

A school-based cross-sectional study to understand the public health measures needed to improve the emotional and mental wellbeing of young carers aged 12 to 14 years

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Abstract

The emotional and mental wellbeing of young carers is known to be poorer than their peers. Data from a large cross-sectional school survey of 7,477 12 to 14 year olds (72% response rate) living in Cornwall, South West of England were analysed to assess whether existing school-based interventions support the wellbeing of young carers. Outcome measures were derived from the Short Warwick-Edinburgh Mental Wellbeing scale (SWEMWBS) and the Strengths and Difficulties Questionnaire (SDQ). Young carers experienced greater emotional and mental wellbeing problems than their peers. Being eligible for free school meals did not attenuate these higher needs, indicating that broader support than financial measures are needed such as Education, Health and Care Plans which were associated with higher mental wellbeing among young carers. Early community and school-based interventions that consider the complex needs of young carers, especially emotional wellbeing are needed.

Key words

Young carers; Emotional problems; Mental health; Free school meals; Education, health and care plans

Word count: 7,345 (including everything apart from the supplemental file)

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Introduction

The prevalence of poor mental and emotional wellbeing among children and adolescents is increasing in high income countries (Inchley et al 2020). The Children's Society (2018) have described young people's wellbeing as one of the greatest health inequalities across England (The Children's Society 2018). One group of young people at high risk for poorer mental and emotional wellbeing are young carers (Office of National Statistics 2013). Over the past 20 years the body of evidence on the impacts of caring on young people's wellbeing has been growing, identifying beneficial as well as detrimental effects (Abraham and Aldridge 2010, Choudhury and Williams 2020, Cree 2003, Hamilton and Redmond 2020, Järkestig-Berggren et al 2019, Lloyd 2013, Robison et al 2020). Health and education services may not be aware when a young person adopts caring responsibilities and therefore much research has focused on describing the population of young carers. But recently, Joseph et al (2020) have argued that research now needs to focus on how to address the needs of young carers rather than additional epidemiological data.

In the United Kingdom (UK) a young carer is defined as a young person aged under 18 years who provides or intends to provide care for another person (HM Government 2014). However, definitions vary between countries and studies resulting in estimates of the proportion of young carers varying from 2% in the UK up to 50% in one Canadian study (Areguy et al 2019, Office of National Statistics 2013). Joseph et al (2020) in their overview of studies concluded that 2-8% of children and adolescents are young carers. Some definitions specify what types of conditions the

person being cared for has, while others focus on the nature of the caring responsibilities (Hamilton and Redmond 2020, Robison et al 2020). It is rare for definitions to specify the degree of responsibility a young person must have in order to be considered a carer. However, one common thread in most definitions is the recognition of the additional responsibilities young carers have (Cree 2003). These additional responsibilities are thought to lead to both the beneficial and detrimental impacts of caring. Cree (2003) describe three areas of concern for young carers that impact on their wellbeing: worry about the person being cared for, worry about the impact of the persons illness on the family and worry about the impact on their own current and future lives. These worries include worrying about who will care for the young person themselves, which ties into worries about the potential consequences of involving social services if they disclose their caring status, also thought to contribute to underreporting (Becker and Becker 2008, Department for Education 2016, Richardson et al 2009, Smyth et al 2011).

Efforts to support young carers need to recognise the benefits of the additional responsibilities while mitigating the detrimental impacts of the responsibilities. Wind and Jorgensen (2020) found the Danish Buddy respite programme to be beneficial for young carers in Denmark, noting ‘the importance of fun and cosy activities that provide children with respite from the serious concerns that otherwise fill the lives of young carers’ (p.100). Abraham and Aldridge (2010) recommended that educators needed training in how to identify young carers. However, might existing school-based support services already be supporting young carers?

A systematic review by Cohen et al (2021) found the universal provision of school meals to be linked to a number of beneficial educational (e.g. participation

and academic performance) as well as health outcomes (e.g. diet quality and body mass index). While, in the UK the provision of school meals dates back to the late 19th and early 20th centuries when it was recognised that hunger was preventing children from benefiting from their education, today most children in statutory education only receive free school meals (FSM) if their parent or carer is in receipt of certain benefits (social security) (Cornwall Council 2021, Harris 1995). Alongside the nutritional value FSM policies have been recognised as relieving some financial stress on families, with the interruption to the provision of meals while school buildings were closed during the COVID-19 pandemic attracting widespread criticism of the UK government (Beaton et al 2014, Shields 2021). A more recent policy development has been the introduction of Education, Health and Care Plans (EHCPs) in 2014 (GOV.UK n.d.). EHCPs 'identify educational, health and social needs and set out the additional support to meet those needs' which can include financial and non-financial support (GOV.UK n.d.). When an EHCP is requested an assessment is undertaken of the child's educational, health and social needs, including reports from relevant professionals in order to determine eligibility for a plan (GOV.UK n.d.). Some young carers will be eligible for FSMs and/or EHCPs while others will not, providing an opportunity to examine whether these policies support young carer wellbeing.

In the UK, the five-year HeadStart project 'aims to explore and test new ways to improve the mental health and wellbeing of young people aged 10 to 16 and prevent serious mental health issues from developing.' (University College London 2021). The inclusion of the county of Cornwall in South West England as one of the six HeadStart sites meant that unique data were available to explore the potential impact of existing school-based interventions on young carers. Subsequently, we

undertook a secondary data study with the aims of characterising the emotional and mental wellbeing of young carers in Cornwall and exploring whether FSMs or EHCPs were associated with better wellbeing among young carers.

Method

In Cornwall, all mainstream schools and Alternate Provision Academies are participating in the HeadStart programme (29,027 pupils), which commenced in 2017 (HeadStart Kernow 2021). All year 8 and 9 pupils (aged 12-14 years) in Cornwall were asked by school staff to complete the Wellbeing Measurement Framework (WMF) online survey between March and May 2018 (Deighton et al 2019). The WMF is a longitudinal study started in 2017 surveying year 7 pupils (aged 11-12 year) and following them for 5 years with a fixed-age comparison study surveying year 9 pupils (aged 13-14 years) each year. The surveys were designed to be completed during school time by pupils aged between 11 and 16 years of age. It is a self-report survey, which recorded gender, the year group of each pupil and whether they were a young carer. This was defined as 'children and young people under 18 who provide regular or ongoing care to a family member who has an illness, disability, mental health condition or drug/alcohol dependency' (Child Outcomes Research Consortium 2017). Based on this definition, the questionnaire asked participants, 'are you or have you ever been a young carer?', information that Cornwall Council were not systematically collecting in any other form. Existing instruments which are reliable, valid and sensitive to change were used as part of the WMF to measure pupils' emotional and mental wellbeing (Goodman 2001, Goodman et al 1998, Stewart-Brown et al 2009, Tennant et al 2007).

Schools were provided with guidance on how to administer the survey, which was made available to them from the HeadStart Learning Team (n.d.). This comprised an introductory film for teachers and pupils and a crib sheet for teachers.

The crib sheet contained:

- Text for the teachers to read out to pupils to explain that the answers would be kept confidential by the people running the survey and that teachers and parents would not see their answers.
- Practical guidance on how to administer the survey including the amount of time it would take to complete, suggestions on activities for early finishers, how to support children to understand the words and concepts, and how to help pupils with reading difficulties or special educational needs.
- Frequently asked questions in order that the teachers had pre-prepared answers to questions pupils may have.
- A glossary of terms.

The WMF was completed on school IT equipment during a lesson with a teacher present. Each pupil was given a unique log in and having logged in each pupil was reminded about who would have access to their data and asked to consent to participate. Within the survey pop outs were available to explain what terms meant. The learning derived from this method of data collection was developed into a case study on how to get a good response rate when assessing wellbeing in schools (Evidence Based Practice Unit 2018).

To assess the emotional and mental wellbeing of pupils, the WMF asked each pupil to complete questions set out by the self-completed Short Warwick-Edinburgh Mental Wellbeing scale (SWEMWBS) (Hughes et al 2016, Stewart-Brown et al 2009,

Tennant et al 2007) and the Strengths and Difficulties Questionnaire (SDQ) (Deighton et al 2019, Goodman 2001, Goodman et al 1998). These are validated and widely used survey instruments, with the seven SWEMWBS items used to calculate a mental wellbeing score (Stewart-Brown et al 2009, Tennant et al 2007), whereas the 25 SDQ items are used to calculate four problem scales: emotional symptoms, conduct problems, hyperactivity/inattention, and peer relationship problems, that are combined to produce a total difficulties score and a single strength scale: prosocial behaviour (Goodman 2001, Goodman et al 1998). The WMF data were cleaned and processed by the University of Manchester HeadStart team before the dataset was provided to Cornwall Council. Both SWEMWBS and SDQ have previously been used in studies of young carer wellbeing (Abraham and Aldridge 2010, Järkestig-Berggren et al 2019, Robison et al 2020). SWEMWBS mental wellbeing score was our measure of mental wellbeing with higher scores representing higher positive mental wellbeing (Stewart-Brown et al 2009, Tennant et al 2007). Our primary measure of emotional wellbeing was the SDQ total difficulties score with higher scores representing lower positive emotional wellbeing (Goodman 2001, Goodman et al 1998). To obtain data on whether each child was eligible for FSM or had an EHCP, Cornwall Council and the HeadStart team worked together to securely link the WMF data with locally available data held by the Performance Data Team (Together for Families) using unique pupil numbers (Supplementary material 1) (Evidence Based Practice Unit n.d.).

Ethical approval for the HeadStart programme was granted by University College of London in November 2017 (reference 8097/003) (Deighton et al 2019). With the HeadStart study commencing before the General Data Protection Regulations were introduced in 2018 an opt-out process was granted ethical

approval, with information sheets provided to parents/carers and the child assenting to participate by logging in to complete the survey online. Only one wave of WMF data were analysed to minimise the risk of contamination by any interventions introduced through the HeadStart study. In Cornwall, 10,345 children from Years 8 and 9 were asked to participate in the WMF in 2018.

Statistical analysis plan

Due to the cross-sectional nature of the sample, we conducted complete case analyses. The sample were first divided into those who did and did not identify as young carers. Each group was characterised according to the following characteristics: age, gender, ethnicity, English as an Additional Language (EAL), whether a pupil was considered as young for their year group (i.e., born during the summer months of May, June, July, and August), socioeconomic status of home address, mental wellbeing (SWEMWBS mental wellbeing score), emotional wellbeing (SDQ total difficulties score), FSM eligibility and EHCP status. Both SWEMWBS mental wellbeing score and SDQ total difficulties score as the primary dependent variables were assessed as being normally distributed.

Using continuous outcomes measures (raw SWEMWBS mental wellbeing and SDQ total difficulties scores), multilevel univariable and multivariable (adjusted for gender, ethnicity, summer born and deprivation) regression models were then used to assess the adjusted impact of being a young carer on emotional and mental wellbeing. The three-level multilevel models accounted for the potential for clustering within schools and year groups (Deighton et al 2019). The first models used SWEMWBS mental wellbeing score and SDQ total difficulties score to assess the mental and emotional wellbeing of young carers respectively. To explore this further,

we separately assessed the emotional wellbeing of young carers using the four SDQ problem scales (emotional symptoms, conduct problems, hyperactivity/inattention, and peer relationship problems), and the single strength scale (prosocial behaviour). Finally, we tested the interaction between caring and EHCP or FSM in the SWEMWBS mental wellbeing score and SDQ total difficulties score multilevel models to examine any potentially protective associations with the emotional and mental wellbeing of young carers. We also tested the interaction between caring and deprivation living in the lowest 20% deprived neighbourhoods) to assess whether this carried any additional impact. All statistical analyses were carried out in Stata version 15.0 (College Station, US), all statistical tests undertaken were two-tailed with $\alpha=0.05$.

Results

In Cornwall 8,865 children from year 8 (4,627) and 9 (4,238) responded (response rate of 85%) to the WMF survey, which makes up nearly a third of the national HeadStart sample (Deighton et al 2019). No data are available on non-respondents preventing comparisons. Complete data for this study were only available for 7,477 (72%) pupils. The demographics of those with missing data differed in terms of gender, deprivation, level of support, being a young carer, and mental and emotional wellbeing (Table 1). Notably the complete cases included fewer male pupils and pupils living in more deprived areas.

Of the sample with complete data, there were 1,037 pupils (13.9%) who said they were or had ever been a young carer (Table 1). In terms of their demographic profile, young carers were similar to their peers, in terms of gender, ethnicity, the proportion of summer births and EAL pupils. More young carers had an EHCP

(16.2% versus 9.1%, $p < 0.001$), were eligible for FSM (38.1% versus 18.2%, $p < 0.001$) and lived in more deprived neighbourhoods (20.8% versus 11.9%, $p < 0.001$).

[Insert Table 1 around here]

Young carer wellbeing and school-based interventions

Young carers mean mental wellbeing score was 22.5 (standard deviation (SD) 5.6), significantly lower than their peers (mean 23.9, SD 5.2, $t(7,475) = 8.00$, $p < 0.001$) (Table 1). In terms of SDQ, young carers had a higher total difficulties score (mean 16.2, SD 6.55) than their peers (mean 13.0, SD 6.3, $t(4,475) = -15.16$, $p < 0.001$) (Table 1). Among young carers the pairwise correlation between mental and emotional wellbeing was -0.51, compared to -0.60 among those without caring responsibilities. The proportion of the variation in emotional and mental wellbeing attributable to differences between year groups and schools among carers and non-carers was <2%.

In the regression analyses, children who have caring responsibilities were found to have a lower mental wellbeing score (-1.39, 90% confidence interval -1.72 to -1.04) and higher total difficulties score (3.16, 95% confidence interval 2.74 to 3.57) than their peers without caring responsibilities (Tables 2). The magnitude and statistical significance of these associations did not alter markedly following adjustment for gender, season of birth, ethnicity, and area deprivation (Table 2). Examining the four problem domains and single strength domain of the SDQ separately found that being a young carer was statistically significantly associated with higher scores in each problem domain, but a non-significantly higher score on the prosocial behaviour strength domain (Table 3).

[Insert Table 2 around here]

[Insert Table 3 around here]

The provision of FSM and/or EHCP are intended to help more vulnerable children in schools. Which is consistent with the finding that eligibility for FSM and having an EHCP were both associated with poorer mental and emotional wellbeing in the unadjusted and adjusted analyses (Tables 2). Additionally, adjusting for FSM and EHCP markedly attenuated the association between caring responsibilities and mental and emotional wellbeing (Table 2). While the coefficient of caring remained statistically significant in both the models of SWEMWBS mental wellbeing and SDQ total difficulties scores, adjusting for FSM and EHCP reduced the magnitude of both coefficients. The interactions between caring and FSM eligibility and having an EHCP in place tested whether these means of support were associated with differences in emotional and mental wellbeing (Table 4). The interactions between caring and FSM eligibility were not statistically significant for either mental or emotional wellbeing. However, the interactions between caring and having an EHCP was significant for mental wellbeing (1.01, 95% confidence interval 0.04 to 1.97), but not emotional wellbeing. In each of these cases, the interaction coefficient was in the opposite direction to the coefficient for caring, which would suggest that the wellbeing outcomes were better for young carers with an EHCP. The interaction between living in one of the 20% most deprived postcodes in England and being a young carer was also examined, as it was found that the proportion of young carers living in these areas was almost double the proportion of non-carers who lived in one of these areas (Table 1). Like FSM and EHCP, the coefficient of the interaction with caring was in the opposite directions to the coefficient for caring for both mental and

emotional wellbeing (Tables 4). This interaction was again only significant for mental (1.06, 95% confidence interval 0.19 to 1.94) and not emotional wellbeing (Table 4).

[Insert Table 4 around here]

Risk factors influencing the emotional and mental wellbeing of pupils

These findings need to be put into context with other risk factors influencing the emotional and mental wellbeing of children and young people within schools across Cornwall. In the fully adjusted models, boys were found to have a mental wellbeing score of 1.29 (95% confidence interval 1.05 to 1.53) points higher than girls, which was also reflected with corresponding lower SDQ total difficulties score (-1.07, 95% confidence interval -1.35 to -0.79) (Table 2). Neither minority ethnicity nor having English as an additional language were statistically significantly associated with emotional or mental wellbeing, although these populations are small in Cornwall (Tables 1 and 2). Nor was being born in May, June, July, or August (Table 2). Living in the most 20% deprived neighbourhoods was associated with higher emotional and mental wellbeing needs unless models were adjusted for FSM eligibility and EHCP (Table 2). In comparisons with these wellbeing inequalities, it appears that the difference in mental wellbeing of young carers in Cornwall is similar to that of known gender and deprivation inequalities, however, the emotional wellbeing impact is bigger than that associated with these known inequalities.

Discussion

Young people with caring responsibilities in Cornwall were more vulnerable (e.g., living in deprivation, eligible for FSM and had an EHCP) and were found to

have reduced mental wellbeing and greater emotional difficulties than their peers. Young carers experienced increased emotional difficulties regardless of having an EHCP or being eligible for FSM. However, our findings may suggest that having an EHCP in place may support the mental wellbeing of young carers (Table 4). Beyond highlighting the need to understand the wider implications of being a young carer, our findings indicate that further research is needed to evaluate and potentially refine existing support systems for young carers, especially the emotional wellbeing of young carers.

Half of the sample across both year groups were female and the majority of pupils were white British, which is consistent with the demographic profile across the national sample. The proportion of young people in the HeadStart Kernow study who reported being a young carer was higher than most estimates at 13.9%, although it was still within the range of estimates found in the literature (Areguy et al 2019, Joseph et al 2020, Office of National Statistics 2013). Studies in Northern Ireland and Glasgow both identified 12% of adolescents as young carers (Lloyd 2013, Robison et al 2020). Notably, the higher prevalence in the HeadStart Kernow study might have arisen from the fact that the question asked about both current and previous young carer status. Our finding might highlight transient periods of caring among young people for example for a grandparent who has now died or a parent with an addiction or mental health problem that has been treated (Wayman et al 2016). The beneficial and detrimental impacts of caring are unlikely to be resolved quickly when the need for care stops and therefore future studies may want to seek out current and past carers (Lloyd 2013, Robison et al 2020).

Despite the lower levels of ethnic diversity in Cornwall, our findings are consistent with prior associations between gender, ethnicity, EHCP and FSM and greater emotional difficulties among young carers (Choudhury and Williams 2020,

Deighton et al 2019, Järkestig-Berggren et al 2019). Choudhury and Williams (2020) have previously identified EHCPs as an important source of support for young carers. However, eligibility for an EHCP is assessed against a number of criteria (GOV.UK n.d.) which a number of the young carers in Choudhury and Williams (2020) study had not met. In the current study 16.2% of the young carers had an EHCP (Table 1), we do not have information on whether any of the young carers without an EHCP had applied and been found ineligible. The eligibility criteria for EHCPs means that it may be possible to conduct a regression discontinuity quasi-experimental evaluation of EHCPs where relevant outcome data are available routinely. The relationship between EHCP and mental wellbeing, and inconsistency with the emotional problems may be a result of a weak correlation between mental illness and subjective wellbeing (Fink et al 2015). We found a lower correlation between emotional and mental wellbeing among young carers than their peers. This supports the need to consider both the emotional and mental wellbeing of young carers in the development of whole school approaches.

There is a clear need to address the emotional and mental wellbeing of young carers because the most profound decline in general health status since 2001 has been observed in carers aged between 0 and 24 years (Office of National Statistics 2013). There are consistent trends across this age group with the prevalence rates of long-standing mental illness among children and young people increasing by six fold since 1995 across England (Pitchforth et al 2019). The rise in prevalence may be the result of a number of complex and overlapping factors. These potentially include the accuracy of self-reported outcomes, a rise in difficulties, austerity, academic pressures, reduced sleep, increased use of social media and changes in diagnosis (Deighton et al 2019). While it is outside the scope of HeadStart to assess

the impact of these risk factors, future programmes should consider these wider determinants of health.

These findings also need to be put into the context of the potential benefits of caring for others. Many carers value their role, and over time, have developed new skills, coping mechanisms and resilience to deal with the difficulties of being a young carer (Wayman et al 2016). Despite these benefits there is a clear need to understand and support the development of coping mechanisms that can support the physical and mental wellbeing of young carers (Becker and Becker 2008, Joseph et al 2020, Nagl-Cupal et al 2014). EHCPs which put in place plans for various situations that could arise for the young carer may lead to improved wellbeing by reducing some of their worries while not completely removing the additional responsibilities (Cree 2003).

Future strategies must account for the variable conditions, disabilities, stresses and strains on young carers because every situation is dynamic, subject to ongoing flux and change (Wayman et al 2016). These must also attempt to help overcome the impact of diverse risk factors such as living in lower income populations, social isolation and living in poor housing conditions (Becker and Becker 2008, Wayman et al 2016). Future strategies and interventions need to account for contributory pressures such as reduced infrastructure, transport, education attainment/employment opportunities, sparse service provision and being isolated from other family members (Frank and McLarnon 2008, Wayman et al 2016).

Systemic changes are needed to address these wider determinants of health, which require early intervention, significant resourcing and additional support provision (Deighton et al 2019) that are tailored to the needs of young carers. To overcome the pressures and hidden nature of being a young carer (Järkestig-

Berggren et al 2019, Smyth et al 2011), these need to be incorporated into future wellbeing programmes and be delivered alongside increased interdisciplinary and multiagency working outside the school environment (Joseph et al 2020). This should also include identification and special attention paid to young carers at the start of their adult lives when they are undergoing extensive changes and taking major decisions on study and career issues (Boumans and Dorant 2018).

The large sample size and high response rate of the WMF survey across Cornwall reduces the risk of bias in the study and adds considerable strength to our study. Despite this strength, several limitations exist. The experience of undertaking the WMF survey in 2018 highlighted the need for data collection to adapt to the needs of specific students such as those with reading difficulties or those with English as an additional language (Evidence Based Practice Unit 2018). While the sensitivity and security of the data were emphasised to the teachers and pupils, we do not have any information about how privacy was maintained during survey completion. The presence of a teacher is likely to have minimised the discussion between pupils, but we cannot rule out the potential for bias related to social desirability, peer pressure or stigma. This has the potential to lead to both under- (for example, due to fear of peers or teachers knowing about their caring status) and over-reporting (for example, friendship groups seeking to share similar characteristics) of wellbeing and caring and is therefore difficult to account for in the analysis. We conducted a complete case analysis, limited by missing data across schools, which appears to have meant that some vulnerable young people were lost from the analysis, especially males and those living in more deprived areas. Due to the specialist data collection, we have not been able to make any comparisons between those who did and did not complete the WMF survey. There is a clear reliance on self-reporting of the emotional and mental wellbeing questions in the

WMF survey tool, although widely used validated and reliable measures were employed (Deighton et al 2019). While the use of SWEMWBS and SDQ may lack specificity and sensitivity, they are validated and are commonly used with children and young people, including young carers (Abraham and Aldridge 2010, Goodman 2001, Goodman et al 2000, Goodman et al 1998, Järkestig-Berggren et al 2019, Robison et al 2020).

Conclusion

Secondary analysis of data from the HeadStart study has continued to confirm that young carers report poorer mental and especially emotional wellbeing than their peers without caring responsibilities. Additionally, our study found that primarily financial interventions like FSMs do not seem to have as much of an impact on carer wellbeing as broader interventions like EHCPs. Our findings regarding EHCPs alongside those of Choudhury and Williams (2020) may indicate the need for an evaluation of EHCPs for young carers and a review of the eligibility criteria to better support young carers. Interventions like EHCPs that work with the young person, their family and school to implement appropriate support and plans may help the young person maintain their caring responsibilities while mitigating against the more unpredictable and detrimental aspects of caring (Cree 2003, Järkestig-Berggren et al 2019, Wind and Jorgensen 2020). However, there remains a need to support the emotional wellbeing of young carers.

Funding details

The data used in this study was collected as part of the HeadStart learning programme and supported by funding from the National Lottery Community Fund. The HeadStart learning programme is being delivered by a consortium of partners

led by the Evidence Based Practice Unit (EBPU) (a collaboration between University College London and the Anna Freud National Centre for Children and Families) including the University of Manchester, and the Child Outcomes Research Consortium (CORC). The content is solely the responsibility of the authors and it does not reflect the views of the National Lottery Community Fund, EBPU, University of Manchester, or CORC.

Started in 2016, HeadStart is a five-year, £58.7 million National Lottery funded programme set up by The National Lottery Community Fund, the largest funder of community activity in the UK. HeadStart aims to explore and test new ways to improve the mental health and wellbeing of young people aged 10 to 16 and prevent serious mental health issues from developing. To do this, six local authority led HeadStart partnerships are working with local young people, schools, families, charities, community and public services to design and try out new Facilitator interventions that will make a difference to young people's mental health, wellbeing and resilience. The HeadStart partnerships are in the following locations in England: Blackpool; Cornwall; Hull; Kent; Newham; Wolverhampton.

Conflict of interest statement

The Authors declare that there is no conflict of interest

Acknowledgements

We would like to thank first and foremost the young people of Cornwall who have been part of the HeadStart Kernow programme and have given their consent to complete the Wellbeing Measurement Framework Survey, in particular the young people who self-identified as young carers. We would also like to acknowledge the

dedication of staff in the secondary schools and the Alternative Provision Academies in Cornwall without whom the collection of this data would not have been possible.

We would like to acknowledge and thank all of those from the national and local team at Cornwall Council who have contributed to the design and delivery of HeadStart research. This includes the wider Cornwall Council teams who have supported the HeadStart programme, which made this secondary data analysis study possible.

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Table 1 – Sample characteristics

		Complete (n=7,477)	Missing (n=1,332)	p- value*	Carer (n=1,037)	Non- carers (n=6,440)	p- value*
Gender	Female	50.5%	42.0%	<0.01	50.4%	50.6%	0.94
Summer born		33.4%	37.2%	0.01	34.8%	33.2%	0.37
Ethnicity	White	92.9%	91.0%	0.02	93.0%	92.9%	0.90
	British	1.9%	1.7%	0.56	1.7%	1.9%	0.65
English as an additional language							
Index of Multiple Deprivation (IMD) decile of home postcode	1	5.2%	8.2%	<0.01	8.5%	4.7%	<0.01
	2	7.9%	11.3%		12.3%	7.2%	
	3	15.4%	15.9%		16.4%	15.2%	
	4	26.7%	26.6%		26.6%	26.7%	
	5	21.2%	16.8%		16.2%	22.0%	
	6	10.6%	10.0%		9.9%	10.7%	
	7	7.6%	6.5%		6.5%	7.8%	
	8	4.7%	4.0%		3.8%	4.9%	
	9	0.7%	0.8%		0.4%	0.8%	
	10	<0.1%	0.0%		0.0%	<0.1%	
20% most deprived IMD		13.1%	19.6%	<0.01	20.8%	11.9%	<0.01
Free school meals		21.0%	28.1%	<0.01	38.1%	18.2%	<0.01
Education, Health and Care Plan		10.1%	20.5%	<0.01	16.2%	9.1%	<0.01
Carer		13.9%	18.8%	<0.01	-	-	-
Short Warwick Edinburgh Mental Wellbeing Scale mental wellbeing score		23.7±5.3	22.7±6.0	<0.01	22.5±5.6	23.9±5.2	<0.01
Strengths and Difficulties Questionnaire total difficulties score		13.5±6.4	14.9±6.5	<0.01	16.2±6.5	13.0±6.3	<0.01

*Two-tailed t-tests for continuous measures and chi-squared test for categorical measures

Table 2 – Unadjusted and adjusted multilevel regression estimates of the determinants of mental wellbeing (SWEMWBS mental wellbeing score) and emotional wellbeing (SDQ total difficulties score)

	Unadjusted		Partially adjusted model		Fully adjusted model	
	Coefficient	95% CI	Coefficient	95% CI	Coefficient	95% CI
Mental Wellbeing (SWEMWBS mental wellbeing score)						
Gender (male)	1.25	1.01 to 1.48	1.24	1.00 to 1.48	1.29	1.05 to 1.53
Summer born	-0.07	-0.32 to 0.19	-0.03	-0.28 to 0.22	-0.01	-0.26 to 0.24
Ethnicity (not White British)	-0.37	-0.84 to 0.09	-0.40	-0.87 to 0.06	-0.39	-0.91 to 0.13
English as an additional language	-0.52	-0.36 to 1.39	-	-	0.01	-0.96 to 0.99
20% most deprived IMD	-0.72	-1.09 to -0.35	-0.58	-0.94 to -0.21	-0.28	-0.65 to 0.09
Free school meals	-1.68	-1.97 to -1.38	-	-	-1.38	-1.68 to -1.08
Education, Health and Care Plan	-0.95	-1.35 to -0.55	-	-	-0.86	-1.26 to -0.45
Carer	-1.39	-1.72 to -1.04	-1.34	-1.69 to -1.00	-1.04	-1.38 to -0.69
Intercept	-	-	23.66	23.14 to 24.18	23.92	23.35 to 24.49
Emotional Wellbeing (SDQ total difficulties score)						
Gender (male)	-0.93	-1.22 to -0.64	-0.91	-1.20 to -0.63	-1.07	-1.35 to -0.79
Summer born	0.29	-0.02 to 0.59	0.24	-0.06 to 0.55	0.19	-0.11 to 0.48
Ethnicity (not White British)	0.18	-0.39 to 0.74	0.24	-0.32 to 0.79	-0.11	-0.72 to 0.51
English as an additional language	-1.36	-2.42 to -0.30	-	-	-1.27	-2.43 to -0.11
20% most deprived IMD	1.46	1.01 to 1.90	1.16	0.72 to 1.60	0.73	-0.29 to 1.17
Free school meals	2.53	2.18 to 2.88	-	-	1.80	1.44 to 2.15
Education, Health and Care Plan	2.81	2.33 to 3.29	-	-	2.41	1.93 to 2.89
Carer	3.16	2.74 to 3.57	3.06	2.65 to 3.47	2.56	2.15 to 2.98
Intercept	-	-	13.11	12.48 to 13.73	13.05	13.37 to 13.73

IMD; Index of multiple deprivation, 95% CI; 95% confidence interval of the coefficient

Table 3 – Adjusted multilevel regression estimates of the determinants of the four problem and single strength scales of the Strengths and Difficulties Questionnaire (SDQ)

	Problem scales							
	Emotional symptoms		Conduct problems		Hyperactivity/ inattention		Peer-relationship problems	
	Coef	95% CI	Coef	95% CI	Coef	95% CI	Coef	95% CI
Gender (male)	-1.74	-1.85 to -1.63	0.43	0.34 to 0.51	0.31	0.20 to 0.42	0.09	0.01 to 0.17
Summer born	0.07	-0.05 to 0.19	-0.01	-0.10 to 0.08	0.08	-0.04 to 0.21	0.11	0.02 to 0.20
Ethnicity (not White British)	0.13	-0.09 to 0.34	-0.07	-0.24 to 0.10	0.19	-0.03 to 0.41	-0.01	-0.17 to 0.15
20% most deprived IMD	0.27	0.10 to 0.44	0.29	0.16 to 0.43	0.30	0.12 to 0.47	0.30	0.17 to 0.43
Carer	0.82	0.65 to 0.98	0.73	0.60 to 0.86	0.83	0.67 to 1.00	0.70	0.57 to 0.83
Intercept	4.59	4.36 to 4.82	2.12	1.93 to 2.31	4.26	4.02 to 4.51	2.12	1.95 to 2.29

Coef: regression coefficient, IMD; Index of multiple deprivation, 95% CI; 95% confidence interval of the coefficient

Table 4 – Adjusted multilevel regression estimates of the determinants of mental wellbeing (SWEMWBS mental wellbeing score) and emotional wellbeing (SDQ total difficulties score) with interactions between caring and existing public health measures

	Free school meals		Education, Health and Care Plan		20% most deprived IMD	
	Coefficient	95% CI	Coefficient	95% CI	Coefficient	95% CI
Mental Wellbeing (SWEMWBS mental wellbeing score)						
Gender (male)	1.22	0.99 to 1.46	1.32	1.08 to 1.56	1.24	1.00 to 1.47
Summer born	-0.03	-0.28 to 0.22	<-0.01	-0.25 to 0.25	-0.04	-0.29 to 0.21
Ethnicity (not White British)	-0.41	-0.87 to 0.05	-0.40	-0.86 to 0.06	-0.40	-0.86 to 0.06
20% most deprived IMD	-0.30	-0.67 to 0.07	-0.53	-0.90 to -0.17	-0.79	-1.20 to -0.39
Free school meals	-1.56	-1.89 to -1.23	-	-	-	-
Education, Health and Care Plan	-	-	-1.29	-1.74 to -0.84	-	-
Carer	-1.25	-1.67 to -0.82	-1.42	-1.79 to -1.05	-1.55	-1.93 to -1.16
<i>Interactions</i>						
Carer eligible for free school meals	0.49	-0.24 to 1.22	-	-	-	-
Carer with an Education, Health and Care Plan	-	-	1.01	0.04 to 1.97	-	-
Carer from 20% most deprived IMD	-	-	-	-	1.06	0.19 to 1.94
Intercept	23.93	23.41 to 24.45	23.72	23.20 to 24.24	23.69	23.17 to 24.21
Emotional Wellbeing (SDQ total difficulties score)						
Gender (male)	-0.89	-1.17 to -0.61	-1.12	0.62 to 1.49	-0.91	-1.19 to -0.62
Summer born	0.24	-0.06 to 0.54	0.17	-0.12 to 0.47	0.25	-0.05 to 0.55
Ethnicity (not White British)	0.24	-0.31 to 0.79	0.21	-0.34 to 0.76	0.23	-0.32 to 0.79
20% most deprived IMD	0.77	0.33 to 1.21	1.05	0.62 to 1.49	1.33	0.84 to 1.82
Free school meals	2.15	1.75 to 2.55	-	-	-	-
Education, Health and Care Plan	-	-	2.91	2.37 to 3.44	-	-
Carer	2.91	2.40 to 3.42	3.02	2.57 to 3.46	3.22	2.76 to 3.68
<i>Interactions</i>						
Carer eligible for free school meals	-0.63	-1.50 to 0.25	-	-	-	-
Carer with an Education, Health and Care Plan	-	-	-0.97	-2.12 to 0.19	-	-
Carer from 20% most deprived IMD	-	-	-	-	-0.84	-1.90 to 0.21

Emotional and mental wellbeing of young carers

Intercept	12.74	12.12 to 13.36	13.00	12.38 to 13.63	13.09	12.46 to 13.71
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IMD; Index of multiple deprivation, 95% CI; 95% confidence interval of the coefficient

Supplementary material 1 – Data linking with locally available data held by the Performance Data Team (Together for Families)

Variable	Description
Ethnicity	Defined as Asian, Black, Chinese, Mixed, White or any other ethnic group).
Summer born	Defined by date of birth and if children born were in May, June, July & August.
SEN	Special educational needs (SEN) – includes children on an Education, Health and Care plan (EHCP), receiving SEN support and statemented children (these children were gradually moved onto an EHCP).
FSM	Free school meals (FSM) – Children are eligible for free schools meals where a parent or guardian meets specific financial criteria. Data provided here relates to pupils who have been eligible for free school meals at any time in the last 6 years (FSM6). These pupils are eligible for the deprivation element of the Pupil Premium.
EAL	Children speaking English as an addition language.
Deprivation	For the purposes of this analysis, pupils whose home postcodes are in the most deprived 20% of Lower Super Output Areas in England, according to the Index of Multiple Deprivation. Home address sourced from the Department for Education Spring School Census (Jan 2018).