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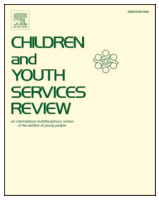

Understanding young caring in the UK pre- and post-COVID-19: Prevalence, correlates, and insights from three UK longitudinal surveys

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ABSTRACT

Background: Despite increasing awareness of young carers in recent years, there remains a significant gap in our understanding of both the prevalence and the characteristics of young carers. Our study aims to address this gap by examining the impact of the COVID-19 pandemic on the prevalence and characteristics of young carers.
Methods: This research utilised data from three UK longitudinal surveys: the UK Household Longitudinal Study (UKHLS), the COVID Social Mobility and Opportunities (COSMO) study, and the Millennium Cohort Study (MCS). We focused on adolescents aged 16–18, and examined two pre-COVID (UKHLS and MCS) and two post-COVID (UKHLS and COSMO) samples.
Results: The prevalence of young carers increased from 8.0 % pre-COVID to 9.8–11.9 % since COVID. Young carers were more commonly found in single-parent and socioeconomically disadvantaged households, with a higher prevalence of young carers in homes where parents were out of paid employment or held lower educational qualifications. Young carers were also more likely to reside in deprived areas. Most young carers engaged in low-intensity caring (< 10 h/week), but post-COVID there was an increase in high-intensity caring (10 + hours/week), predominantly assumed by young female carers. The primary recipients of care were parents, followed by grandparents and siblings, with no change in the care recipient type since COVID.
Conclusion: This study showed an increase in the prevalence of young carers, particularly those providing high-intensity care, since the onset of the COVID pandemic. Further, young carers were more likely to come from socioeconomically disadvantaged households and areas. Given the potential impacts that young caring can have on young peoples' lives, it is imperative that support for young carers is increased, particularly for those facing multiple disadvantages. In tandem, services that support adult health and social care need to play a key role in identifying young carers.

1. Introduction

1.1. Young carers in the UK

There has been a growing awareness of young carers in recent years. The Children Act 1989 (as modified by Children and Families Act 2014) defines a young carer as *"A person under 18 who provides or intends to provide care for another person other than as a result of a contract or voluntary work"* ("Children and Families Act 2014," n.d.). A young carer may provide care to a friend or family member due to disability, illness, mental health problems, old age or an addiction (Carers Trust, n.d.).

In England, early attempts to estimate the number of young carers suggested that around 10,000 children acted as primary carers in the 1980 s (O'Neill, 1988; Page, 1988) The first analysis of census data indicated that approximately 2–3 % of young people were carers (Becker & Becker, 2008). More recently, the 2021 Census revealed that there were at least 120,000 young carers in England, aged between 5 and 17 years (Office for National Statistics (ONS), 2023b). However, it is important to note that Census returns are most often completed by adults/parents, and the question does not mention those who provide care for persons with substance use disorders. Hence, this number (which equates to just 1.4 % of 5–17-year-olds) is likely to be a

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substantial underestimate of the true prevalence of young caring in society. In contrast, a BBC survey based on self-disclosure found that 8 % of secondary school students *"were performing intimate and personal care"* (Joseph et al., 2019a).

Nevertheless, studies on the prevalence of young carers rarely obtain representative or sufficiently large samples, limiting the precision of the findings (Joseph, 2023). Accurately determining the true extent of caregiving among young people remains challenging. However, these figures are essential, as they influence government responses and service development. A significant knowledge gap persists regarding the full extent of the prevalence of young carers, who they are, and the specific characteristics of their caring roles. This gap is particularly relevant in the context of the COVID-19 pandemic, an event that has reshaped social and familial dynamics, potentially altering the landscape of young caring.

1.2. COVID and young caring

While the long-term effects of the pandemic are not yet completely known, data so far indicates that it has had a considerable impact on physical and mental health (Dubey et al., 2023; World Health Organization, 2022), increasing cases of disability (House of Commons, 2023) and longstanding illness (Faghy et al., 2022) and exacerbating health inequalities (British Medical Association, 2022), thereby increasing care need in society. For instance, the Department for Work and Pensions reported a consistent rise in the proportion of the UK population with a disability, with 16.0 million people, or 24 % of the total population, reporting a disability in 2021/22 (House of Commons, 2023). The pandemic also introduced the challenge of 'long COVID,' with the ONS estimating that 1.9 million people in the UK were experiencing ongoing symptoms as of March 2023 (Office for National Statistics (ONS), 2023a). Mental health, too, suffered a significant deterioration during the pandemic and is yet to return to pre-pandemic levels (World Health Organization, 2022). Moreover, the prevalence and severity of dementia increased with COVID (Dubey et al., 2023).

To further compound this issue, the effects of the pandemic disproportionately hit vulnerable populations. Those living in deprived areas, migrant populations, and ethnic minorities faced significant indirect health impacts from the COVID-19 pandemic, including both mental health issues and disruptions to routine care (Berchet et al., 2023). The socio-economic impact of the pandemic disproportionately affected essential workers, who are often in lower-paid, precarious employment. These workers faced higher exposure to COVID-19, which led to an increased prevalence of long-term health conditions, and had limited access to adequate healthcare services, heightening their vulnerability (Song et al., 2021). Additionally, lower-income groups were more than twice as likely to experience economic hardship during the pandemic compared to the highest earners, reducing their ability to afford formal care services (Witteveen, 2020). Vulnerable groups are less resilient in recovering from events like the pandemic, which can prolong its effects. This may result in an increase in the number of family carers from more vulnerable backgrounds.

With a growing number of people experiencing health problems and reduced access to and funding for healthcare and social services (World Health Organization, 2023), individuals with disabilities and illnesses lacked of formal support. Moreover, COVID-19 placed significant additional burdens on welfare, health, and care systems. This is likely to have placed a greater burden on informal carers, including young carers, who had to assume additional responsibilities when formal support structures were unavailable or overwhelmed by the crisis.

Furthermore, the pandemic's influence extends beyond the health crisis, affecting social structures and community networks, and reshaping various social and familial dynamics, potentially including the responsibilities of young carers.

In households with an individual already needing long-term care, the pandemic's disruption—such as the loss of school routines and social interaction—had a detrimental effect on the physical and mental health of parents. As a result, young carers faced an even greater caring burden (Blake-Holmes & McGowan, 2022). More importantly, the nature of caring roles undertaken by these young individuals may have evolved, adapting to the changing needs and circumstances of those who require care.

1.3. Impacts of young caring

Caring responsibilities, while sometimes rewarding, can also be demanding, especially for younger individuals. The young caring role challenges societal norms about caring and childhood/adolescence. Evidence suggests that this also contributes to their under-recognition and lack of support (King, Singh, & Disney, 2021). The role of a carer, typically associated with adults, is juxtaposed against the backdrop of a young person's developmental stage, leading to a range of impacts. Young carers often experience poorer physical and mental health on average than those not involved in caring roles, not only while they are engaged in caring roles (Lacey, Xue, & McMunn, 2022) but also for several years afterwards (Lacey, Xue, Di Gessa, Lu, & McMunn, 2023). Furthermore, young carers are also less likely to obtain a university degree and enter employment (Xue, Lacey, Di Gessa, & McMunn, 2023), which further contributes to lower earnings from paid employment (Brimblecombe, Knapp, King, Stevens, & Cartagena Farias, 2020) compared to their peers. Additionally, the demands of caring often results in a diminished social circle, evidenced by a reduction in the number of close friends (Lacey, Di Gessa, Xue, & McMunn, 2023), as these responsibilities can limit social interactions and opportunities for peer bonding. This confluence of health, educational, economic, and social challenges underscore the multifaceted impact that caring responsibilities can have on young people.

Another critical aspect of young caring is its intersection with socioeconomic factors. Young people from low-income households are more likely to be involved in caring and for longer periods of time (Di Gessa, Xue, Lacey, & McMunn, 2022). This trend suggests a strong link between economic disadvantage and caring burden, a link that may have been further accentuated by the pandemic. The disproportionate impact of the pandemic on the most vulnerable groups (British Medical Association, 2022; Gaynor & Wilson, 2020; Paton, Fooks, Maestri, & Lowe, 2020) calls for further exploration of its effects on the relationship between young carers and socioeconomic circumstances.

1.4. The present study

This study aimed to describe the prevalence of young carers aged 16–18 in the UK, both before and after the COVID-19 pandemic, represented in three large, nationally representative samples. We also explored the caring, social and demographic characteristics of young carers and how these may have changed during the pandemic.

2. Material and Methods

This is a cross-sectional secondary analysis, using data extracted from four nationally representative population samples. The surveys include the UK Household Longitudinal Study (UKHLS) (University of Essex Institute for Social and Economic Research, 2023), the Millennium Cohort Study (MCS) (Fitzsimons et al., 2020), and the COVID Social Mobility and Opportunities (COSMO) study (Adali et al., 2023). UKHLS is a large-scale, nationally representative panel survey initiated in 2009, originally recruiting approximately 40,000 households. MCS is a prospective nationally representative, longitudinal study in the UK, tracking the developmental trajectories of around 19,000 children born between 2000 and 2002. Lastly, the COSMO study is a cohort of around 13,000 young people in England who were in school year 11 (age 15–16) when the UK went into the first COVID lockdown in March 2020. Wave 1 of COSMO was collected when participants were aged 16/17.

We selected four samples from the three surveys, encompassing two pre-COVID and two post-COVID datasets. The pre-COVID samples included data from wave 9 of UKHLS, collected between January 2017 and May 2019, and the seventh sweep (age 17) of the MCS, gathered from January 2018 to March 2019. The post-COVID samples comprised data from wave 12 of UKHLS, which was collected from January 2020 to May 2022, and the first wave of the COSMO study, obtained between October 2021 and March 2022 (Fig. 1).

Given that the COSMO and MCS data was exclusively collected from individuals aged between 16 and 18 years, we constrained our analysis to this age group across all surveys to maintain consistency and allow for comparative analysis. Therefore, the analyses were restricted to respondents aged 16–18, who disclosed their caring status during these respective waves and sweep. For the UKHLS wave 12 data, we exclusively considered information collected from March 2020 onwards, to accurately reflect the post-COVID landscape following the first UK lockdown.

2.1. Variables

2.1.1. Young carer status

In UKHLS waves 9 and 12, participants were asked two questions, "*Is there anyone living with you who is sick, disabled or elderly whom you look after or give special help to (for example, a sick, disabled or elderly relative/husband/wife/friend etc)?*" and "*Do you provide some regular service or help for any sick, disabled or elderly person not living with you?*" In COSMO, participants were asked "*Do you regularly look after anyone who is ill, disabled or elderly and in need of care, without being paid? This includes people who live with you and who live elsewhere, but please don't include volunteering*". MCS framed the question as "*Some people have extra responsibilities because they look after someone who has long-term physical or mental health difficulties or disability, or problems related to old age. Do you regularly look after anyone who is ill, disabled or elderly and in need of care, without being paid? This includes both people who live with you and those who live elsewhere. Please do not include caring you do for others that you do in a professional capacity (i.e. as a job)*." In all four samples, we generated a binary variable for 'care status', categorising participants as 'non-carers' or 'young carers'.

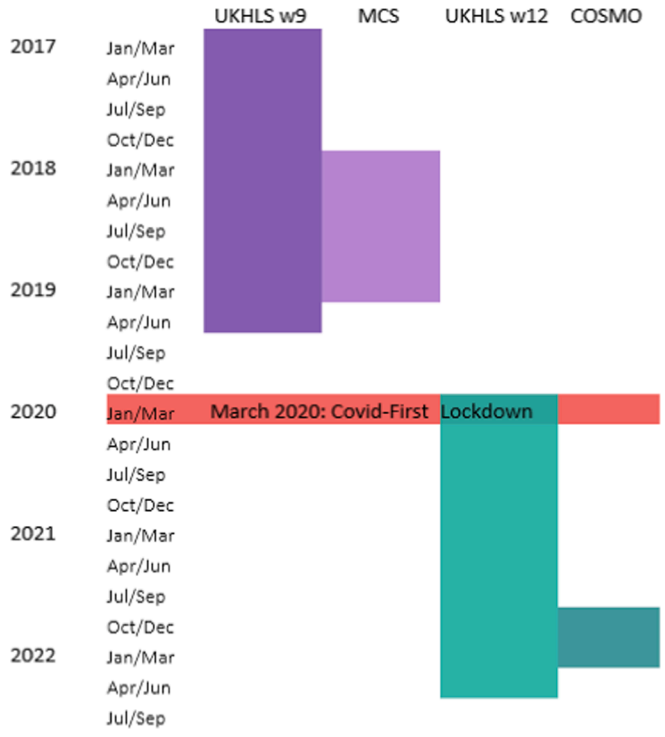

Fig. 1. Timeline of data collections used in this study from COSMO, MCS, UKHLS surveys.

2.1.2. Care intensity

Both UKHLS and MCS asked participants to report the number of hours they spent on caring responsibilities each week. UKHLS utilised 8 categories ranging from 0 to 4 h to over 100 h per week (0–4 / 5–9/ 10–19/ 20–34/35–49/50–99/Varies under 20 h per week/Varies over 20 hrs per week). In the MCS, cohort members were provided with 6 categories:0–2/ 3–4/ 5–9/ 10–19/ 20–29/ 30 or more hours per week. Based on the findings of Di Gessa et al. (2022), which indicated that most young carers typically provide care for less than 10 h per week, we created a binary variable for 'care intensity': caring for 1–9 h per week and 10 + hours per week. COSMO did not include a question on caring hours.

2.1.3. Care recipient

In the UKHLS and MCS, young carers were further asked to specify their relationship with the care recipient. UKHLS required respondents to report who they were caring for within their household and their relationship to that person was identified using the person number within the household. If they were providing care for someone outside the household, they were presented with a list of options (including parent, grandparent, aunt or uncle, other relative, friend, neighbour, client, or other). In the MCS, the options were more extensive, including immediate family members, extended family, and non-relatives. In both the UKHLS and MCS, participants could select multiple categories as applicable. For the present analyses, responses were reclassified into categories: parent, grandparent, sibling, other relative (including aunts, uncles, nieces, nephews, cousins), and other non-relative (including friends, neighbours, boyfriends, girlfriends, and other unrelated individuals). Responses indicating 'client' were excluded from the analysis. COSMO did not collect this information.

2.2. Covariates

Gender was categorised as either male or female. Age was limited to three categories: 16, 17, or 18 years old. For ethnicity, we adopted the classification used in the COSMO study, which was the only one available for that sample. To facilitate comparison, we maintained the same categorisation across all samples, including the following categories: White, Mixed, Asian (covering Indian, Pakistani, Bangladeshi, Chinese), Black and Other.

In terms of family structure, our analysis considered two key aspects: i) parental composition was defined as either living in a single-or two-parent household; ii) household size, representing the total number of people in each household, was treated as a continuous variable. However, due to low numbers in the larger households, categories were collapsed at seven or more residents.

Three socio-economic indicators were included: i) parental occupational class was determined by the National Statistics Socio-economic Classification (NS-SEC), recording the highest occupational class present in the household. This classification included categories for those not in employment, as well as those employed in managerial/professional, intermediate, and routine/manual jobs. For MCS sweep 7, data from MCS sweep 6 was used as NS-SEC was not available in sweep 7. ii) Parental educational attainment was assessed recording the highest parental qualification held within the household and was categorised as: Higher education (including Degree, Other Higher Qualification); Secondary education (including A-Levels and GCSE, among others) and Other Qualification/No Qualification. These two were combined due to low numbers. iii) Area deprivation through the Indices of Multiple Deprivation (IMD), which are calculated at the small area level. These IMDs, while individually tailored for each UK country, are constructed using a consistent methodology. They encompass a range of domains including health status, crime rates, living environment, and others. The

analysis used IMD rank quintiles (Niggebrugge, Haynes, Jones, Lovett, & Harvey, 2005).

A detailed description of how all the variables were categorised for this study is available in Appendix A.

2.3. Analyses

The prevalence of young carers was first examined for the entire sample within each dataset and then stratified by gender. This was followed by bivariate analyses using logistic regression models to outline the distribution of demographic, family structure, and socioeconomic characteristics in each data source, according to young carer status. Finally, the caring characteristics of young carers (weekly hours spent caring and recipient of care) were reported for all carers and stratified by gender.

Our analytic sample comprised individuals who participated in the relevant waves and sweeps of the surveys, were aged 16 to 18, and had complete data on caring and all social and demographic variables used in these analyses. A complete case analysis was conducted. Respondents with missing data were more likely to be from households with lower occupational class, lower educational qualifications, and most deprived areas (Table B.1 in Appendix B). Our final samples were 1,429 for UKHLS wave 9, 789 for UKHLS wave 12, 5,504 for the MCS and 6,354 for COSMO, representing a 89.3 %, 83.4 % 89.0 % and 56.8 % of the original sample respectively (Table B.2 in Appendix B).

The analyses applied survey weights to account for non-random participation and the complex survey designs of all studies. Cross-sectional weights were used in accordance with guidelines provided by the survey teams (Adali et al., 2023; Fitzsimons et al., 2020; University of Essex Institute for Social and Economic Research, 2023). All analyses were performed using STATA statistical software, version 18 (StataCorp, 2023).

3. Results

Fig. 2 presents the prevalence of young carers across the four samples, spanning from 2017 to 2022. Prior to the COVID-19 pandemic, in 2017/2019, there was a consistent pattern, both UKHLS wave 9 and the MCS reported a prevalence of 8.0 % and 7.9 % respectively. However, post the COVID-19, by 2020/2022, UKHLS wave 12 exhibited an increase to 9.8 %, while COSMO presented the highest prevalence at 11.9 % by 2021/2022. When stratified by gender (Fig. 3), the analysis reveals a consistent increase in the prevalence of young male carers. Specifically, data from the UKHLS indicate a rise from 6.6 % at wave 9 to 11 % by wave 12. The COSMO dataset further corroborates this trend, showing a prevalence of 12.2 % post-COVID. In contrast, the prevalence of young female carers, as reported by the UKHLS, remains relatively stable, with a slight decrease from 9.4 % pre-COVID to 8.6 % post-COVID. A comprehensive review of all datasets reveals variability in the prevalence rates for female carers, ranging from 7.8 % pre-COVID (MCS) to 11.2 % post-COVID (COSMO).

3.1. Characteristics of respondents

Table 1 summarises the sociodemographic, family, and socioeconomic aspects over the four samples. Gender distribution remained stable across all surveys, featuring nearly equal representation of males and females. Within all samples White was the predominant ethnicity, ranging from 78.9 % to 90.3 %, followed by Asian, with COSMO wave 1 having the highest percentage at 10.7 %, which includes participants from Pakistani, Bangladeshi, and other Asian backgrounds. The representation of participants with Black backgrounds ranged from 2.3 % to 4.9 % across samples, while the representation of other ethnicities falls below 2 % in all samples.

Family structure was similar across samples; about three-quarters of individuals lived in two-parent households, with an average household size of 4 persons. However, in the MCS sample, the average household size was 5 persons.

In the four samples, the Managerial/Professional occupational class was the most common, with the highest proportion in MCS at 53.9 %. The Intermediate and Routine classes showed a similar distribution across the studies. Conversely, in all four samples, the smallest group

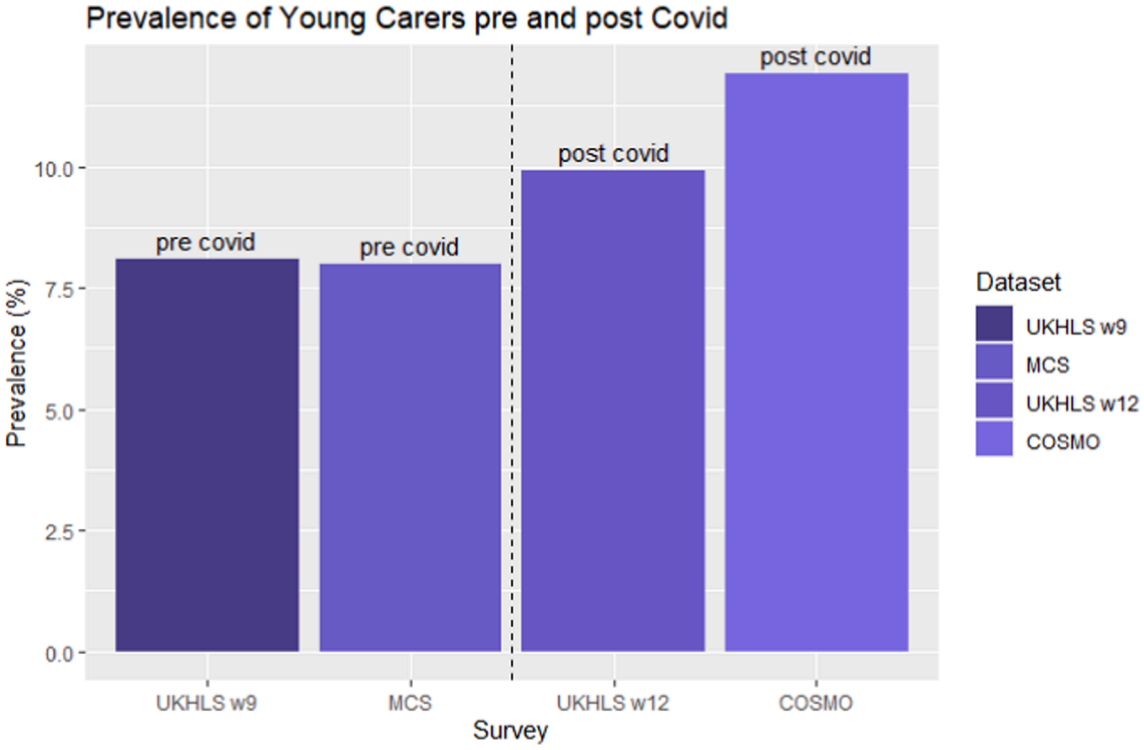

Fig. 2. Prevalence of Young Carers Pre and Post COVID (Weighted complete case data).

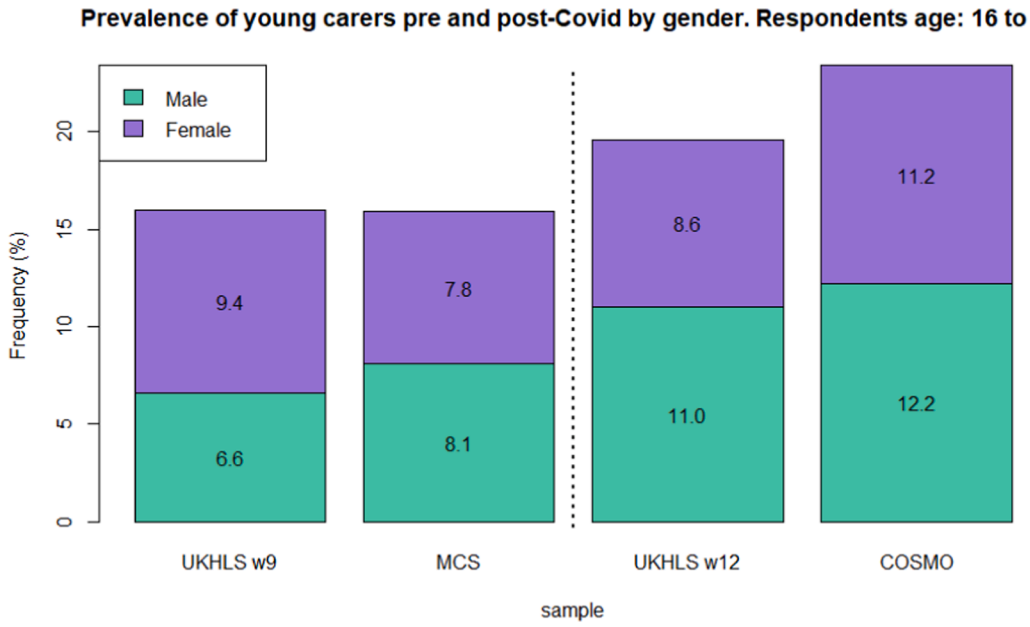

Fig. 3. Prevalence of Young Carers Pre and Post COVID by gender (Weighted complete case data).

consisted of children from households with both/all parents out of paid employment, with distribution ranging from 9.0 % at UKHLS-wave 12 to 14.3 % in COSMO. Similarly, in all samples most children came from households with parents holding higher education qualifications. Children with parents reporting no or other qualifications were uncommon in MCS and UKHLS (with distribution ranging from 3.4 % in MCS to 0.8 % in UKHLS-w12) but more common in COSMO (10.7 %).

3.2. Association between social and demographic characteristics and young caring

Table 2 shows that there was no significant gender difference in young carer prevalence in any sample (UKHLS w9 $p = 0.193$; MCS $p = 0.756$; UKLHS w12 $p = 0.636$; COSMO $p = 0.264$). Some differences in ethnicity were detected, although the pattern was not consistent across samples. In MCS, Asian participants were 1.55 times ($p = 0.032$) more likely to be young carers compared to White individuals, and they were 1.29 times ($p = 0.024$) more likely in COSMO. Furthermore, the data reveal that White participants experienced an increase in young carers prevalence from pre-COVID (7.2 % and 6.7 %) to post-COVID (8.8 % and 11.1 %), while Asian participants maintained a stable prevalence around 10 % in UKHLS w9, MCS and UKHLS w12, with COSMO indicating a higher prevalence of 13.9 %. Due to low sample sizes in some ethnic groups, no pre- and post-COVID prevalence comparison could be conducted for Mixed, Black, and Other ethnic categories. Additionally, in the UKHLS wave 9, participants classified under Other ethnicities showed a prevalence of 36.9 % and a significant association (OR 7.56p=<0.001). This finding should be interpreted with caution, as this group consists of a very small sample size ($n = 7$), therefore one carer would have a big impact in the prevalence of this group.

In terms of family structure, young carers were significantly more likely to live in single-parent homes. Specifically, children in single-parent households were 1.6 (UKHLS w12 and COSMO, $p < 0.001$) to 2 times (UKHLS w9, $p < 0.001$) more likely to be young carers than those in two-parent homes. The prevalence of young carers rose from pre-COVID to post-COVID in both household types, with a greater increase in single-parent homes (from 10.3 % in MCS to 15.4 % in COSMO). Conversely, there was no difference in household size between young carers and non-carers across all four samples.

Regarding socioeconomic factors, the prevalence of young carers varied across different parental occupational classes, showing a graded trend; the prevalence was higher in households where parents were unemployed, followed by those with parents in routine occupations, and young carers' prevalence was lower in families from managerial or professional backgrounds. Specifically, young people from homes with unemployed parents were 2.4 times (COSMO, $p < 0.001$) to 9.3 times (UKHLS w9, $p < 0.001$) more likely to be young carers compared to those with parents in managerial or professional positions. Additionally, the distribution of young carers by parental occupational class showed variations pre- and post-COVID. In the post-COVID samples, the prevalence of young carers living in households from employed parents were higher, although the gradient trend observed in pre-COVID samples remained consistent. Also, a significant association was observed between parental educational qualification in the distribution of young carers; lower parental education was associated with a higher prevalence of young carers. Lastly, an association was identified between the Index of Multiple Deprivation and the prevalence of young carers. Living in a more deprived area was associated with higher prevalence rates of young carers, with those individuals living in most deprived areas being between 2.5 times (COSMO $p < 0.001$) and 3.3 times (UKHLS w9 $p < 0.001$) more likely to be a young carer than those participants from least deprived areas.

3.3. Characteristics of caring among young carers

Table 3 presents information on care intensity, age of carers and care recipients reported by young carers, stratified by gender. Most young carers engaged in low-intensity caring, defined as dedicating 1 to 9 h per week. In pre-COVID samples, 16.6 % of carers reported high-intensity caring (more than 10 h per week). However, these proportions increased post-COVID, exemplified by 25.4 % young carers in the UKHLS w12 reporting over 10 h of caring weekly. Furthermore, the data suggests that the increase in care intensity was primarily taken on by female young carers, as in the UKHLS w12 (post-COVID) sample, 31.3 % of female young carers were engaged in high-intensity caregiving, in contrast to 19.7 % of their male counterparts.

Young carers were most commonly providing care for a parent across all samples (ranging from 40.8 % – 49.8 % of young carers). The next most common recipients were grandparents, cared for by 35.1 % to 39.2 % of respondents, followed by siblings (ranging from 14.5 %–32.2 % of young carers). Gender differences were observed in the UKHLS waves 9 and 12 regarding whom young carers were providing care for; females

Table 1
Descriptive of the samples distributions % (n).

	UKHLS-wave 9	MCS – sweep 7	UKHLS – wave 12	COSMO-wave 1
Data collection dates	Jan2017/ May2019	Jan2018/ Mar2019	Mar2020/ May2022	Oct 2021/ Mar2022
N Complete cases	1,429	5,504	789	6,354
Carer				
No	91.9 (1,317)	92.1 (5,064)	89.2 (712)	88.1 (5,483)
Yes	8.1 (112)	7.9 (440)	9.8 (77)	11.9 (871)
Gender				
Male	50.6 (673)	45.1 (2,428)	47.8 (350)	52.0 (3,038)
Female	49.4 (756)	54.9 (3,076)	52.2 (439)	48.0 (3,316)
Ethnicity				
White	86.0 (1,024)	90.3 (4,732)	85.7 (581)	78.9 (4,202)
Mixed	3.9 (63)	0.8 (49)	3.3 (41)	3.5 (236)
Asian	6.9 (264)	4.8 (428)	7.1 (131)	10.7 (1,237)
Black	2.4 (71)	2.3 (171)	3.8 (33)	4.9 (535)
Other	0.8 (7)	1.8 (124)	0.2 (3)	2.0 (144)
Household size				
2 or 3	27.1 (334)	6.5 (358)	25.6 (193)	25.4 (1,632)
4	38.3 (537)	23.3 (1,217)	44.2 (335)	40.2 (2,351)
5	20.6 (297)	41.4 (2,191)	21.0 (164)	21.1 (1,365)
6 or more	15.1 (261)	28.5 (1,738)	9.3 (97)	12.3 (1,006)
(Mean household size)	(4.2)	(5.0)	(4.1)	(4.1)
Parental composition				
Two-parent Household	69.5 (1,015)	77.0 (4,209)	75.7 (600)	75.5 (4,472)
Single parent Household	30.5 (414)	23.0 (1,295)	24.3 (189)	24.5 (1,882)
Parental occupational class				
Managerial/ Professional	36.6 (629)	53.9 (3,004)	47.2 (373)	41.0 (2,221)
Intermediate	19.0 (300)	13.9 (768)	21.6 (174)	22.1 (1,362)
Routine	21.4 (316)	20.8 (1,137)	22.2 (172)	22.6 (1,712)
Not working	13.0 (184)	11.3 (595)	9.0 (70)	14.3 (1,059)
Parental educational attainment				
Higher education	59.0 (828)	65.4 (3,398)	63.4 (503)	54.4 (3,169)
Secondary education	39.8 (582)	31.2 (1,833)	35.8 (281)	34.9 (2,241)
Other/None	1.2 (19)	3.4 (273)	0.8 (5)	10.7 (944)
IMD				
Least deprived	23.1 (282)	25.7 (1,412)	24.5 (156)	21.2 (1,042)
4	19.7 (242)	19.8 (1,086)	18.6 (162)	19.9 (1,072)
3	19.0 (252)	19.1 (1,050)	21.1 (158)	18.6 (1,116)
2	19.1 (306)	17.7 (972)	18.3 (134)	19.4 (1,371)
Most deprived	19.1 (347)	17.9 (984)	17.6 (179)	20.9 (1,753)

Sample size: individuals aged between 16 and 18 who answered the care question (yes or no). Complete cases of weighted data.

more commonly provided care for their parents compared to males, while males more often took care of siblings and other non-relatives compared to females. However, no significant gender differences were observed in caring for grandparents. The analysis showed that among parents, the majority of care recipients were mothers (ranging from 56.7 % to 87.8 %) and that female carers are more likely to provide care to their mothers compared to male carers.

4. Discussion

Using four large, nationally representative samples of young people aged 16 to 18 living in the UK, the current study aimed to describe how the COVID-19 pandemic has affected young carers in terms of prevalence, socioeconomic inequalities, and the nature of their caring responsibilities. We observed an increase in the prevalence of young carers from approximately 8 % pre-pandemic to 9.8 % – 11.9 % post-pandemic. Young carers were more prevalent in single-parent households and within more disadvantaged socioeconomic groups. A higher prevalence was observed in homes where parents were unemployed, less educated, or lived in areas of higher deprivation. Regarding caring characteristics, most young carers provided low-intensity care (1–9 h per week). However, there was an increase in higher-intensity care (exceeding 10 h per week) post-pandemic, predominantly among female carers. The recipients of care remained consistent pre- and post-COVID, with care primarily provided to parents, followed by grandparents and in third place siblings.

The pre-COVID prevalences of 8.0 % (UKHLS w9) and 7.9 % (MCS) among young carers aged 16 to 18 align with expected rates. Prior to 2020, most studies indicated a prevalence rate for young carers ranging from 2 % to 8 % (Leu & Becker, 2017). For instance, Switzerland had a prevalence of 7.6 % (Otto, Leu, Bischofberger, Gerlich, & Riguzzi, 2020), and Australia reported 5.6 % (Australian Bureau of Statistics, 2018). However, other studies have reported higher prevalence rates, such as a BBC survey in the UK which reported a prevalence of 22 % (Joseph et al., 2019). These rates, however, are challenging to compare due to significant variations in the age range of participants across these surveys and in the methodology used. Further analysis of UKHLS data by Di Gessa et al. (2022) revealed about a 9 % prevalence in the 16–29 age group which remained static from 2009 to 2019. The slightly lower prevalence in the adolescent group could be anticipated considering that the prevalence of carers increases with age (Office for National Statistics (ONS), 2023b).

Our study suggests that the COVID pandemic has escalated the prevalence of young carers, with post-COVID figures from UKHLS w12 and COSMO of 9.8 % and 11.9 %, respectively. This indicates a shift in young carer prevalence, possibly influenced by societal changes associated with the pandemic. Contrastingly, the 2021 UK Census reported that just 3.7 % of 5 to 17 year olds were young carers. This difference might be due to the Census' reliance on adult (mostly parental) reports and the timing of the Census. Research consistently shows that young carers themselves often report a greater burden than parental accounts suggest (Cheesbrough, Harding, Webster, Taylor, & Aldrige, 2017). Discrepancies between UKHLS w12 and COSMO might stem from differences in survey question phrasing and timing. Nevertheless, it is likely that the actual prevalence of young carers is even higher, with many young carers remaining unrecognized due to factors like stigma, bullying, lack of support, or their own non-self-identification as carers (Department of Health, 2010; Phelps, 2020; Social Care Institute for Excellence, 2005). Despite these differences, the data clearly indicates a marked increase in the prevalence of young carers post-COVID.

While the COVID-19 pandemic likely played a role in the observed rise in young carers' prevalence, this trend is probably the result of a broader socio-demographic and policy context. Socio-demographic changes, such as smaller family sizes, increased life expectancy, and growing awareness and recognition of young carers, may also contribute to this rise. Additionally, the consistent reduction in social services in the UK over the last decade has likely influenced who provides care and how many young people are involved. With fewer resources available for formal support, young people most probably have had to step in to provide care, particularly in disadvantaged households.

Regarding gender, while it is established that gender plays a significant role in unpaid care among adults, our study found no gender differences in prevalence among any of the samples of young carers, pre- or post-COVID. This finding aligns with research on younger samples (Hunt, Levine, & Naiditch, 2005). For instance, Dearden & Becker (2004) observed significant gender differences in specific caring tasks, like domestic or intimate care, but found a similar gender distribution in general caring roles among 16 to 18-year-olds adolescents. Similarly, national data from Australia (Australian Bureau of Statistics, 2018) suggests that gender disparities in caring emerge after age 24. Correspondingly, Arber & Ginn (1995) reported significant gender differences in caring emerging only after the age of 34. However, our study did observe differences in care intensity post-COVID, with a rise predominantly assumed by female carers.

Table 2
Bi-variate analysis and distribution of young carers aged 16–18 by sociodemographic, family structure and socioeconomic characteristics. Prevalence % and OR (95%CI).

	Pre COVID										**Post COVID**									
	UKHLS w9					MCS sw7					UKHLS w12					COSMO w1				
	Jan 2017/May 2019					Jan 2018/ Mar 2019					Mar 2020/May 2022					Oct 2021/ Mar 2022				
Sample n	1,429					5,504					789					6,354				
	Non carer	**Carer**				**Non carer**	**Carer**				**Non carer**	**Carer**				**Non carer**	**Carer**			
n	1,317	112				5,064	440				712	77				5,483	871			
	%	**%**	**OR**	**95 %CI**	p-value	**%**	**%**	**OR**	**95 %CI**	p-value	**%**	**%**	**OR**	**95 %CI**	p-value	**%**	**%**	**OR**	**95 %CI**	p-value
Gender																				
Male	93.4	6.6	ref			91.9	8.1	ref			88.9	11.0	ref			87.8	12.2	ref		
Female	90.6	9.4	1.48	(0.81–2.68)	0.193	92.2	7.8	0.96	(0.76–1.22)	0.756	91.4	8.6	0.83	(0.37–1.83)	0.636	88.8	11.2	0.90	(0.75–1.08)	0.264
Ethnicity																				
White	92.8	7.2	ref			93.3	6.7	ref			91.2	8.8	ref			88.9	11.1	ref		
Mixed	84.0	16.0	2.45	(0.92–6.50)	0.070	96.5	3.5	0.51	(0.12–2.08)	0.345	95.1	4.9	0.53	(0.05–5.54)	0.593	86.2	13.8	1.28	(0.84–1.95)	0.251
Asian	89.6	10.4	1.50	(0.60–3.74)	0.381	89.9	10.1	1.55	(1.04–2.31)	0.032	89.7	10.3	1.19	(0.43–3.33)	0.737	86.1	13.9	1.29	(1.03–1.61)	0.024
Black	95.3	4.7	0.64	(0.10–4.13)	0.639	92.3	7.7	1.16	(0.64–2.09)	0.625	91.4	8.6	0.97	(1.46–11.9)	0.979	87.1	12.9	1.18	(0.87–1.61)	0.087
Other	63.1	36.9	7.56	(5.00–11.4)	<0.001	90.4	9.6	1.47	(0.70–3.06)	0.306	28.0	72.0	26.5	(0.1–2405)	0.343	84.3	15.7	1.48	(0.90–2.43)	0.122
Household size																				
Mean H size	4.3	3.9	0.75	(0.51–1.12)	0.161	5.0	5.0	0.97	(0.86–1.09)	0.617	4.1	4.0	0.88	(0.60–1.29)	0.504	4.1	4.2	1.09	(1.00–1.11)	0.050
Household parental composition																				
Two parents H	93.8	6.2	ref			94.1	5.9	ref			92.1	7.9	ref			89.5	10.5	ref		
Single parent H	88.3	11.7	2.00	(1.15–3.50)	0.014	89.7	10.3	1.81	(1.40–2.33)	<0.001	88.0	12.0	1.60	(1.00–3.98)	0.050	84.6	15.4	1.59	(1.33–1.90)	<0.001
Parental Occupational class																				
Manag/Prof	96.2	3.8	ref			95.0	5.0	ref			92.2	7.1	ref			92.1	7.9	ref		
Intermediate	95.8	4.2	1.14	(0.51–2.51)	0.753	94.1	5.9	1.18	(0.80–1.74)	0.410	92.3	7.7	1.10	(0.28–4.28)	0.890	88.6	11.4	1.50	(1.15–1.95)	0.003
Routine	91.2	8.8	2.47	(0.88–6.97)	0.087	90.7	9.3	1.97	(1.46–2.67)	<0.001	92.9	7.1	1.01	(0.33–3.05)	0.991	84.5	15.5	2.12	(1.75–2.84)	<0.001
Not working	73.3	26.7	9.31	(2.89–22.3)	<0.001	80.1	19.9	4.23	(3.09–5.81)	<0.001	74.3	25.7	4.54	(1.29–16.0)	0.019	82.9	17.1	2.45	(1.87–3.21)	<0.001
Parental educational attainment																				
Higher ed	94.0	6.0	ref			94.4	5.6	ref			92.0	8.0	ref			91.0	9.0	ref		
Secondary ed	90.7	9.3	1.62	(0.85–3.10)	0.144	91.0	9.0	1.66	(1.29–2.12)	<0.001	89.3	10.7	1.38	(0.61–3.10)	0.434	86.2	13.8	1.66	(1.35–2.04)	<0.001
Other/None	43.3	56.7	20.7	(8.18–52.3)	<0.001	87.3	12.7	2.43	(1.49–3.96)	<0.001	99.9	0.1	–	–		81.6	18.4	2.35	(1.83–3.01)	<0.001
IMD																				
Least dep	96.3	3.7	ref			95.2	4.8	ref			92.8	7.2	ref			92.5	7.5	ref		
4	91.1	8.9	2.51	(1.12–5.56)	0.025	94.0	6.0	1.28	(0.86–1.85)	0.235	94.9	5.1	0.70	(0.22–2.26)	0.548	92.1	7.9	1.02	(0.73–1.43)	0.980
3	94.3	5.7	1.56	(0.49–5.04)	0.449	92.9	7.1	1.49	(1.02–2.18)	0.038	91.7	8.3	1.17	(0.24–5.67)	0.844	88.4	11.6	1.56	(1.13–2.16)	0.007
2	89.3	10.7	3.09	(1.02–9.40)	0.047	90.8	9.2	1.99	(1.38–2.88)	<0.001	86.3	13.7	2.04	(0.55–7.58)	0.282	86.0	14.0	1.91	(1.40–3.37)	<0.001
Most dep	88.7	11.3	3.30	(1.27–8.55)	0.014	88.5	11.5	2.56	(1.79–3.65)	<0.001	89.0	11.0	1.59	(0.40–6.33)	0.506	82.5	17.5	2.52	(1.89–3.37)	<0.001

Row percentages. Complete case analysis (considering complete data on gender, care, ethnicity, age, household size, parental composition, parental occupational class, parental educational class and IMD).
Weighted, cross sectional weights for MCS, COSMO and UKHLS w9 and w12.
p-values from bivariate analysis using logistic regression.
When information about parental occupation, IMD and paternal highest educational qualification was not available at MCS sweep 7, the information was complemented with answers from MCS sweep 6.
H: Household; ed: education

Table 3
Caring characteristics among young carers by gender (%).

	UKHLS w9				MCS sw7				UKHLS w12			
	2017/2019				2018/2019				2020/2022			
	Total	**Male**	**Female**		**Total**	**Male**	**Female**		**Total**	**Male**	**Female**	
Carers n	112	48	64		440	194	246		77	39	38	
	%	%	%	p-value	%	%	%	p-value	%	%	%	p-value
Weekly hours spent providing care												
1 to 9	83.4	80.5	85.5	0.077	83.4	83.3	83.4	0.979	74.6	80.3	68.7	0.064
10 or more	16.6	19.5	14.5		16.6	16.7	16.6		25.4	19.7	31.3	
Age												
16	34.1	31.9	35.7	0.369	41.7	44.8	39.1	0.735	23.9	24.2	23.6	0.902
17	48.8	48.8	48.8		58.3	55.3	60.9		45.8	47.9	43.5	
18	17	19.2	15.5		0.0				30.3	27.9	32.9	
Recipient												
Parent	49.8	32.6	67.4	0.005	45.3	51.3	48.7	0.091	40.8	36.3	63.7	0.007
Grandparent	35.7	47.4	52.6	0.094	35.1	45.1	54.9	0.823	39.2	64.5	35.5	0.227
Sibling	18.3	68.5	31.5	<0.001	32.2	52.7	47.4	0.111	14.5	73.1	26.9	<0.001
Other relative	3.4	67.5	32.5	<0.001	3.1	62.8	37.2	0.229	3.1	0.0	100	0.004
Other non-relative	6.8	60.7	39.4	0.001	5.7	16.3	83.8	0.019	9.7	85.9	14.1	<0.001
If recipient is a parent												
Father	12.2	15.4	10.6	0.667	43.1	52.3	33.5	0.030	23.0	25.8	18.0	0.058
Mother	87.8	84.6	89.4		56.9	47.7	66.5		77.0	74.2	82.0	

Weighted, complete case analysis of participants identified as carers.
Column percentages.
p-values for bi-variate analysis between gender and care intensity (weekly hours), gender and age, gender and recipient of care among young carers.
COSMO have not asked about care intensity or care recipient.

Some differences based on ethnicity were found, though the pattern was not consistent across samples. The observed association with Asian ethnicity aligns with findings by Warren (2023) who noted a higher prevalence of young carers among ethnic minorities. However, our categorisation into five ethnic groups might have hidden specific associations with certain ethnic groups. For example, Di Gessa et al., (2022) reported a higher likelihood of Bangladeshi or Indian individuals being young carers.

We identified marked socioeconomic inequalities among young carers. This finding aligns with prior research (Di Gessa et al., 2022; Hunt et al., 2005; Otto et al., 2020; Warren, 2023). Young carers are disproportionately from single-parent and socioeconomically disadvantaged households (parents out of paid employment or with lower educational qualifications), particularly in areas with higher deprivation levels. Single-parent households, which are disproportionately female-headed, often face higher poverty rates compared to two-parent households (Brady & Burroway, 2012). The gendered nature of these households means that women are more likely to experience economic disadvantage due to lower wages and higher employment precarity. This supports the idea that, even at younger ages, factors like economic necessity and lack of resources require children in disadvantaged families to assume caring roles. This finding, in combination with the absence of a significant difference in household size between young carers and non-carers suggests that the caring role might be more influenced by the presence or absence of one parent rather than the number of individuals in the household. Also, we found that higher parental education or occupation may serve as a protective factor against becoming a young carer. Several theories can explain these observations. Parents in more disadvantaged occupational classes or with limited education might have job roles that are less accommodating of family needs and may necessitate children stepping into caring roles. A novel aspect of this study is the association with area deprivation. As the deprivation of an area increases, young people's risk of becoming carers increases. This is possibly due to the inability to access alternative care options, as higher deprivation often correlates with limited and under-funded support services, increasing the likelihood of children assuming caring responsibilities. These inequalities, occurring at a time when adolescents are transitioning from secondary to higher education or employment, may exacerbate disparities in later life stages, potentially having a long-lasting impact (Carers Trust, 2023).

Additionally, our analysis revealed that most young carers engaged in low intensity care, contributing 1 to 9 h weekly. However, a notable shift was observed post-COVID, with high-intensity young carers (more than 10 h per week) increasing since COVID. This increase was predominantly shouldered by female carers, suggesting that the pandemic may have exacerbated traditional gender roles in caring, placing a disproportionate burden on young females. Blake-Holmes and McGowan (2022), in a qualitative study, similarly found an increase in caring intensity during the pandemic, with young carers taking on more responsibility not only for the person they were caring for but also for younger siblings. This increase can be partially explained by a series of overlapping circumstances. Lockdown measures restricted support from family members or friends outside the household, shifting more responsibility to young carers. Many parents lost their jobs or experienced reduced wages, limiting their ability to afford formal care, while those in essential jobs often faced illness. Additionally, access to support services and care centres was reduced. These factors collectively placed greater pressure on young carers, forcing them to take on additional caring responsibilities.

The gendered consequences of young caring must be considered, especially in light of evidence that young female carers are more likely to assume high-intensity caring roles. This might have significant long-term implications for their mental health, wellbeing (Lacey, Xue, & McMunn, 2022), social and economic trajectories. Studies suggest that becoming a young carer is associated with a reduction in the number of close friends in the short-term, as caregiving responsibilities limit social interactions (Lacey, Di Gessa, Xue, & McMunn, 2023). Moreover, young people in caring roles are less likely to complete a university degree or secure stable employment, with the number of weekly caring hours crucially affecting these outcomes (Xue, Lacey, Di Gessa, & McMunn, 2023). These findings highlight how the disproportionate burden of care on girls, who often spend more hours caring, can negatively impact their educational and employment prospects, reinforcing gender inequalities and placing them in a more vulnerable position throughout their lives.

The data also reveals that young carers primarily provide care for parents, followed by grandparents and then siblings. This observation is consistent with the findings of Di Gessa et al. (2022), who noted a similar pattern in the recipient of care provided by young adult carers. This

trend may be reflective of life stages, where younger individuals are more likely to have living grandparents and less likely to be responsible for caring for partners. Interestingly, gender differences were observed in who young carers were supporting. Female carers were more likely to care for parents, while male carers more frequently tended to care for siblings.. This pattern might reflect societal expectations, where girls often face higher demands than boys to perform caring tasks (Stamatopoulos, 2015), consequently this distribution may indicate that females are more frequently involved in caring for parents, which maybe requires a greater level of commitment or a higher intensity of care, while males tend to engage in caring roles that are less demanding on their time. Other explanation could be related with gender role expectations. Care for parents often requires personal assistance, which might align more with traditional views of female caring roles, whereas care for siblings or non-relatives could involve more support roles, which might not conflict with traditional masculine roles. Among those caring for a parent, the majority reported caring for their mother. Previous literature has shown that caring activities are broader and more extensive when the care recipient is a mother rather than a father (Aldridge, 2006). Ireland and Pakenham (2010) found that young carers are more likely to take on caring tasks for their mother than their father, especially in single-parent households. They suggest that traditional social norms around masculinity may discourage fathers from accepting help from their children, and that in families where mothers typically manage caring, they may extend this role to care for an ill or disabled father. However, when the mother herself becomes ill, a gap in caring is created, with children often taking on more instrumental, emotional, and household responsibilities. Lastly, this finding might indicate that the relationship with the care recipient may influence who becomes a carer.

4.1. Implications

This study contributes significantly to the understanding of how societal crises, such as the COVID-19 pandemic, can exacerbate existing vulnerabilities among young carers. It underscores the necessity for responsive and adaptive support systems and policies. The increase in the prevalence of young carers is indicative of the substantial effect that the pandemic had on the responsibilities of young people. Consequently, there is an urgent need for enhanced support and recognition of young carers in public policies and post-pandemic recovery strategies. It is crucial to involve different services and agencies working with young people and those individuals with long-term conditions, to collaborate effectively in identifying and supporting young carers. This collaborative effort can include strategies such as the sharing of information and resources to create a more coordinated and effective support network, or training for professionals across various sectors to enable them to recognise signs of young caring and identify opportunities for support.

The post-pandemic rise in care intensity, primarily among female carers, highlights a gendered impact and burden assumed by female carers in the wake of the pandemic. This situation highlights the need for implementation of gender-sensitive policies and support systems tailored to address the unique challenges faced by young female carers. Furthermore, the higher prevalence of young carers in more disadvantaged households and areas underscores the intersection of caring with socioeconomic disparities. This calls for targeted interventions to support young carers in socioeconomically disadvantaged circumstances. Policy measures must focus on maintaining and improving support services in deprived areas to mitigate these risks and respond to the higher prevalence of young carers in those areas. Lastly, the study draws attention to the crucial need for incorporating the requirements of young carers into political agendas, especially during and after crises. It is plausible that more crises will occur, and it is vital to support and monitor vulnerable populations during and after such events. Vulnerable individuals are more rapidly affected by societal and contextual changes, such as those experienced during the pandemic (British Medical Association, 2022). This aspect further underscores the importance of considering the needs of young carers in policy-making processes, particularly during and following crises like the COVID pandemic.

4.2. Strengths and limitations

The principal strength of this study lies in the utilisation of the UK Household Longitudinal Study (UKHLS), the Millennium Cohort Study (MCS), and the COVID-19 Social Mobility & Opportunities Study (COSMO) datasets. These datasets are unique in that they provide high-quality, nationally representative data, enhancing the generalisability of the findings across the UK/England population. Further, the three surveys offer valuable self-reported insights into young carers, featuring specific questions about caring and providing household level socio-demographic data enabling exploration of social inequalities. Self-reporting offers a firsthand perspective on young carers' experiences and improves their identification (Cheesbrough et al., 2017; HM Government, 2010). Lastly, to our knowledge, this is the first study to measure prevalence of young carers post-COVID, reporting up to date prevalence and improving our understanding of the determinants associated with young caring.

The analysis is not without limitations. Despite the robustness of the data used, the actual prevalence of young carers is likely underestimated. Some young carers may remain undetected because they either do not recognise themselves as carers or do not wish to be identified as such (Phelps, 2020). Additionally, the categories used to classify ethnic background were based on the data available in COSMO and was replicated in the other samples to allow for comparability. However, this approach to classifying ethnicity might underestimate the impact of ethnicity on the prevalence of young carers. This indicates a need for future studies to explore this aspect. Lastly, our study focuses on a specific subgroup of young carers aged 16 to 18, guided by the availability of data in COSMO and MCS, thus excluding younger carers. We acknowledge that caring responsibilities can begin at very early age, and the dynamics and context of these duties change with age. The global prevalence of young carers aged 15 and younger is estimated to range between 2 % and 8 %, with numbers continuing to rise (Becker, 2017). We estimate that, as with the age group studied in this research, the actual prevalence may be higher, with an estimate more in line with the figures observed in this study. While our research provides insights into the experiences of older adolescents, conducting further studies encompassing a broader age range is essential to fully understand the prevalence and varied characteristics of young carers, and if these change across developmental stages.

4.3. Further studies

The increase in the prevalence of young carers raises important questions regarding the long-term stability of these changes. It remains uncertain whether this surge in young carers is a transient response to the pandemic's immediate effects or a reflection of more enduring societal shifts. Given the ongoing strain on health and social care systems, it is plausible that the demand for informal care, especially within socioeconomically disadvantaged households, will persist. However, future research should monitor these trends to determine whether the prevalence of young carers stabilizes at post-pandemic levels or reverts to pre-pandemic norms as formal support structures recover. Longitudinal studies will be critical in tracking the persistence of care roles and

understanding how young carers' responsibilities evolve over time. Additionally, further research should explore whether the elevated levels of care need observed post-pandemic signal a new baseline in care requirements due to the long-term impacts of COVID-19 on population health.

The findings of an increase in the numbers of young carers providing high-intensity care, may have long-term implications, such as impacts on their mental health and educational development. This necessitates ongoing monitoring to address these potential impacts. Additionally, the relationship between gender and the intensity of caring may have unequal effects on life course outcomes for males and females, potentially exacerbating gender inequalities: this aspect also needs further exploration. Furthermore, the findings raise questions about the specific needs of young carers in single-parent households compared to those in two-parent households. Understanding these differences is crucial for providing appropriate support to individuals in different contexts. Moreover, it is relevant to examine the direction of the association with area deprivation. It should be considered whether families with young carers live in deprived areas due to their socio-economic conditions, or if living in a deprived area itself contribute to a higher prevalence of illness, thus increasing the demand of carers, including young carers; clarifying this relationship will be instrumental to inform public policy. Lastly, further research is needed to understand how the needs and experiences of young carers vary depending on the care recipient. This inquiry is particularly relevant given the population's increasing longevity and the finding of a high percentage of carers looking after grandparent. Such research would offer insights into specific support requirements, enabling tailored interventions for the unique needs of young carers across diverse caring contexts.

5. Conclusions

This study aimed to address the critical knowledge gap concerning young carers in the wake of the COVID-19 pandemic. By analysing three nationally representative datasets, we identified a significant increase in the prevalence and intensity of caring provided by young individuals aged 16 to 18 during the post-pandemic period. Our findings also reveal the existence of socioeconomic and gender inequalities, with more females engaging with higher intensity care than males, and a concentration of young carers in socioeconomically deprived areas, single-parent households, and families facing unemployment and lower educational qualifications. These insights underscore the urgent need for targeted policies that not only identify and support young carers but also address the underlying socioeconomic and gender inequalities that shape their experiences. As the landscape of young caring evolves in response to global health crises like COVID-19, it becomes imperative for policymakers and support systems to adapt and provide robust assistance to this vulnerable group.

CRediT authorship contribution statement

Alejandra Letelier: Conceptualization, Methodology, Formal analysis, Writing – original draft, Visualization. **Anne McMunn:** Conceptualization, Methodology, Supervision, Writing – review & editing. **Andy McGowan:** Writing – review & editing. **Beth Neale:** Writing – review & editing. **Rebecca Lacey:** Conceptualization, Funding acquisition, Investigation, Methodology, Project administration, Resources, Supervision, Writing – review & editing.

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Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper. Study sponsors did not have any role in study design; collection, analysis, and interpretation of data; writing the report; or in the decision to submit the report for publication.

Declaration of competing interest

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Appendix A

Table A1
Description of variables and classification of categories.

UKHLS w9 and w12			COSMO			MCS		
Variables	**labels**	**categories**	**Variables**	**labels**	**categories**	**Variables**	**labels**	**categories**
Care status								
Care inside	no	non carers	Care	no	non carers	Care inside or	no	non carers
	yes	carer	inside or	yes	carer	outside	yes	carer
Care outside	no	non carers	outside					
	yes	carer						
Demographic factors								
Gender	Male	Male	Gender	Male	Male	Gender	Male	Male
	Female	Female		Female	Female		Female	Female
				Nonbinary/other	Nonbinary/other			
Ethnicity	British/English/Scottish/ Welsh/northern	White	Ethnicity	White	White	Ethnicity **	White	White
	Irish			Mixed	Mixed		Mixed	Mixed
	Gypsy or Irish traveller			Asian	Asian		Indian	Asian
	Any other white background			Black	Black		Pakistani or Bangladeshi	
	White and black Caribbean	Mixed		Other	Other		Black or Black British	Black
	White and black African						Other ethnic group	Other
	White and Asian							
	Any other mixed background							
	Indian	Asian						
	Pakistani							
	Bangladeshi							
	Any other Asian background							
	Caribbean	Black						
	African							
	Any other black background							
	Arab or any other	Other						
UKHLS w9 and w12			**COSMO**			**MCS**		
Family structure								
Household size	continuous	2 or 3 collapsed and 6 + collapsed	Household size	continuous	2 or 3 collapsed and 6 + collapsed	Household size	continuous	2 or 3 collapsed and 6 + collapsed
Household parental composition	Couple with 1 child	two parents house	Household parental composition	yes	two parents house	Household parental composition	Two parents/ carers	two parents house
	Couple with 2 children			no	single parent house		One parent/ carer	single parent house
	Couple with 3 or more children		Parent marital status	Married	two parents house			
	3 or more adults, 1–2 children, incl. at least one couple			In a registered civil partnership				
	3 or more adults, >2 children, incl. at least one couple			Never married and never registered in a civil partnership	single parent house			
	1 adult, 1 child	single parent house		Separated, but still legally married				

(*continued on next page*)

Table A1 (*continued*)

UKHLS w9 and w12		COSMO				MCS		
Variables	**labels**	**categories**	**Variables**	**labels**	**categories**	**Variables**	**labels**	**categories**
	1 adult, 2 or more children				Separated, but still legally in a civil partnership			
	2 adults, not a couple, 1 or more children				Divorced			
	3 or more adults, 1 or more children, excl. any couples				Formerly in a civil partnership which is now legally dissolved			
					Widowed/ Surviving partner from a registered civil partnership			
UKHLS w9 and w12			**COSMO**			**MCS**		
Socioeconomic indicators								
NS-SEC 3 categories*	Management & Professional	Management & Professional	NS-SEC 3 categories*	Employers in large establishments	Management & Professional	NS-SEC 3 categories*	Modern professional occupations	Management & Professional
	Intermediate	Intermediate		Higher managerial and administrative occupations			Senior managers or administrators	
	Routine	Routine		Higher professional occupations			Traditional professional occupations	
				Lower professional and higher technical occupations			Clerical and intermediate occupations	Intermediate
				Lower managerial and administrative occupations			Middle or junior managers	
				Higher supervisory occupations			Technical and craft occupations	
				Intermediate occupations	Intermediate		Semi-routine manual and service occupations	Routine
				Employers in small organisations			Routine manual and service occupations	
				Own account workers		+ NS-SEC-sweep 6	Management & Professional	Management & Professional
				Lower supervisory occupations			Intermediate	Intermediate
				Lower technical occupations			Small employers and own account workers	
				Semi-routine occupations	Routine		Lower supervisory and technical occupations	
				Routine occupations			Semi-routine and routine occupations	Routine

(*continued on next page*)

Table A1 (*continued*)

UKHLS w9 and w12		COSMO				MCS		
Variables	**labels**	**categories**	**Variables**	**labels**	**categories**	**Variables**	**labels**	**categories**
				Never worked and long-term unemployed				
Employment status	Self employed	Employed	Employment status	Employee in paid work	Employed	Employment status	employment	Employed
	Paid employment(ft/pt)			Employee on furlough			self-employment	
	On maternity leave			Self-employed			looking after family	Not in paid employment
	On furlough			Looking after family	Not in paid		waiting to start a job	
	Temporarily laid off/ short term working			Waiting to start a job	employment		looking for a job	
	Unemployed	Not in paid		looking for a job			sickness/disability	
	Retired	employment		Out of work for reasons of poor health			being on a government scheme	
	Family care or home			On a government scheme/ apprenticeship scheme			being on an apprenticeship scheme	
	Full-time student			Full-time student			full-time education	
	LT sick or disabled			Retired from paid work			retirement	
	Govt training scheme			Voluntary work			not being in paid work	
	Unpaid, family business			Not in paid work for some other reason				
	On apprenticeship							
	Doing something else							
Parental educational attainment	Degree	Higher education	Highest parental education	Higher Degree and Postgraduate qualification	Higher education	Highest parental education ****	NVQ level 5	Higher education
	Other higher degree			First Degree – including B.Ed			NVQ level 4	
	A-Level etc	Secondary education		Post-graduate Diplomas or Certificates			NVQ level 3	Secondary education
	GCSE etc			Diplomas in higher education			NVQ level 2	
	Other qualification	Other/Non-qualification		Teaching qualifications for schools or Further Education – below degree level			NVQ level 1	
	No qualification			A or AS levels or equivalent	Secondary education		Overseas qual only	Other/ Non-qualification
				GCSE or O level or equivalent			None of these	
				CSE below grade 1, or GCSE or O Level below grade C or equivalent				
				Other qualificat	Other/ No qualificat			
				None of these				
IMD	Least deprived	Least deprived	IMD	Least deprived decile	Least deprived	IMD ****	Least deprived decile	Least deprived quintile
	fourth quintile	fourth quintile		9	quintile		9	
	third quintile	third quintile		8	Fourth		8	Fourth
	second quintile	second quintile		7			7	
	Most deprived	Most deprived		6	Third		6	Third
				5			5	
				4	Second		4	Second
				3			3	

(*continued on next page*)

Table A1 (*continued*)

UKHLS w9 and w12		COSMO				MCS		
Variables	**labels**	**categories**	**Variables**	**labels**	**categories**	**Variables**	**labels**	**categories**
				2 Most deprived decile	Most deprived		2 Most deprived decile	Most deprived
UKHLS w9 and w12			**COSMO**			**MCS**		
Caring characteristics								
care intensity	0-4hrs	1 to 9 hrs per	care intensity	not available		care intensity	0-2hrs	1 to 9 hrs per week
	5-9hrs	week					3-4hrs	
	10-19hrs	10 + hrs per					5-9hrs	
	20-34hrs	week					10-19hrs	10 + hrs per week
	35-49hrs						20-29hrs	
	50-99hrs						30hrs or +	
	varies under 20							
	varies over 20 hrs							
recipient of care within house	Biological son/daughter	parent	not available	not available		recipient of care	Mother	parent
	Adopted son/daughter						Father	
	Foster child						Grandmother	Grandparent
	Stepson/stepdaughter						Grandfather	
	Son/daughter-in-law						Brother	sibling
	Grand-child	grand parent					Sister	
	Biological brother/sister	sibling					Aunties	other relative
	Half-brother/sister						Cousin	
	Step-brother/sister						Nice	
	Adopted brother/sister						Nephew	
	Foster brother/sister						Friend	non relative
	Brother/Sister-in-law						People not related	
	Grand-parent	other relative					Boyfriend	partner
	Cousin						Girlfriend	
	Aunt/Uncle							
	Niece/Nephew							
	Other relative							
	Employee	non relative						
	Employer							
	Lodger/Boarder/Tenant							
	Landlord/Landlady							
	Other non-relative							
	Husband/Wife	partner						
	Partner/Cohabitee							
	Civil Partner							
	Biological parent	child						
	Adoptive parent							
	Foster parent							
	Step-parent							
	Parent-in-law							
recipient of care outside house	Parent/parent-in-law	parent						
	Grandparent	grand parent						
	Aunt/uncle	other relative						
	Other relative							
	Friend or neighbour	non relative						
	Client of voluntary org	excluded						
	Other							

*Paternal occupations classified into NS-SEC using SOC 2010 guidelines.

** In the case ethnicity was missing in MCS we used information from the previous sweep (sweep 6).

***When information about parental occupation was not available at sweep 7, the information was complemented with answers from MCS sweep 6.

****Educational qualification information from parents and index multiple deprivation were sourced from MCS sweep 6.

Appendix B

Table B1
Descriptive characteristics of respondents included and excluded from the samples % (n of excluded individuals).

	UKHLS wave 9		MCS		UKHLS wave 12		COSMO	
Eligible sample n	1,600		6,598		887		11,180	
	Included	Excluded	Included	Excluded	Included	Excluded	Included	Excluded
N	1,429	171	5,504	1,094	789	98	6,354	4,827
Carer								
No	91.9	89.7 (156)	92.1	86.5 (947)	89.2	85.6 (88)	88.1	87.8 (4176)
Yes	8.1	10.3 (15)	7.9	13.5 (147)	9.8	14.4 (10)	11.9	12.2 (650)
Gender								
Male	50.6	41.0 (72)	45.1	42.4 (470)	47.8	34.3 (35)	52.0	50.9 (2191)
Female	49.4	59.0 (99)	54.9	57.6 (624)	52.2	65.7 (63)	48.0	49.1 (2635)
Ethnicity								
White	86.0	70.5 (89)	90.3	91.8 (104)	85.7	62.8 (42)	79.0	66.2 (1739)
Mixed	3.9	7.3 (13)	0.8	0.2 (1)	3.3	6.1 (7)	3.6	6.2 (184)
Asian	6.9	14.7 (40)	4.8	3.8 (10)	7.1	22.3 (38)	10.6	16.8 (818)
Black	2.4	7.5 (26)	2.3	4.3 (5)	3.8	8.9 (11)	4.8	8.7 (439)
Other	0.8	0.0 (1)	1.8	0.0 (0)	0.2	0.0 (0)	2.0	2.0 (75)
Household size								
2 or 3	27.1	37.4 (58)	6.5	18.9 (180)	25.6	42.1 (29)	25.4	25.8 (1215)
4	38.3	25.9 (48)	23.3	23.0 (231)	44.2	24.5 (24)	40.2	37.1 (1609)
5	20.6	15.9 (25)	41.4	28.5 (282)	21.0	19.4 (19)	21.1	22.3 (1101)
6+	15.1	20.8 (40)	28.5	29.5 (401)	9.3	16.3 (26)	12.3	14.8 (901)
(Mean Hh size)	(4.2)	(4.1)	(5.0)	(4.7)	(4.1)	(3.8)	(4.1)	(4.2)
Parental composition								
Two parents Hh	69.5	56.1 (90)	77.0	60.2 (597)	75.7	46.0 (53)	75.5	75.0 (1137)
Single parent Hh	30.5	43.9 (81)	23.0	39.8 (383)	24.3	54.0 (45)	24.5	25.0 (488)
Household occupational class								
Managerial/Prof	36.6	100 (1)	53.9	46.5 (121)	47.2	26.5 (1)	41.0	17.2 (105)
Intermediate	19.0	0.0 (0)	13.9	13.9 (39)	21.6	0.0 (1)	22.1	17.4 (122)
Routine	21.4	0.0 (1)	20.8	20.2 (69)	22.2	73.5 (2)	22.6	40.1 (331)
Not working	13.0	0.0 (0)	11.3	19.3 (60)	9.0	0.0 (0)	14.3	25.3 (199)
Household paternal education								
Higher educ	59.0	36.8 (53)	65.4	46.0 (119)	63.4	37.5 (33)	54.4	54.0 (361)
Secondary educ	39.8	60.1 (112)	31.2	45.2 (112)	35.8	60.0 (57)	34.9	29.9 (216)
Other/None	1.2	3.1 (6)	3.4	8.8 (34)	0.8	2.5 (3)	10.7	16.0 (146)
IMD								
Least deprived	23.1	13.1 (22)	23.9	13.5 (79)	24.5	6.9 (7)	21.2	18.7 (681)
4	19.7	11.2 (17)	19.0	19.7 (103)	18.6	25.6 (16)	19.9	18.8 (724)
3	19.0	17.3 (26)	19.0	20.8 (137)	21.1	13.3 (9)	18.6	17.8 (785)
2	19.1	30.3 (53)	18.3	21.9 (172)	18.3	24.4 (25)	19.4	20.3 (1082)
Most deprived	19.1	28.0 (52)	19.8	24.1 (254)	17.6	29.8 (37)	20.9	24.4 (1445)

Respondents were included/excluded from the analysis based on: i. inclusion/exclusion criteria and ii.complete case analysis
Hh: Household; Prof: Professional; Educ: education

Table B2
Process of sample selection (n).

	UKHLS w9	MCS	UKHLS w12	COSMO
All sample	1,603	10,730	890	12,828
Eligible sample	1,600	6,598	887	11,180
Complete data sample	1,429	5,504	789	6,354
Total excluded	171	1,094	98	4,827

All sample: individuals aged 16 to 18 included in the data.
Eligible sample: individuals who replied to the care question: yes or no aged 16–18.
Excluded because of missing information in any of the variables.

Data availability

Data will be made available on request.

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