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# A study exploring key areas of worry in children and their expression through drawings amid COVID-19 outbreak in March 2020

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## Abstract

Areas of worry at the outbreak of COVID-19 were explored in a two-phased study spanning for 9 weeks. A mixed sample of boys and girls of 47 UK resident children of different ethnicities in two age groups- 8-11 years (n=21, boys n=10; girls n=11) and 12-16 years (n=26, boys n=14; girls n=12) were recruited. The content and colour of drawings made on COVID-19 by children were also analysed. Significant gender and age differences were observed after means, percentages and t-test analysis on areas of worry and depiction in the drawings. Identify, differentiate, SODE/ SUDI, creative arts and feedback (IDSCF), proposing solutions (SO) and detail (DE) and support (SU) and discussion (DI) with children is proposed for COVID-19 and worries.

## Introduction

The word worry comes from the old English word “wyrgran”, which originally meant "strangle," (Collins Dictionary, 2020). Anxiety, fear and worry have been three constructs that have been understood and applied in different ways in many studies. Studies find it difficult to define worry and this word is often confused with fear and anxiety. Therefore, many researchers in the past have continuously focussed on delineating the meaning of this construct and differentiating it from fear and anxiety (Izard, 1977; Beck, 1985; Barlow, 1988). Anxiety comprises four key components namely- cognitive, behavioural, affective and physiological (Silverman, La Greca, & Wasserstein, 1995; Lang, 1997). A range of researches indicates worry to be one of the cognitive components of anxiety (Barlow, 1988; Vasey, Daleiden, Williams, & Brown, 1995; Mathews, 1990). Worry involves images and thoughts that relate

to a negative or aversive situation. Mathews (1990) indicates that worry can lead to problem solving and better preparedness preparation to deal with the aversive or negative situation in some individuals. A worrying individual thinks and rethinks the aversive situations and tries to find ways of avoiding them or solutions to them

### Worry and children in COVID-19

For the present study, the definition by Vasey et al. (1995) has been understood and applied. They define worry as “an anticipatory cognitive process involving thoughts and images with possible threatening outcomes and consequences” (Vasey et al. 1995). Although many studies have understood and applied the word worry in a negative way some studies highlight that worry can lead to positive problem solving and results in children and adolescents (Borkovec et al., 1983).

Silverman et al. (1995) maintains maintain that “research on worry in children is important for theoretical, clinical and developmental reasons”. A range of studies focussed in the past on children and their worries. Many studies maintain that in the present modern times it is normal for children and adolescents to worry (Cartwright - Hatton,2006). Some studies have focussed on what children worry about while others have focussed more on the cognitive aspects of worry. Comparison of age, gender, socio cultural factors, and content of worry, have been the focus of most of the studies. Studies have explored in the past that intolerance to uncertainty can lead to worry in children. Intolerance to uncertainty is defined as “an individual's dispositional incapacity to endure an aversive response triggered by the perceived absence of salient, key, or sufficient information, and sustained by the associated perception of uncertainty” (Carleton, 2016). Index of uncertainty (IU) is defined as a “dispositional characteristic that arises from a set of negative beliefs about uncertainty and its connotations and consequences” (Birrell, Meares, Wilkinson, & Freeston, 2011) and is underpinned by appraisals such as ‘uncertainty is dangerous’, ‘uncertainty is intolerable’ and ‘I can't deal with uncertainty’ (Koerner & Dugas, 2006).

### **Children's drawings - content and colour**

The worries children have about this new pandemic are unsettling and many times difficult to express amidst the lockdown and social distancing measures. Expression of inner emotions thought process about the situation can be done very well through free hand drawings and use of colour in an uninhibited way. Studies recognise the importance of drawing as a tool to understand and interpret feelings and emotions (Yavuzer, 2007). Children's inner world and emotions can be captured very well through drawings along with intelligence, personality and characteristics about the real world (Arici, 2006). Some studies like those by Babaoglu (2016) , Bal (2010); Burnham (2005); Burnham, Lomax, & Hooper (2013); Golomb (2003); Christie & MacMullin (1998) have explored fear and its depiction in children's drawings. Age and gender have been key factors that impact children's fears and their

depiction in drawings. There is an absence of studies about worry in children as depicted through drawings. Along with content of the drawings, the colour used by children in drawings has been focussed by researchers in the past. Emotions and colour used in drawings and differences in colour used by boys and girls have been a focus of some researches. Colour use can be linked to emotions in children Burkitt, Barrett, & Davis (2003). Children use the colour they attach with positive and negative emotions on the drawings they make. Children aged 4-11years used their preferred colour to colour a “nice” figure and their least preferred colour to colour in a “nasty” figure. Black was used for colouring in negatively characterised figures. The study found a difference in the use of primary and secondary colours in the drawings. In the present COVID-19 crisis, worry can be for real problems (hand washing, social distancing) and hypothetical problems (Most people dying) (Whalley & Kaur, 2020). COVID-19 poses both real and hypothetical problem worries to children of all ages and gender. It is therefore relevant to focus on the key areas of worry for children in two age groups –namely 8-11 years and 12-16 years. Therefore, the key objectives of the present study were as follows;1. To identify the key areas of worry for children in two age groups 8-11years and 12-16 years on a five-point scale. 2. To identify significant gender differences between boys and girls in terms of areas of worry. 3.To identify differences in the depiction of content and colour usage in the drawings made by children in two age groups 8-11 and 12-16. 4. To identify gender-related differences in the depiction of content and colour used in the drawings made by children.

### **Method**

**Hypotheses** - In line with the key objectives of the study the hypotheses were;1. Children in the two age groups 8-11 years and 12-16 year will have different areas of worry. 2. Boys and girls will vary significantly in terms of different areas of worry. 3. The content and colour use of two age groups will be significantly different. 4. Girls and boys will vary significantly in terms of colour and content depicted in the drawings.

**Subjects** - Although the attempt of the researcher was to achieve equal number of boys and girls along with equal age groups, due to lockdown and closures of schools due to COVID-19, a total sample of n=47 children participated out of the 60 invited children. In the present study, a mixed sample comprised of n=45 children with 24 boys and 23 girls. The two age ranges in focus were 8- 11years, n=21 comprising of boys n=10; girls n=11 (Junior school) (JS) and 12- 16 years, n=26 comprising of boys n=14; girls n=12 (secondary school) (SS). The rationale for the two age ranges was to include children from junior and secondary schools. The age groups were classified into two 8-11 years and 12-16 years as these are the two age groups for Junior school and secondary school pupils in the UK. The majority of the children in the two age groups (75%) were from schools in Hampshire, Surrey, Berkshire along with (25%) children from other counties like Warwickshire and Greater London.

**Procedure** - In accordance with the British Psychological Society (BPS) (2014) code of human research ethics and the British Educational Research Association BERA (2018) guidance for ethics in educational research signed informed consent was taken from all parents through email requesting their children's participation in the study. The letter explained the purpose of the study clearly with the participant rights to withdraw from the study at any point. In line with General Data Protection Regulation GDPR (2020), all names and identities of individuals and settings were kept confidential and used purely for academic research purposes. Data storage and data protection were ensured throughout the study. The received information, consents, and questionnaires along with all drawings were stored on a password locked desktop with only the researcher access. All data will be stored for up to three years after the publication of the study and will be destroyed thereafter. During the entire study, the safety of participants and adults amid the pandemic was compromised. In case of queries and details regarding the participation, all were answered by the researcher through a range of technology dependent on the technological tools availability of the participating families such as email, phone, facetime calls and SKYPE calls and ZOOM calls.

The research was carried out in two phases namely-

**Phase 1** - Focus group children devised questionnaire;  
**Phase 2** - Data collection from children on Task 1 (Questionnaire) and Task 2 (colour and draw with primary colours) 8- 11years, n=21 (boys n=11; girls n=10) (Junior school) (JS), 12- 16 years, n=26 (boys n=14; girls n=12) (Secondary school) (SS)

**Phase 1** - Children Devised Questionnaire - A focus group for selecting the questionnaire themes was formed around mid-March. As two age groups namely 8-11 years and 12-16 years were in focus, two boys and two girls each in the two age groups formed the focus group to select the themes of worry. This was done to ensure that the "children's voice" in selection of themes ensured their right to participation and agency. Two broad categories of real problems (hand washing, social distancing) and hypothetical problems (Most people dying) (Whalley & Kaur, 2020) were discussed with the focus group and they were asked to pay equal attention to both broad categories. After four meetings online the focus group created six themes that were of importance to them as children- with at least three under each broad category. The researcher devised a questionnaire based on the themes of the focus group to be answered on a five-point scale 1- not worried at all; 2. Slightly worried; 3. Medium worried ; 4. Very worried and 5. Extremely worried Statements 1, 2 and 6 covered the Real worry areas and statements 3,4 and 5 covered the Hypothetical worry areas. The final draft of the questionnaire, after the incorporated five-point rating scale was included, was sent back to the focus group for their approval. This phase finished end of March. In the pre pilot, the selected questionnaire was given to six children besides the focus group to test for its reliability and validity.

**Phase 2** - Data collection- After obtaining consents from parents and approval of the children-devised questionnaire (Appendix 1) the data collection was done. The first set of questionnaires were sent out through emails around March end and the data collection lasted till April end. About 10 participants were reminded of returning the questionnaire after the Easter break. To avoid stress on participants for return of tasks a month was given for return of tasks. Most tasks returned within two weeks of sending them with an average return rate of 12 days.

The participating children were given two tasks - complete the questionnaire (Task 1) and use primary colours (red, yellow and blue) to draw and colour anything about COVID-19 on an A4 sheet. The colour selection of primary colours was done to ensure that all children had a “neutral” (Burkitt et al., 2003) palette easily available to all. A4 paper sheet is easily available in all households and is not expensive for any participant. All questionnaires and drawings were returned through email. Some participants had difficulty in sending the email of the drawings and used WhatsApp social media to send the drawings through. The entire study spanned around 9 weeks of two phases entailing steps from the focus group formation, theme selection, questionnaire final draft to data collection from children. Each participating family and child were thanked by the researcher as soon as the tasks were safely received. The responses on the questionnaire from each child were collated for two age groups 8-11years and 12-16years. The responses from boys and girls under each age group were separated for data analysis and evaluation. The drawings by children were analysed on two criteria namely-content and colour use. All drawings were evaluated for the depiction of content and colour by a team of raters. The team comprised of three individual raters including two children - boy (13Years) girl (15 years) and the researcher. This was done to ensure that children’s voice and agency is incorporated in the second task too along with inter rater reliability. For each drawing content and colour had to be scored under each category at least two raters had to agree throughout for content and colour use. The content of the drawings had to be

classified under four broad categories-a) Animate and inanimate objects, b) Emotions, c) Language and d) others.

#### Content depicted in drawings

**a) Animate and inanimate objects**1. People-faces, people, stick figures. 2.Animals- pets and other animals. 3.Buildings- schools, hospitals, houses 4.Nature- flowers, trees, grass, sun. 5.Vehicles- Cars, cycles, rockets. 6.COVID-19 virus 7.Daily use objects-table, chairs, books, **b) Emotions**1. Negative Emotions - Unhappiness, fear, anger, sadness. 2.Positive Emotions- Hope, happiness, gratitude, love. **c) Language** - Letters, Words **d) Others** - Symbols and depictions that cannot be classified elsewhere in other categories.The colours were evaluated in terms of number of times the primary colours - red, blue and yellow were used in the drawings. Each object, emotion, language and others category depicted in the content was counted as one in each of the drawings for colour use.

**Colour used in drawings** - Red, Blue, Yellow, Other colours

### Results and Data Analysis

The results obtained were analysed in terms of four hypotheses of the study for task 1 and task 2. Detailed statistical analysis of the responses of the children in two age groups 8-11years and 12-16 years for the two tasks were carried out in terms of the mean values, standard deviations, percentages, and t-test. Table 1 below tabulates Standard Deviation and Mean table of Age 8-11 years and 12-16 years

**Table 1:** Standard Deviation and Mean table of Age 8-11 years and 12-16 years

Age group	School work- work, revision, and online learning	Friends-meeting and wellbeing	COVID-19- news and information from media about COVID-19	Food and resources- family coping and changes	Adult discussion about COVID-19	After school Activities and changes in participation and routine.	
8 - 11 years	Mean	2.76	2.42	3.38	3.61	2.76	2.14
	N	21	21	21	21	21	21
	Std. Deviation	1.48003	.97834	.58959	1.28360	.53896	.85356
12 - 16 years	Mean	2.23	2.26	2.61	2.00	2.46	1.69
	N	26	26	26	26	26	26
	Std. Deviation	1.24283	.96157	1.23538	1.09545	.81146	.61769

**Table 1:** Standard Deviation and Mean table of Age 8-11 years and 12-16 years

Age group	School work-work, revision, and online learning	Friends-meeting and wellbeing	COVID-19-news and information from media about COVID-19	Food and resources-family coping and changes	Adult discussion about COVID-19	After school Activities and changes in participation and routine.
	Mean	2.46	2.34	2.95	2.72	1.89
Total	N	47	47	47	47	47
	Std. Deviation	1.36495	.96181	1.06235	1.42497	.75855

**Hypothesis 1** - Children in the two age groups 8-11 years and 12-16 year will have different areas of worry. The results obtained for 8-11 year and 12-16 years are depicted in Table 1. The mean values and standard deviations (SD) for the age groups were calculated for 8-11 years and 12-16 age groups. The mean values of all the worry areas were higher for 8 – 11 years. Within the age group of 8-11 years, the highest mean value was for the area of COVID-19- news and information from media about COVID-19 Mean value=3.38(SD=.58) followed by Food and resources-family coping and changes mean value=3.61(SD=1.28). The lowest

areas of worry for 8-11 years were Friends-meeting and wellbeing mean value =2.42(SD=.97). The age group 12-16 years showed the highest mean value for the area COVID-19- news and information from media about COVID-19 Mean value=2.61 (SD=1.23). This area was followed by Adult discussion about COVID-19, Mean Value=2.46 (SD=.81). The lowest area of worry for this age group was After school Activities and changes in participation and routine mean value= 1.69 (SD=.61). Table 2 below shows t-test for areas of worry and age groups.

**Table 2:** t-test for areas of worry and age groups.

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
School work-work, revision, and online learning	Equal variances assumed	2.126	.152	1.338	45	.188	.53114	.39708	-.26862	1.33089
	Equal variances not assumed			1.313	39.118	.197	.53114	.40462	-.28721	1.34948
Friends-meeting and wellbeing	Equal variances assumed	.071	.791	.560	45	.578	.15934	.28432	-.41330	.73198
	Equal variances not assumed			.559	42.626	.579	.15934	.28485	-.41526	.73394
COVID-19- news and information from media about COVID-19	Equal variances assumed	23.556	.000	2.606	45	.012	.76557	.29374	.17394	1.35719
	Equal variances not assumed			2.791	37.373	.008	.76557	.27432	.20993	1.32121

**Table 2:** t-test for areas of worry and age groups.

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Food and resources-family coping and changes	Equal variances assumed	6.275	.016	4.666	45	.000	1.61905	.34702	.92012	2.31798
	Equal variances not assumed			4.586	39.513	.000	1.61905	.35300	.90533	2.33277
Adult discussion about COVID-19	Equal variances assumed	6.994	.011	1.455	45	.153	.30037	.20640	-.11535	.71608
	Equal variances not assumed			1.518	43.534	.136	.30037	.19788	-.09856	.69929
After school Activities and changes in participation and routine.	Equal variances assumed	1.270	.266	2.098	45	.042	.45055	.21476	.01801	.88309
	Equal variances not assumed			2.028	35.427	.050	.45055	.22219	-.00033	.90143

Percentages for different areas of worry for 8-11years Major percentage of students aged between 8 – 11 years were slightly worried for school work – work revision, medium worried for friends meeting, medium worried about COVID-19 - news, extremely worried for food and resources, medium worried for adult discussion and slightly for after school activities

and changes. Percentages of 12-16 years for different worry areas are presented. Major percentage of students aged between 12 – 16 years were not worried for school work – work revision, medium worried for friends meeting, very worried about COVID–19 news, medium worried for food and resources

**Table 3:** Mean and Standard Deviation for Gender

Age group		School work- work, revision, and online learning	Friends-meeting and wellbeing	COVID-19 -news and information from media about COVID-19	Food and resources-family coping and changes	Adult discussion about COVID-19	After school Activities and changes in participation and routine.
Boy	Mean	1.7083	2.6250	2.4167	3.0833	2.5417	2.1667
	N	24	24	24	24	24	24
	Std. Deviation	.95458	1.05552	.97431	1.76725	.77903	.63702
Girl	Mean	3.2609	2.0435	3.5217	2.3478	2.6522	1.6087
	N	23	23	23	23	23	23
	Std. Deviation	1.28691	.76742	.84582	.83168	.64728	.78272
Total	Mean	2.4681	2.3404	2.9574	2.7234	2.5957	1.8936
	N	47	47	47	47	47	47
	Std. Deviation	1.36495	.96181	1.06235	1.42497	.71200	.75855

**Hypothesis 2** - Boys and girls will vary significantly in terms of different areas of worry. Mean values and percentages were calculated for two gender groups. Table 3 depicts the mean values and standard deviation for boys and girls with highest mean value for boys was in the area of worry Food and resources-family coping and changes mean value =3.08 (SD=1.76), followed by Adult discussion about COVID-19 mean value=2.54(SD=.77). Boys had lowest worry in the area of School work- work, revision, and online learning mean value=1.70(SD=.95). Girls on the other hand were most

worried about COVID-19- news and information from media about COVID-19, mean value=3.52 (SD=.84). Girls had School work- work, revision, and online learning mean value=3.26 (SD=1.28) as the second highest areas of worry. Girls had lowest worry about After school Activities and changes in participation and routine mean value=1.60 (SD=.78). Figure 2 depicts the areas of worry percentages for boys and girls. The t-test for gender and areas of worry are presented in Table 4 illustrated below.

**Table 4:** Independent sample t-test on Gender and Worry Areas

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
School work- work, revision, and online learning	Equal variances assumed	7.528	.009	-4.711	45	.000	-1.55254	.32954	-2.21626	-.88882
	Equal variances not assumed			-4.682	40.537	.000	-1.55254	.33162	-2.22249	-.88258
Friends-meeting and wellbeing	Equal variances assumed	2.360	.131	2.152	45	.037	.58152	.27019	.03734	1.12570
	Equal variances not assumed			2.167	42.009	.036	.58152	.26838	.03991	1.12313
COVID-19- news and information from media about COVID-19	Equal variances assumed	1.719	.196	-4.145	45	.000	-1.10507	.26663	-1.64209	-.56805
	Equal variances not assumed			-4.157	44.577	.000	-1.10507	.26582	-1.64059	-.56955
Food and resources-family coping and changes	Equal variances assumed	49.703	.000	1.812	45	.077	.73551	.40584	-.08190	1.55292
	Equal variances not assumed			1.838	33.016	.075	.73551	.40026	-.07881	1.54982
Adult discussion about COVID-19	Equal variances assumed	1.578	.215	-.528	45	.600	-.11051	.20941	-.53227	.31126
	Equal variances not assumed			-.530	44.131	.599	-.11051	.20857	-.53082	.30981
After school Activities and changes in participation and routine.	Equal variances assumed	4.691	.036	2.686	45	.010	.55797	.20775	.13953	.97641
	Equal variances not assumed			2.674	42.438	.011	.55797	.20867	.13698	.97896

The t-test for gender and areas of worry are presented in Table 4. The p value corresponding to the statements “School work- work, revision, and online learning”, “Food and resources-family coping and changes”, “Friends-meeting and wellbeing”, “COVID-19- news and information from media about COVID-19” and

“After school Activities and changes in participation and routine.” were less than 0.05 and hence we can conclude that, these statements had significant difference between the males and females. Table 5 below summarises Mean and Standard Deviation for the two age groups for content in drawings

**Table 5:** Mean and Standard Deviation for the two age groups for content in drawings

Age		Animate and inanimate objects	Emotions	Language	Others
8-11 years	Mean	52.00	13.50	41.00	10.50
	Std. Deviation	26.870	17.678	21.213	3.536
12-16 years	Mean	52.00	24.50	75.50	3.50
	Std. Deviation	1.414	4.950	7.778	4.950
Total	Mean	52.00	19.00	58.25	7.00
	Std. Deviation	15.535	12.356	23.810	5.354

**Hypothesis 3** -The content and colour use of two age groups will be significantly different. To analyse hypothesis 3 mean values, standard deviation along with percentages for the two age groups were computed for content and colour. Further t-test analysis was done. **Appendix 2** contains some examples of drawing made by boys and girls in the two age groups 8-11years and 12-16 years. **Table 5** depicts the mean and Standard deviation for the two age groups for the content of drawings. The mean values for 8-11 years were lower than the age 12-16 years for two main categories of content-emotions and language. The two age groups had the same mean value for animate and inanimate object depiction Mean value =52.00(SD=26.87) for 8-11 years and (SD=1.41) for 12-16years. For the age groups 8-11years the highest mean value=52.0 (SD=26.87) was for the content category of animate and

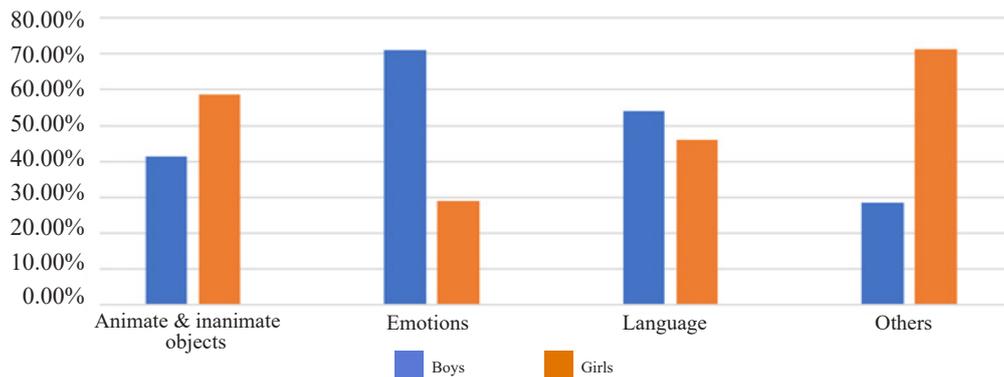
inanimate objects. The lowest mean for 8-11 years was for the others category mean value=10.50 (SD=3.53). The highest SD=26.87) was for the category animate and inanimate objects. From Table 5 we see that the average is seen more in language for 12-16 years of age and that of seen more in animate and inanimate objects for 8-11 years of age. The deviation is higher for 12-16 years for age group for language and is higher 8-11 years of age group for animate and inanimate objects. The highest percentage for 8-11 years for the others category 75% of content followed by 50% in animate and inanimate objects. The two categories of emotions and language were same for 8-11 years. The children in 12-16 years age group had the highest percentage for language category followed by emotions 64.5%. Table 6 below illustrates the colour use by the two age groups with the mean values and standard deviations Communications and Media. (2011). Media use by children

**Table 5:** Mean and Standard Deviation for the two age groups for content in drawings

age		red	blue	yellow	others
8-11 years	Mean	7.00	18.50	5.00	9.50
	Std. Deviation	1.414	.707	0	3.536
12-16 years	Mean	39.00	43.00	31.50	5.00
	Std. Deviation	15.556	1.414	2.121	7.071
Total	Mean	23.00	30.75	18.25	7.25
	Std. Deviation	20.559	14.175	15.349	5.252

**Table 6** indicates that the age group of 8-11 years Blue colour had the highest Mean=18.50(SD=.70) followed by the others colour category with Mean =9.50(SD=3.53). In the age group of 12-16 years the highest mean for colours was seen for the colour Blue Mean=43.0(SD=1.41) followed by Red Mean = 39.0(SD=15.5). Both age groups had the lowest mean

value for others category of colour. The percentages for colour categories for the two age groups. 8-11 years age group of children had the highest percentage use of others colour category (65.5%) followed by blue (30%) and the lowest percentage for yellow colour (13.7%). In comparison the 12-16 years used yellow colour most (86.3%) followed by red colour (84.8%).



**Figure 3:** depicts the percentage scores for boys and girls in the content of the drawings

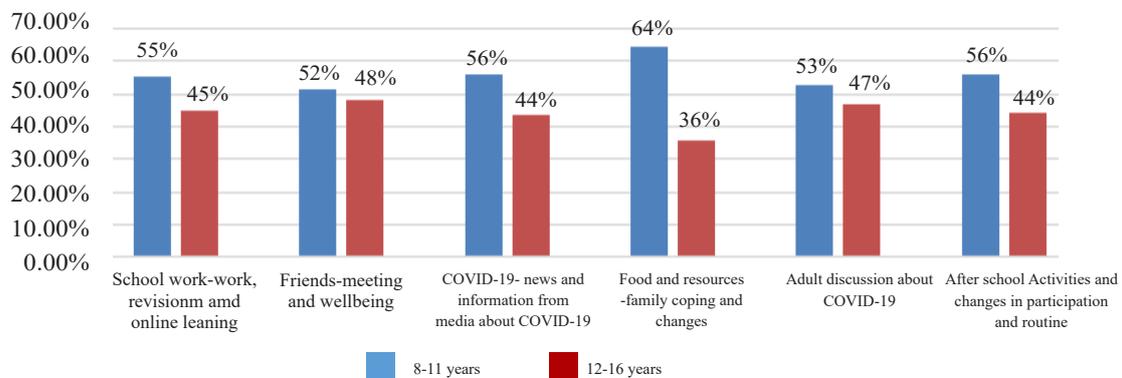
**Hypothesis 4** - Girls and boys will vary significantly in terms of colour and content depicted in the drawings. The percentages for boys and girls for content depiction in drawings in four categories. Figure 3 depicts the percentages for content for boys and girls. Boys had the highest mean=63.00 (SD=9.89) in the Language category and followed by animate and inanimate objects Mean = 43.00 (SD=14.14) mean = 27.00 (SD=1.41) in the emotions category. The girls on the other hand, had the highest mean = 61.00 (SD=14.14) in the animate and inanimate category followed by Mean = 53.50 (SD=38.89). The lowest Mean = 4.00 (SD=5.67) for others category in boys and mean = 10.00 (SD=4.24) in girls was observed. Percentages for content show that boys had the highest percentage in the emotions category (71%), followed by Language (54.1%), Animate and inanimate (41.3%). Girls on the other hand had the highest percentage for others category (71.4%) followed by animate and inanimate objects (58.7%), and Language (45.9%). Lowest percentage for boys was for others category (28.6%) and for girls' emotions category (28.9%) was the lowest percentage.

## Discussion

The results and data analysis obtained are discussed in line with the key hypotheses of the study. The first hypothesis that children in the two age groups 8-11 years and 12-16 year will have different areas of worry is evident clearly in the study. The mean values of all the worry areas were higher for 8 – 11 years. Within the age group of 8-11 years, the highest mean value was for the area of COVID-19- news and information from media about COVID-19 Mean value=3.38(SD=.58) followed by Food and resources-family coping and changes mean value=3.61(SD=1.28). The lowest areas of worry for 8-11 years were Friends-meeting and wellbeing mean value =2.42(SD=.97). Children in 8-11 years show majority of hypothetical areas of worry in comparison to 12-16 years. This can be explained in line with Suarez-Morales & Bell (2006) study that concluded that worry was related to threat interpretation for hypothetical situations leading to higher estimates of occurrence of future threatening situations and ineffective solutions. While processing information related to worry, children have stress, gender and socio-economic status as critical factors.

The age group 12-16 years showed the highest mean value for the area COVID-19- news and information from media about COVID-19 Mean value = 2.61 (SD=1.23). This area was followed by Adult discussion about COVID-19, Mean Value=2.46 (SD=.81). The lowest area of worry for this age group was After school Activities and changes in participation and routine mean value= 1.69 (SD=.61). COVID-19 news and information from the media has greater worry in older children indicating the impact and analysis of media information through various

sources. This can be explained by the influx, exposure and impact of technology on children in the present years (Plowman, Stephen, & McPake, 2010; Hutchby & Moran-Ellis, 2001). Children are throughout the day bombarded with information from various sources including social media platforms and it has a direct correlation to increased anxiety and worry. This is in line with studies like Donovan, Holmes, & Farrell, (2015); Grist & Field (2011) who discuss the role of factors like age, worry and cognitive elaboration in older children.



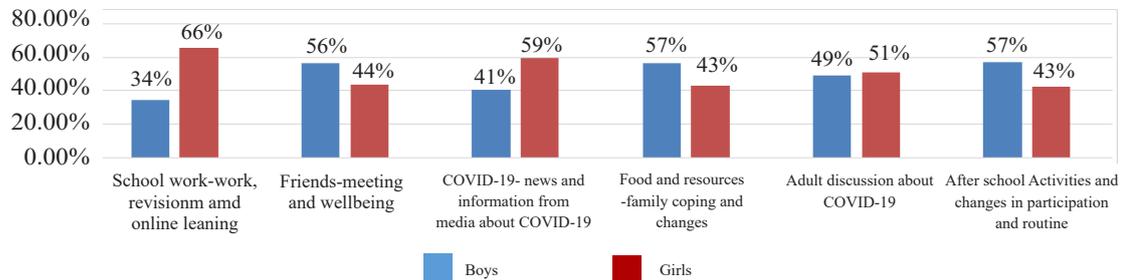
**Figure 1:** depicts the percentage scores for different worry areas for the two age groups 8-11 years and 12-16 years

**Figure 1** clearly depicts the percentages for the two age groups in the six areas of worry. In comparison the 8-11 years age group had the lowest percentage (52%) for Friends meeting and wellbeing, while 12-16 years old children had lowest worry (47%) for food and resources-family coping and changes category. 8-11 years had (64%) worry in this area. The T test analysis indicates that COVID-19- news and information from media about COVID-19”, “Food and resources -family coping and changes” and “After school Activities and changes in participation and routine.” were less than 0.05 and hence, these statements had significant difference between the 8 – 11 years and 12 – 16 years age group. As information about COVID-19 is being explored and understood by scientists and professionals, the age differences can be explained also in line with studies that have explored in the past that intolerance to uncertainty can lead to worry in

children. Intolerance to uncertainty is defined as “an individual's dispositional incapacity to endure an aversive response triggered by the perceived absence of salient, key, or sufficient information, and sustained by the associated perception of uncertainty” (Carleton, 2016). The second hypothesis is proved by this study- boys and girls will vary significantly in terms of different areas of worry. The highest mean value for boys was in the area of worry Food and resources-family coping and changes mean value =3.08 (SD=1.76), followed by Adult discussion about COVID-19 mean value=2.54 (SD=.77). Boys had lowest worry in the area of School work- work, revision, and online learning mean value=1.70 (SD=.95). Girls on the other hand were most worried about COVID-19- news and information from media about COVID-19, mean value=3.52(SD=.84). Girls had School work- work, revision, and online learning mean value=3.26(SD=1.28) as the second

highest areas of worry. Girls had lowest worry about After school Activities and changes in participation and routine mean value=1.60(SD=.78).

In the figure 2 attached below, the percentages for different areas of worry for boys and girls has been illustrated



**Figure 2:** depicts the percentage scores for different worry areas for boys and girls

Figure 2 depicts clearly that for girls the highest percentage (66%) was for worry area school work-work revision and online learning. The lowest area of worry for girls was after school activities (43%). Boys on the other hand worried more about after school activities and changes in participation and routine (57%). Boys had least worry for (34%) for school work, revision and online learning. This can be explained in line with recent study by McGeown & Warhurst (2020), who concluded that the differences in reading, writing and motivation to education were much more than the just sex differences. These differences can be further explained by the Expectancy value theory (Eccles et al., 1983) It could be that the differences in worry about the school work and revision between boys and girls is an outcome of their ability to perform and succeed along with how important the school work and revision are perceived and enjoyed by the two groups. The t-test analysis indicates that the p value corresponding to the statements “School work-work, revision, and online learning”, “Food and resources -family coping and changes”, “Friends-meeting and wellbeing”, “COVID-19- news and information from media about COVID-19” and “After school Activities and changes in participation and routine.” were less than 0.05 and hence these statements had significant difference between the boys and girls. Some studies have in the past highlighted how children perceive schooling pays little attention

to their subjective well-being (Huebner, Hills, & Jiang, 2013). For boys may be other friend’s well-being therefore was a significant area of worry than the girls. Friends provide reciprocal and emotional support (Fattore, Mason, & Watson, 2016) which may be is important for boys in COVID-19 outbreak scenario with the school closures. Shared experiences in understanding the pandemic and building information and knowledge around the disease can be more useful for boys. Third hypothesis stated that the content and colour use of two age groups will be significantly different. The mean values for 8-11 years were lower than the age 12-16 years for two main categories of content-emotions and language. The two age groups had the same mean value for animate and inanimate object depiction Mean value = 52.00 (SD=26.87) for 8-11 years and (SD=1.41) for 12-16years. For the age groups 8-11years the highest mean value=52.0(SD=26.87) was for the content category of animate and inanimate objects. The lowest mean for 8-11 years was for the others category mean value=10.50(SD=3.53). The highest SD=26.87) was for the category animate and inanimate objects. Within the age group 12-16 years the highest mean value was for the category language, mean value=75.50(SD=7.77). The lowest mean for this age group was for the category others mean value=3.50(SD=4.95). The Standard deviation (SD=7.778) is highest for 12-16 years for age group

for language. The children in 12-16 years were using emotion and language depiction more in their drawings as compared to the younger age group 8-11 years. This could be explained in terms of the social, educational and peer related issues that impact that particular age group more than the others. Many children in secondary school are in the midst of preparation for their exams, assessments and evaluation which can add more burden on their evaluation of the COVID related situation.

The percentages of emotions (64%) depiction through drawings were evident more for 12-16 years of age. Children in 8-11 years depicted objects that belonged to other category as highest percentage (75%). Analysis of drawings indicated use of symbols, unexplained objects in the drawings showing confusion, lack of clarity about what to draw and sometimes unreal objects. Some studies like those by Burnham (2005); Burnham et al. (2012); Golomb (2003); Christie & MacMullin (1998) have explored fear and its depiction in children's drawings. Depiction of more of "other" category of objects indicates that worries in 8-11 years of children may be caused by unexplained fear of COVID-19 that is leading to worry. This could be due to the lack of understanding of the facts about COVID-19 or misinterpretation of information received in this age group. Drawings have been able to capture their worries well and this could be a relevant area of support for young children. As shown in Figure 4, older children 12-16 years depicted more language (64.8%) and emotions (64.5%) through drawings. It may be useful for practitioners, parents, and key workers to use the medium of drawing and free expression to support the older age group with techniques like drawings, paintings, drama and creative expression using technology tools in challenging uncertain times of the entire duration of this pandemic. The colour categories used by the two age groups differed significantly. 8-11 years children used Blue colour Mean=18.50(SD=.70) followed by the others colour category with Mean =9.50(SD=3.53). In the age group of 12-16 years the highest mean for colours was seen for the colour Blue Mean=43.0(SD=1.41) followed by Red Mean = 39.0(SD=15.5). Both age groups had the lowest mean value for others category

of colour. Although, studies in the past have highlighted use of primary colours for neutral (Burkitt et al., 2003) figures depiction, use of Blue and red in the present study for the two age groups for COVID-19 related depiction shows that these two colours are attached to the pandemic. This could be explained in terms of use of red and blue in the NHS and media campaigns to illustrate the COVID-19 virus and related literature. Children of both age groups have relevantly picked the choice of red and blue colours use along with the heightened worry areas here.

Fourth hypothesis states that the girls and boys will vary significantly in terms of colour and content depicted in the drawings. This is proved by the present study. The differences in boys and girl's percentage scores for content is shown. Boys had the highest percentage in the emotions category (71%), followed by Language (54.1%), Animate and inanimate (41.3%). Girls on the other hand had the highest percentage for others category (71.4%) followed by animate and inanimate objects (58.7%), and Language (45.9%). Lowest percentage for boys was for others category (28.6%) and for girls' emotions category (28.9%) was the lowest percentage. Figure 3 depicts this. This can be explained in terms of some existing studies that highlight that display of expressions of hurt, worry, care and concern may make boys look "girly" or "gay" (Oransky & Marecek, 2009). Boys expressed their worry through drawings and depiction of content. Expectations differences about the expression of emotions from girls and boys differs in society (Thomassin, Bucsea, Chan, & Carter, 2019) and in this pandemic these differences still persist. Some studies illustrate that gender differences in expression of emotions are more pronounced when children are alone (Chaplin & Aldao, 2013). Girls may be were involved more in school work and were in touch with friends through other social mediums rather than boys during the pandemic start. This could explain the differences in expression of emotions between boys and girls in the drawings. Gender differences in expression of emotions are passed through books, television, social media, school and home (Aznar & Tenenbaum, 2015; Tepper & Cassidy, 1999). Girls drew the other category most in their drawings. Studies indicate

that girls tend to be more expressive and draw more metaphorical objects in their expression in drawings rather than literal content (Picard & Boulhaisa, 2011). COVID-19 drawings by girls had metaphorical content rather than the boy's drawings.

### Implications of the study

Lack of clarity, too much media information, parental input about the disease all contributing to the building of worries and the way information is processed by children in the two age groups. This study proposes a two-pronged approach to address worries in children during this pandemic. A model proposing Solution (SO), Detail (DE) for real problems (SODE) and support (SU) and discussion (DI) for hypothetical worries (SUDI) Real worries can be handled with solutions and detail while hypothetical worries require support and discussion with children. For children 8-11 years (SODE) and for older children 12-16 years (SUDI) might be effective approaches to address worries. Future research should concentrate and focus on a researching a larger sample of children across different age groups and genders. The nature of worry for the same group of children may vary with the pandemic still on in 2021 and would make an interesting reading. Use of IDSCF model to work with creative arts to see its impact on children's worry may also be an interesting topic to research. A cross cultural approach to understand the differences in worries during this pandemic of different children across various countries may present a comprehensive picture of the nature of worries and their approach.

### Conclusion

There are significant age and gender differences in (real and hypothetical) areas of worry that children exhibited in 8-12 years and 12-16 years of age through the start of the pandemic COVID-19. Children show both real and hypothetical worries related to the pandemic that vary with age and gender. As the areas of worry are different the approaches to resolve worries have to be different. As COVID-19 unfolds with greater challenge, multiple unknown factors play a predominant role in

changing the types of real and hypothetical worries in children linked to uncertainty, lack of control and changing environment. It is important to assess the changing nature of the areas of worry in 8-11 year and 12-16 years of children with giving them sufficient opportunities to embed Solution (SO), Detail (DE) for real problems (SODE) and support (SU) and discussion (DI) for hypothetical worries (SUDI).

### Appendix 1 - Self devised questionnaire assessing worry in children

**Part 1 – Questionnaire** -Thank you for participating in this study. As you are aware there is a pandemic COVID-19 declared by the WHO (2020). I would like to know the areas that you are particularly worried about in the present circumstances. This is an independent study and the data collected will be used only for academic purposes and kept confidential throughout in line with BERA (2018). The data collected will be strictly for educational and research purposes setting to write an article in a journal.

*Gender – Age – years.*

1. Not worried at all 2. Slightly worried 3. Medium worried 4. Very worried 5. Extremely worried

*Please put the number against each area depending on how you feel about it in present circumstances.*

**For example**, if someone is very worried about school work presently then they should write a 5 under school work column as shown below

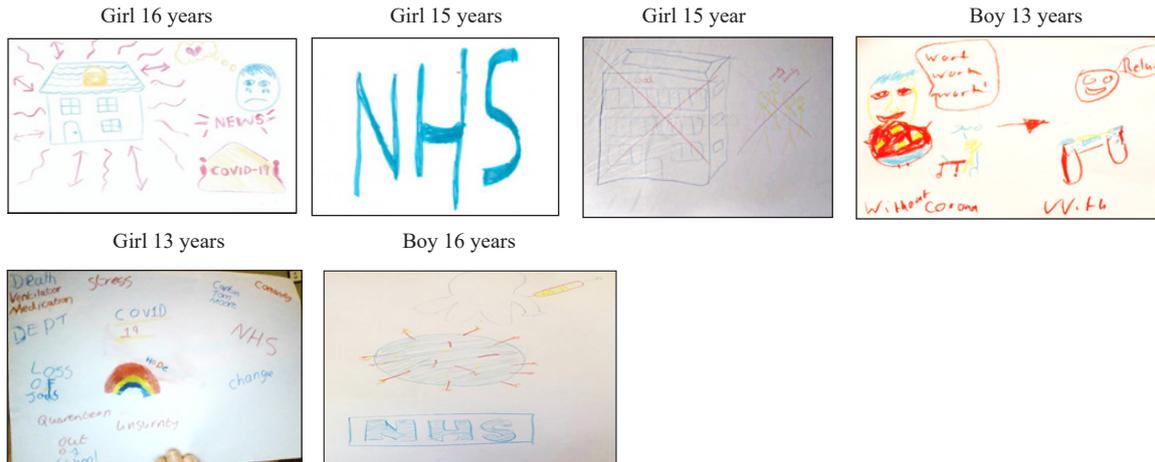
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Areas	1	2	3	4	5
1.School work					

Areas	1	2	3	4	5
School work- work, revision, and online learning (Real Worry Area)					
Friends-meeting and wellbeing (Real Worry Area)					
COVID-19- news and information from media about COVID-19 (Hypothetical worry Area)					
Food and resources-family coping and changes (Hypothetical worry Area)					
Adult discussion about COVID-19 (Hypothetical worry Area)					
After school Activities and changes in participation and routine. (Real Worry Area)					

**Appendix 2 - Examples of drawings for task 2 from the two age groups**





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