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## Do Health and Well-Being Change Around the Transition to Informal Caring in Early Adulthood? A Longitudinal Comparison Between the United Kingdom and Germany

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### ABSTRACT

**Purpose:** Providing care in early adulthood may have long-term consequences, given the importance of this life stage for life-course transitions. This study aimed to analyze how the transition into caring during young adulthood (17–29 years old) influenced health and life satisfaction in the United Kingdom and Germany.

**Methods:** Datasets were from 10 annual waves of the UK Household Longitudinal Study and the German Socioeconomic Panel between the years 2009–2018. We used propensity score matching to match young adult carers (YACs) to similar noncarers to address the endogeneity of unpaid care provision. Then we applied piecewise growth curves to observe changes in self-rated health (United Kingdom N = 2,851; Germany N = 454) and life satisfaction (United Kingdom N = 2,263; Germany N = 449) between YAC and noncarers before, during, and after the onset of care. We assessed carer status, weekly hours spent on care, and duration of care.

**Results:** In the United Kingdom, life satisfaction decreased and the probability of reporting poor health increased after becoming a YAC, particularly for those who reported caring for more weekly hours. However, no such differences were found between YAC and noncarers in Germany.

**Discussion:** The onset and intensity of caring responsibilities during early adulthood influenced health and life satisfaction in the United Kingdom but not in Germany. One possible interpretation for these differences may be attributed to the different welfare contexts in which YACs are providing informal care. Our results highlight the importance of identifying and supporting the needs of young adults who are providing informal care while making key life-course transitions.

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### IMPLICATIONS AND CONTRIBUTION

Transitions into caring responsibilities during early adulthood influenced health and life satisfaction in the United Kingdom, especially for those caring for more weekly hours, but this was not seen in Germany. These findings highlight the importance of country contexts and the need to identify and support young adult carers early on in their caregiving roles.

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Studies on the provision of informal care have concentrated on middle- or older-aged carers, with few focused on informal young adult carers (YACs). YACs are young adults, typically between 18 and 25 years old, who provide unpaid care to friends or family members (such as parents, grandparents, siblings, and

children) who have illness, disability, problems related to old age, and other conditions [1]. YACs are an important but under-recognized group that often lacks sufficient support [2]. Providing informal care may represent a non-normative life-course experience for young adults and thus may influence their health and well-being [3]. YACs are more likely to live in socio-economically disadvantaged circumstances and are less likely to have a university degree compared to other young adults [4,5]. In terms of health and well-being, previous cross-sectional studies found that YAC had poorer mental health [2–7], worse quality of sleep [2], more psychosocial problems [8], a higher prevalence of smoking [9], and lower life satisfaction [3] than noncarers. Recent reviews on the mental health of YAC aged 18–25 years old and those under 18 years old reported similar results [9–11]. These reviews also underlined the lack of longitudinal data investigating the outcomes of YAC [10,11]. A study using the UK Household Longitudinal Study (UKHLS) found that YAC reported worse mental and physical health than noncarers one year later, but this study did not analyze the potential long-term impact of caring responsibilities nor assess the effect of long-duration care [6].

An important insight from research on the effects of informal care on mental health is that high-intensity care is associated with even worse mental health outcomes [7]. Similar findings regarding YAC can be found in Haugland et al.'s work on the link between YAC and increased depressive symptoms [8], as well as Grenard et al.'s finding that YAC's mental distress is correlated with weekly caring hours [9]. Despite the cross-sectional design of these studies on YAC, the intensity of caring may be especially important as it is often tied to the gender of the caregiver, with studies pointing towards women providing high-intensity and long-duration care more often than men [10].

Furthermore, it is important to analyze the outcomes of the provision of YAC in the context of welfare states, care-related policies, and institutional settings in which care is being provided and which shape the provision and outcomes of informal caregiving [11]. One framework for considering the position of young adults in different welfare states is Chevalier's typology of youth welfare citizenship [12]. Chevalier analyzed how young adults are positioned in and have access to educational-related networks, social, and family policies, and how their transition into paid employment is structured by different school-to-work and (un)employment policies, as well as the distribution and acquisition of relevant work-related skills [12]. The United Kingdom, in this typology, is an example of an individualized welfare state with selective educational and training policies as well as unemployment policies aiming at lowering the labor costs of young adult labor. Germany is characterized by its familiarized and encompassing educational and training policies and unemployment policies aimed at enhancing the human capital of young adults. Similarly, while care-related policies tend to target informal caregivers in the United Kingdom, in Germany they tend to target the recipients of (informal) care and have a greater emphasis on subsidiary care relations that favor a combination of familiarized care provision and public care services (instead of market-oriented solutions like in the United Kingdom) [11,13]. As a result, the characteristics of YAC may differ between the United Kingdom and Germany, and the different country contexts may additionally structure the provision of care itself, e.g., incentivizing YAC in the United Kingdom to become "primary carers" due to a lack of sufficient resources compared to Germany, where YACs are more likely to become "secondary

carers" next to other (public) care services or their parents or other relatives.

### *This study*

This study aimed to analyze the effect of becoming an informal carer during 17–29 years of age on the health and life satisfaction of young adults in the United Kingdom and Germany, using 2009–2018 data from the longitudinal UKHLS and German Socioeconomic Panel (GSOEP) datasets. For this study, in comparison to other studies that usually analyze YAC aged 18–25 years old, we used a wider age range to reflect the extension of the life course period of young adulthood for the past few decades [13]. We used propensity score matching (PSM) to match carers to similar noncarers and to compare differences in the health and life satisfaction between carers and noncarers before, during, and after the onset of care, as well as the differences by care intensity and duration.

### *Data*

Both datasets used for this study are ongoing, nationally representative household panel studies, including information on social, economic, health-related, and behavioral factors [14,15]. In the UKHLS, about 40,000 households have been interviewed annually since 2009. The GSOEP, started in 1984, has offered yearly information for 15,000 households since 2009. For this study, we purposefully used prepandemic data only, as the nature of caring may have been different during the COVID-19 pandemic and data were collected in different ways during the pandemic. The household response rate by 2018 was 65.4% for UKHLS and 85.3% for GSOEP [15,16]. Both datasets are household studies, and thus institutional populations (e.g., students in university halls, people in care homes, and prisons) are not part of the sample. Datasets are available to researchers by registering at the UK Data Service for UKHLS and for registered users at the Research Data Center of the German Socio-Economic Panel. Our research is classified as exempt from ethical approval from the University College London Research Ethics Committee, as both datasets are secondary and it is not possible to identify individuals from the information provided.

### *Sample Selection*

Our analytic sample consisted of YAC and their matched noncarers (see details in the Statistical Method section below). We limited our sample to those aged 17–29 years old at any wave of the survey and defined YAC as those who provided care during any wave while between the ages of 17–29 years. To observe the transition of becoming a YAC, we excluded YAC who did not have at least one measure of well-being/health before and after the onset of care. In other words, YAC who cared throughout the survey, who participated in one wave, or who only had information either before or after their onset of care were not included in our sample. We excluded YAC with any missing data on analysis variables (the main source of missing data was due to missing information for self-rated health and life satisfaction). In the next step, we included matched noncarers (for the matching criteria, see the covariates section) with at least one measure of well-being/health before and once after the care onset age of YAC that they are matched to. Due to the matching process, our final sample sizes for the health analysis were 1,817 carers and 1,034

noncarers in the United Kingdom and 279 carers and 175 noncarers in Germany. For life satisfaction analyses, we had 1,435 carers and 828 noncarers in the United Kingdom and 279 carers and 170 noncarers in Germany. Details of sample selection are in [Supplementary Table S1](#).

## Measures

### *Caring characteristics*

We analyzed three caring aspects that were comparable between the two data sets, including carer status, intensity of care, and duration of care. The intensity of care was categorized into no care, regular care (less than 10 hours/week), and intensive care (10 hours/week or more). We used 10 hours/week as the cut-off point, as this is roughly the median level of caring for YAC in both datasets. Duration of care was grouped into no care, caring for only one wave, and caring for two waves or more. Original care-related questionnaires in both datasets and the process of harmonization are shown in [Supplementary Table S2](#).

### *Outcomes*

Our outcomes were life satisfaction and self-rated health, as only these two well-being outcomes were measured in both the United Kingdom and Germany.

### *Life satisfaction*

During each wave, participants were asked about their satisfaction with life overall. The UKHLS used a 7-point Likert scale from completely dissatisfied (1) to completely satisfied (7). The GSOEP used an 11-point Likert scale from completely dissatisfied (0) to completely satisfied (10). To make the variables as comparable as possible, we used z scores (calculated as  $(x - \bar{x}) / \sigma$ ,  $x$  = raw score,  $\bar{x}$  = mean,  $\sigma$  = standard deviation) of life satisfaction.

### *Self-rated health*

During each wave, participants were asked, “In general, would you say your health is” (UKHLS) or “How would you describe your current health?” (GSOEP). Both datasets use 5-point Likert scales (Excellent/Very good/Good/Fair/Poor in the UKHLS and Very good/Good/Satisfactory/Poor/Bad in the GSOEP). Those who reported the lowest 2-point scales (Fair/Poor in the UKHLS or Poor/Bad health in the GSOEP) were considered to have poor health (binary outcome).

### *Covariates*

Covariates for PSM (see below for details) included age, sex, ethnicity (United Kingdom only: White, Black, Indian, Pakistani, Bangladeshi, and other Asian/other), migration (Germany only: yes/no), whether had a university degree, equalized household income quintiles, living with or without a partner, number of biological/adopted/step children under age 16 in the household, parental occupational class when participants were age 14 (United Kingdom) or 15 (Germany), whether living in an urban or rural area, number of waves the cohort member participated in, occupational social class, and employment status. Occupational class was measured by the National Statistics Socio-economic

Classification three-class version (managerial/professional, intermediate, and routine/manual) [17] plus a ‘currently not working’ category. For the German analysis, we transformed Erikson-Goldthorpe schemes (based on ISCO88-scores) to match the UK classification [18]. Employment status included working full-time with long hours (40+ hours/week), working full-time (30–40 hours/week), working part-time (<30 hours/week), unemployed, in education and not working, or something else. All the covariates were collected at baseline (i.e., the wave first interviewed).

## Statistical Method

### *Propensity score matching*

This study used PSM in combination with piecewise growth curve models. PSM matched those who become carers to noncarers with similar sociodemographic characteristics (see covariates above) and thus reduced the problems of unequal selection into becoming a YAC (Stata command `psmatch2`) [19]. We performed a 1:1 nearest-neighbor algorithm, and thus, each YAC has a matched noncarer with similar sociodemographic characteristics [20]. To ensure the quality of matching, we used caliper width to define the range within which the propensity scores must fall to be considered a valid match. Caliper of width equal to 0.2 of the standard deviation of the logit of the propensity score was applied [21]. Balance diagnostics for comparing the distribution of baseline sociodemographic characteristics between YAC and matched noncarers are shown in [Supplementary Table S3](#). After the PSM, YAC’s age of onset of caring was applied to their matched noncarers.

### *Piecewise growth curve models*

After the PSM, piecewise growth curve models were used to estimate trajectories of life satisfaction and self-rated health pre- and post-caring transition [22]. Piecewise growth curves reduce the influence of unobserved characteristics by comparing the same group of people before and after the transition [23]. The trajectories of each outcome were centered on the transition into caring for YAC and matched caring transition for noncarers. Multilevel mixed-effects linear regression (Stata command `mixed`) was used for the continuous life satisfaction outcome, and multilevel mixed-effects logistic regression (Stata command `melogit`) was used for the binary self-rated health outcome. The yearly repeated measures of life satisfaction and self-rated health were nested within individuals. Then, the yearly average score of life satisfaction and the yearly probability of reporting poor health, as well as their 95% confidence intervals were calculated using margin.

## Results

### *Descriptive results*

The prevalence of YAC among those aged 17–29 was 16.2% in the United Kingdom and 4.9% in Germany ([Table S2](#)). Descriptive characteristics and balance diagnostics of YAC and their matched noncarers are available in [Table S3](#). In both countries, YACs were more likely to be female, single without any children, in full-time education, and living in urban areas. The majority of YACs were White (in the United Kingdom) and had no migration

background (in Germany). YACs were more likely to live in low-income households in the United Kingdom, which was not the case in Germany. YAC in Germany and the United Kingdom had a similar age (19 vs. 20 years old). Overall, matched noncarers had similar characteristics as YAC, represented by small standardized differences. The only exception was that YACs were more likely to be single than matched noncarers in Germany. Most YAC provided low-intensity care (<10 hours/week) and cared for one wave, but low-intensity care was more prevalent in the United Kingdom (69%) than in Germany (58%), while caring for one wave was more prevalent in Germany (80%) than in the United Kingdom (62%).

### Caring and life satisfaction

Figure 1 shows life satisfaction trajectories before, during, and after the caring transition in the United Kingdom. For YAC, transitions into caregiving occurred between year 0 and year 1 (delineated by two vertical dotted lines). Lower (z) scores represent lower life satisfaction. In the United Kingdom (Figure 1A), there was some evidence that the life satisfaction of YAC started to decrease a year before the transition into caring, and the differences between YAC and noncarers became bigger during the transition into caring. The association between caring and life satisfaction was short-term, as the differences between YAC and noncarers were less marked by year 3.

In Figure 1B, we stratify YAC by the number of hours of care provided per week. Those YAC providing intensive care (10+ hours/week) reported a larger deterioration in life satisfaction than those caring less intensively. The difference between intensive carers and noncarers was more than 0.2-point z score and 0.2 point z score equalizes to 0.3 point raw score [calculated as  $0.2 \times SD$ ]. This is a similar difference between those young adults from the fifth quintile (highest) of household income and those from third quintile of household income (results not shown in the table), suggesting the effect size of becoming a YAC is not small. The deterioration in life satisfaction for those caring intensively persisted several years later.

In Figure 1C, we stratify YAC by care duration. At the time of transition into caring, there was no difference in life satisfaction between those who provided care for a longer duration (two waves or more) versus those who provided care for a shorter duration (1 wave). Longer care duration may have some effect on life satisfaction in the longer term (i.e., deterioration started from year two and persisted several years later), but the effects were

weaker and not significant. Figure 2 shows life satisfaction trajectories in Germany. Only baseline differences between YAC and noncarers were found, and there was no evidence to suggest YAC reported a deterioration in life satisfaction upon becoming a carer in Germany.

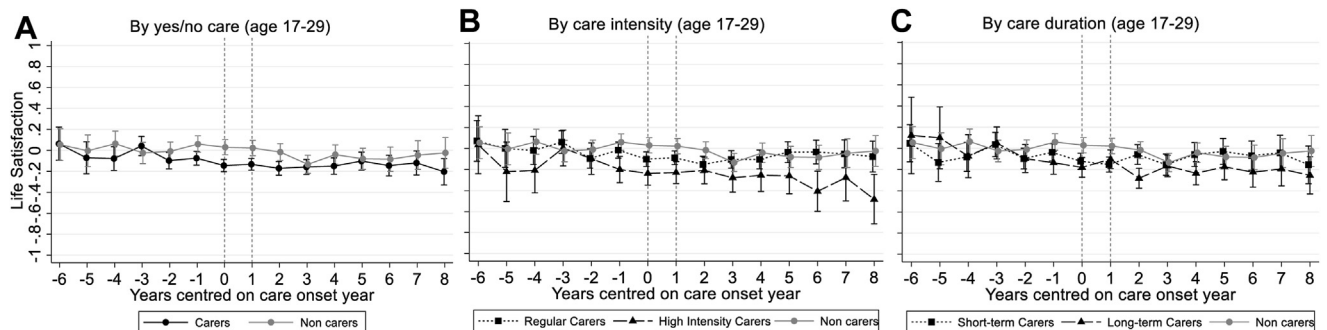
### Caring and self-rated health

Figure 3 shows the probabilities of reporting poor health before, during and after the caring transition in the United Kingdom. In Figure 3A, YAC started with a higher probability of reporting poor health than noncarers at the baseline. Then their differences became very small two years before the onset of caring. Their differences increased again since they uptake caring responsibility. By year 3, YACs were about 7% more likely to report poor self-rated health than noncarers at the same time point. Figure 3B was stratified by the number of hours of care provided per week, and Figure 3C was stratified by care duration. Akin to life satisfaction, the effect of young adulthood caring on self-rated health was larger for those caring intensively. Figure 4 shows the probabilities of reporting poor health in relation to caring transition in Germany, and no difference was found between YAC and noncarers.

## Discussion

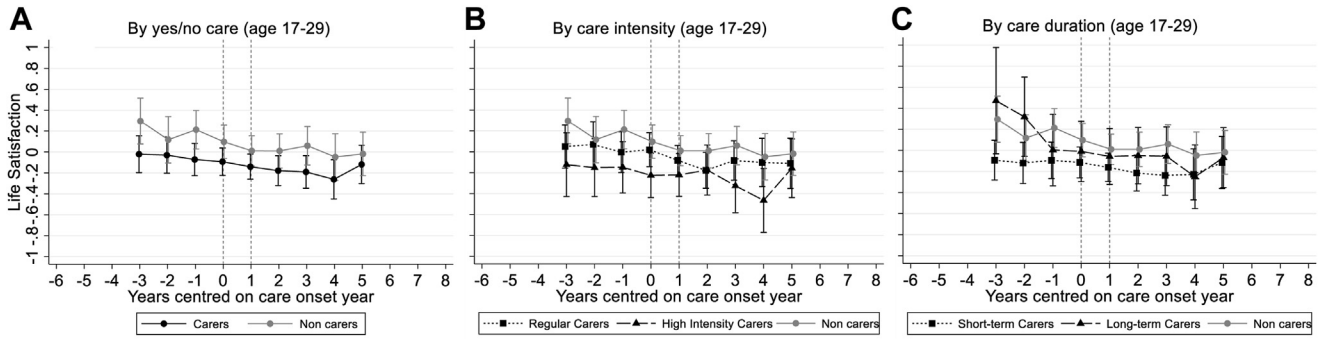
We analyzed how the transition into caring during young adulthood influences life satisfaction and health using longitudinal datasets from the United Kingdom and Germany. In the United Kingdom, life satisfaction decreased and the prevalence of poor health increased shortly after young adults transitioned into care, and these associations were greater for intensive carers (cared for 10 hours or more per week). However, no association between young adulthood caring and life satisfaction or self-rated health was found in Germany.

The United Kingdom results showing lower life satisfaction among YAC support previous findings by Haugland et al [8]. Reasons for the differences in life satisfaction between noncarers and YAC may be due to the care demands restricting available time resources to partake in previous hobbies, meet friends and peers, or pursue educational and employment aspirations [24], which in turn decrease the carer's satisfaction with their current situation and life. Increasing these demands and caring hours thus further restricts available time resources and can further enhance feelings of loneliness of YAC [25], leading to a greater



**Figure 1.** Trajectory of life satisfaction z score before, during, and after the uptake of care by caring characteristics in the United Kingdom. The last year before care was labeled as 'year 0', and the first year of providing care was labeled as 'year 1'. Data were from the UKHLS.



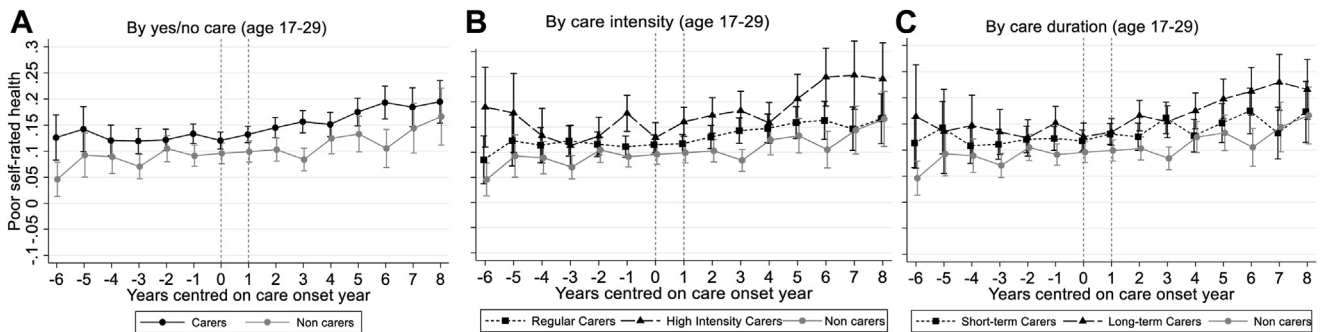


**Figure 2.** Trajectory of life satisfaction z score before, during, and after the uptake of care by caring characteristics in Germany. The last year before care was labeled as ‘year 0’, and the first year of providing care was labeled as ‘year 1’. Data were from the GSOEP.

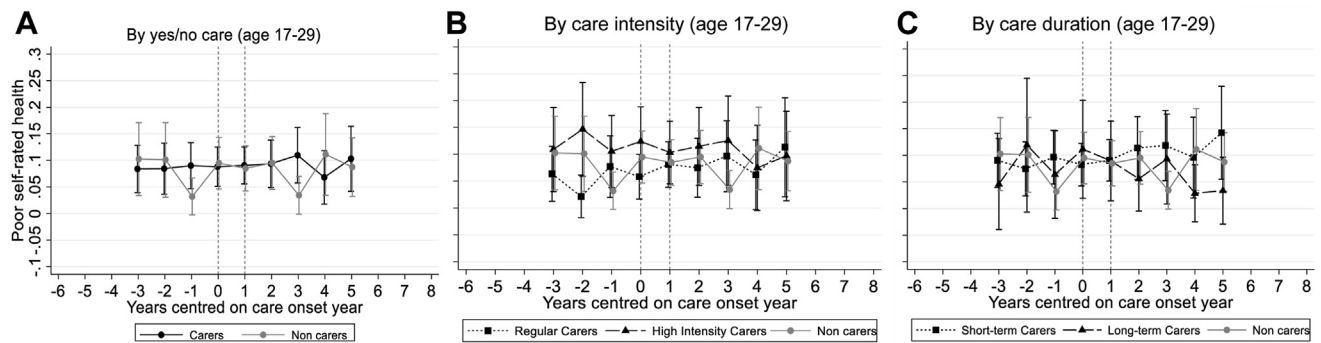
deterioration in life satisfaction. Also, we found a decline in the YAC’s life satisfaction just before the onset of care. It is possible that the pathway into caregiving is not necessarily immediate but may be a process in which prospective carers are able to observe the problems of the prospective care recipients and anticipate their upcoming care needs. Additionally, the deterioration in a parent’s health—for example—can also lead to a decrease in one’s life satisfaction without necessarily anticipating any care needs [26,27].

In terms of the poor self-rated health among YAC in the United Kingdom, possible explanations may lie in the often stressful situations carers can find themselves in, especially if providing care at a high intensity and for a long duration. These situations may be stressful due to a combination of different types of role strains, carer’s and care-recipients’ behaviors, as well as the carer’s self-image and construct [28], and this, as demonstrated by previous studies may lead to worse mental health problems, sleep disturbances, as well as feelings of loneliness and social isolation. YAC also often provides care for a parent or grandparent [5], and the provision of care for a close relative or family member can be emotionally challenging and thus associated with increased stress and reduced well-being [29]. Informal care, especially personal informal care, can also be associated with high levels of physical labor, especially if the carer has to support the care recipient while getting up, leaving the bed, or having to take a shower, and these activities can lead to a multitude of physical problems [30].

One striking difference between the United Kingdom and Germany was that no association between transitions to informal care and changes in health or life satisfaction was found in Germany. One possible explanation may be the different types of youth welfare citizenship in the United Kingdom and Germany, and especially the monitored youth citizenship of the latter ‘protecting’ YAC from the worst effects of informal caring [12]. From this point of view, parents are often expected to provide for their children for longer, and there is also a broad spectrum of public and private care services that care recipients can additionally rely on [11]. Thus, YAC may not be the primary caregivers; rather, they may provide supplementary care to another formal or informal caregiver, and thus they are less affected by the provision of care. This may also explain why YACs are less prevalent and why there is a distinct lack of support policies and intervention strategies aimed at YAC in Germany compared to the United Kingdom [31]. In terms of young adults in the United Kingdom, there is less protection for young adults that is tied to a broader family (and especially parental) network, and young adults (carers) are expected to be more independent [12]. This, in combination with a greater emphasis on personal responsibilities, a smaller public care sector, and less affordable private care services, especially for low-income young adults [13], may lead to additional stressors and a greater overall tendency to be the primary caregiver in the United Kingdom, thus increasing negative effects of caring on YAC’s life satisfaction and health.



**Figure 3.** Trajectory of the probability of reporting poor health before, during, and after the uptake of care by caring characteristics in the United Kingdom. The last year before care was labeled as ‘year 0’, and the first year of providing care was labeled as ‘year 1’. Data were from the UKHLS.



**Figure 4.** Trajectory of the probability of reporting poor health before, during, and after the uptake of care by caring characteristics in Germany. The last year before care was labeled as 'year 0', and the first year of providing care was labeled as 'year 1'. Data were from the GSOEP.

### Strength and limitations

Our data are nationally representative household panel studies in the United Kingdom and Germany. We applied PSM to reduce the selection bias, and the piecewise method assessed changes in health and well-being several years before and following the caring transition. Our study also has some limitations. A key limitation is the smaller sample size in the German analysis, which may explain the nonsignificant results in Germany. This may also be exacerbated by limiting the dataset to only those with well-being/health information before and after the onset of care. Also, our PSM method only included observed confounders and not unobserved confounders. We conducted a sensitivity analysis (see appendix), and the E-value suggested that our association is relatively robust to potential unmeasured confounding [32]. We do not know the caring history of YAC before they enter this survey, nor the reason why YACs are providing care or the health condition of the recipient of care. Our results rely on self-reported information, and some YAC may not self-identify themselves as carers. The life satisfaction was measured in different scales in two datasets. However, high consistency between different scales of life satisfaction has been confirmed in previous research [33]. YAC who provide the most intensive care may not be able to participate in the survey or are perhaps more likely to leave the survey, so our results on YAC may be biased. In addition, although it is important to analyze the effects of the provision of care in the context of different gendered norms and experiences, we decided to exclude a sex-stratified analysis. This decision was based on the aforementioned small sample size in the German analysis, which would have been reduced further in the stratification.

### Conclusions

We found that providing informal care in young adulthood may negatively influence young adults' health and life satisfaction in the United Kingdom but not in Germany. Our study provides new insight into the importance of different types of welfare contexts in which young people are providing care. Our study highlights the necessity of extending the already existing support structures and intervention policies for YAC in the United Kingdom; however, more support and intervention strategies for YAC in Germany are also still needed. Screening for YAC in both countries may be important to better understand YAC's experience in different country contexts. Our analysis has

focused on pre-pandemic. COVID-19 lockdown measures may have increased the caring load and stress for YAC [34,35]. Continued investment in cross-national studies will allow us to better understand how to best provide support to YAC.

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### Supplementary Data

Supplementary data related to this article can be found at <https://doi.org/10.1016/j.jadohealth.2023.11.398>.

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