0.20, and the interclass correlation reveals that 6 percent of the variance can be attributed to the country level. Thus, there is a slight impact of compositional effects of all control variables included in Model 1 as the ICC of Model 1 compared to the empty model is reduced.

Model 2 adds information on formal long-term care resources available in each country, as well as youth unemployment rates. Both indicators are statistically associated with NEET status. For each additional unit of the LTC index, the odds of being in NEET status lowers by 7 percent. In contexts with more generous state support for care, the probability of being NEET is thus lower than in contexts in which state support is scarcer. The impact of youth unemployment is

Table 3. Multilevel logistic regression on the odds of being NEET.

		Model 0			Model 1			Model 2			Model 3		
		OR	SE	P-value	OR	SE	p-value	OR	SE	p-value	OR	SE	p-value
Intensity of care (No care)	Less than 10 hours				1.08	0.06	0.176	1.08	0.06	0.170	1.09	0.12	0.425
	10–20 hours				1.32	0.17	0.030	1.32	0.17	0.031	1.19	0.21	0.311
	More than 20 hours				1.51	0.18	0.001	1.51	0.18	0.001	1.31	0.23	0.127
Sex (Men)	Women				1.72	0.05	0.000	1.72	0.05	0.000	1.72	0.05	0.000
Age (18–19)	20–24				2.30	0.12	0.000	2.29	0.12	0.000	2.29	0.12	0.000
	25–29				3.90	0.20	0.000	3.89	0.20	0.000	3.90	0.20	0.000
Education (Primary)	Lower secondary				0.40	0.03	0.000	0.40	0.03	0.000	0.39	0.03	0.000
	Upper secondary				0.18	0.01	0.000	0.18	0.02	0.000	0.18	0.01	0.000
	Tertiary				0.10	0.01	0.000	0.10	0.01	0.000	0.10	0.01	0.000
Household type (One-person)	Lone parent				2.04	0.16	0.000	2.04	0.16	0.000	2.04	0.16	0.000
	Couple without children				0.92	0.07	0.252	0.92	0.07	0.263	0.93	0.07	0.316
	Couple with children				1.67	0.12	0.000	1.67	0.12	0.000	1.66	0.12	0.000
	Other types of HH				1.43	0.11	0.000	1.43	0.11	0.000	1.43	0.11	0.000
Number of persons living in the household					1.14	0.02	0.000	1.14	0.02	0.000	1.14	0.02	0.000
Birth Place (Native-born)	Born in EU				1.17	0.10	0.076	1.17	0.10	0.071	1.16	0.10	0.082
	Born outside EU				1.35	0.08	0.000	1.35	0.08	0.000	1.35	0.08	0.000
	No info				0.52	0.22	0.119	0.71	0.24	0.307	0.67	0.18	0.132
Long-term care Index								0.90	0.02	0.000	0.91	0.02	0.000
Youth unemployment								1.16	0.07	0.020	1.18	0.05	0.000
LTC index * Caregiving intensity	Less than 10 hours										1.01	0.04	0.758
	10–20 hours										0.91	0.06	0.199
	More than 20 hours										0.95	0.06	0.411
Constant		0.16	.02	.000	0.11	0.02	0.000	0.11	0.01	0.000	0.11	0.06	0.000
Variance between countries		0.25	0.07		0.20	0.06		0.10	0.03		0.10	0.03	
Intraclass correlation coeff.		0.07	0.02		0.06	0.02		0.03	0.01				
N Respondents								37,146					
N Countries								28					

Source: Wave 3 EHIS, except UK (wave 2) and Spain (ENSE).

also statistically significant and, as expected, each increase in the percentage of youth unemployment, increases the odds of being NEET by 17%. Moreover, the addition of country-level indicators does not seem to alter the direction and magnitude of caregiving intensity, and it also reveals that the variance in NEET attributed to the remaining country differences is reduced to 3. Hence, the three macro-indicators explain part of the country-level variation (a reduction of about 50%).

Finally, in Model 3 we test whether the association between care and NEET status differs by country long-term care resources It tests the moderating impact of the availability of formal care resources on the effect between caregiving and NEET status. Results reveal that the caregiving gap for those who care between 10 and 20 hours or more than 20 hours is reduced the ampler the state resources on long-term care are. In particular, for each additional standard deviation of the LTC index, the likelihood of being NEET lowers by 0.91 for both those who care between 10 and 20 hours and more than 20 hours compared to non-carers, although differences are not statistically significant.

Table 4 shows results for reporting fair or bad self-perceived health. The empty model reveals that 9 percent of the variance in self-perceived health is due to the country level, and 91 percent can be attributed to the individual level. Model 1 shows that carers are more likely to report fair or poor health compared to non-carers, and the associations are statistically significant for all categories of care hours. The inclusion of all individual variables does not change the intraclass correlation coefficient. When we include macro-aggregated indicators in Model 2, the association between caregiving intensity and fair/poor health remains, and we observe a clear gradient in health risk with increasing care hours across models.

Table 4. Multilevel logistic regression on the odds of reporting fair/bad self-perceived health.

		Model 0			Model 1			Model 2			Model 3		
		OR	SE	P-value	OR	SE	p-value	OR	SE	p-value	OR	SE	p-value
Intensity of care (No care)	Less than 10 hours				1.25	0.08	0.001	1.24	0.08	0.001	1.27	0.18	0.099
	10–20 hours				1.46	0.21	0.009	1.45	0.21	0.009	1.37	0.28	0.119
	More than 20 hours				1.62	0.23	0.001	1.62	0.23	0.001	1.59	0.32	0.020
Sex (Men)	Women				1.29	0.05	0.000	1.29	0.05	0.000	1.29	0.05	0.000
Age (18–19)	20–24				0.47	0.03	0.000	0.47	0.03	0.000	0.47	0.03	0.000
	25–29				0.75	0.03	0.000	0.75	0.03	0.000	0.75	0.03	0.000
Education (Primary)	Lower secondary				0.78	0.08	0.021	0.78	0.08	0.019	0.78	0.08	0.021
	Upper secondary				0.46	0.05	0.000	0.46	0.05	0.000	0.46	0.05	0.000
	Tertiary				0.27	0.03	0.000	0.27	0.03	0.000	0.27	0.03	0.000
Household type (One-person)	Lone parent				1.16	0.09	0.067	1.16	0.09	0.065	1.16	0.09	0.067
	Couple without children				0.95	0.07	0.458	0.95	0.07	0.472	0.95	0.07	0.507
	Couple with children				0.98	0.08	0.795	0.98	0.08	0.803	0.98	0.08	0.805
	Other types of HH				1.08	0.09	0.299	1.09	0.09	0.290	1.09	0.09	0.286
Number of persons living in the household					0.95	0.02	0.009	0.95	0.02	0.009	0.95	0.02	0.006
Birth Place (Native-born)	Born in EU				0.87	0.09	0.186	0.87	0.09	0.169	0.87	0.09	0.171
	Born outside EU				0.82	0.06	0.014	0.82	0.06	0.014	0.83	0.07	0.016
	No info				1.04	0.43	0.920	0.91	0.35	0.805	1.04	0.30	0.891
Household income (Below 1st quintile)	1st-2nd quintile				0.87	0.05	0.013	0.87	0.05	0.013	0.87	0.05	0.011
	2nd-3rd quintile				0.75	0.04	0.000	0.75	0.04	0.000	0.74	0.04	0.000
	3rd-4th quintile				0.73	0.04	0.000	0.73	0.04	0.000	0.72	0.04	0.000
	4th-5th quintile				0.57	0.04	0.000	0.57	0.04	0.000	0.57	0.04	0.000
	Unknown				0.69	0.06	0.000	0.69	0.06	0.000	0.70	0.06	0.000
Long-term care Index								1.08	0.05	0.089	1.08	0.04	0.047
Youth unemployment								0.88	0.10	0.258	0.93	0.06	0.275
LTC index * Caregiving intensity	Less than 10 hours										1.02	0.06	0.669
	10–20 hours										1.15	0.09	0.066
	More than 20 hours										0.92	0.07	0.282
Constant		0.11	.01	.000	0.18	0.03	0.000	0.18	0.03	0.000	0.18	0.03	0.000
Variance between countries		0.34	.09		0.32	0.09		0.27	0.08		0.24	0.05	
Intraclass correlation coeff.		0.09	.02		0.09	0.02		0.08	0.03				
N Respondents							35,397						
N Countries							28						

Source: Wave 3 EHIS, except UK (wave 2) and Spain (ENSE).

All carers are more likely to report bad health than those who do not provide care. However, adding standardized measures at the country level lowers the percentage of the variance associated with country level to 8%. In Model 2, we also observe that the LTC index and youth unemployment are not statistically associated with fair/poor self-perceived health. Moreover, the odds ratios for the LTC index and youth unemployment go in unexpected directions, and each additional unit of LTC resources increases the likelihood of reporting poor health among young adults, while each additional unit of youth unemployment lowers it. Nonetheless, our interest lies in knowing whether young adult carers in countries with generous long-term care resources may feel alleviated by them and report better health. Hence, we use the interaction effect in Model 3 to disentangle these associations. We find that while those who care for more than 20 hours a week are more likely to report fair/bad health compared to non-carers in average LTC provision contexts (odds=1.59), long-term care state resources only marginally seem to alleviate this. but as indicated in Table 4, the cross-level interactions are not significant. This may indicate that long-term care resources do not specify differences in the caregiving gap regarding self-perceived health. This gap does not seem to be moderated by a less or more ample state support to LTC.

In Table 5, we show the results for mental health. Model 1 reveals that carers are more likely to report worse mental health than non-carers. The addition of individual-level variables changes the

Table 5. Multilevel logistic regression on the odds of reporting worse mental health scores.

		Model 0			Model 1			Model 2			Model 3		
		OR	SE	P-value	OR	SE	p-value	OR	SE	p-value	OR	SE	p-value
Intensity of care (No care)	Less than 10 hours				1.52	0.12	0.000	1.52	0.12	0.000	1.61	0.30	0.012
	10–20 hours				1.77	0.32	0.001	1.77	0.32	0.002	1.51	0.42	0.138
	More than 20 hours				1.96	0.34	0.000	1.97	0.35	0.000	1.97	0.51	0.008
Sex (Men)	Women				1.84	0.09	0.000	1.84	0.09	0.000	1.84	0.09	0.000
Age (18–19)	20–24				0.86	0.07	0.047	0.86	0.07	0.047	0.86	0.07	0.059
	25–29				0.95	0.05	0.338	0.95	0.05	0.331	0.95	0.05	0.341
Education (Primary)	Lower secondary				0.77	0.12	0.087	0.77	0.12	0.083	0.78	0.12	0.108
	Upper secondary				0.47	0.07	0.000	0.47	0.07	0.000	0.47	0.07	0.000
	Tertiary				0.31	0.05	0.000	0.31	0.05	0.000	0.32	0.05	0.000
Household type (One-person)	Lone parent				1.06	0.11	0.557	1.07	0.11	0.524	1.07	0.11	0.488
	Couple without children				0.73	0.07	0.001	0.73	0.07	0.001	0.73	0.07	0.001
	Couple with children				0.85	0.09	0.118	0.85	0.09	0.128	0.85	0.09	0.138
	Other types of HH				1.10	0.11	0.334	1.11	0.11	0.326	1.09	0.11	0.384
Number of persons living in the household					0.91	0.02	0.000	0.91	0.02	0.000	0.91	0.02	0.000
Birth Place (Native-born)	Born in EU				1.05	0.13	0.698	1.04	0.13	0.725	1.04	0.13	0.768
	Born outside EU				1.08	0.10	0.421	1.08	0.10	0.423	1.08	0.10	0.439
	No info				1.18	0.71	0.778	0.67	0.38	0.480	0.71	0.26	0.348
Household income (Below 1st quintile)	1st-2nd quintile				0.92	0.06	0.211	0.92	0.06	0.218	0.91	0.06	0.199
	2nd-3rd quintile				0.79	0.06	0.001	0.79	0.06	0.001	0.78	0.06	0.001
	3rd-4th quintile				0.67	0.05	0.000	0.67	0.05	0.000	0.66	0.05	0.000
	4th-5th quintile				0.58	0.05	0.000	0.57	0.05	0.000	0.57	0.05	0.000
	Unknown				0.68	0.08	0.002	0.69	0.08	0.002	0.69	0.08	0.002
Long-term care Index								1.28	0.08	0.000	1.30	0.06	0.000
Youth unemployment								0.78	0.12	0.119	0.85	0.08	0.072
LTC index * Caregiving intensity	Less than 10 hours										1.00	0.07	0.943
	10–20 hours										1.09	0.11	0.399
	More than 20 hours										0.98	0.09	0.804
Constant		.05	.01	.000	0.12	0.03	0.000	0.11	0.03	0.000	0.11	0.02	0.000
Variance between countries		1.15	.33		1.10	0.32		0.54	0.16		0.39	0.09	
Intraclass correlation coeff.		0.26	.05		0.25	0.05		0.14	0.04				
N Respondents								34,997					
N Countries								28					

Source: Wave 3 EHIS, except UK (wave 2) and Spain (ENSE).

ICC from 26 to 25 percent. Hence, for the case of mental health, a larger percentage of the country variance is to be explained compared to what we find in the case of NEET status and perceived health.

In model 2, we add the two country-level indicators and find that the LTC index is positively and significantly associated with reporting worse mental health. Hence, the addition of 1 unit in each indicator increases the odds of reporting worse health by 22 percent. Moreover, the addition of these country-level indicators decreases the remaining variance explained on this level to 14 percent (a reduction of 53% in the ICC). Finally, the interaction effect between LTC index and caregiving intensity reveals no significant differences.

Sensitivity analysis

To find a better explanation of our results, we performed a couple of sensitivity analyses. First, we tested the interaction effect between caregiving intensity and types of care regime. Models can be found in the appendix, tables A3-A5. We found that in strong DF/SF countries, caring for more than 10 hours or more goes less often together with being NEET, but more often with fair/bad health and

worse mental health. However, there are some selection issues to consider. In these countries with high state support, those who provide long hours of care and are highly burdened by this task may be more selective than intense carers in the other two regimes. Second, we tested models with and without controlling for education and the interaction effect between care intensity and education (see appendix, Figures A6-A8). Results showed that education explains part of the difference between carers and non-carers, but the amount of state resources does not mediate this relationship. This means that policies targeting carers' education opportunities may be more successful in enhancing future employment opportunities for young adult carers, and their health.

Discussion and conclusions

Summary of results in the context of previous evidence

This paper aimed to obtain a better understanding of how young adult carers in Europe are doing compared to non-carers. In particular, we explore the association between caregiving and NEET status, as well as self-perceived health and mental health using cross-sectional data for Europe.

Overall, we find that carers are more likely to report being in NEET status, fair/bad self-perceived health, and worse mental health than non-carers. Hence, there is a caregiving gap, especially for those who care intensively (more than 20 hours), in each of these outcomes, and these associations were not explained by contextual factors. In addition, we tested under which circumstances this gap holds, and used long-term care resources to study in which contexts the caregiving gap is moderated by the amount of state support. However, the interaction effect between caregiving intensity and LTC resources turned out to be statistically insignificant. This means that while there is an association between caring and the three main studied outcomes, the gap between carers and non-carers is not moderated by the amount of state resources in each of the countries included in the sample.

Regarding NEET status, we found that only those who care intensively (more than 20 hours per week) are significantly more likely to be in NEET status compared to non-carers. In addition, our results show that there are no significant cross-level interactions between care intensity and the amount of LTC resources, but results go in the expected direction: more state resources for long-term care lowers the likelihood of being NEET for those who care more than 10 hours per week. There is no previous work that we are aware of investigating NEET as an outcome for young adult carers, but our findings are in line with the limited existing evidence on other education and employment outcomes for young adult carers in the UK (Brimblecombe et al., 2020; Xue et al., 2023) and Germany (King et al., 2023). These studies used longitudinal nationally representative survey data to show that young adult caring was linked with a decreased likelihood of obtaining a university degree, delays in entering the labour market, and an increased likelihood of entering unemployment, and these associations were particularly pronounced for those caring for more weekly hours or longer durations (Brimblecombe et al., 2020; King et al., 2023; Xue et al., 2023). Previous cross-sectional evidence on this topic has suffered from a lack of comparison group (Sempik & Becker, 2013) or very small sample size (Cass et al., 2009). In qualitative evidence young adult carers in higher education have reported having less time to complete assignments, participate in group activities or prepare for exams, and leaving home for education could be problematic for primary carers (Day, 2015; Kettel, 2018).

With respect to health, carers were more likely to report poor health and have worse mental health than non-carers, regardless of the time devoted. There are very few previous studies on the health of young adult carers, as most studies of care and health have focused on carers aged 45+ years (Lacey et al., 2022), but our results are in line with a few studies using longitudinal, nationally representative surveys which found worsening mental health and increases in poor self-rated health around the transition to care in this age group in the UK (Hirst, 2005, Lacey et al., 2023; Xue et al., 2024), but not in Germany (Xue et al., 2024). This suggests the importance of country context and this is the first study as far as we are aware to compare outcomes for young adult carers across more than

two country contexts. Our analysis suggests that the worse employment, education and health outcomes of those caring most intensively are strongest in countries that invest less in long-term care. This is particularly the case for the likelihood of being NEET and suggests that investment in formal care provision may support young adult carers to more easily combine care with other roles and activities such as education and employment. We find the prevalence of informal care to be generally higher in individualist or 'de-familial' countries and lower in more traditional 'familialist' countries and this is in line with previous work showing that the prevalence of care is higher in countries with more state support, but the prevalence of intensive caring is much lower, as state support enables family members to combine care with employment and other responsibilities (Brandt & Deindl, 2013).

Strengths and limitations

This study suffers from its cross-sectional design, so we are not able to say whether care leads to worse health, education or employment outcomes or whether those with worse health or not in education or employment are more likely to take up care, or both. There was also a high percentage (above 5%) of missing values in some countries for self-rated health (BE 17.67%, BG 4.10%, FI 6.30%, PL 15.58%, UK 5.04%) and mental health (BE 22.3%, BG 6.56%, DK 6.94%, FI 10.99%, HR 5.22%, LT 7.80%, LU 8.77%PL 17.04%, SE 6.49%). Also, it was necessary to use older data for the UK and Spain. However, this is the first study to examine associations between unpaid care and education, employment and health outcomes in early adulthood across European countries, and we were able to use a European survey which includes identical measures across countries. Countries also used random selection methods to ensure samples were as representative as possible.[7] We decided not to impute it because it is safer and could imply important biases in the interpretation of the results.

Finally, we acknowledge that care is complex and some of the detrimental effects of caring for a family member may be the experience of witness a decline in a family member's health or wellbeing. Unfortunately, we cannot observe this with our data, but other studies pointed out that mental health worsens around the transition from not caring to caring (Lacey et al., 2024; Hirst, 2005).

Conclusion

Early adulthood is a pivotal life stage in which care provision is less normative and may impede crucial transitions into adult roles and activities such as employment, partnership, and parenthood. Becoming a carer in this life stage might therefore result in strain and, ultimately, poor mental health and wellbeing. State support for care is likely to be critical in protecting young adults from intensive caring roles and early identification of, and support for, current young adult carers should be made a priority. In addition, provision for country comparative longitudinal European survey data on people under age 50 is imperative for understanding how to improve outcomes for such at-risk groups.

The findings of this study highlight significant challenges faced by young adult carers in Europe, particularly in relation to health, education, and employment outcomes. Young adults can be a valuable asset in the care of an older family member, but caregiving can interfere with the young adult's education, occupation, and social relationships (Fingerman et al., 2024). Addressing these challenges requires comprehensive, cross-sectoral policy interventions that recognize the critical role of caregiving in young adulthood and its impact on broader life trajectories. Policy efforts should focus on increasing state support for long-term care targeting this group, providing mental health and social support, and ensuring that caregiving does not preclude young adults from achieving their educational and employment goals. Previous studies have demonstrated that carers in midlife and later life benefit from tailored interventions and cultural adaptations (Epps et al., 2022; Jang et al., 2024), and interventions for young adults could build on the insights gained from these successful efforts.

Furthermore, fostering intergenerational solidarity through mutual support, knowledge-sharing, and collaboration between generations could help alleviate the strain on young carers while strengthening social cohesion across age groups. This might involve enhancing LTC services for elderly individuals while simultaneously providing younger carers with the financial, emotional, and practical support they need to manage their dual roles as carers and young adults transitioning into education and work.

Notes

1. Austria (AT), Belgium (BE), Bulgaria (BG), Croatia (HR) Czech Republic (CZ), Denmark (DK), Estonia (EE), Finland (FI), France (FR),Germany (DE), Greece (EL), Hungary (HU), Ireland (IE), Iceland (IS), Italy (IT), Lithuania (LT), Luxembourg (LU), Latvia (LV), Netherlands (NL), Norway (NO), Poland (PL), Portugal (PT), Romania (RO), Sweden (SE), Slovenia (SI), Slovak Republic (SK).
2. The UK was not included in EHIS 2019 but participated in the second wave (2013–2014). Spain had no information on mental health in both waves, reason why we relied on the 2011–12 Spanish National Health Survey. The more recent 2019–20 ENSE survey was discarded because of potential bias regarding the care variables due to the COVID-19 pandemic. However, both countries have full information on our key study variables.
3. There are no standard and internationally comparable cut-off points in the literature of mental health (Hoyemans et al., 2004), and studies have used theoretical basis to determine optimal scores (Smits et al., 2008). We opted for dichotomizing our variable on mental health, rather than using it continuously, to give coherence to the analysis of our three outcome variables.
4. In additional analyses (not shown), we tested each of the subcomponents separately and found similar associations than the final Index (available upon request).
5. Youth unemployment is retrieved from Eurostat's yearly averages, available at https://ec.europa.eu/eurostat/cache/metadata/en/employ_esms.htm. We selected 2018, which is a year before the survey for all countries except for Germany. In this country, EHIS was conducted in 2020. For the UK and Spain, youth unemployment data corresponds to 2012.
6. Commission Regulation (EU) No. 2018/255 available on [https://ec.europa.eu/eurostat/cache/metadata/en/hlth_det_esms.htm#conf1721223098256]
7. Information on EHIS microdata available at [https://ec.europa.eu/eurostat/web/microdata/european-health-interview-survey]

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References

Becker, F., & Becker, S. (2008). *Young adult carers in the UK: Experiences, needs and services for carers aged 16-24*. The Princess Royal Trust for Carers.

Becker, S., & Sempik, J. (2018). Young adult carers: The impact of caring on health and education. *Children & Society*, *33* (4), 377–386. https://doi.org/10.1111/chso.12310

Bengtson, V. L., & Roberts, R. E. L. (1991). Intergenerational solidarity in aging families: An example of formal theory construction. *Journal of Marriage and the Family*, *53*(4), 856–870. https://doi.org/10.2307/352993

Brandt, M., & Deindl, C. (2013). Intergenerational transfers to adult children in europe: do social policies matter? *Journal of Marriage & Family*, *75*(1), 235–251. https://doi.org/10.1111/j.1741-3737.2012.01028.x

Brimblecombe, N., Knapp, M., King, D., Stevens, M., & Cartagena Farias, J. (2020). The high cost of unpaid care by young people: Health and economic impacts of providing unpaid care. *BMC Public Health*, *20*(1), 1–11. https://doi.org/10.1186/s12889-020-09166-7

Cass, B., Smith, C., Hill, T., Blaxland, M., & Hamilton, M. (2009). Young carers in Austratlia: Understanding the advantages and disadvantages of their caregiving. *SSRN Electronic Journal*, (38), 132 pages. https://doi.org/10.2139/ssrn.1703262

Chevrier, B., Lamore, K., Untas, A., & Dorard, G. (2022). Yound adult carers' identification characteristics and support: A systematic review. *Frontiers in Psychology*, *13*, 1–17. https://doi.org/10.3389/fpsyg.2022.990257

Coleman, J. S. (1990). *Foundations of Social Theory*. Harvard University Press.

Day, C. (2015). Young adult carers: A literature review informing the re-conceptualization of young adult caregiving in Australia. *Journal of Youth Studies*, *18*(7), 855–866. https://doi.org/10.1080/13676261.2014.1001826

Day, C. (2019). An empirical case study of young adult carers' engagement and success in higher education. *International Journal of Inclusive Education*, *25*(14), 1597–1615. https://doi.org/10.1080/13603116.2019.1624843

Dellman-Jenkins, M., & Blankmeyer, M. (2009). Emerging and young adulthood caregiving. In K. Shifren (Ed.), *How caregiving affects development: Psychological implications for child, adolescent, and adult caregivers* (pp. 93–118). American Psychological Association.

DiGessa, G., Xue, B., Lacey, R., & McMunn, A. (2022). Young adult carers in the UK – New evidence from the UK Household Longitudinal Study. *International Journal of Environmental Research and Public Health*, 19(21), 14076.

Epps, F., Moore, M., Chester, M., Gore, J., Sainz, M., & Adkins, A. , Clevenger, C. Aycock, D. (2022). The alter program: A nurse-led, dementia-friendly program for african american faith communities and families living with dementia. *Nursing Administration Quarterly*, *46*(1), 72. https://doi.org/10.1097/NAQ.0000000000000506

Feng, Z., Everignton, D., Ralston, K., Dibben, C., Raab, G., & Graham, E. (2015). *Consequences, Risk Factors and Geography of Young People Not in Education, Employment or Training (NEET)*. Scottish Government.

Fingerman, K. L., Zhou, Z., Haley, W. E., & Zarit, S. H. (2024). Young adult caregivers for older family members: Setting a new research agenda. *Innovation in Aging*, igae112. https://doi.org/10.1093/geroni/igae112

Fleitas Alfonzo, L., Singh, A., Disney, G., Ervin, J., & King, T. (2022). Mental health of young informal carers: A systematic review. *Social Psychiatry & Psychiatric Epidemiology*, *57*(12), 2345–2358. https://doi.org/10.1007/s00127-022-02333-8

Gallagher, S., Daynes-Kearney, R., Bowman-Grangel, A., Dunne, N., & McMahon, J. (2021). Life satisfaction, social participation and symptoms of depression in young adult carers: Evidence from 21 European countries. *International Journal of Adolescence and Youth*, *27*(1), 60–71. https://doi.org/10.1080/02673843.2021.2025115

Hamilton, M. G., & Adamson, E. (2013). Bounded agency in young carers' life course-stage domains and transitions. *Journal of Youth Studies*, *16*(1), 101–117. https://doi.org/10.1080/13676261.2012.710743

Haugland, B. S. M., Hysing, M., & Sivertsen, B. (2020). The burden of care: A national survey on the prevalence, demographic characteristics and health problems among young adult carers attending higher education in Norway. *Frontiers in Psychology*, *10*, 2859. https://doi.org/10.3389/fpsyg.2019.02859

Hirst, M. (2005). Carer distress: A prospective, population-based study. *Social Science & Medicine*, *61*(3), 697–708. https://doi.org/10.1016/j.socscimed.2005.01.001

Hoyemans, N., Garssen, A. A., Westert, G. P., Verhaak, P. F., Brandli, O., Lichtenschopf, A., Guyatt, G. H., & Schunemann, H. J. (2004). Measuring mental health of the Dutch population: A comparison of the GHQ-12 and the MHI-5. *Health and Quality of Life Outcomes*, *2*(1), 1–6. https://doi.org/10.1186/1477-7525-2-1

Jang, Y., Hepburn, K., Haley, W. E., Park, J., Park, N. S., Ko, L. K., & Kim, M. T. (2024). Examining cultural adaptations of the savvy caregiver program for Korean American caregivers using the framework for reporting adaptations and modifications-enhanced (FRAME). *BMC Geriatrics*, *24*(1), 79. https://doi.org/10.1186/s12877-024-04715-w

Kettell, L. (2018). Young adult carers in higher education: The motivations, barriers and challenges involved – a UK study. *Journal of Further Education*, *44*(1), 100–112. https://doi.org/10.1080/0309877X.2018.1515427

King, M. K., Xue, B., Lacey, R., DiGessa, G., Wahrendorf, M., McMunn, A., & Deindl, C. (2023). Does young adulthood caring influence educational attainment and employment in the UK and Germany? *Journal of Social Policy*, 1–21. Published online.https://doi.org/10.1017/S0047279423000454

Lacey, R. E., Xue, B., DiGessa, G., Lu, W., & McMunn, A. (2023). Mental and physical health changes around transitions into unpaid caregiving in the UK: A longitudinal, propensity score analysis. *Lancet Public Health*, *9*(1), E16–E25. https://doi.org/10.1016/S2468-2667(23)00206-2

Lacey, R. E., Xue, B., & McMunn, A. (2022). The mental and physical health of young carers: A systematic review. *Lancet Public Health*, *7*(9), E787–E796. https://doi.org/10.1016/S2468-2667(22)00161-X

Maguire, S. (2018). Who cares? Exploring economic inactivity among young women in the NEED group across England. *Journal of Education & Work*, *31*(7), 660–675. https://doi.org/10.1080/13639080.2019.1572107

Meuleman, B., & Billiet, J. (2009). A Monte Carlo sample size study: How many countries are needed for accurate multilevel SEM? *Survey Research Methods*, *3*(1), 45–58.

Pennoni, F., & Bal-Domańska, B. (2022). NEETs and youth unemployment: A longitudinal comparison across European countries. *Social Indicators Research*, *162*(2), 739–761. https://doi.org/10.1007/s11205-021-02813-5

Pope, N. D., Baldwin, P. K., Gibson, A., & Smith, K. (2022). Becoming a Caregiver: Experiences of young adults moving into family caregiving roles. *Journal of Adult Development*, *29*(2), 147–158. https://doi.org/10.1007/s10804-021-09391-3

Rentería, E., Lozano, M., Spijker, J. (2023). The consequences of caring on health during early adulthood in Spain. *Journal of Youth Studies*, *0*, 1–17. https://doi.org/10.1080/13676261.2023.2280850

Sempik, J., & Becker, S. (2013). *Young adult carers at college and university*. Carers Trust.

Shifren, K., & Kachorek, L. (2003). Does early caregiving matter? The effects on young caregivers' adult mental health. *International Journal of Behavioral Development*, *27*(4), 338–346. https://doi.org/10.1080/01650250244000371

Smits, N., Smit, F., Cuijpers, P., & De Graaf, R. (2008). Using decision theory to derive optimal cut-off scores of screening instruments: An illustration explicating costs and benefits of mental health screening. *International Journal of Methods in Psychiatric Research*, *16*(4), 219–229. https://doi.org/10.1002/mpr.230

Tseliou, F., Rosato, M., Maguire, A., Wright, D., & O'Reilly, D. (2018). Variation of caregiver health and mortality risks by age: A census-based record linkage studies. *American Journal of Epidemiology*, *187*(7), 1401–1410. https://doi.org/10.1093/aje/kwx384

Van Damme, M., & Spijker, J. (2023). Country differences in long-term care institutions: Towards a care regime typology. *OSF Preprints*. https://doi.org/10.31219/osf.io/xcjaq

Verbakel, E. (2018). How to understand informal caregiving patterns in Europe? The role of formal long-term care provisions and family care norms. *Scandinavian Journal of Public Health*, *46*(4), 436–477. https://doi.org/10.1177/1403494817726197

Wiemers, E. E. (2014). The effect of unemployment on household composition and doubling up. *Demography*, *51*(6), 2155–2178. https://doi.org/10.1007/s13524-014-0347-0

Xue, B., King, M., Deindl, C., Lacey, R., DiGessa, G., & McMunn, A. (2024). Do health and wellbeing change around the transition to informal caring in early adulthood? A longitudinal comparison between the united kingdom and germany. *Journal of Adolescent Health*, *74*(5), 885–891. https://doi.org/10.1016/j.jadohealth.2023.11.398

Xue, B., Lacey, R. E., DiGessa, G., & McMunn, A. (2023). Does providing informal care in young adulthood impact educational attainment and employment? *Advances in Life Course Research*, *56*, 100549. https://doi.org/10.1016/j.alcr.2023.100549