

Higher Education Perceived Stress and Physical Stress: Big Data Analysis.

Ruihua Zhang

School of Computer and Information & Key Laboratory of Complex Systems and Intelligent Optimization of Guizhou, Qiannan Normal University for Nationalities, Duyun, Guizhou china

Jincheng Zhou

School of Computer and Information & Key Laboratory of Complex Systems and Intelligent Optimization of Guizhou, Qiannan Normal University for Nationalities, Duyun, Guizhou china

Tao Hai

School of Computing, Faculty of Engineering, Universiti Teknologi Malaysia (UTM), 81310 UTM Skudai, Johor Bahru, Johor, Malaysia

Shixue Zhang

Faculty of Education, Language and Psychology Postgraduate Department, Segi University, Malaysia

Jude Osamor (✉ jude.osamor@gcu.ac.uk)

Department of Cyber Security and Networks Glasgow Caledonian University, Cowcaddens Road, Glasgow, G4 0BA, Scotland, United Kingdom

Marvellous GodsPraise Iwendi

University of Nigeria, Nsukka, Nigeria;

Mohammad Shah

University of Westminster London, United Kingdom

Research Article

Keywords: Perceived Stress, Resilient Coping, Higher Education, Pandemic, Physical Stress, COVID-19

Posted Date: October 10th, 2022

DOI: <https://doi.org/10.21203/rs.3.rs-2146058/v1>

License:   This work is licensed under a Creative Commons Attribution 4.0 International License.

[Read Full License](#)

Abstract

Like other countries, China has suffered severe consequences as a result of the COVID-19 outbreak and pandemic. The lockdown, physical distancing, social isolation has disrupted the day-to-day activities of its citizens. The higher education sector has had to adopt state-of-the-art technologies and use online platforms to hold classes in order to engage students and ensure the continuity of education for an effective learning process. The second wave and Delta variant of the virus compelled numerous Higher Educational Institutes (HEIs) to start offline and remote work for both academic and non-academic staff; a stressful ordeal for them. Teaching has always been a stressful career path, and the stress faced by teachers has adverse consequences on the learning and performance of students. In this paper, we aim to identify and study the stress HEIs staff perceive and its impact on their physical stress and wellbeing. The resilient coping mechanism was evaluated as a moderator in the relationship between the staff and faculty's perceived and physical stress. Using a standard survey questionnaire, 500 responses were collected. The findings revealed that the staff with the highest perceived stress also showed high symptoms of physical stress. It also indicated that resilience copers experienced reduced or very inconsequential symptoms of physical stress regardless of high perceived stress, thus validating the important moderating function of resilience in the relationship between the physical and perceived stress of the employees.

1. Introduction

The outbreak of the novel Coronavirus (COVID-19) significantly changed the lives of people across the world in several ways. Numerous countries took several measures to mitigate its spread including enforcing lockdowns and other restrictions, and shutting down parts of the economy that weren't regarded as essential services. This pandemic has led to the loss of millions of lives, and inflicted physical, social, economic, personal and professional stress on the survivors [1]. China, the first place the Coronavirus was discovered, has experienced two lockdowns because of the fast-spreading virus. This led to massive hindrance in economic growth, and caused fear and uncertainty among the citizens about their livelihood and future. These circumstances has had grave consequences on the livelihoods of people, thus increasing their stress, worry, and fear for their well-being.

Despite the minor abatement of the virus in the later months of 2020, in early 2021, the health of people become at risk once more because of the new Delta variant of the virus, believed to be more severe than the original Alpha COVID variant. The outbreak of the pandemic has created several challenges for the education sector and significantly affected the learning engagement of students, as well as the overall learning-teaching process. The majority of universities and colleges had to adopt remote or online teaching in order to move the education sector forward. This further led to other challenges for the academic and non-academic staff, especially after the second COVID wave, regardless of the fact that the classes were only conducted online.

While the some of the stressors in faculty stress remained consistent, many other factors were added to it including factors such as visiting campus public convenience, which is an infection threat to themselves and the health of their families. High stress among faculty staff is very likely to impact their performance, and affects the social adjustments and academic outcomes of their students [2]. The role of the faculty in improving the performance of students, as well as the overall learning process cannot be overemphasized. Because of this, higher education universities and colleges have the vital role in creating a system and developing policies and regulations for lowering the stress of faculty members, and taking care of their overall well-being.

The aim of this study is to identify and monitor the perceived stress level perceived in these circumstances, and how it affects the symptoms of their physical stress, such as the frequency of their irritation, depression, anxiety and anger. The coping abilities of both academic and non-academic staff under the stressful conditions are also examined. Following previous research, this study has the objective of determining the moderating impact of resilient coping on perceived stress and its effects as regards physical stress.

The rest of this paper is organized as such: Section 2 reviews the related literature. Section 3 explores the methodology used in the study. Section 4 discusses the results and findings of the study. Section 5 concludes the paper.

2. Literature Review

The outbreak and spread of the coronavirus at the beginning of 2020 infected and took the lives of millions of people worldwide. As a result of its severity, the virus opens the door to numerous mental health challenges such as anxiety, fear, stress, and depression, especially when it results in long periods of isolation from the family or in death. Workplaces were not unaffected by the virus; employers experienced and faced several challenges as regards to changes in employee-related issues. Members of the workforce were faced with several professional uncertainties such as delayed salary, job insecurity, salary deductions, and technological upgradation. Numerous firms had to resort to laying off a large amount of their employees as a result of the business losses and downturn in the economy. After the multiple lockdowns, they could not afford to pay their employees' salaries. These circumstances and uncertainties had significant effects on the mental health of the employees. The employees feared they could lose their jobs at any time, or that their management would deduct from their salaries, affecting their performance and productivity in the workplace. In [3], the authors noted employers' concerns for addressing the workplace challenges in the pandemic era. They suggested more focus on the individual physical and mental health, and encouraging more employee engagement practices.

When the news about COVID-19 was dispersed worldwide through the various social media outlets, panic and anxiety spread. The most prevalent emotion however was fear. The news terrified people, leading them to think, do, and say things they ordinarily wouldn't do. The COVID-19 outbreak in January 2020, spurred researchers into conducting multiple studies to identify and discuss the pandemic's effect on

people's mental and physical well-being [4] [5]. The authors in [6], [7], and [8] conducted studies to identify the different coping mechanisms of people for dealing with the critical aspects of COVID-19 such as remote work, lockdown, physical distancing, and home isolation. A study was conducted in [9] to pinpoint the psychological impact of COVID-19 in relation to depression, anxiety and stress, and the risk of developing Post-Traumatic Stress disorder (PTSD) obtained from 1612 samples from seven countries including China. They found that over 50% of the respondents had high levels of depression, anxiety, stress and the possibility of developing PTSD.

In several studies, resilience has been associated with various positive outcomes in stress conditions. Its role in management of stress has been researched and studied extensively. Various researchers have defined it in multiple ways and different contexts including resilient coping, emotional and psychological resilience. The authors in [10] defined psychological resilience as an adaptation of positive adversities. In [11], the authors defined it as the ability to handle critical situations and recover from them with positive adaptation to any change. Emotional resilience has been defined as the ability to generate positive emotions and quickly recover from negative emotional experiences as a response to stressful situations. It is believed to be an important part of psychological resilience. The authors in [12] and [13] found that research carried out in academic institutions suggests that resilience lowers the possibility of psychological distress, and encourages a positive coping environment, while also enhancing learning performance.

A similar study carried out in [14] revealed that emotional resilience is a vital part of adolescent mental health and improves their coping strategies and learning efficiency when faced with a severe life-changing event. The authors in [15] reported that the lack of resilience had a negative impact on the mental health of university students, while increasing their psychological suffering because they had the risk of stressors. A higher level of resilience is a crucial factor in the protection against the negative effects of exposure to stress for many industries and professions. For instance, a study conducted in [16] on military soldiers revealed that soldiers who had seen military action suffered less from severe depression and stress syndrome as a result of their resilience. Previous studies have shown that resilience acts as a moderator for the connection between stress and its adverse effects. The authors in [17] conducted a study during the height of the COVID-19 pandemic investigating the impact of resilience between the symptoms of anxiety and depression, and stress among adults. The findings of the study revealed that resilience acted as a moderator for the relationship of anxiety and stress, where the subgroup of high resilience was not as affected as the subgroup of low resilience as a result of exposure to stress. This study also revealed an important connection between depression symptoms and exposure to stress.

The coronavirus pandemic has caused several changes in the education sector, as well as in different workplaces. The shift in the paradigm of learning and teaching process across the world has been noticed by both teachers and students. Teachers are facing challenges in conducting classes, and managing the students and their work-life. These challenging conditions caused added stress to teachers, so [18] recommended that educational institutes take suitable measures to help the teachers cope and

manage their stress appropriately. The second COVID-19 wave has led to an increase in people's health concerns, and created more mental health awareness. In the Wuhan region, teaching and non-teaching staff began reporting to the campus every day on rotation since a lot of HEIs reopened from May 2021 only. The threat and fear of the COVID-19 Delta variant made coming to the workplace a challenge for people. In [19], the authors carried out research to identify the mental health issues associated with the COVID-19 pandemic and how prevalent they were in its early period in China. Using publicly available data, they discovered that from anxiety, depression, and stress, stress was the most prominent mental health consequence of the pandemic.

The authors in [20] reported that healthcare workers suffered an unprecedented amount (55.1%) of psychological stress during the pandemic in China. In [21], the authors estimated how prevalent PTSD was among Chinese teachers in the mainland during the pandemic, and created a model with moderation and mediation effects in order to explain the PTSD. Their findings revealed that the fear and threat of COVID-19 among the teachers resulted in PTSD via psychological distress. The authors concluded that educational re-trainings and mental health interventions need to be carried out to reduce the fear and stress among teachers. The authors in [22] conducted a cross-sectional survey to examine the level of worry and its determinants among teachers in the Henan Province in China during the COVID-19 pandemic. Their findings revealed that there are a large portion of teachers 'very worried' about the COVID-19 situation. In [23], the authors conducted an online survey of college students in China to examine the psychological impact of the COVID-19 pandemic. The results of their survey was that there was a high level of anxiety and stress among the students, especially among those who hadn't resumed school yet. They suggested that faculties provide psychological interventions to avoid the students experiencing greater pressure levels and deteriorating into cognitive impairment.

3. Methodology

3.1. Sample and Data Collection Methods

In this study, we adopted a survey method for data collection with the assistance of a structured questionnaire circulated online between May and July 2021. The samples taken comprises of academic and non-academic staff of the public and private higher educational institutes in China. The respondents reported their responses by filling a Google form. The respondents were selected based on personal networking, and convenience sampling was used. A total of 500 respondents participated in the study. 258 of the respondents were male, while the remaining 242 were female.

3.2. Measures

After the outbreak of the new COVID-19 Delta variant in April-May 2021, and following the orders of the government, HEIs resorted to conducting online classes. However, most colleges and educational institutes still insisted on their staff reporting in the campus regularly. As a result, both academic and non-academic staff had challenges showing up in their workplace and maintaining a healthy work-life balance. The vital goal here was to find balance in their lives and regulate the levels of their stress. The

perspectives of employees regarding an event, challenge, or transition greatly determines their stress response. To identify the common features of their physical stress, a standard questionnaire with 11 physical symptoms such as headache, restlessness, boredom, anxiety, etc., was shared with the respondents. The frequency of these stress symptoms were recorded and collected using the scale ranging from Every Day (5) to Never (1) [24]. The more frequent their experience of these symptoms of physical stress, the more likely it was that stress was causing serious problems in their lives.

The Perceived Stress Scale (PSS) in [25] was adopted to measure how much the COVID-19 situation and lockdown, and remote working during the pandemic had affected the levels of stress of academic and non-academic staff. The PSS is a commonly used stress measurement tool with a total of ten items in it. First developed in 1983, this tool is still an extremely popular choice to really understand how various events affect the stress levels and feelings of individuals. The questions in the scale probes into the feelings and thoughts of an individual throughout the past month. The responses were recorded ranging from Very Often (4) to Never (0). Items no. 1, 2, 3, 6, 9, and 10 are scored from 0 to 4 and item no. 4, 5, 7, and 8 are scored reversely, from 4 to 0. The scores range between 0 and 40, and scores between 0 and 13 are considered low perceived stress, 14–26 are moderate stress, and scores equal to or higher than 26 are high perceived stress. The respondents were asked questions regarding the frequency of a particular feeling or thought for recording purposes. Their responses were fast, and they were asked to choose the option that appeared to be the most accurate estimate without attempting to calculate the amount of times they felt a particular way. Higher scores indicate that the individuals perceived more stress.

Resilience is a multifarious term used to describe how individuals appropriately adjust and cope with stressful and life-threatening circumstances and conditions, like a pandemic. A 4-item questionnaire used in [26] was used to determine the resilience level among the academic and non-academic staff. The responses were recorded with the aid of a 5-point rating scale ranging from "Describes me very well" (5) to "Does not describe me at all" (1). The gathered data were examined with the SPSS 24.0 version, in which descriptive, regression, and moderator analyses, and correlations were performed.

4. Results And Findings

To test the hypotheses, we performed descriptive analyses for each scale in the study, inclusive of the Cronbach alpha and mean scores for each variable. Table 1 presents the results. The Cronbach alpha score of the PSS-10 in this study is .745. Similarly, the Cronbach alpha of the Resilience Coping scale and Symptoms of stress scale and are .852 and .923, respectively, suggesting that all the scales are sufficiently reliable.

Table 1
Descriptive Statistics.

Constructs	N	Mean	Minimum	Maximum	Std. Deviation	Cronbach Alpha
Perceived Stress (PSS-10)	500	20.88	9	35	5.600	.745
Physical Stress	500	27.98	11	55	10.548	.923
Resilience Coping	500	12.52	4	20	4.063	.852

Respondents were asked to record their thoughts in order to determine their stress level associated with the conditions of the COVID-19 pandemic. The percentage of the respondents' perceived stress levels are presented in Table 2. 70.3% of respondents showed perceived moderate stress, while 22.2% showed perceived high stress. Only 5.7% reported low stress.

Table 2
The Percentage of the Respondents' Perceived Stress Levels.

Level of Perceived Stress	Frequency	Percentage
Low perceived stress	28	5.7
Moderate perceived stress	352	70.3
High perceived stress	120	24

The percentage of resilient copers among the respondents are presented in Table 3. Most of the respondents were low resilient copers (59.8%), implying that they had a lot of struggles while carrying out their duties and coping with regular problems on a basic or ineffective level. They became anxious and felt panic when coming across any situation that needed to be handled and solved immediately. On the other hand, the high resilient copers (31%) reported, indicated that they could handle responsibilities or difficulties successfully and calmly.

Table 3
The Percentage of Resilient Copers.

Level of Resilient Copers	Frequency	Percentage
Low Resilient copers	299	59.8
Medium Resilient copers	46	9.2
High Resilient copers	155	31

In this study, we tried to determine if people experienced the same level of physical stress as the stress perceived by them during the pandemic. A Pearson Product-moment correlation between symptoms of physical stress and perceived stress were calculated to test this hypothesis. Table 4 presents the results. Previous research has shown that highly resilient people experience reduced stress and thus, have very few symptoms of physical stress. The correlation is calculated to evaluate the relationship between resilient coping, symptoms of physical stress and perceived stress.

Table 4 results indicate that there is a significant inverse relationship between physical stress and resilient coping ($r = -.350, p < .01$), implying that high resilient copers were less likely to have physical stress. A significant negative relationship between perceived stress and resilient coping was found ($r = -.458, p < .01$), implying that highly resilient copers also have perceived low stress because they can effectively manage difficult situations. The analysis conducted suggested a strong and significant relationship between perceived stress and physical stress ($r = .740, p < .01$), implying that people with perceived high stress showed multiple physical stress symptoms. Conversely, people who showed low physical stress symptoms perceived low stress.

Table 4
Correlation between Resilient Coping, Perceived Stress and Symptoms of Stress.

Variables	Resilient Coping	Perceived Stress	Physical Stress
Resilient Coping		-.458**	-.350**
Perceived Stress	-.458**		.740**
<i>**p ≤ .01; *p ≤ .05</i>			

The impact of the perceived stress of the respondents on their physical stress was further examined and tested using regression analysis. Table 5 presents the results of this analysis. The results indicate that perceived stress accurately predicted the respondents' physical stress and explained 55.1% of its variance. The significant impact of perceived stress was found in the physical stress of the employees, implying that people with perceived high stress as a result of the pandemic also had high physical symptoms such as headache, anxiety, and restlessness. ($\beta = .740$). It is also shown that resilient coping has a negative effect on the individuals' physical stress ($\beta = -.350$), implying that individuals effective at handling difficult situations and managing their daily lives had less physical stress. Resilient coping predicted 13% of variance for physical stress.

Table 5
Regression Analyses of Physical Stress (DV), Perceived Stress (IV)
and Resilient Coping (IV).

Independent Variables	Physical Stress			
	Beta (β)	Adj. R ²	t	F
Perceived stress	.740**	.548	17.37**	307.21*
Resilient Coping	-.350**	.126	-6.15**	35.14**

Based on previous literature, we hypothesize that resilient coping is capable of moderating the relationship between physical stress and perceived stress. To analyse resilient coping's moderation effect, Andrew F. Hayes' Process Macro v4.0 in SPSS was utilized to conduct the moderator analysis. Before the analysis was performed, the resilient coping score was classified into three (Low, Medium and High). For the model testing, resilient coping was utilized as an ordered categorial moderator of the relationship between physical stress (continuous stress) and perceived stress (continuous variable). Table 6 shows that resilient coping significantly moderates the relationship between physical stress and perceived stress, and explained the statistically significant 56.1% of variation. It illustrates that physical stress significantly reduces when high resilient copers combine with perceived stress.

Table 6
Model Summary for the Moderation Effect of Resilient Coping.

R	R ²	MSE	F	df1	df2	p
.740	.548	52.53	65.75	5.00	246.00	.000
<i>**p ≤ .01</i>						

To test the interaction of moderator (resilient coping with perceived stress), low resilient coping was utilized as a reference category, and medium and high resilient coping group were used to test the interaction.

Table 7
Coding of Categorical W Variable (Resilient Coping) for Analysis:

Category of Moderator	W1 (Low to Medium)	W2 (High to low)
1 (Low Resilient Coping)	.00	.00
2 (Medium Resilient Coping)	1.00	.00
3 (High Resilient Coping)	.00	1.00

Table 8 shows that perceived stress significantly predicted the physical stress ($t = 12.59, p < .01$), and the low-to-medium and high-to-low resilient group did not significantly predict the physical stress when used in a regression equation. Also, the interaction between perceived stress and the low-to-medium resilient group did not significantly predict the physical stress. Similarly, the interaction between perceived stress and high-to-low resilient group was found to be significantly predicting the physical stress. Conversely, the overall interaction test in Table 9 between perceived stress and resilient coping was found to be statistically significant (R^2 change = .0185, $p \leq .01$). The impact of each classification of the resilient group is illustrated in Table 10 after the interactions were computed accordingly. Table 10 shows that each interaction effect is statistically significant at a 99% confidence interval. These findings support previous research on resilience's moderating role on negative outcomes of stressful experiences [27].

Table 8
Multiple Regression for Moderator Group and Interactions.

	Coefficient	SE	t	P
Constant	28.298	.740	37.48	.000
Perceived Stress	1.642	.129	12.59**	.000
W1	.138	1.225	.111	.910
W2	-.836	1.239	-.667	.504
Int_1	-.176	.255	-.659	.507
Int_2	-.645	.199	-3.24**	.001
Outcome variable = Physical stress, ** $p \leq .01$				

Table 9
Test of Highest Order Unconditional Interaction.

Interaction	R² Change	F	Df1	Df2	p
Perceived Stress (X) * Resilient Coping (W)	.0185	5.328	2.00	246.00	.005

Table 10
Conditional Effects of the Focal Predictor at Values of the Moderator(s).

Category of Moderator	Effect	SE	t	p
1 (Low Resilient Coping)	1.67	.131	12.89	.000
2 (Medium Resilient Coping)	1.49	.237	6.46	.000
3 (High Resilient Coping)	1.03	.149	6.78	.000

Table 11 below shows the plot for the moderating effect of resilient coping and the focal predictor's conditional effect.

Table 11
Plot of the Moderation Effect.

Perceived Stress	Category of Moderator	Mean of Physical Health
-5.74	1.00	18.87
.00	1.00	28.47
5.74	1.00	38.07
-5.74	2.00	20.02
.00	2.00	28.61
5.74	2.00	37.19
-5.74	3.00	21.74
.00	3.00	27.63
5.74	3.00	33.52

5. Conclusion

In this study, we examined the relationship and effect of stress felt by academic and non-academic staff in higher education institutes, and its impact on their physical stress and symptoms during the COVID-19 pandemic. The objective was to identify the function of resilient coping in handling stress and its impact on reducing physical stress. The findings implied that resilient coping can significantly moderate physical symptoms related to stress. People with a higher level of resilience reported reduced symptoms of physical stress compared to people with a low or medium level of resilience. The results of the study emphasize the role of resilience in determining the effectiveness of a person's coping strategy when going through stressful life events like the pandemic. Our research implies that people who are highly resilient are less likely to suffer symptoms of physical stress such as headache, restlessness, and

anxiousness, and they recover faster from setbacks regardless of how stressful the pandemic is for them. Academic stress causes physical and psychological stress such as anxiety, irritation, boredom, rage, worry, etc., and these reactions have only worsened further because of the pandemic. However, as stated earlier, resilient coping is effective in lowering the impact of physical stress. It is recommended that higher educational institutes conduct mindfulness-based-resilience programs for their staff to enhance their mental and physical health. In summary, the findings of this study advises educational institutes to focus on the distress of their employees during this difficult time and assist them with appropriate support.

References

1. Nicola, M., Alsaifi, Z., Sohrabi, C., Kerwan, A., Al-Jabir, A., Iosifidis, C., Agha, M. & Agha, R. (2020). "The Socio-economic Implications of the Coronavirus Pandemic (COVID-19): A Review". *International Journal of Surgery*, 78: 185-193.
2. MT, Greenberg, JL, Brown, & RM, Abenavoli (2016). Teacher stress and health. The Pennsylvania State University. <https://www.rwjf.org/en/library/research/2016/07/teacher-stress-and-health.html>.
3. Carnevale, J. B. & Hatak, I. (2020), "Employee Adjustment and Well-being in the Era of COVID-19: Implications for Human Resource Management". *Journal of Business Research*, 116: 183–87.
4. Agha, S. (2020). Mental well-being and association of the four factors coping structure model: A perspective of people living in lockdown during COVID-19. *Ethics, Medicine and Public Health*.<https://doi.org/10.1016/j.jemep>.
5. Taylor, S., Landry, C.A., Paluszek, M.M., Fergus, T.A., McKay, D., & Asmundson, G.J.G. (2020). COVID stress syndrome: Concept, structure, and correlates. *Depress Anxiety*.37, 706–714. <https://doi.org/10.1002/da.23071>
6. Abdullah, N.F.A, Rahmati, N.H., Zawawi, F.Z., Khamsah, M.A.N. (2020). Coping with Post Covid-19: Can Work from Home be a New Norm? *European Journal of Social Sciences Studies*, 5(6), 61-81.
7. Wei, Z, Yi W., Xiandong M., and Jiping L. (2020). The mediation effects of coping style on the relationship between social support and anxiety in Chinese medical staff during COVID-19, *BMC Health Services Research* (2020) 20:1007, DOI: 10.1186/s12913-020-05871-6
8. Shelestova O. (2020). Coping Strategies and Models of Overcoming Post-stress Conditions. *Herald of Kiev Institute of Business and Technology*, 70-74. DOI: 10.37203/kibit.2020.43.09.
9. Passavanti, M., Argentieri, A., Barbieri, M. D., Lou, B., Wijayaratna, K., Mirhosseini, A., Wang, F., Naseri, S., Qamhia, I., Tangerang, M., Pellicciari, M., and Ho, Chun-H. (2021) The psychological impact of COVID-19 and restrictive measures in the world Marco. *Journal of Affective Disorder*, 283, 36-51.
10. Reich, J. W., Zautra, A. J., & Hall, J. S. (Eds.). (2010). *Handbook of adult resilience*. The Guilford Press.
11. Lengnick-Hall, M. L., & Beck, T. E. (2005). Adaptive fit versus robust transformation: How organizations respond to environmental change. *Journal of Management*, 31(5), 738-757.

12. Deasy, C., Coughlan, B., Pironom, J., Jourdan, D., and Mannix-McNamara, P. (2014). Psychological Distress and Coping amongst Higher Education Students: A Mixed Method Enquiry. *PLoS ONE* 9(12): e115193. doi:10.1371/journal.pone.0115193.
13. Va'zquez, F., Otero, P., and Dia`z, O (2012) Psychological distress and related factors in female college students. *J Am Coll Heal* 60: 219–225.
14. Zhang, Q., Zhou, L., Xia, J. (2020). Impact of COVID-19 on emotional resilience and learning management of middle school students. *Medical Science Monitor*, 26. <https://doi.org/10.12659/MSM.924994>.
15. Pidgeon, A.M., Rowe. N.F., Stapleton. P., Magyar. H.B., and Lo, B.C.Y. (2014). Examining Characteristics of Resilience among University Students: An International Study. *Open Journal of Social Sciences*, 2, 14-22. <http://dx.doi.org/10.4236/jss.2014.211003>.
16. Pietrzak, R.H.; Johnson, D.C.; Goldstein, M.B.; Malley, J.C.; Southwick, S.M. (2009). Psychological resilience and post deployment social support protect against traumatic stress and depressive symptoms in soldiers returning from Operations Enduring Freedom and Iraqi Freedom. *Depress Anxiety*, 26, 745–751.
17. Havnen, A., Anyan, F., Hjemdal, O., Solem, S., Riksfjord, M.G., Hagen, K., (2020). Resilience Moderates Negative Outcome from Stress during the COVID-19 Pandemic: A Moderated-Mediation Approach; *International Journal of Environmental Research and Public Health*. DOI: 10.3390/ijerph17186461
18. Oducado, R.M., Rabacal, J.S., Moralista, R.B., Tamdang, K.A. (2020). Perceived Stress due to COVID-19 Pandemic Among Employed Professional Teachers. *International Journal of Educational Research and Innovation (IJERI)*, 15, 305-316 ISSN: 2386-4303 DOI <https://doi.org/10.46661/ijeri.5284>.
19. Bareeqa S.B., Ahmed S.I., Samar S.S., Yasin W., Zehra S., Monese G.M., Gouthro R.V. Prevalence of Depression, Anxiety and Stress in China during COVID-19 Pandemic: A Systematic Review with Meta-analysis. *International Journal of Psychiatry Med.* (2021). 56(4): 210-227. doi: 10.1177/0091217420978005.
20. Xiao X., Zhu X., Fu S., Hu Y., Li X., Xiao J. Psychological Impact of Healthcare Workers in China during COVID-19 Pneumonia Epidemic: A Multi-center Cross-sectional Survey Investigation. (2020). *J Affect Disord.* 274: 405-410. doi: 10.1016/j.jad.2020.05.081.
21. Kukreti, Shikha & Ahorsu, Daniel & Strong, Carol & Chen, I-Hua & Lin, Chung-Ying & Ko, Nai-Ying & Griffiths, Mark & Chen, Yu & Kuo, Yi-Jie & Pakpour, Amir. (2021). Post-Traumatic Stress Disorder in Chinese Teachers during COVID-19 Pandemic: Roles of Fear of COVID-19, Nomophobia, and Psychological Distress. *Healthcare*. 9. 1288. 10.3390/healthcare9101288.
22. Wang, Yanqing & Li, Quanman & Tarimo, Clifford & Wu, Cuiping & Miao, Yudong & Wu, Jian. (2021). Prevalence and Risk Factors of Worry among Teachers during the COVID-19 epidemic in Henan, China: A Cross-Sectional Survey. *BMJ Open*. 11. 45386. 10.1136/bmjopen-2020-045386.
23. Zhan, Huali & Zheng, Chunmei & Zhang, Xianqin & Yang, Meng & Zhang, Lin & Jia, Xu. (2021). Chinese College Students' Stress and Anxiety Levels Under COVID-19. *Frontiers in Psychiatry*. 12.

615390. 10.3389/fpsy.2021.615390.

24. McCarthy, Christopher & Seraphine, Anne & Matheny, Kenneth & Curlette, William. (2000). Factor Analysis of the Coping Resources Inventory Scales for Educational Enhancement. *Measurement and Evaluation in Counselling and Development*. 32. 10.1080/07481756.2000.12068987.
25. Cohen, S., Kamarck, T., & Mermelstein, R. (1983). "A global measure of perceived stress". *Journal of Health and Social Behavior*, 24(4), 385–396.
26. Sinclair, Vaughn & Wallston, Kenneth. (2004). Sinclair, V. G. & Wallston, K. A. The Development and Psychometric Evaluation of the Brief Resilient Coping Scale. *Assessment* 11, 94-101. 10.1177/1073191103258144.
27. Anyan, F. and Hjemdal, O. (2016). "Adolescent stress and symptoms of anxiety and depression: Resilience explains and differentiates the relationships". *Journal of Affective Disorders*. 203, 213–220.

Figures

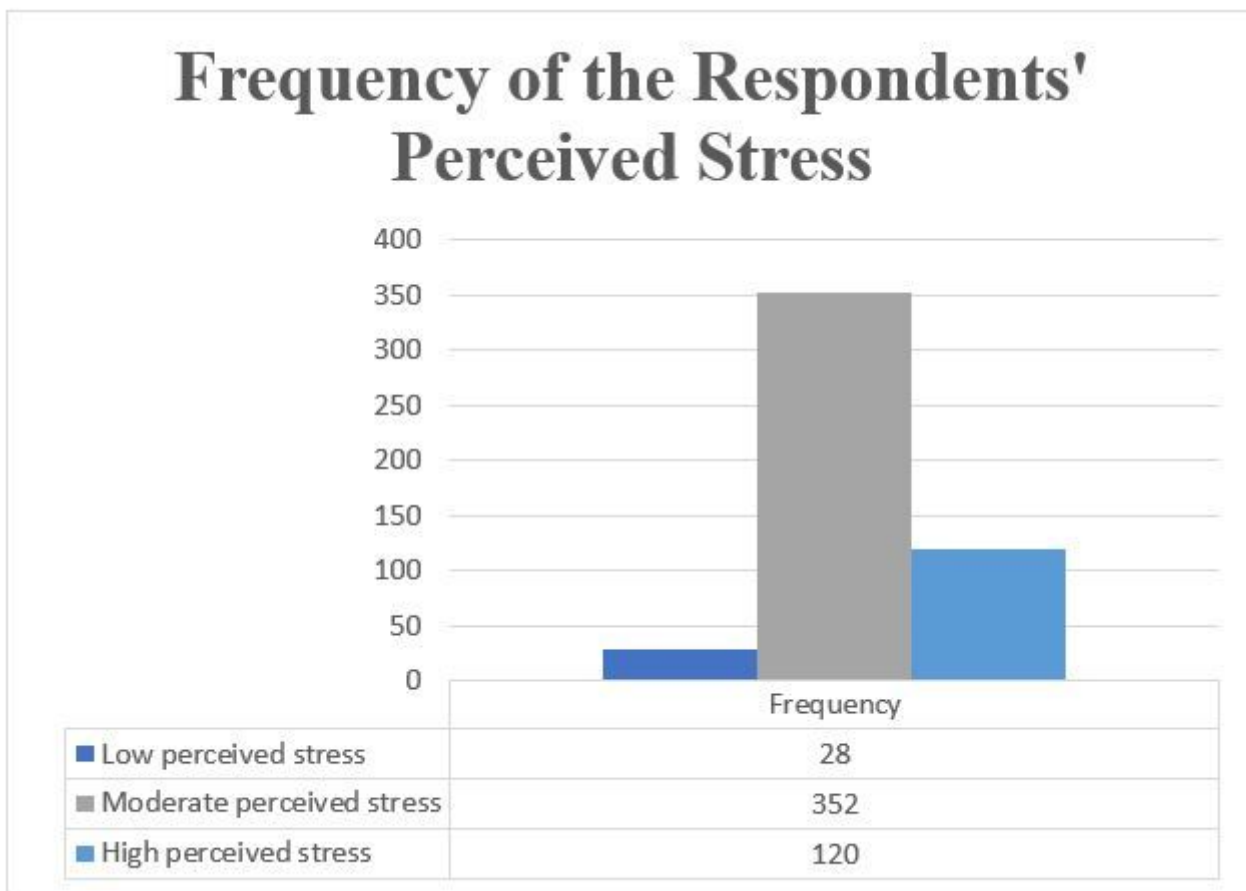


Figure 1

Frequency of the Respondents' Perceived Stress.

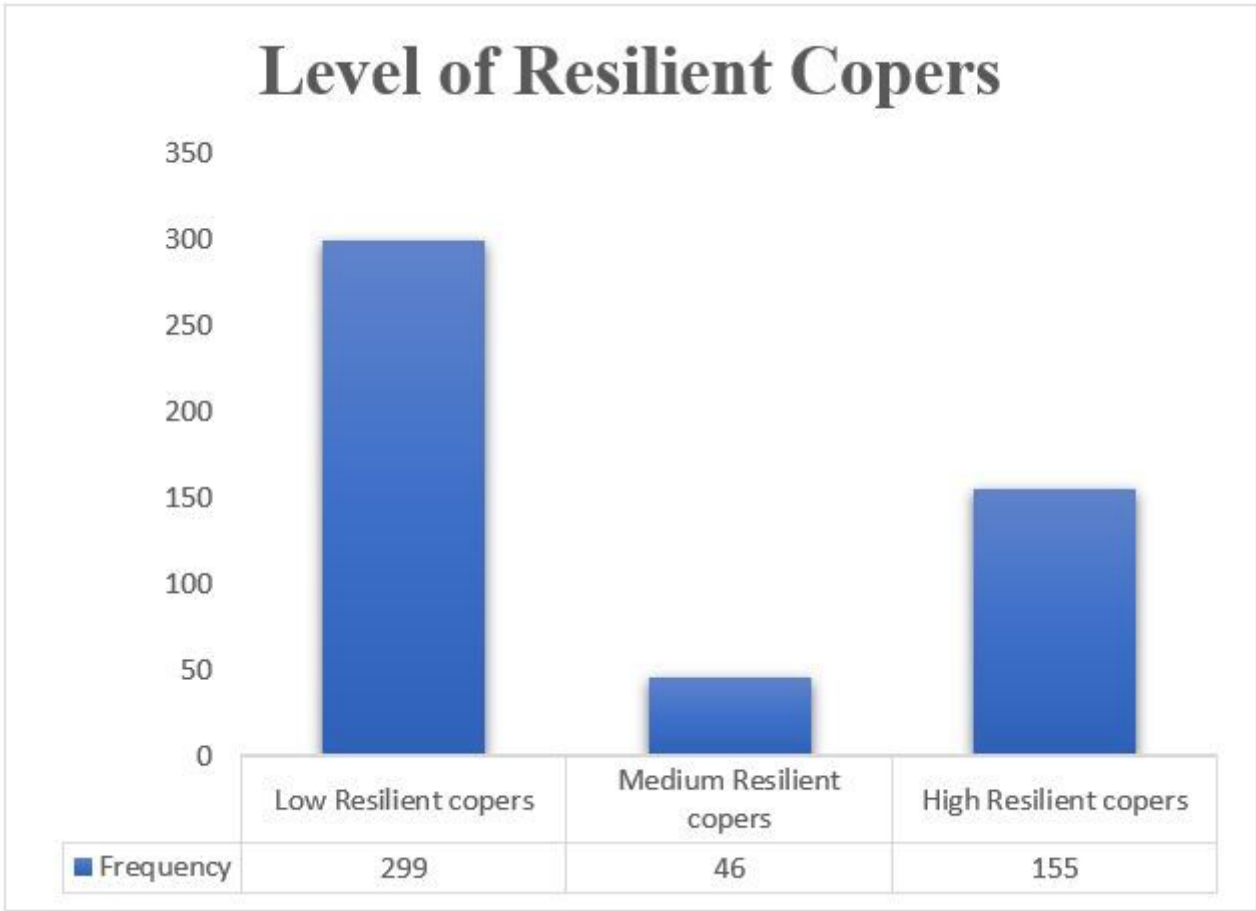


Figure 2

Level of Resilient Copers.

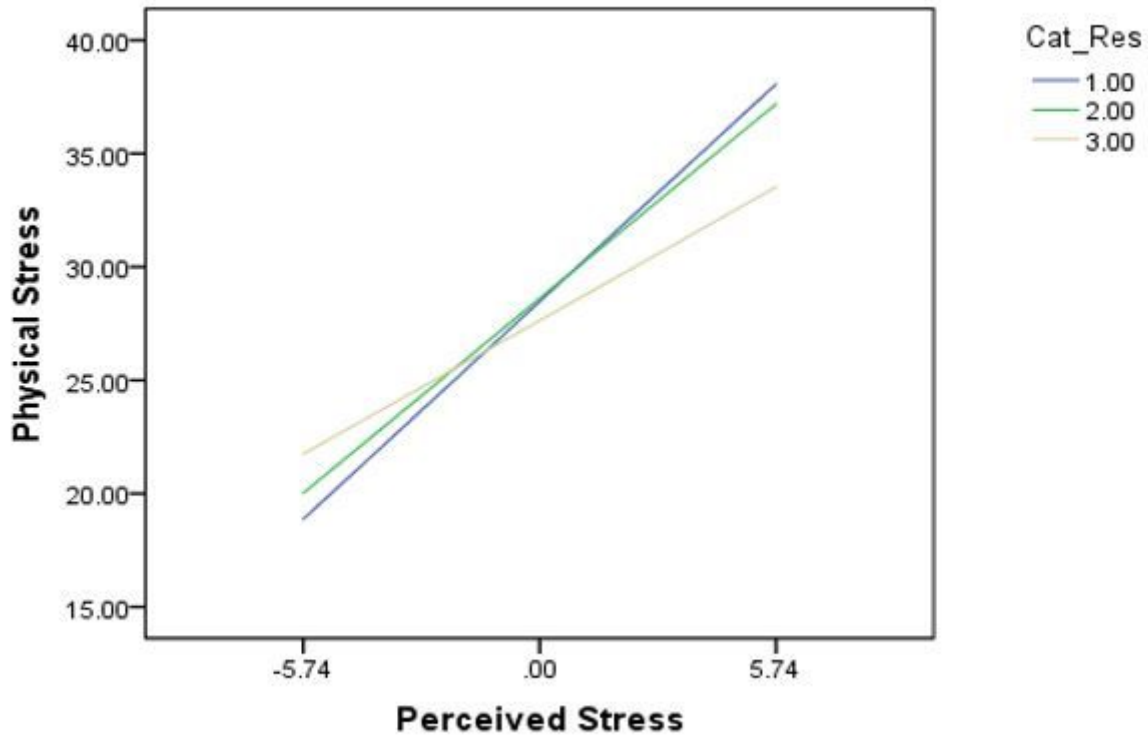


Figure 3

Plot of the Moderation Effect.