Cognit Ther Res. 2023 Jun 3:1–12. Online ahead of print. doi: 10.1007/s10608-023-10396-3

Self-Reported Worries in Young People During the COVID-19 Pandemic

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PMCID: PMC10238236 PMID: 37363750

Abstract

Purpose

COVID-19 pandemic has had long-standing consequences for all aspects of life. Although young people appear less susceptible to severe forms of physical illness due to the coronavirus, they

have not escaped unscathed from its' psychological impacts. The present study measured the content of worries in young people residing in the UK during the pandemic and how it varied with sociodemographic factors.

Methods

Between May and December 2020, UK-residing participants aged 12–25 years completed an online survey that presented participants with free-text fields to describe their top three worries over the last two weeks, in addition to demographic and other information. Cross-sectional data from 2560 participants (Males = 767; Female = 1793) was analyzed.

Results

Irrespective of sociodemographic, a majority of the participants reported worries related to academics, followed by social relationships, own physical health, social and work routines, and physical health of others. Significantly more females reported concerns about academics, finances, physical health, social and work routines, social relationships, mental health and emotions, and physical health of others. Expectedly, more older (18–25 years) than younger (12–17 years) participants reported concerns about career-prospects and finances, while more younger than older ones were worried about academics (98.41% vs. 80.90%). With respect to financial worries, a higher percentage of BAME (Black, Asian and Minority Ethnic) communities in the UK reported such worries. Ethnicity significantly predicted more worries about social relationships among White than BAME participants. Significant differences also existed across different SES groups regarding endorsement of a particular category of worry.

Conclusion

These findings highlight the need for tailored interventions depending on the major concerns for young people of different ages, sexes, ethnicities, and SES.

Supplementary Information

The online version contains supplementary material available at 10.1007/s10608-023-10396-3.

Keywords: worry, COVID-19, minority, SES, Age, Sex

The COVID-19 pandemic has had a significant, multifaceted impact on young people's lives. Alongside bereavements, pressures on families, disruption of daily routines, including periods of school closure and restricted social contacts, continued uncertainty over the course of the pandemic has yielded adverse effects on young peoples' mental health and well-being. Worldwide, young people have reported loneliness, reduced positive and increased negative affect (Groarke et al., 2020; Jia et al., 2020), poorer mental and physical health, lower quality of life and increased healthcare burden (Loades et al., 2020), and sources of morbidity that may be more prolonged in the post-pandemic world than the infection itself (Silva Junior et al., 2020). Helping young people to manage the fears and worries that have arisen during the pandemic necessarily involves identifying the perceived sources of stress. Even as the pandemic becomes less salient in daily lives, these data could offer a lens to understanding the emotional impact of other current global events, which have also had and continue to have cascading and not dissimilar impacts on young peoples' lives. Cost-of-living concerns have directly affected lifestyle choices for many families globally. In the UK and many other countries, these have also led to a range of strike actions which have had effects on school attendance and access to medical care. Changes from global warming have brought in unpredictable weather patterns, again impacting on school attendance and opportunities to attend extracurricular recreational activities. The primary aim of our study was to investigate young peoples' sources of self-reported worries during the pandemic. However, as these negative impacts (brought on by the pandemic but also likely by these other global events) are not evenly distributed across individuals, and some sub-groups of young people may be more vulnerable to mental health difficulties than others, we also compared whether sub-groups of young people (females versus males, younger versus older adolescents, young people from marginalised versus non-marginalised groups) endorsed different types of worries. These comparisons are important for tailoring interventions.

A few studies have already looked at worry themes in "emerging adults" (those aged 16–24 years) during the pandemic. The 'UCL social study', an ongoing study accumulating comprehensive information about the psychological and social experiences of adults living in England during the COVID-19 pandemic (N = 36,520; 18+ years), found that the youngest adults (18–29 years) most reported worrying about family/friends, falling seriously ill, work, finances, and future plans. Compared to older adults in the study, they had fewer concerns about catching COVID-19 but more concerns about unemployment and finances (Fancourt et al., 2021). The 'Opinions and Lifestyle Survey' (OPN), which included young people aged 16–29 years, identified education as the most reported concern (Office for National Statistics (ONS), 2020). This survey also showed that approximately one-fifth of the school-aged participants reported having no access to the resources required for their studies from home, and that studying from home was having a negative impact on their relationships with other members in their households (Office for National Statistics, 2020). Finally, the ONS reported that 60% of young people (16–29 years) were concerned about their friendships over the course of pandemic-

related social restrictions, whereas only 34% of older adults reported this. There have been fewer studies to have measured the content of worries in young people under the age of 18 years, who due to the unique developmental challenges and opportunities across early-to-mid adolescence may have different needs, and therefore worries, than emerging adults. A study of children (8–11 years) and adolescents (12–16 years) that used focus groups and drawings found that these young people worried most about COVID-19 news and information from the media, with pre-adolescent children also worrying about food and resources, and the family's capacity to cope (Bhandari, 2021) – in contrast to worries about disruptions over schooling, socialising and recreational activities, which were acknowledged and discussed but endorsed less. This is in contrast to a study of young people (12–18 years) in North India where the top worries were academic attainments, social and recreational activities, and physical health (Shukla et al., 2021).

Together these studies that have assessed specific worries in young people show concerns about schooling and education, unemployment and resources, social restrictions and to some extent COVID-19 itself. What these studies are less clear about is whether different subgroups of young people report different types of worries. Many studies that reported overall symptom scores of anxiety, depression and loneliness during the pandemic have found differences across age-groups even within youth (Gambin et al., 2021; Santomauro et al., 2021; Varma et al., 2021). Other research suggests that females (both children and adolescents) compared to males (Chen et al., 2020; Ellis et al., 2020; Hafstad et al., 2021; Hagquist, 2023; Halldorsdottir et al., 2021; Racine et al., 2021; Thorisdottir et al., 2021) reported more negative emotions during the pandemic. Finally, a few studies have reported greater worries and symptoms of depression in young people of lower socioeconomic status, as indexed by parental educational level (Hagquist, 2023; Schoon & Henseke, 2022) or household income (Shukla et al., 2021).

However, a clear gap that remains unaddressed by previous studies is understanding how worries in young people vary across these different groups as the drivers of these negative emotions. To best help young people struggling with the emotional impact of the pandemic, it is important to assess whether the content of worries is evenly distributed across young people and to identify the (potentially) unique experiences that may affect different subgroups of young people. The COVID-19 crisis, its' government-imposed restrictions and the recent cost-of-living crisis have widened existing inequalities in health, employment, and education within the UK (Andrew et al., 2020; Cullinane, 2020; UKRI, 2021), with young people of ethnic minority backgrounds and lower SES disproportionately affected (McKnight-Eily et al., 2021; Smith et al., 2020). By understanding the specific concerns and worries of vulnerable groups in the current study, we can start to understand where to focus resources for remedial practices to limit the impact for these groups.

Here, we addressed these gaps by studying (and comparing) young people residing in the UK. We measured the content of perceived stress across young people, comparing worry themes across age (within youth), but also sex, ethnicity, and socioeconomic status. We recruited participants in the age range of 12 to 25 years, which included younger participants (early to mid-adolescents, 12-15-year-olds) than those targeted in previous studies (18–29 years: Fancourt et al., 2021; 16–29 years: ONS, 2020). Our study also provides a complementary approach to existing studies, which have presented participants with a checklist of potential stressors. This has the advantage of being standardised across participants. However, this approach also limits the breadth of worries/stressors reported and there is a possibility that this method may miss authentic worries experienced by young people. Qualitative methodology helps to mitigate this issue by providing detailed and in-depth information, especially in areas about which little information is available (Holloway & Galvin, 2016). Here we enabled participants to express their worries in their own words, providing the opportunity to capture the lived experiences of the participants. This enabled us to develop a coding scheme that best reflected themes that emerged in these free-text responses. We then examined how the content of worry varied across age groups (12–18 years, 19–25 years), sex (male, female), SES (higher, lower), and ethnicity (minority, majority status). It was hypothesised that major worries reported by the participants would vary across age, sex, SES, and ethnicity, drawing on previous literature that shows greater vulnerability for mental health issues due to the pandemic among younger adolescents (e.g., Chen et al., 2020; Hafstad et al., 2021), females (e.g., Halldorsdottir et al., 2021; Racine et al., 2021;), adolescents belonging to lower SES (e.g., Rodríguez-Cano et al., 2022), and young people from marginalised groups (McKnight-Eily et al., 2021; Smith et al., 2020).

Materials & Methods

Participants and Procedures

Between May and December 2020, participants aged 12 to 25 years old were recruited into a multi-wave study of young peoples' emotions during the pandemic. The present study reports on data gathered at the first assessment (Data available on request). As context, in the UK, the national lockdown began on 23rd March 2020, with citizens being ordered to 'stay at home'. Lockdown restrictions were gradually eased over the Summer of 2020, albeit with social distancing measures still in place, and local lockdowns enforced in certain areas. The UK entered a further period of stricter 'lockdowns' during the Winter of 2020–2021 with lockdown restrictions gradually easing from March 2021, following national rollout of COVID-19 vaccinations.

Ethics Approval for the study was granted by the Psychiatry, Nursing and Midwifery Research Ethics Committee at Kings College London (REF: HR-19/20-18250). Participants over the age of 16 years provided informed consent; all other participants were required to provide parental/guardian consent as well as assent for their own participation.

Participants were recruited through various methods including via schools, colleges, and universities, on social media platforms, through charities and on research advertisement websites. The survey was administered using an online platform (Qualtrics software, Prove, UT), and comprised a battery of measures. Participants were asked to describe their top three worries over the last two weeks using three free text boxes. Demographic information collected included age, sex assigned at birth, ethnicity, and highest educational qualification achieved by either parent, as an indicator of SES. Ethnicity information was collected using questions based on the ONS recommendations (ONS, 2017).

4,872 participants began completing the survey. Participants were then removed from the baseline dataset if they: (1) did not complete any measures other than initial demographic information (n = 1932), (2) were duplicate responses (based on contact information, n = 33), (3) did not meet the age criteria (n = 13), (4) had a survey completion time < 5 min (n = 41), (5) were not in the UK (n = 48); (6) showed other evidence of careless/inauthentic responding (n = 245). Thus, the final dataset which was used for analysis contained data from 2,560 participants. Five minutes was chosen as the minimum survey duration because based on our pilot testing it seemed unlikely that anyone could complete the survey in less than that time and be answering the questions properly. We also included Completely Automated Public Turing Test to tell Computers and Humans Apart (also called captcha) verification at the start of the survey.

Coding

The analysis of the qualitative data followed conceptual content analysis, with greater focus on *manifest analysis*, which refers to describing the surface structure of the information and what is obvious in the informant's report (Bengtsson, 2016). Each of the free text worry responses was coded into one worry category. To develop the worry codes, two independent researchers (AC, AW) familiarised themselves with a subset of the worry responses obtained from the participants and derived categories independently. The coding categories were then compared, any disagreement was discussed and reviewed by two other researchers (LR, JL). A final set of coding categories and descriptions for each category was then developed, and 12 main worry categories were identified. Any worry responses that were ambiguous or did not fit into one of the worry categories were coded as 'unclear'. Single word answers were generally coded into 'unclear', with the exceptions of (1) 'relationships', which was coded into 'social relationships',

(2) ‘school’/ ‘university’/ ‘college’, which were coded into ‘education’. It was agreed that although these were one-word answers, there was little ambiguity.

Any worry responses that were missing or invalid were assigned as ‘invalid’. Responses such as ‘no’, ‘nothing’, ‘no problems’, ‘N/A’ were labelled as ‘no worries’. It should be noted, however, that a response stating ‘no problems’ or similar does not mean that a participant reported having no worries at all; as there were three free text boxes available for participants to write their three key recent worries, they may have written worries in one or two of the boxes, then ‘no problems’ in the third. Therefore, the number of participants who have a response coded as ‘no worries’ should not be interpreted as the number of participants who reported experiencing no worries at all. There was a strong agreement between the two raters (k = 0.86) and a final coding scheme containing 12 worry categories was used for analysis.

Data Analysis

IBM SPSS (v.23) was used for statistical analysis. Logistic regressions were carried out using the Stats package in R (version 4.0.5). First, we present the percentage of participants who stated each worry category as one of their top three worries, showing the most frequently experienced worries across the whole sample. Logistic regression analyses were then used to test whether the worry categories reported were predicted by demographic characteristics of interest: sex (males compared with females), age group (12–17 year olds compared with 18–25 year olds), SES (highest parental education ‘up to undergraduate’, indicating lower SES, compared with highest parental education ‘undergraduate or above’, indicative higher SES), and ethnic status (participants identifying as White compared with participants identifying as one of the minority ethnic groups in the UK, which included Asian, Black, Mixed ethnic groups, and any Other ethnic groups). Adjusted p-values following Bonferroni-correction for multiple comparisons were used to interpret the results of the logistic regression analyses.

Results

Demographics.

Table 1 depicts the sociodemographic characteristics of the participants. The mean age of participants in the total sample was 18.38 years (*SD* = 3.59 years). The mean of the younger age group (n = 1268) was 15.37 years (*SD* = 1.74 years) and 21.33 years (*SD* = 2.22 years) in the older age group (n = 1292). The majority were female (70.04%). Most of the participants were White (50.20%), with a high number reporting being Asian (16.60%). Many participants had parents with an Undergraduate or Postgraduate degree (64.88%). The majority of participants were themselves currently in education (87.77%).

Table 1.

Sociodemographic characteristics of the participants

	Male ***n*** **(% of total sample)**	**Female** ***n*** **(% of total sample)**	**Total** ***n*** **(% of total sample)**
Ethnicity			
White	379 (14.80)	906 (35.39)	1285 (50.20)
Asian	96 (3.75)	329 (12.85)	425 (16.60)
Black	18 (0.70)	66 (2.58)	84 (3.28)
Mixed	40 (1.56)	128 (5.00)	168 (6.56)
Other	12 (0.47)	37 (1.44)	49 (1.91)
Prefer not to say	15 (0.59)	28 (1.09)	43 (1.68)
Parental Education			
Primary	27 (1.05)	47 (1.84)	74 (2.89)
GCSE	110 (4.30)	233 (9.10)	343 (13.40)
A-level	135 (5.27)	347 (13.55)	482 (18.83)
Undergraduate	291 (11.36)	718 (28.05)	1009 (39.41)
Masters	158 (6.17)	329 (12.85)	487 (19.02)
PhD	46 (1.80)	119 (4.65)	165 (6.44)

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Ethnicity data were missing for *n* = 549 participants

Overall, male participants (M = 17.09 years, SD = 3.56 years) were somewhat younger than female participants (M = 18.23 years, SD = 3.54 years; t (2558) = 7.42, $p < .001$, d = 0.02). Conversely, younger (n = 1268; Males = 464, Females = 804) and older (n = 1292; Males = 303, Females = 989) participant groups differed significantly in terms of sex distribution (χ^2 (1, N = 2560) = 52.66, $p < .001$), such that there were more younger males than older males (36.59% vs.

23.45%, respectively), but fewer younger females than older females (63.41% vs. 76.55%, respectively). The sex distribution did not differ by SES groups, (χ^2 (1, N = 2560) = 0.06, p = .81), but male to female distribution differed significantly by ethnicity, χ^2 (1, N = 2011) = 10.32, p < .001 (White participants- males vs. females: 29.49% vs. 70.51%; Minority ethnic participants- males vs. females: 22.86% vs. 77.13%).

Participants in lower and higher SES groups were similar in age (t (2558) = – 0.19, p = .85, d = 0.01). Similarly, participants from 'White' and minority ethnic groups did not differ significantly in age (t (2009) = 1.81, p = .070, d = 0.08). However, the ethnicity distribution differed significantly across lower and higher SES groups, (χ^2 (1, N = 2011) = 4.43, p < .05), such that there were more White than minority ethnic (67.32% vs. 62.67%) participants in the higher SES group and more minority ethnic than White participants in the lower SES group (32.68% vs. 37.33%).

As the age ranges of the younger and older groups could mean that the younger group were more likely to still be in education (and educational status could potentially impact certain worries, such as those relating to education and careers), we also examined whether the age groups differed by education status. A significantly higher proportion of younger (n = 1238, 98.41%) than older (n = 1008, 80.90%) participants were currently in education, χ^2 (1, n = 2505) = 206, p < .001.

Content of Worries

Table 2 depicts the 12 worry categories derived from the free-text responses and the percentage of participants who reported each worry category as featuring among any one of their top three worries. Examples of themes within each worry category are included in the Supplementary Table 1; we did not use these 'sub-themes' in subsequent analyses as the frequencies for each of these were small. Looking at the whole sample, most participants (59.88%) reported concerns about *Education* as one of their top three worries. The next most frequently experienced worry related to *Social relationships* (24.06%), followed by those who reported concerns about their *Social and work routines* (19.49%), worries relating to their *Physical health* (18.55%), and *Physical health of others* (18.05%).

Table 2.

Content of worries reported by the participants overall and by age, sex, SES, and ethnicity

Worry categories	**Description of worry categories**	**Percentage of participants reporting the worı group, SES, and ethnicity**				
		Overall	**Males (*n* = 767)**	**Females (*n* = 1793)**	**Younger participants (*n* = 1268)**	**Older partic (*n* = 1**
Education	Concerns around capacity and opportunities to learn and educational achievement	59.88	28.77	71.23	55.31	44.68
Social relationships	Concerns about changes to personal relationships with others, including family members, friends and partners	24.06	26.30	73.70	48.38	51.62
Social and work routines	Concerns around changes to typical social, recreational and work routines: e.g., lack of social activities, working from home, cancelled holidays	19.49	32.06	67.93	49.10	50.90
Physical health	Concerns about being infected during the pandemic, concerns about physical health, diet and fitness, including general health concerns	18.55	28.63	71.36	53.05	46.94
Physical health of	Concerns about physical health of	18.05	26.41	73.59	53.68	46.32

Worry categories	Description of worry categories	Percentage of participants reporting the worr group, SES, and ethnicity				
		Overall	Males (*n* = 767)	Females (*n* = 1793)	Younger participants (*n* = 1268)	Older partic (*n* = 1
others	others, family and friends being infected					
Mental health and emotions	Concerns about mental health, psychological symptoms and emotions, including sleeplessness, boredom, guilt, loneliness	16.95	23.73	76.27	50.46	49.54
Finances	Concerns around money problems faced/anticipated by participants about them or their family: e.g., paying rent, loss of income	15.47	27.52	72.47	14.90	85.10
Uncertainty about lockdown phases	General concerns indicating uncertainty owing to course of the pandemic and future lockdown phases	12.73	26.99	73.01	48.77	51.23
Career-related prospects & opportunities	Concerns around job/placement/training opportunities and stability	11.44	21.50	78.50	11.94	88.05
Global and societal concerns	Concerns about the economy, inequalities, death rates, bereavements, society not following restrictions	5.51	36.88	63.12	42.55	57.45

Worry categories	Description of worry categories	Percentage of participants reporting the worr group, SES, and ethnicity				
		Overall	Males (*n* = 767)	Females (*n* = 1793)	Younger participants (*n* = 1268)	Older partic (*n* = 1
Mental health and well-being of others	Concerns about the mental health and wellbeing of others, such as family and friends	2.62	22.38	77.61	58.21	41.79
Access to essential resources	Concerns about accessing food, medical and healthcare services/resources	2.11	35.18	64.81	55.56	44.44
No worries	Responses indicating that the participant had no worries	4.69	60.83	39.17	68.33	31.67
Unclear	Concerns where the content of the worry was ambiguous or did not fit into a specific category	39.30	31.11	68.89	49.02	50.97
Invalid	e.g., 'don't know' or missing responses	1.2	33.33	66.67	80.00	20.00

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Predicting Content of Worries from Age-Group, Sex, SES, and Ethnicity

Table 2 also shows the percentage of participants in each age, sex, SES, and ethnicity group reporting a worry category as one of their top three worries. Results of logistic regression analyses conducted to predict endorsement of each worry category by these demographic groups are reported in Table 3. Only the models in which the inclusion of the demographic variables produced a significant improvement in model fit compared to a model with only the

constant, i.e., a significant model chi-square statistic, are shown. While Table 3 contains information about significant predictors with and without adjustment for multiple testing, here, we highlight only those predictors that significantly associated with each worry category following Bonferroni-adjustments.

Table 3.

Experience of worry categories predicted by demographic factors

		***B* (SE)**	**OR [95% CI]**	**Unadjusted *p***	**Model χ^2 (*df*)**	***p* (Model χ^2)**	**R^2 (H-L, C-S, N)**
Education	Intercept	0.63 (0.30)		0.038	123.14 (4)	< 0.001	0.05, 0.06, 0.08
	Age group	-0.84 (0.10)	0.43 [0.36, 0.53]	**< 0.001***			
	Sex	0.12 (0.11)	1.13 [0.91, 1.39]	0.269			
	SES	-0.07 (0.10)	0.94 [0.77, 1.14]	0.511			
	Ethnicity	0.77 (0.10)	2.16 [1.77, 2.64]	**< 0.001***			
Career-related prospects and opportunities	Intercept	-5.42 (0.56)		< 0.001	167.04 (4)	< 0.001	0.11, 0.08, 0.15
	Age group	2.12 (0.21)	8.33 [5.62, 12.86)	**< 0.001***			
	Sex	0.24 (0.17)	1.28 [0.92, 1.80]	0.155			
	SES	-0.05 (0.14)	0.96 [0.72, 1.27]	0.755			

		***B* (SE)**	**OR [95% CI]**	**Unadjusted *p***	**Model χ^2 (*df*)**	***p* (Model χ^2)**	**R^2 (H-L, C-S, N)**
	Ethnicity	-0.38 (0.15)	0.68 [0.51, 0.91]	**0.009**			
Finances	Intercept	-4.60 (0.46)		< 0.001	201.91 (4)	< 0.001	0.11, 0.10, 0.16
	Age group	1.97 (0.17)	7.18 [5.18, 10.17]	**< 0.001***			
	Sex	-0.17 (0.14)	0.84 [0.64, 1.12]	0.226			
	SES	-0.25 (0.13)	0.78 [0.61, 1.00]	**0.047**			
	Ethnicity	0.27 (0.13)	1.31 [1.03, 1.68]	**0.031**			
Mental health and emotions	Intercept	-2.08 (0.40)		< 0.001	19.08 (4)	0.001	0.01, 0.01, 0.02
	Age group	-0.09 (0.12)	0.91 [0.72, 1.15]	0.434			
	Sex	0.45 (0.15)	1.58 [1.19, 2.11]	**0.002***			
	SES	0.18 (0.13)	1.20 [0.93, 1.54]	0.166			
	Ethnicity	-0.34 (0.13)	0.71 [0.55, 0.92]	**0.009**			

		B (SE)	OR [95% CI]	Unadjusted *p*	Model χ^2 (*df*)	*p* (Model χ^2)	R^2 (H-L, C-S, N)
Social relationships	Intercept	-1.79 (0.35)		< 0.001	19.90 (4)	0.001	0.01, 0.01, 0.02
	Age group	0.19 (0.11)	1.21 [0.98, 1.49]	0.077			
	Sex	0.18 (0.12)	1.19 [0.94, 1.52]	0.145			
	SES	0.28 (0.11)	1.33 [1.06, 1.66]	**0.013**			
	Ethnicity	-0.32 (0.11)	0.73 [0.58, 0.90]	**0.004***			
Physical health of others	Intercept	-1.02 (0.38)		0.006	11.95 (4)	0.018	0.01, 0.01, 0.01
	Age group	-0.26 (0.12)	0.77 [0.61, 0.97]	**0.026**			
	Sex	0.23 (0.14)	1.26 [0.97, 1.65]	0.089			
	SES	-0.08 (0.12)	0.93 [0.73, 1.18]	0.536			
	Ethnicity	-0.26 (0.12)	0.77 [0.60, 0.98]	**0.038**			

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Values in bold are significant at unadjusted p−value

*Significant at adjusted p−value of 0.004 (adjusted *p* (with Bonferroni correction) = 0.05/12 = 0.004)

SE=standard error; OR=odds ratio; CI=confidence intervals, H−L=Hosmer and Lemeshow; C−S=Cox and Snell; N=Nagelkerke

Both age group and ethnicity significantly predicted endorsement of worries about '*Education*'. 12–17-year-olds were over twice as likely as 18–25-year-olds to report worrying about education. Participants from a minority ethnic group were also over twice as likely as White participants to report educational worries.

Worries about '*Career-related prospects and opportunities*' were significantly predicted by age group. 18–25-year-olds were over eight times as likely as 12–17-year-olds to endorse career-related worries.

Age group also significantly predicted worries about '*Finances*'. 18–25-year-olds were over seven times as likely as 12–17-year-olds to report worrying about finances.

Worries relating to '*Mental health and emotions*' were significantly predicted by sex. Females were 58% more likely than males to report Mental health related worries.

Ethnicity significantly predicted worries about '*Social relationships'*. Participants from a minority ethnic group were 37% less likely than White participants to report worrying about social relationships.

None of the worry categories of '*Access to essential resources*', '*Physical health*', '*Social and work routines*', *'Global and societal concerns', 'Uncertainty about lockdown phases'*, *'Mental health and well-being of others'*, and *'Physical health of others'* were predicted by age, sex, ethnicity, and SES, after correcting for multiple comparisons.

Discussion

This study described the most frequently experienced sources of worry for adolescents and young adults aged 12–25 years in the UK during the COVID-19 pandemic, from May to December 2020 and explored whether these worry categories were endorsed more by some groups of young people than others. Here, we discuss the most reported worries across all

participants and consider these against study findings of other large COVID-surveys. Next, we discuss individual differences in worry categories.

Frequently Reported Worries in Youth During the COVID-19 Pandemic

There were 12 main themes of worry identified from the dataset. Worries relating to *Education* were by far the most prevalent in this cohort of young people, consistent with the results reported by 16–29-year-olds early in the pandemic (ONS, 2020). The present study thus expands on the findings by ONS by highlighting that education-related worries also extend to younger individuals aged 12–18 years, which previously had not seen much focus. This category spanned a heterogenous sub-group of concerns relating to closure of educational institutions, online teaching, uncertainty about cancelled examinations and exam results, capacity to learn outside school environment and socioeconomic inequalities relating to quality of education online (Supplementary Table 1). Similar worries about cancellation of examinations and other academic events have been reported in another study by Lee (2020). A US-based study (Dorn et al., 2021) estimates that unless appropriate steps are undertaken to address the 'unfinished learning' of students, that is transferrable or "soft skills" such as communication, and working in a group, this would reduce the lifetime earnings of students by $49,000 - $61,000 when they enter the workforce. This would then negatively impact US economy by $128 - $188 billion per year.

The next most frequently reported category involved worries relating to *Social relationships*, involving concerns about changes to personal relationships with others. Many participants were concerned about worsened relationships with friends, partners, and family due to restrictions on social interaction. Many also reported worsened relationships and tension with family members or people living in the same household. Previous studies among school and college-going students have also noted that disruptions in the opportunities for socialization, inability to meet friends, play outdoors, and engage in school activities in-person have resulted in lower levels of affect, as well as uncertainty and anxiety among such students (Jiao et al., 2020; Lee, 2020; Liu et al., 2020; Zhai & Du, 2020). Many youth organisations in OECD countries (which includes the UK) expressed concern about COVID-19's impact on, among other things, relationships with family and friends (OECD, 2020). The relatively high frequency of participants that reported worrying about this supports the notion that social relationships and interactions are highly important for young people (Loades et al., 2020). In general, the finding that young people (aged 17 years or below) demonstrate most frequently worries about education and social interactions closely mirrors findings from pre-pandemic research into worry prevalence among adolescents aged 9–17 years (de Matos et al., 2013) and young adults aged 18–25 years (Hunt et al., 2003) – and again emphasises neurodevelopmental shifts in peer orientations and social priorities at this developmental juncture (Haller et al., 2015).

Another common worry was regarding *Social and work routines*, with 19.49% of participants reporting this. This category included worries regarding being unable to go outdoors, holiday plans being cancelled, working from home, etc. (see Supplementary Table 1). This finding is in line with previous studies on adolescents, such as Muñoz-Fernández and Rodríguez-Meirinhos (2021), which reported that due to the pandemic adolescents' interaction with the outside world was confined to online contexts, which positively predicted their frustration levels. Studies such as Xiao et al. (2021) highlight the negative impacts of the new work-from-home situation brought on by the pandemic. Such new work routines were a source of worry for the young participants in our study as well.

The next highest percentage of participants reported worries centred on their *Physical health*. Concerns around getting infected by COVID-19 and spreading the infection to others expressed by children and adolescents have been reported previously (Saurabh & Ranjan, 2020) and these concerns were expressed by several participants in the present study too. Many participants reported this as being worried about contracting the virus, however very few mentioned being worried about getting seriously ill. This is similar to the 18–29 age group in 'The UCL Social Study', where very few reported concerns about getting seriously ill (Fancourt et al., 2021). A large proportion of those who worried about their own physical health worried about their diet, exercise, and fitness levels, due to inactivity and boredom. This suggests that participants were more afraid of the physical impacts of social restrictions associated with the pandemic than the virus itself, and therefore, easing the fears about the virus should target its physical health concerns that the young adults have. Thus, developing interventions that increase the capacity to maintain a healthy diet and physical activity may help to alleviate some of these concerns.

In contrast, young people endorsed other worries less, including *Mental health and emotions, Finances, Uncertainty about lockdown phases, Career-related prospects & opportunities, Global and societal concerns, Mental health and well-being of others, and Access to essential resources*. However, there were differences in endorsement of these worries in some sociodemographic groups than others.

Age and Sex Group Differences in Worry Content

While more younger adolescents (12–17 years) were concerned about *Education* than older youth (18–25 years), the older youth were more concerned about *Career-related prospects and opportunities* and *Finances* or current sources of income. These age differences are perhaps to be expected, since a higher proportion of the younger age group in our study were currently in education compared to the older age group, and those in the older age group are of an age when choosing a career becomes particularly important. Even before the pandemic, young people

aged 15–24 years were thrice as likely to be unemployed than those aged 25 years or above (International Labour Office, 2020). The COVID-19 pandemic is likely to exacerbate this job crisis for young people, and therefore it is likely that young adults would be concerned about career-prospects and finances. In the context of the UK, a nationally representative survey revealed that overall, 18% of employees had stopped working since the pandemic, with the majority (33%) being in the age range of 18–24 years, followed by 20% aged 25–29 years, and 19% aged 30–34 years. Moreover, one-third of employees in the age range of 18–24 years had their pay reduced (Gustafsson, 2020). Thus, such career and financial concerns as reported in this study by 19–25-year-olds can be expected.

In general, sex differences in worry domains were less common than age group ones. More females than males worried about *Mental health and emotion.* These worries included concerns around loneliness, being forgotten, anxiety, depression, boredom, sleeplessness, suicidal thoughts, and self-harm, to name a few. This finding is consistent with previous studies, which have identified females to be more vulnerable to psychological distress during a pandemic (Brooks et al., 2020; Jia et al., 2020). Such mental health problems may be long-lasting, affecting individuals from several months to up to three years later (Brooks et al., 2020). However, this should be considered alongside the well-documented higher rates of mood and anxiety disorders in women outside of the pandemic (Riecher-Rössler, 2017). Irritability, uncertainty, irritation and anxiety among children and young people during the pandemic have been reported in other studies too (Jiao et al., 2020; Viner et al., 2020). However, findings contrary to such reports can also be found. For instance, as reported by Cowie & Myers (2021), in the ongoing Co-SPACE study in England which is keeping track of mental health of children and adolescents aged 4–16 years, preliminary findings indicate that while parents or carers report attentional difficulties and restlessness among adolescents, the adolescents themselves did not report any change in their behaviour or emotions. The present findings show that female young people (compared to males) are more vulnerable to experiencing poor mental health during the pandemic, and interventions to improve mental health amongst adolescents in the future phases of the pandemic or post-pandemic should take this sex difference into account.

Worries of Socially Marginalised Groups

Previous research indicates that the COVID-19 pandemic has disproportionately impacted Black, Asian, and Minority Ethnic (BAME) communities in the UK financially (Cross & Burrell, 2021; Parkes et al., 2020). Here, we showed that adolescents and young adults from ethnic minorities in the UK were more worried about *Education* and less worried about *Social relationships* than White participants. Educational inequalities have been evident during the pandemic, as reported in earlier studies (Andrew et al., 2020; Cullinane, 2020), and findings from the present study further elaborate on this general observation. This can inform governmental responses during similar public health crises in the future, where provisions of

safe and accessible study spaces, high-speed internet facilities and equipment may be made to those already struggling with educational opportunities. Young people from White ethnicity groups were more likely to report worries about social relationships. Though preliminary findings from ongoing research studies, such as UCL COVID-19 Social Study (Fancourt et al., 2021), indicate that individuals from BAME communities experienced more loneliness than White people during the pandemic, and even before the pandemic, some minority ethnicities exhibited a higher risk of being socially isolated in comparison to Whites (McPherson et al., 2006), our findings stand in striking contrast to such findings. However, our finding closely mirror previously reported findings about the social impact of the pandemic on the different ethnic groups in the UK (ONS, 2020). This study found that during the pandemic, feelings of loneliness were reported the most by individuals having White Irish ethnicity (28%), followed by those who were White British (18%), Black, African, Caribbean, or Black British (11%), and Chinese and other Asian ethnicity (10%), after controlling for several demographic and other factors (e.g., age, sex, living alone, having a health condition). Thus, it is likely that young people from White ethnicity were more worried about social relationships during the pandemic.

Finally, it is notable that SES background did not elevate worries about any one category. This indicates that the adolescents and the youth experienced different categories of worries regardless of which SES they belonged to. While a previous study (Shukla et al., 2021) has reported that adolescents belonging to lower SES experienced greater impact of the pandemic on various life domains, such as work, study, social life, finances, physical health, etc., it is important to note that SES was defined differently in the said study from that defined in the present study. While Shukla et al. (2021) define SES as per capita monthly income, the present study defined it as the highest educational qualification of the parents of the participants. Therefore, a reason why SES did not predict any worry in the present study may be that SES was defined rather narrowly and household income provides a closer approximation of availability of resources than education (Brito & Noble, 2014).

Limitations

There are several limitations to the study. First and foremost, this study is limited by the lack of a pre-pandemic baseline and relatedly, the absence of data on lockdown restrictions at the time of each participants' assessment point. This means that we cannot show changes in worry content from before to during the pandemic and in relation to (or control for) specific restrictions or changes in policy. Another limitation is that the sample was large but not nationally representative of young people in the UK. Most of the participants were females (70.04%), limiting the generalisability of the sample to male populations. Additionally, the ethnic minority groups represented 36.1% of the sample (which is an overrepresentation of the ethnic minority groups in the UK), and 74.53% of the sample's parents had at least undergraduate level qualifications. Thus, generalisability of the findings needs to consider these

characteristics of the present sample. Another limitation of this study is that in adult populations, SES can be derived not just from education, but also from income and occupation (Wardle et al., 2002). However, in adolescent populations determining SES is more challenging and this study used only highest parental educational qualification as a measure of SES, which may not provide an accurate representation of the socioeconomic demographic. Most of the data collected for this survey was done in the early months of the pandemic, with 82.5% of the participants' baseline responses occurring between May to September 2020, and 31% of these were in the very first month (May). The pandemic was still unfolding after recruitment ended and therefore the full picture of the impact of the pandemic is far from complete. Additionally, this study only involved analysis of the baseline data set from a longitudinal study, the subsequent responses after baseline were not included in this research project. This allowed for analysis of a larger data set but restricted exploration into within-subject fluctuations in worry themes over the course of the pandemic. The use of qualitative, opened-ended questions, such as those used to obtain the worry responses, have strengths and weaknesses. The strengths are that there are no restrictions on response, the data collected provides a greater insight into the lived experiences of the participants, and there is the opportunity to incorporate themes of worry that may have otherwise been neglected through using quantitative, pre-determined categories. However, it is also susceptible to inauthentic, unclear, or irrelevant responses, as seen in the large proportion of single-word responses in this study's dataset. This excluded a significant proportion of responses from analysis. Lastly, we omitted to enquire about participants' gender identity in the survey. The variable used here to distinguish males from females only relies on biological sex, which may limit associations with worry content.

The coding scheme developed as part of the study has the potential to be used for further analysis of worry content. As the worry categories have been developed based specifically on the worry responses from young people (12–25 years) during the COVID-19 pandemic, the categories could be used in future pandemic related surveys as pre-determined categories using quantitative scales. The study highlights aspects of the COVID-19 pandemic that caused the greatest sources of worry for young people. This is of great significance as the findings may support provisions to be made for young people in the post-pandemic recovery phases, such as providing opportunities to further education and learning. Additionally, the findings could be of use in determining which aspects of the pandemic have the greatest psychological impact on young people, which would be of clinical value going forward due to the risk in the effects being long-standing. Clinical interventions from medical and mental health providers could be tailored to address the highlighted areas of concerns for young people. For example, developing coping mechanisms specific to individual worry themes. Finally, these findings could be used to compare worries in the age group 12–25 years to ongoing studies on adult populations during the pandemic.

Electronic Supplementary Material

Below is the link to the electronic supplementary material.

Supplementary Material 1 (422.2KB, pdf)

Supplementary Material 2 (25.8KB, docx)

Acknowledgements

We wish to thank the participants and their families for taking part. Data collection for this study was funded by Rosetrees Trust (CM949) to JYFL. LR was supported by an ESRC grant (ES/T00004X/1) to JYFL.

Author Contributions

MS drafted the manuscript. JYFL & MS conceived of the study, participated in its design and coordination; JYFL, MS, and LR participated in the design, statistical analysis, and interpretation of the data; AC, TH & LR participated in the design and coordination of the study and data collection; LDH, VK & JYFL critiqued the output for important intellectual content. All authors read and approved the final manuscript.

Funding

Data collection for this study was funded by Rosetrees Trust (CM949) to JYFL. LR was supported by an ESRC grant (ES/T00004X/1) to JYFL.

Data Availability

The datasets generated during and/or analysed during the current study are available from the corresponding author on reasonable request.

Declarations

Ethics Approval

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards. The study was approved by the Psychiatry, Nursing and Midwifery Research Ethics Committee at Kings College London (REF: HR-19/20-18250).

Consent to Participate

Informed consent was obtained from all individual participants above the age of 16 years included in the study. For those aged less than 16 years, informed consent was obtained from the parents.

Conflict of interest

The authors declare that they have no conflict of interest.

Footnotes

Publisher's Note

Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

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Associated Data

This section collects any data citations, data availability statements, or supplementary materials included in this article.

Supplementary Materials

Supplementary Material 1 (422.2KB, pdf)

Supplementary Material 2 (25.8KB, docx)

Data Availability Statement

The datasets generated during and/or analysed during the current study are available from the corresponding author on reasonable request.