

## Fear of COVID-19 and stress in university students: mediating role of cyberchondria and moderating role of creative coping and social supports

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### Abstract

**Objective:** To find the moderating role of social support and creative coping, and the mediating role of cyberchondria in relationship between fear of coronavirus disease-2019 and stress in university students.

**Method:** The correlational study was conducted at the Lahore Garrison University, Lahore, Pakistan, between May and September 2020, and comprised students regardless of gender and age from different public and private universities across Pakistan. Data was collected online using Fear of Coronavirus Disease-2019 Scale, Cyberchondria Severity Scale, Creative Coping Strategies Scale, Social Support Survey, Perceived Stress Scale and Perception of Academic Stress Scale. Data was analysed using SPSS 22.

**Results:** Of the 205 subjects, 83(40.5%) were males and 122(59.5%) were females. The overall mean age was  $21.22 \pm 1.84$  years. Fear of coronavirus disease-2019 had significant positive relationship with cyberchondria, and cyberchondria had significant positive relationship with creative coping and academic stress ( $p < 0.05$ ). Social support had significant negative relationship with general stress ( $p < 0.05$ ). There was significant interaction among fear of coronavirus disease-2019, creative coping, social support and cyberchondria in predicting general stress ( $p < 0.05$ ). Fear of coronavirus disease-2019 alone did not predict stress ( $p > 0.05$ ), but it significantly predicted cyberchondria which, in turn, predicted stress ( $p < 0.05$ ). Creative coping and social support significantly moderated the relationship involving fear of coronavirus disease-2019, cyberchondria and general stress ( $p < 0.05$ ). The female subjects utilised more creative coping strategies, received more social support, and had higher levels of general stress compared to the males ( $p < 0.05$ ), while the male subjects had more mistrust on medical professionals ( $p < 0.05$ ).

**Conclusion:** The findings are important for students, parents and teachers to understand the role of social support to reduce the fear of coronavirus disease-2019.

**Keywords:** Fear of COVID-19, Stress, Cyberchondria, Creative coping, Social support, Students. (JPMA 72: 1564; 2022)

**DOI:** <https://doi.org/10.47391/JPMA.4350>

### Introduction

Severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) is a newly identified virus that has caused the ongoing coronavirus disease-2019 (COVID-19) pandemic of respiratory illness, and is among the biggest challenges in the world with a mortality rate ranging from 1.5% to 3.6% across the world. Infectious diseases are characterised by the presence of fear in population due to their extremely detrimental and unprecedented repercussions for health, which is often absent in non-infectious diseases.<sup>1</sup>

Along with high fatality rates, COVID-19 brought economic crisis, losses and great panic, and all this created a universal psychosocial impact on the people.<sup>2</sup> Misinformation can be a serious hazard to public health during pandemics, such as the COVID-19. According to the World Health Organisation (WHO), rapid spread of misinformation is enlarged by social media and could result in the lack of observance to suggested public

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health measures or could result in involvement in non-recommended behaviours. This excessive availability of information increases anxiety about one's health which is a characteristic of cyberchondria<sup>3</sup> which is the anxiety about one's own health leading to looking up symptoms online. It is characterised by dimensions of compulsion, distress, excessiveness, reassurance and mistrust of medical professionals. During the pandemic, general stress increased in individuals due to many reasons, such as scarcity of basic necessities, isolation, stress, etc.

Globally, the dependence on virtual modes of teaching during the pandemic also increased. As Pakistan is among the last quartile ranking 76th out of 100 countries with poor quality of networks, low affordability, and lower levels of digital literacy,<sup>4</sup> the worries and fear associated with academic performance in students increased, while uncertainty by the end of the semester gave rise to high levels of stress.

In times of uncertainty, like the pandemic, people's coping can be categorised into different tendencies, like negative, or destructive, external and internal expression along with positive or proactive internal and external

expression.<sup>5</sup> Creative coping (CC) and social support (SS) may reduce the stress linked with COVID-19 and its associated stressors.

Infectious diseases bring with them the component of fear which increases the impact of such diseases<sup>6</sup> and lay the foundation for psychological disorders. Anxiety related to health has a positive relationship with cyberchondria, depression and a negative relationship with general mental health.

In collectivist cultures, like Pakistan, individuals have strong belief from the young age that people would be there for them in time of need, and this perception of support alleviates stress. SS and CC have a positive effect on individuals suffering from a disease. Problem-focussed and active coping is the most effective strategy in dealing with stressors, particularly in situations over which a person has some control.<sup>7</sup> Creativity helps in coping with stressors and trauma,<sup>8</sup> and improves academic performance.

The integrated model of research during the COVID-19 for fear associated with the pandemic<sup>9</sup> theorises four inter-linked domains. The first domain is fear for the body which can be associated with health anxiety. The second domain is fear for significant others which is associated with stress that leads to abiding by the preventive measures and social distancing, which reduces social interactions. The third domain is the fear of knowing or not knowing which is associated with influx of information and can also be linked to cyberchondria. The fourth and the last domain is fear of taking action or inaction which can be associated with utilising coping strategies.<sup>9</sup>

Prevalence of COVID-19 has created a sense of fear among individuals across the world. The dilemma of maintaining preventive standard operating procedures (SOPs) along with countering associated stress is widespread among the people. Excessive accessibility to information related to symptoms of COVID-19 on the internet further adds to the fear and stress. The situation has particularly been stressful for university students who experienced change in mode of education along with the pandemic.

According to official data given on Government of Pakistan's website (<http://covid.gov.pk/stats/pakistan>), 678,000 cases of COVID-19 had been reported till April 2021, with 14,600 deaths across the country.<sup>10</sup> Pakistan has significant differences in dynamics of SS, healthcare systems and belief systems compared to Western countries, so nationally representative psychosocial and longitudinal researches are needed to highlight the mental risks associated with COVID-19 along with the emerging psychosocial needs.

Due to the prevalent fear of COVID-19 (FOC) and a limitation in terms of visiting healthcare facilities, individuals tend to check their symptoms online which leads to cyberchondria.<sup>11</sup> Additionally, shift to online mode of teaching might have added to the stressors associated with academics in university students which need to be countered with coping mechanisms.

The current study was planned to find the moderating role of SS and CC, and the mediating role of cyberchondria in relationship between FOC and stress in university students.

## Subjects and Methods

The correlational study was conducted at the Lahore Garrison University, Lahore, Pakistan, between May and September 2020. After approval from the Board of Studies of the Department of Psychology and the institutional Board of Advance Studies and Research. The sample size was calculated using G-Power calculator<sup>7</sup> by adding all the study variables. The sample was raised from among university unmarried students of either gender aged 18-25 years. Regular university students enrolled in undergraduate or postgraduate programmes who attended online classes during the pandemic, and owned at least one personal mobile phone with active internet connection were included provided they had not contracted COVID-19 themselves.

Students having any medical condition, such as diabetes, hypertension, blood pressure etc., or any physical disability, such as loss of limb, muscular dystrophy, deafness, cerebral palsy, spinal cord injury etc., were excluded, and so were those having had psychological treatment in the preceding 3 months, and students who were doing a job along with their studies.

Data was collected after taking informed consent from the participants. The students were motivated to fill the study questionnaire with the help of monetary reward. Email addresses of the participants were added in an online randomiser software and 20 participants were selected through a raffle. They were contacted through their emails to give them the mobile top-up using Jazz cash.

Permissions for using the respective study instruments were sought from the respective authors. The data was collected online through Google forms due to travelling restrictions and standard operating procedures (SOPs) related to COVID-19. The link of the questionnaire was disseminated through social media platforms to the students at universities in different areas of Pakistan along with the teachers who were asked to forward the link in their respective circles. The initial part of the

questionnaire comprised a screening tool and the students were instructed not to continue with the study if they did not fulfil the criteria.

After the first part, the questionnaire comprised the 7-item FOC Scale (FOCS)<sup>12</sup> which is scored on a 5-point likert scale ranging from 1= strongly disagree to 5 = strongly agree. The scores ranges 7-35, and higher score indicates higher FOC. The reliability of the scale is 0.82,<sup>12</sup> while in the current study it was 0.86.

The 33-item Cyberchondria Severity Scale (CSS)<sup>13</sup> has multiple domains scored on a 5-point scale ranging from 1 = never to 5 = always. The CSS comprises 5 subscales: compulsion, distress, excessiveness, reassurance seeking and mistrust of medical professionals. The Cronbach alpha reliability of the subscales in the current was: compulsion = 0.91, distress = 0.88, excessiveness = 0.82, reassurance seeking = 0.84, and mistrust on medical professionals = 0.81.

The 29-item Creative Coping Strategies Scale (CCSS)<sup>14</sup> measured the types of CC strategies utilised to cope with the stressors. It is scored on a 5-point scale, with 1 = never and 5 = always. There are 8 dimensions: recreation, music, creation, self-organising, expressionism, innovation, arts and crafts, and religious coping. The score ranges 29-145. The reliability of the scale has been reported to be 0.83<sup>14</sup>, while in the current study it was 0.85.

The 19-item Social Support Survey (SSS)<sup>15</sup> measured the extent of SS across multiple domains. It is scored on a 5-point scale, with 1 = none of the time and 5 = all of the time. The scale has 4 dimensions: emotional support, tangible support, affectionate support, and positive social interaction. The score ranges 1-5. The Cronbach alpha of scale has been reported to be 0.91,<sup>15</sup> while in the current study it was 0.90.

The 10-item Perceived Stress Scale (PSS)<sup>16</sup> measured the perceived level of stress in a given time period. It is scored on a 5-point scale, with 0 = never and 4 = very often. The score ranges 0-40. The Cronbach alpha of scale has been reported to be 0.85,<sup>16</sup> while in the current study it was 0.70.

The 18-item Perception of Academic Stress Scale (PASS)<sup>17</sup> measured the level of academic stress perceived by an individual. It is scored on a 5-point scale, with 1 = strongly agree and 5 = strongly disagree. The score ranges 18-90, with higher score indicating higher level of academic stress. The Cronbach alpha of the scale has been reported to be 0.70,<sup>17</sup> while in the current study it was 0.75.

Data was analysed using SPSS 22. Pearson product

moment correlation was applied to investigate the relationship among the variables. In case of inferential statistics, significance level was 95%. The four-step process to execute the mediation effect was used. To test mediation, pre-requisites were to be fulfilled that required a significant correlation between FOC, general and academic stress (relationship between independent variable [IV] and dependent variables [DVs]); a significant relationship between FOC and cyberchondria (relationship between IV and mediator); a significant relationship between cyberchondria, general stress and academic stress (relationship between mediator and DVs); a significant correlation between FOC, general and academic stress after controlling the effect of cyberchondria (relationship between IV and DVs after controlling the effect of mediator). All the four assumptions of mediation were fulfilled.

The moderated mediation was analysed using Hayes' process macro<sup>18</sup>. Moderated mediation required two steps: to establish a mediation effect of cyberchondria between FOC and general and academic stress; and to investigate the moderating effect of CC and SS on FOC and general and academic stress via cyberchondria.  $P < 0.05$  was considered statistically significant.

## Results

Of the 330 responses received, 125(37.9%) had to be discarded, and the final sample comprised 205(62.1%) subjects; 83(40.5%) males and 122(59.5%) females, with an overall mean age of  $21.22 \pm 1.84$  years. Majority of participants were enrolled in an undergraduate degree programme 180(87.8). Those living in a nuclear family were 170(82.9%), 105(51.2%) had 6-10 members living in a single house, 94(45.9%) had online classes 5 days a week, 183(89.3 %) helped in household chores during the pandemic, 101(49.3%), employed family members of the participants were receiving full salaries, and 21(10.2%) were receiving reduced salaries (Table-1).

Source of information about COVID-19 for 92(44.9%) subjects was internet, 102(53.2%) had input from multiple sources, 101(49.3%) were sometimes involved in raising awareness on social media platforms, 59(28.8%) had some family member diagnosed with COVID-19, 24(40.7%) had immediate family members falling victim to it, and the most common outdoor activity during the pandemic was going out for groceries 88(42.9%) (Table-2).

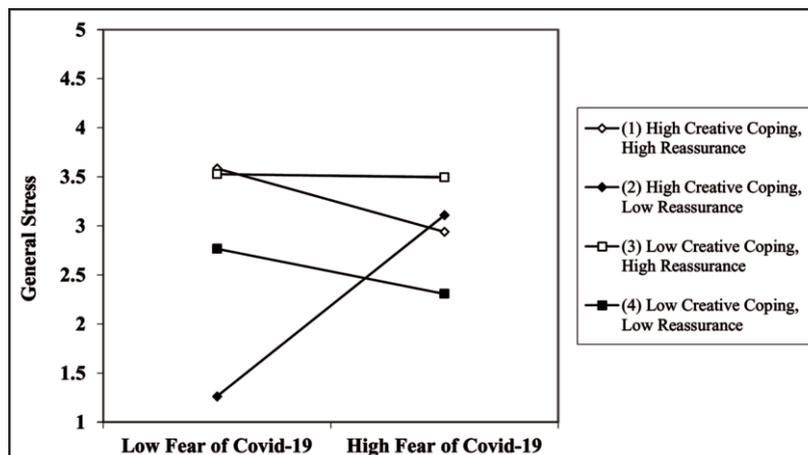
Correlation analysis showed that FOC had a significant positive relationship with cyberchondria domains of compulsion ( $r=0.34$ ,  $p < 0.001$ ), distress ( $r=0.42$ ,  $p < 0.001$ ), excessiveness ( $r=0.25$ ,  $p < 0.001$ ) and reassurance ( $r=0.22$ ,  $p < 0.01$ ). Compulsion to seek symptoms online had a

**Table-1:** Demographic data.

Variable	N	%
<b>Gender</b>		
Men	83	40.5
Women	122	59.5
<b>Degree</b>		
Undergraduate	180	87.8
Postgraduate	25	12.2
<b>Semester</b>		
Initial semesters (1-4)	109	53.2
Final semesters (5-8)	96	46.8
<b>Number of Occupants in House</b>		
1-5 members	90	43.9
6-10 members	105	51.2
More than 10 members	10	4.9
<b>Family system</b>		
Nuclear	170	82.9
Joint	35	17.1
<b>Days per week having classes</b>		
2 days per week	7	3.4
3 days per week	20	9.8
4 days per week	76	37.1
5 days per week	94	45.9
6 days per week	8	3.9
<b>Help in household chores</b>		
Yes	183	89.3
No	22	10.7
<b>Family members being paid</b>		
Yes	101	49.3
No	83	40.5
Yes, but pay is cut due to pandemic	21	10.2

Participants' mean age was 21.22±1.84 years.

positive relationship with CC ( $r=0.23$ ,  $p<0.01$ ) and perceived academic stress ( $r=0.20$ ,  $p<0.01$ ). Distress associated with looking up for symptoms online also had a positive relationship with CC ( $r=0.28$ ,  $p<0.001$ ) and



**Figure-1:** Simple slope analysis for interaction effects of fear of coronavirus disease-2019 (COVID-19), creative coping, reassurance and general stress in university students.

**Table-2:** Information related to coronavirus disease-2019 (COVID-19).

Variable	n	%
<b>Source of information about COVID-19</b>		
Internet sources	92	44.9
In-person	4	2.0
Multiple sources (Internet, in-person)	109	53.2
<b>Participation to raise awareness on social media regarding COVID-19</b>		
Never	29	14.1
Sometimes	101	49.3
Often	32	15.6
Most of the time	32	15.6
Always	11	5.4
<b>Family members diagnosed with COVID-19</b>		
Yes	59	28.8
No	146	71.2
<b>Relationship with those family members</b>		
Immediate family (siblings, parents)	24	40.7
Other relatives	35	59.3
<b>Friends diagnosed with COVID-19</b>		
Yes	60	29.3
No	145	70.7
<b>Outdoor activities during COVID-19</b>		
No outdoor activity	11	5.4
Going out for grocery	88	42.9
Going out to meet friends/relatives	48	23.4
Other reasons (Gym, sports, social work)	10	4.9
Multiple reasons (Outdoor activity, grocery, meet friends/family)	48	23.4

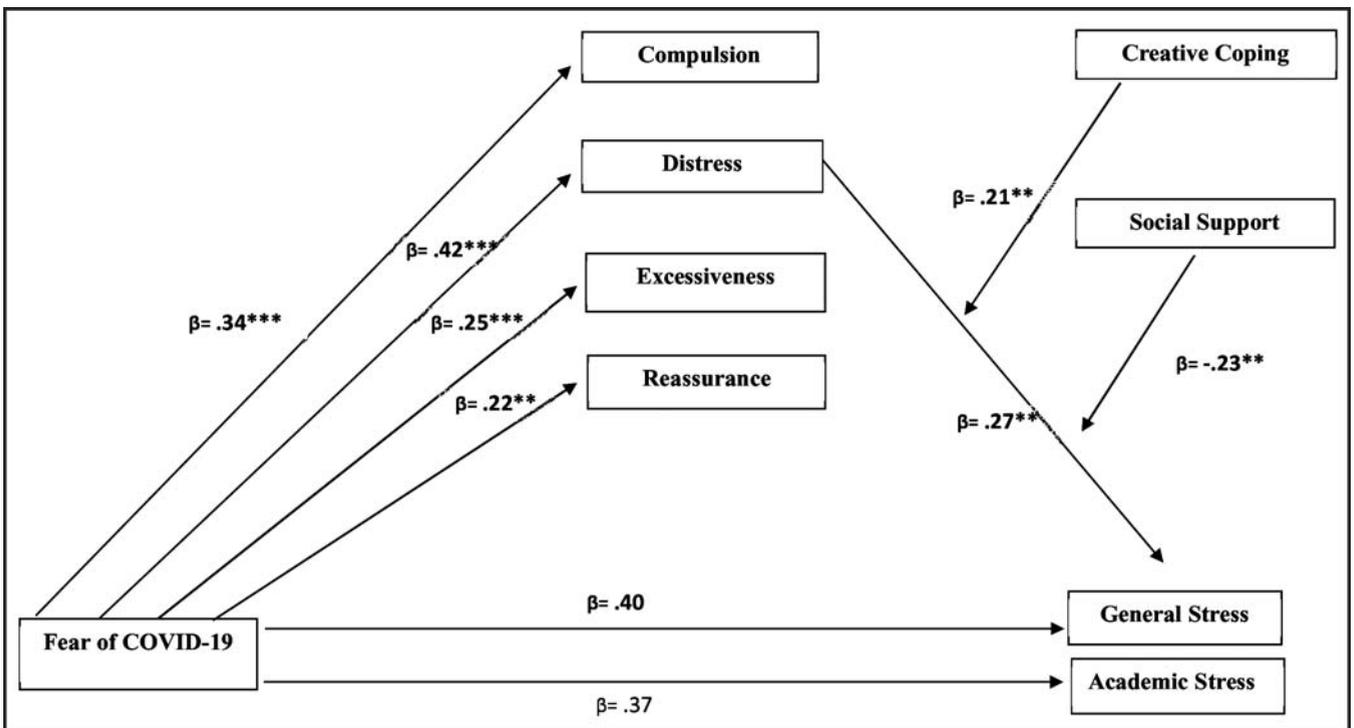
perceived academic stress ( $r=0.34$ ,  $p<0.01$ ). Cyberchondria domains of mistrust in medical professionals had a negative relationship with CC ( $r=-0.17$ ,  $p<0.05$ ). CC had a significant positive relationship with SS ( $r=0.28$ ,  $p<0.001$ ) and perceived academic stress ( $r=0.16$ ,  $p<0.05$ ). SS had a significant negative relationship with general stress ( $r=-0.14$ ,  $p<0.05$ ).

It was initially hypothesized that cyberchondria would mediate the relationship of FOC with general and academic stress, but there was no significant relationship found ( $p>0.05$ ) after controlling the effect of demographics and mediator cyberchondria. Thus, partial mediation existed to allow partially moderated mediation analysis which showed that being female predicted general stress, and this remained constant across all the 4 models ( $p<0.05$ ). SS negatively predicted general stress in models 2 and 3 ( $p<0.05$ ) whereas in model 4 it was non-significant ( $p>0.05$ ). Distress due to looking up for symptoms online predicted general stress in model 2 ( $p<0.05$ ), but it was non-significant in model 3 ( $p>0.05$ ). The interactions of FOC, CC and reassurance significantly predicted

**Table-3:** Moderated mediation effect of cyberchondria, creative coping, social support on fear of coronavirus disease-2019 (COVID-19) with general stress and academic stress.

Variable	General Stress								Academic Stress							
	Model 1		Model 2		Model 3		Model 4		Model 1		Model 2		Model 3		Model 4	
	$\beta$	SE	$\beta$	SE	$\beta$	SE	$\beta$	SE	$\beta$	SE	$\beta$	SE	$\beta$	SE	$\beta$	SE
<b>Block 1</b>																
Gendera	.24**	.76	.28***	.76	.27***	.77	.26***	.76	.14	1.34	.15*	1.33	.14*	1.34	.17*	1.35
COVID in Friends	-.06	.83	-.03	.84	-.02	.84	.00	.85	.18*	1.48	.22**	1.46	.22**	1.47	.18*	1.52
<b>Block 2</b>																
Creative Coping			.02	.03	.02	.03	.43*	.07			.21**	.05	.21**	.05	.74***	.12
Social Support			-.22**	.41	-.23**	.41	-.30	1.06			-.13	.71	-.14	.71	-.26	1.88
Compulsion			-.19	.10	-.20	.10	-.58	.32			.17	.17	.17	.17	-.41	.56
Distress			.27*	.10	.23	.10	-.16	.33			.16	.17	.14	.17	.34	.58
Excessiveness			-.01	.10	-.01	.10	.29	.31			-.23	.17	-.24	.17	.05	.54
Reassurance			-.04	.12	-.03	.12	.57	.42			-.03	.21	-.02	.21	-.16	.74
Mistrust			.05	.12	.05	.12	.29	.35			-.07	.20	-.07	.20	.48	.62
<b>Block 3</b>																
Fear of COVID-19					.08	.07	.40	.30					.05	.12	.37	.54
<b>Block 4</b>																
FOCxCCxREAS															-.02	.00
FOCxCCxSSxEXC															.65	.00
R	.54								.50							
R <sup>2</sup>	.29								.25							
F	2.30***								1.83**							
$\Delta R^2$	.11								.08							

FOC: Fear of COVID-19, CC: Creative coping, SS: Social support, REAS: Reassurance, EXC: Excessiveness.  
 a 0 = Men, 1= Women. \*p ≤ .05. \*\* p ≤ .01. \*\*\* p ≤ .001.



**Figure-2:** Emerged statistical model of research.

Note. Fear of coronavirus disease-2019 (COVID-19) led to general and academic stress. Cyberchondria mediated the relationship in fear of COVID-19 and general stress. Individuals who had higher academic stress utilised more creative coping strategies during the pandemic in order to reduce stress. Individuals with greater social support available during the pandemic had less general stress.

**Table-4:** Gender differences in fear of coronavirus disease-2019 (COVID-19), cyberchondria, creative coping, social support, general stress and academic stress in university students.

Variables	Men <sup>a</sup>		Women <sup>b</sup>		T	p	Cohen's d
	M	SD	M	SD			
Fear of COVID-19	17.17	5.57	18.69	5.49	.06	-1.93	0.28
<b>Cyberchondria</b>							
Compulsion	14.98	6.25	14.23	6.62	.81	.42	.12
Distress	16.00	6.53	16.29	6.82	-.30	.76	.43
Excessiveness	17.52	5.66	18.62	6.82	-1.21	.23	.18
Reassurance	12.06	4.67	13.27	5.71	-1.6	.11	.23
Mistrust	10.02	3.51	8.23	4.07	3.37	<.01	.47
Creative Coping	67.63	12.69	73.14	16.52	-2.70	.01	.37
Social Support	3.04	.76	3.42	1.03	-3.08	<.01	.42
General Stress	19.04	3.45	22.03	5.81	-4.61	<.01	.63
Academic Stress	58.06	9.68	59.79	8.39	-1.36	.18	.19

M: Mean, SD: Standard deviation. <sup>a</sup> = 83; <sup>b</sup> = 122.

general stress ( $p < 0.05$ ). Interaction involving FOC, CC, SS and excessiveness significantly predicted general stress ( $p < 0.05$ ). CS predicted academic stress, and this remained constant across all the 4 models ( $p < 0.05$ ). Female gender as well as having friends who had contracted COVID-19 were predictors for academic stress, and the values remained constant across all the 4 models ( $p < 0.05$ ). However, FOC alone did not predict general or academic stress ( $p > 0.05$ ). The partially moderated mediation model was supported by the findings (Table 3) and is also shown in Figure-2.

Simple slope three-way analysis showed that students with less FOC having high SS and CC had more general stress compared to those with less FOC with high CC but low SS, and less FOC with low CC and SS, while students with low CC and high SS had the same FOC, and students with less FOC along with low CC and SS had less general stress than the others (Figure-1).

There were significant differences between the genders in terms of mistrust on medical professionals domain of cyberchondria, CC, SS and general stress (Table-4).

## Discussion

The study found FOC to have a significant positive relationship with cyberchondria, which is similar to earlier findings.<sup>19</sup>

As FOC gives rise to cyberchondria,<sup>20</sup> the levels of associated stress and anxiety also increase for which different coping strategies are utilised by individuals. In collectivist cultures, like Pakistan, where familial ties and relationship have a special place culturally, the most effective coping strategies to battle disease are SS<sup>21</sup> and CC. Creativity especially helps in coping with stressors. The stressors associated with academics stem from expectations related to academic performance which is

improved by utilisation of CC.<sup>22</sup> Anxiety levels during COVID-19 reduced SS.<sup>23</sup> Additionally, an individual's SS perception is linked with reduced symptoms of stress.

Women are generally found to be more stressed compared to their male counterparts owing to their biological disposition.<sup>24</sup> Other factors, like emotional labour, unpaid domestic work and juggling between work and home life, also contribute towards higher levels of stress in women.<sup>25</sup>

Cyberchondria is a side effect of the COVID-19 pandemic which causes stress owing to reliance on online information and perception of information overload which exacerbates cyberchondria associated with COVID-19.<sup>26</sup> While all types of coping strategies served as protective factors against the detrimental effect of pandemic-related stressors, scholarly and everyday creativity were found to be predictors of academic stress.<sup>27</sup> This is because students indulge in more creative endeavours to cope with academic stress. Major predictors for academic stress for students during COVID-19 was disruption in everyday life. Social isolation as a preventive measure along with the fear of physical well-being of loved ones, including friends and family, cause stress in case of exposure to novel pathogens,<sup>28</sup> as in the case of COVID-19.

Men generally have a greater exposure to outside world and get news from multiple sources. The testing kits imported from China had accuracy rate of only 30-35% which created a sense of mistrust in medical professionals and the healthcare system. Women have greater fear associated with COVID-19 compared to men so their trust in medical professionals is higher.<sup>29</sup>

In terms of limitations, the current study did not ask the participants if their family members who contracted

COVID-19 died or recovered, which could have affected their stress levels. Future studies should exclude individuals whose family members died because of COVID-19. Participants who lost a loved one due to any reason except for COVID-19 in the preceding 3-months were not excluded, and this could have served as an additional stressor. Future studies should exclude such individuals as well. Due to COVID-19 preventive measures, data had to be collected online where participants did not read instructions properly and a lot of responses had to be discarded.

Despite the limitations, the current study has important implications for students, parents and teachers to understand the role of social support to reduce FOC.

## Conclusion

FOC had a significant positive relationship with cyberchondria. Compulsion to seek symptom online and subsequent distress had positive relationship with CC and perceived academic stress. Cyberchondria domains of excessiveness and reassurance had a positive relationship with CC, while mistrust in medical professionals had a negative relationship with CC. CC was found to have a significant positive relationship with SS and perceived academic stress. SS had a significant negative relationship with general stress. Cyberchondria mediated, while CC and SS moderated the relationship between FOC and stress. FOC alone did not predict general or academic stress, while women utilised more CC strategies, received more SS, and had higher levels of general stress, while men had greater mistrust on medical professionals.

**Disclaimer:** The text is based on an academic thesis.

**Conflict of Interest:** None.

**Source of Funding:** None.

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