

An initial study of perceived adolescent stress in relation to grade and gender during the COVID-19 pandemic

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ABSTRACT

The Covid-19 (ECDC, 2020) Pandemic took the world by surprise in December 2019 and the subsequent disaster that struck the world and India in general was and is unthinkable. The associated uncertainty is increasingly testing psychological resilience of the masses. Since there is a severe dearth of research on this issue, it was decided that a study of perceived adolescent stress on students from high school would throw some light on how this pandemic is affecting the young population. It was hypothesized that Perceived Stress would be present in both Gender and Grades. 42 subjects participated in this study. The Perceived Stress Scale was used; this is the most widely used psychological instrument for measuring perception of stress. It is a measure of the degree to which situations in one's life are appraised as stressful. Items were designed to tap how unpredictable, uncontrollable, and overloaded respondents find their lives. The scale also includes a number of direct queries about current levels of experienced stress. In the present study, the Scatterplot shows that the correlation i.e. the linear relationship is exactly +1. A perfect uphill (positive) linear relationship is observed. From the results it is evident that Grade and Gender are positively affected by Perceived Stress. It is also evident that a certain amount of stress is observed in these subjects during this period of COVID-19 and is supported by the WHO (2020) concern that the psychological impact of this pandemic in terms of stress amongst the adolescent population is also of grave concern. This initial study suggests that more than half of the participants had a significant psychological impact of stress during the COVID-19 pandemic and this is supported by the study in China (2020). Banerjee 2020 has suggested that only anecdotal discussion and case reports have been done on the Indian population. This is an initial study which attempts to indicate perceived stress is observed in the young population of India.

Keywords: *Adolescent Stress, Relation, Grade And Gender, COVID-19 pandemic*

The Pandemic of 2020 popularly known as COVID-19 (ECDC, 2020) took the world by surprise in December 2019 and the subsequent disaster that struck the world and India in general was and is unthinkable. Initially, confusion reigned the world over and although testing, finding a cure and preventing transmission has been the main aim of

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Governments and Medical Experts; many have gone through a plethora of psychological problems in adjustment to lifestyles and more importantly, the inherent fear that this virus has created. It was decided that a study of perceived adolescent stress on students from high school would throw some light on how this pandemic is affecting the young population in India.

Coronavirus is a sub-family virus which originates from the Corona Viridae family. The virus initially infected amphibians, birds and mammals (Virus Taxonomy, 2012); and there was no major human contact (WHO, 2020). Subsequently, Severe Acute Respiratory Syndrome (SARS-CoV) emerged in 2003, followed by the Human Corona Virus (HCoV NL63) in 2004 (Galante *et al*, 2015), HKU1 in 2005 (Kanwar *et al*, 2017), and the Middle East Respiratory (MERS) in 2012 (WHO, 2019). However this particular virus – the Coronavirus - has now reached a threat unknown before and right from the time it originated to now, it seems to have mutated a handful of times as all RNA viruses seem to have; and like the flu and measles, are more prone to changes and mutations compared with DNA viruses, such as herpes, smallpox etc (Schleiss, 2020). Gruberg *et al*, (2020), assure us that “we shouldn’t worry when a virus mutates during disease outbreaks”.

Wang *et al*, (2020) have reported significant psychological impact of the COVID-19 virus in a Chinese study where more than half of the subjects were affected. However, a study in Denmark reported psychological well-being as negatively affected (Sonderskov *et al*, 2020). The American Psychiatric Association (APA, 2020) found many anxious participants according to the survey they conducted. Varshnay *et al*, (2020) in their study with 659 subjects concluded that during the initial stages of COVID-19 in India, almost one-third respondents had a significant psychological impact (Rajkumar *et al*, 2020). Additionally, Keating (2020) states that “the risks to adolescent well-being and development may be hard to fully predict, but there is a strong likelihood that those risks are serious, especially if we do not find ways to support their need for social connection”.

Bos *et al*, (2019) and McDonagh *et al*, (2018) make it clear that we should view adolescence as encompassing emerging adulthood into the mid-20s, as a kind of ‘elongated adolescence’. Keating (2020) suggests that the current adolescent generation (referred to as Gen Z) are bright, socially conscious, proactive, and pragmatic, combined with a passion for addressing the existential crisis of our time and climate change.

Symptoms of Stress

Van Hoof (2020) describes the lockdown lifestyle as “the largest psychological experiment ever that will result in a secondary pandemic of stress and anxiety in the latter half of 2020”. Mitra (2020), says stress begins to manifest itself when we do not deal with it; indications include people being worried, withdrawn, detached and those who stop communicating. This affects the young and elderly more as they are aware of their physical vulnerability. Raviv (2020), suggest that teenagers suffering from stress and anxiety may experience loss of appetite, sleeplessness, headaches, stomach aches and may appear depressed and withdrawn. Cognitive changes may also occur in terms of forgetfulness and distraction. Children and adolescents may appear to be less at risk for severe COVID-19 symptoms, but the pandemic has significantly disrupted their lives in other ways. Social distancing and the interruption of typical school routines can be especially challenging for adolescents, say Mendelson and Marshall (2020). Marshall (2020) goes on to say that “two of the developmental tasks of adolescence are to develop social skills and empathy and a sense of identity. Both of these tasks happen through interactions with peers”. Schools are much

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more than just a place for delivering educational content; schools recognize that students will come back with not only educational setbacks but also setbacks in their social and emotional skills.

Present Study

The World Economic Forum has termed COVID-19 pandemic a ‘black swan event’ that has suddenly and dramatically changed our life. Children around the world, including India have found that their lives have drastically changed from the comfort of their fixed routines of school, extra-curricular activities in school and outside school, supportive peer groups, caring and hardworking teachers to being locked-down in their homes. Social distancing has almost created a stifling situation for children and parents. Additionally, fear related to the disease’s potential effects and transmission (Shah *et al*, 2020), and fear due to the contraction of COVID-19 is on the rise because of the death tolls and global spread (Dong & Bouey, 2020). How is this change affecting our children and how are they dealing with it?

During the early stage of the Pandemic in India, this study was focused mainly to assess the impact of the level of perceived stress on adolescents from grades IX and X. Hence, this study attempted to find the initial psychological impact of stress among adolescents during COVID-19.

METHODOLOGY

Hypothesis

It was hypothesized that Perceived Stress would be present in both Gender and Grades.

Tools

Questionnaire: The Perceived Stress Scale (Cohen S, 1983) The Perceived Stress Scale (PSS) is the most widely used psychological instrument for measuring the perception of stress. It is a measure of the degree to which situations in one’s life are appraised as stressful. Items were designed to tap how unpredictable, uncontrollable, and overloaded respondents find their lives. The scale also includes a number of direct queries about current levels of experienced stress. The PSS was designed for use in community samples with at least a junior high school education. The items are easy to understand, and the response alternatives are simple to grasp. Moreover, the questions are of a general nature and hence are relatively free of content specific to any subpopulation group. The questions in the PSS ask about feelings and thoughts during the last month. In each case, respondents are asked how often they felt a certain way.

Primary use / Purpose

Measures the degree to which situations in one's life are appraised as stressful.

Background: Potentially stressful life events are thought to increase risk for disease when one perceives that the demands these events impose tax or exceed a person’s adaptive capacity (Lazarus & Folkman, 1984). In turn, the perception of stress may influence the pathogenesis of physical disease by causing negative affective states (e.g., feelings of anxiety and depression), which then exert direct effects on physiological processes or behavioural patterns that influence disease risk (Cohen, Janicki-Deverts, & Miller, 2007). The Perceived Stress Scale (PSS) measures psychological stress associated with sex, age, education, income, employment status, and a number of other demographics.

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1. **Psychometrics:** The PSS showed adequate reliability and, as predicted, was correlated with life-event scores, depressive and physical symptomology, utilisation of health services, and social anxiety.
2. **Evidence for Validity:** Higher PSS scores were associated with (for example): failure to quit smoking failure among diabetics to control blood sugar levels greater vulnerability to stressful life-event-elicited depressive symptoms more colds
3. **Health status relationship to PSS:** Cohen et al. (1988) show correlations with PSS and: Stress Measures, Self-Reported Health and Health Services Measures, Health Behaviour Measures, Smoking Status, Help Seeking Behaviour.
4. **Temporal Nature:** Because levels of appraised stress should be influenced by daily hassles, major events, and changes in coping resources, predictive validity of the PSS is expected to fall off rapidly after four to eight weeks.
5. **Scoring:** PSS scores are obtained by reversing responses (e.g., 0 = 4, 1 = 3, 2 = 2, 3 = 1 & 4 = 0) to the four positively stated items (items 4, 5, 7, & 8) and then summing across all scale items.
6. **Norm Groups:** L. Harris Poll gathered information on 2,387 respondents in the U.S

Sample

The present sample of population was randomly taken from Grades IX and X school students; from a random group of schools in Maharashtra, India. The PSS was sent out to 120 subjects; of which only 47 responded.

RESULTS

Descriptive Statistics was done for each of the ten statements taking all subjects into account. Results are as follows:

Table 1: Been upset with something in the last month

Column 1: Been upset with something in the last month	
Mean	1.489361702
Standard Error	0.148605421
Median	1
Mode	1
Standard Deviation	1.018787438
Sample Variance	1.037927845
Kurtosis	0.616201016
Skewness	0.674202155
Range	4
Minimum	0
Maximum	4
Sum	70
Count	47
Coefficient of variation	0.684042994
Confidence Level (95.0%)	0.299127198

The Mean value of Being Upset is: 1.5

The Median value of is: 1

The Range is: 4

The Standard Deviation is: 1.01

The Coefficient of Variation is: 0.70

The Confidence Level at 95% is 0.3

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Table 2: Unable to control important things in your life in the last month

Column 2: Unable to control important things in your life in the last month	
Mean	1.170212766
Standard Error	0.156035377
Median	1
Mode	1
Standard Deviation	1.069724648
Sample Variance	1.144310823
Kurtosis	0.442555208
Skewness	0.869727714
Range	4
Minimum	0
Maximum	4
Sum	55
Count	47
Coefficient of Variation	0.914128336
Confidence Level (95.0%)	0.314082923

The Mean value of Unable to Control is: 1.2

The Median value is: 1

The Range is: 4

The Standard Deviation is: 1.01

The Coefficient of Variation is: 0.91

The Confidence Level at 95% is: 0.31

Table 3: Nervous and stressed in the last month

Column 3: Nervous and stressed in the last month	
Mean	1.29787234
Standard Error	0.132278452
Median	1
Mode	2
Standard Deviation	0.906855379
Sample Variance	0.822386679
Kurtosis	-0.96754761
Skewness	-0.09278159
Range	3
Minimum	0
Maximum	3
Sum	61
Count	47
Coefficient of Variation	0.698724637
Confidence Level (95.0%)	0.266262714

The Mean value of Nervous & Stressed is: 1.3

The Median value is: 1

The Range is: 3

The Standard Deviation is: 0.91

The Coefficient of Variation is: 0.7

The Confidence Level at 95% is: 0.3

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Table 4: Confidence in handling personal problems in the last month

Column 4: Confidence in handling personal problems in the last month	
Mean	3.127659574
Standard Error	0.108035272
Median	3
Mode	3
Standard Deviation	0.740652511
Sample Variance	0.548566142
Kurtosis	5.823161215
Skewness	-1.55143268
Range	4
Minimum	0
Maximum	4
Sum	147
Count	47
Coefficient of Variation	0.236807266
Confidence Level (95.0%)	0.217463724

The Mean value of Confidence in Handling Personal Problems is: 3.13

The Median value is: 3

The Range is: 4

The Standard Deviation is: 0.74

The Coefficient of Variation is: 0.24

The Confidence Level at 95% is: 0.22

Table 5: Things going your way in the last month

Column 5: Things going your way in the last month	
Mean	2.489361702
Standard Error	0.145459623
Median	3
Mode	3
Standard Deviation	0.99722093
Sample Variance	0.994449584
Kurtosis	0.176987995
Skewness	-0.45024351
Range	4
Minimum	0
Maximum	4
Sum	117
Count	47
Coefficient of Variation	0.400593023
Confidence Level (95.0%)	0.292795034

The Mean value of Confidence in Handling Personal Problems is: 2.5

The Median value is: 3

The Range is: 4

The Standard Deviation is: 1.00

The Coefficient of Variation is: 0.40

The Confidence Level at 95% is: 0.3

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Table 6: Unable to cope in the last month

Column 6: Unable to cope in the last month	
Mean	1.808510638
Standard Error	0.150970643
Median	2
Mode	2
Standard Deviation	1.035002581
Sample Variance	1.071230342
Kurtosis	0.056224355
Skewness	0.402158309
Range	4
Minimum	0
Maximum	4
Sum	85
Count	47
Coefficient of Variation	0.572295545
Confidence Level (95.0%)	0.303888142

The Mean value of Confidence in Handling Personal Problems is: 1.81

The Median value is: 2

The Range is: 4

The Standard Deviation is: 1.03

The Coefficient of Variation is: 0.6

The Confidence Level at 95% is: 0.3

Table 7: Controlling irritability in the last month

Column 7: Controlling irritability in the last month	
Mean	2.893617021
Standard Error	0.152784947
Median	3
Mode	4
Standard Deviation	1.047440826
Sample Variance	1.097132285
Kurtosis	-0.27486074
Skewness	-0.60926354
Range	4
Minimum	0
Maximum	4
Sum	136
Count	47
Coefficient of Variation	0.361983227
Confidence Level (95.0%)	0.307540148

The Mean value of Confidence in Handling Personal Problems is: 2.9

The Median value is: 3

The Range is: 4

The Standard Deviation is: 1.05

The Coefficient of Variation is: 0.4

The Confidence Level at 95% is: 0.31

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Table 8: On top of things in the last month

Column 8: On top of things in the last month	
Mean	2.468085106
Standard Error	0.163368405
Median	2
Mode	2
Standard Deviation	1.119997357
Sample Variance	1.25439408
Kurtosis	-0.63134462
Skewness	-0.25613735
Range	4
Minimum	0
Maximum	4
Sum	116
Count	47
Coefficient of Variation	0.453792033
Confidence Level (95.0%)	0.328844

The Mean value of Confidence in Handling Personal Problems is: 2.5

The Median value is: 2

The Range is: 4

The Standard Deviation is: 1.12

The Coefficient of Variation is: 0.5

The Confidence Level at 95% is: 0.33

Table 9: Angry because you are not in control in the last month

Column 9: Angry because you are not in control in the last month	
Mean	2.042553191
Standard Error	0.135875027
Median	2
Mode	2
Standard Deviation	0.931512254
Sample Variance	0.867715079
Kurtosis	-0.01402869
Skewness	0.418574853
Range	4
Minimum	0
Maximum	4
Sum	96
Count	47
Coefficient of Variation	0.456052874
Confidence Level (95.0%)	0.273502244

The Mean value of Confidence in Handling Personal Problems is: 2.04

The Median value is: 2

The Range is: 4

The Standard Deviation is: 1.00

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The Coefficient of Variation is: 0.5
 The Confidence Level at 95% is: 0.3

Table 10: Unable to overcome difficulties in the last month

Column 10: Unable to overcome difficulties in the last month	
Mean	0.936170213
Standard Error	0.153299376
Median	1
Mode	0
Standard Deviation	1.050967573
Sample Variance	1.10453284
Kurtosis	1.561018993
Skewness	1.305436058
Range	4
Minimum	0
Maximum	4
Sum	44
Count	47
Coefficient of Variation	1.122624453
Confidence Level (95.0%)	0.308576

The Mean value of Confidence in Handling Personal Problems is: 1.00

The Median value is: 1

The Range is: 4

The Standard Deviation is: 1.05

The Coefficient of Variation is: 1.23

The Confidence Level at 95% is: 0.31

Table 11: Pearsons Correlation on the 10 items (original)

	Gender	Grade	Been Upset	Unable to Control
Gender	1			
Grade	-0.152522219	1		
Been Upset	-0.007582942	-0.16373135	1	
Unable to Control	0.073121372	-0.01934959	0.560225222	1
Nervous & Stressed	-0.011713481	-0.213478405	0.074094234	0.170693625
Confidence in Handline Personal Problems	-0.058671789	-0.156172285	-0.17102139	-0.16521301
Things Going Your Way	0.128792796	-0.109886915	-0.326428823	-0.202053715
Unable to Cope	0.041052779	0.029409892	0.090800793	0.108618605
Controlling Irritability	-0.073755058	0.1557651	0.049845858	0.016512119
In Control of Things	0.060354876	-0.038049233	0.17592739	0.095356931
Angry Because You Are Not in Control	-0.064273868	-0.020913478	0.275372524	0.167103765
Unable to Overcome Difficulties	-0.130475913	0.136705991	0.415572197	0.319260149

Nervous & Stressed	Confidence in Handling Personal Problems	Things Going Your Way	Unable to Cope
1			
-0.025479653	1		
0.219929429	0.296209898	1	

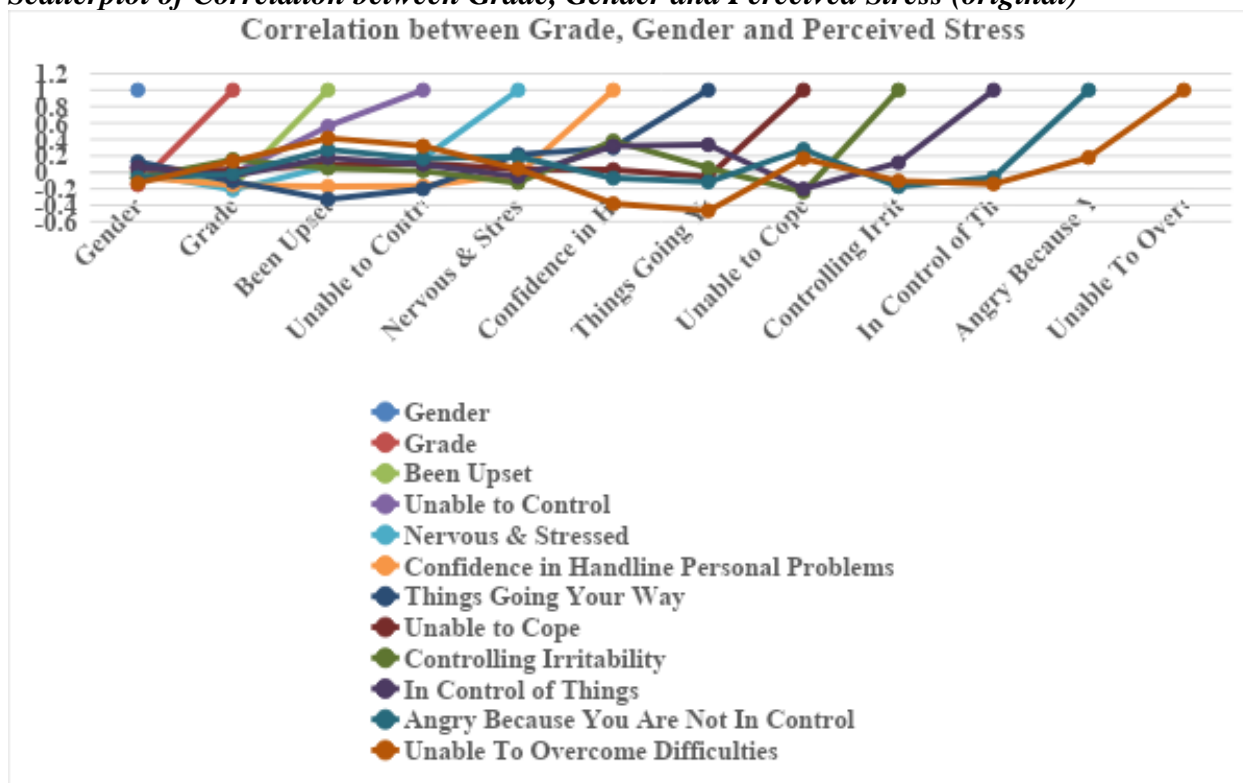
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Nervous & Stressed	Confidence in Handling Personal Problems	Things Going Your Way	Unable to Cope
0.038930675	0.03258233	-0.054672801	1
-0.126117846	0.38217154	0.050923854	-0.2397782
-0.054647528	0.319497478	0.335444709	-0.202299048
0.190544733	-0.071063583	-0.116514563	0.279214064
0.043192363	-0.380294871	-0.467368641	0.168387073

Controlling Irritability	In Control of Things	Angry Because You are Not in Control	Unable to Overcome Difficulties
1			
0.117493564	1		
-0.173503135	-0.061181177	1	
-0.10504261	-0.140283377	0.180480292	1

Pearson correlation is commonly used in statistics. This measures the strength and direction of a linear relationship between two variables. Values always range between -1 (strong negative relationship) and +1 (strong positive relationship). Values at or close to zero imply weak or no linear relationship. A **Positive correlation** – the other variable has a tendency to also increase. This is indicated in the above table i.e. between Grade, Gender and Perceived Stress. When the correlation is positive, regression slope will be positive.

Scatterplot of Correlation between Grade, Gender and Perceived Stress (original)



The Scatterplot shows that the correlation i.e. the linear relationship is Exactly +1. A perfect uphill (positive) linear relationship is observed. Homoscedasticity, which means that the variances along the line of best fit remain *similar* as you move along the line is observed in the above scatterplot.

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From the results indicated above it is evident that Grade and Gender are positively affected by Perceived Stress. It is also evident that a certain amount of stress is observed in these subjects during this period of COVID-19 and is supported by the WHO (2020) who state that the psychological impact of this pandemic in terms of stress amongst the adolescent population is also of great concern.

DISCUSSION, CONCLUSION AND FURTHER RESEARCH IDEAS

The results suggest that more than half of the participants had a significant psychological impact of stress during the COVID-19 pandemic and this is supported by the study in China. Additionally, Varshanay *et al's* (2020) results indicate that almost one-third respondents had a significant psychological impact. This is an initial study which attempts to indicate that a significant amount of perceived stress is indicated in the young population of India. It is suggested that a more systematic assessment of a larger population could be done in two phases with a gap of two months to see whether perceived stress levels drop or not.

Keating (2020), suggests that “taking together the best current evidence on stress, resilience, social media, and screen time, we should be supporting virtual/distant socializing, even if that means some relaxation of family expectations around social media and screen time that apply when they are in school.” “One of the generational resources of today’s adolescents is that they are “digital natives.” They have been online virtually since they could first manipulate any device, from early childhood passive viewing and, from their teen onwards, almost constant engagement with social media. Evidence for this from better-designed studies suggests that, in general, social media has few negative effects, and very small ones at that (Orben & Przybylski, 2019).

Masten (2018) suggests that social connection plays a central, and arguably the most powerful, role in dealing with stress; in terms of developmental health outcomes as well as the biologically embedded counterforces against excess or toxic stress (Keating 2016, 2017). Beyond social connection, mindfulness/planning/consciousness, and taking care of one’s body in ways that provide protection against stress is important.

This crisis is different in many ways and presents stressors with which we have very little experience of. Under the present circumstances, we can turn to what developmental science tells us about stress, coping, and resilience as they function in adolescence more generally, and consider how to apply that knowledge today. Leading factors that act as a buffer to stress are social connection, mindfulness/purpose/planning, and taking care of the physical body. Those lines of research can inform how we may be able to help, recognizing that their application to the current crisis-level stressor may not always be obvious.

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Conflict of Interest

The author declared no conflict of interest.

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