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Original article

Investigating the mediating effect of anxiety and fear of a third wave of COVID-19 among students in South India

Enquête sur l'effet médiateur de l’anxiété et la peur d'une troisième vague de COVID-19 chez les étudiants en Inde du Sud

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ABSTRACT

The COVID-19 pandemic, which is a global health emergency, has potentiality had a serious impact on students’ mental health. An online cross-sectional survey design that included 534 senior year college students from South India revealed a significant and direct positive effect of the fear of a third wave of COVID-19 on academic anxiety which in turn showed a significant and direct positive effect on COVID-19 burnout. Academic anxiety was also found to mediate the relationship between the fear of a third wave of COVID-19 and subsequent cases of burnout. The study suggested measures to be taken by policy makers for the broader interest and wellbeing of student communities. Managerial implications, limitations and future studies were also examined in the paper.

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RÉSUMÉ

La pandémie de COVID-19, qui est une urgence sanitaire mondiale, présente une potentialité d’impact sérieux sur la santé mentale des étudiants. Une enquête transversale en ligne qui comprenait 534 étudiants de dernière année de collège en Inde du sud a montré que la peur de la troisième vague de COVID-19 augmentait significativement l’anxiété scolaire qui à son tour augmentait le burnout lié au COVID-19. Il a également été découvert que l’anxiété scolaire médiait la relation entre la peur d’une troisième vague de COVID-19 et les burnout ultérieurs. L’étude a suggéré des mesures à prendre par les décideurs politiques pour améliorer le bien-être des communautés étudiantes. Les implications managériales, les limites et les études futures ont également été examinées.

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1. Introduction

The novel corona virus identified in December 2019 which had resulted in formidable outbreak across the world is now a major threat to the humanity [60]. The pandemic along with the lockdowns has had an hostile effect on the academic life of student communities [11]. The entire education system from kindergarden to higher education has now collapsed [34]. Today as this sector have totally shifted to online learning platforms to sustain the teaching learning process [37], there are a number of challenges faced by Schools, Universities and Colleges [5]. Managing ICT online [6], larger class sizes, dishonesty, connectivity with students, self-discipline are major challenges in front of teachers [52]. As far as the student communities are considered, the challenges faced by them are social issues, lecture issues, accessibility issues, academic issues, generic issues and learning intention related issues [26].

Fear is one of the most prominent psychological problem in the present day pandemic [59]. College students’ health and stress is a subject of talk in the present day of pandemic outbreak. Academic workload, separation from their institutions and the pandemic
itself are creating fear and anxieties in students [62]. The construct fear is widely associated with various others constructs such as academic stress, mental wellbeing, depression, mindfulness, humor, hopelessness etc. [30,31,44,48]. Considering the fear, worries and anxieties that the world is now passing, a Fear of COVID-19 scale were developed by [1]. The scale so developed has excellent and robust psychometric properties. The scale is now widely used in various languages [2,22,55] and also seen in research studies involving students [36,40,45,47]. It is now quite evident that fear is a major construct which can be used extensively for further research and can appropriately address the concerns and challenges of students.

Academic anxiety is a very broad variable which includes anxiety related to various academic related happenings. Earlier studies show that students have moved into depression out of academic anxieties [27]. Academic anxiety have been composed of many sub components which takes up specific forms such as test anxiety, computer anxiety, maths anxiety and statistical anxiety [9]. Fear of lower performance in comparison to the classmates, worries on handling and taking responsibilities, stress in classrooms are basic signs of academic anxiety [9]. To add things much worser, the pandemic has given much damage on mental health of students [54] and severely affected the academic self-efficacy, state anxieties and trait anxieties of college students [10]. In a recent study, older students were found to be have effected with depression and academic anxieties [23]. It is thus concluded that academic anxiety is a relevant field to be further researched amidst the outbreak of COVID-19 pandemic.

Burnout is as psychological state caused by a long response to interactive stressors, mainly on one’s job [32]. A review of literature shows that burnout is associated with a plethora of issues like health issues, mental well-being pointers such as acute depression, sleep issues, resorting to alcohol, impaired memory, back and neck pain etc [41]. COVID-19 and burnout studies were conducted amidst nurses and doctors. These frontline workers were associated with high burnout rates [58]. A recent study conducted by [16] suggested that parents who experienced stress or parental burnout were more likely to ill-treat their child, neglect them, and abuse them during COVID-19 pandemic. In an another study conducted on teachers, COVID-19 anxieties, teaching anxieties, anxieties in communicating with parents and administrative support were related to their COVID-19 burnouts [43]. Burnouts related to fashion retail workers [46], pharmacists [24] were also observed during this pandemic. Despite these facts, little evidence exists on COVID-19 burnout on students.

Keeping a positive mental health is as important as keeping a good physical health during the pandemic. As teaching has moved online [28], studies have even shown the cases of depression and a concern on future career anxieties in students [29]. With second wave of corona virus being so destructive [3] and the possibility of more waves of the virus in India [14,15], it is now imperative to study psychological factors affecting mental health of students such as fear, academic anxiety and burnout. Thus, the purpose of this study was to investigate the mediating effect of academic anxiety on the relationship between fear of a third wave of COVID-19 and burnout. The study proposed (Fig. 1) the following hypotheses.

$H_1$: Fear of a third wave of COVID-19 would have a direct positive significant effect on COVID-19 Burnout.

$H_2$: Fear of a third wave of COVID-19 would have a direct positive significant effect on Academic Anxiety.

$H_3$: Academic anxiety would have a direct positive significant effect on COVID-19 Burnout.

$H_4$: Academic anxiety would mediate the relationship between the fear of a third wave of COVID-19 on COVID-19 Burnout.

2. Methods

2.1. Procedure

A snowball sampling technique was preferred to complete the data collection. 534 students drawn from South India participated in the online survey (53% males and 47% females; age group from 20 to 26 with a mean age of 24.4 years). All responses were final year post graduate/graduate students mostly doing their studies in science, engineering, business administration and arts. The survey was conducted in online classes along with the supervision of the teachers using a 7-point Likert’s scale.

2.2. Measures

Fear of a third wave of COVID-19 scale: The seven items Fear of COVID-19 scale developed by [1] was modified to a fear of third wave of COVID-19 without disturbing the essence of the scale. The scale [1] which was initially developed in early 2020 was found to be little relevant today in its original form as a vast majority of population of India has lived with the virus, recovered from the infection and moving today in getting vaccinated [14]. However with the disruptions made by second wave of COVID-19 and complications like black fugus infections in India [12], the researcher based on this judgement modified the scale to best fit the present situation. For example, a question ‘I am most afraid of Corona’ was modified to ‘I am most afraid of third wave of Corona’.

![Fig. 1. Conceptual framework of the study.](image-url)
Academic Anxiety scale: Academic anxiety was measured using a 11 item scale developed by [9]. Sample question was like ‘I often feel sick when I need to work on a major class assignment’.

COVID-19 burn out scale: The COVID-19 burnout scale which consisted of 10 items was adapted from work of [30]. A sample item was like ‘When you think about COVID-19 overall, how often do you feel hopeless?’

### 2.3. Data Analysis

In order to access the effect of three constructs namely fear, academic anxiety and burnout, the relationship was predicted through Structural Equation Modelling (SEM). The fit of the structural model was ascertainment through various fit indices. The benchmark mark was used $\chi^2/df < 3$, RMSEA $\leq 0.08$, CFI $\geq 0.9$, TLI $\geq 0.9$ & $p < 0.05$. First the measurement model was tested for its reliability and validity. Cronbach’s $\alpha$, Factor Loadings (FL), Average Variance Extracted (AVE), Composite reliability (CR) were used to check the reliability and validity of the instruments. Discriminant validity of the constructs were also validated and tested. To examine the mediation model, a PROCESS macro (Model 4) was also executed [17]. All findings were reported using standardized regression coefficients. Further, to examine the indirect effect, a bootstrapping procedure (with 5,000 samples) was conducted using 95% confidence intervals [42]. All analyses were carried out in SPSS and AMOS version 21.

### 3. Results

The reliability of the three variable was assessed through Cronbach’s $\alpha$ and were found to above 0.7 which is a reliable figure [64] (Table 1).

As per benchmarks [56], composite reliability must be greater than 0.6 and Average Variance Extracted (AVE) to be greater than 0.5. From Table 2, Composite reliability (CR), Average Variance Extracted (AVE), Factor Loading (FL) and Discriminant Validity were examined. It was found that AVEs were higher than the inter construct correlations. Further it was found that a high co relation existed between the observed variables and their composing variables. Composite reliability was all above 0.70 which was an indication of good reliability of the scale. Moreover, AVE in this study were all above 0.50, which denoted that the latent variables had a good convergence validity. The off-diagonal element in Table 2 which indicated the correlation among the constructs were lesser than the diagonal elements which indicated a good Discriminant Validity as well. It was thus concluded that the measurement model had good reliability of individual variables, internal consistency between variables, the model’s convergence and discriminant validity.

### 4. Analysis of full structural model

Path analysis was tested using AMOS 21. In line with many other SEM researchers, the more rigorous criteria proposed by [21] for fit indices were adopted in this study. A scrutiny of the fit indices showed that the overall model fit for the structural model was good. The full structural model fit ($\chi^2 = 102.3$, $\chi^2/df = 2.31$, GFI = 0.935, TLI = 0.980, CFI = 0.953, RMSEA = 0.046) indicated good fit in the first estimation itself. The structural model was thus validated for hypotheses testing. It was found that fear of a third wave of COVID-19 had a direct significant positive effect ($\beta = 0.641$, $p < .05$) on COVID-19 burnout. H1 was thus accepted (Total Effect). Fear of a third wave of COVID-19 was having direct significant positive effect ($\beta = 0.54$, $p < .05$) on academic anxiety as well. H2 was also accepted. Further, academic anxiety was found to have direct significant positive effect ($\beta = 0.23$, $p < .05$) on COVID-19 burnout. H3 was also accepted. The indirect effect of fear of a third wave of COVID-19 on COVID-19 burnout was also found to be significant ($\beta = 0.125$, $p < .001$) i.e. Academic Anxiety was found to mediate the relationship between the fear of a third wave of COVID-19 on COVID-19 burnout. H4 was thus accepted (Fig. 2, Tables 3 and 4).

### 5. Discussion and managerial implication

The purpose of this research work was to test a simple mediation model and to examine to what extent academic anxiety would mediate the fear of a third wave of COVID-19 virus on COVID-19 burnout. More specifically, considering the second wave of COVID-19 pandemic situation in India, the present study focused on academic anxieties that students normally have encountered in this specific time in order to classify some of the primary mechanisms between their levels of fear of a third wave of COVID-19 and burnouts. The present study tested the hypotheses with regard to the association between the fear of a third wave of COVID-19, academic anxieties and COVID-19 burnouts and examined a simple mediation analysis by testing these associations together.

Earlier studies have shown an increase in negative mental consequences during epidemics [25,33,63]. Examining and mitigating fear linked to physical and mental health is a major apprehension and focus for intervention [53]. As per [8], fear of COVID-19 was highly correlated with anxiety. Previous research on fear of COVID-19 also indicated that intolerance of uncertainty, depression, anxiety, and stress mediated the relationship between the fear of COVID-19 and positivity [4]. Respondents have experienced an increase in fear and anxiety during COVID-19 not only on the direct effect of virus but also due to measures taken to prevent it such as hand washing, wearing mask etc [50]. Studies have even shown that teachers faced a high fear of COVID-19 and teaching burnout [19]. The findings of the study thus closely overlapped with most of the similar studies conducted in earlier years.

From a theoretical point of view, the finding of the present study identified new knowledge, since in most of the literature, the studies were related to frontline workers rather than students. Rapid increase in COVID-19 variants in India [57], large number of victims in the form of deaths and complications (such as mucormycosis), disbelief in health system, misinformation from media, lack of support, all could be the possible reasons to the fear...
of COVID-19 among student communities. This fear has found to be a crucial factor that influences burnouts in students. The effect of this COVID-19 fear on burnout is worsened by the existence of academic anxiety. The results of the study showed that when the fear of a third wave of COVID-19 of the respondents increased, their academic anxieties also increased. This was in line with the findings of a similar study done by [9]. Moreover, when the academic anxieties were higher, the COVID-19 related burnouts were also found to be higher in students. This correlates with the studies conducted among nurses in China [20]. The present study also showed that the fear of a third wave of COVID-19 in India exerted a significant direct positive effect on COVID-19 burnout mediated via academic anxiety. A similar study which was conducted by [29] revealed that students with a high fear of COVID-19 were more likely to feel the pandemic to be threatening and experienced high level of career anxieties.

All these results clearly point toward inappropriate government support and polices towards students. Governments are more focused on curbing the pandemic [13, 18, 35, 38]. From a practical point of view, sufficient strategies should also be brought to place to remove the anxieties and fear that students face during online educations. Final year students are more concerned on their career and are victims of anxiety related disorders [41]. Proper mechanism should be provided to address these issues else many students may move to depression [49]. Mindfulness and resilience strategies is found to have negative associations with COVID-19 fear and anxiety [61]. Mindfulness is found to have reduced stress, anxiety, depression, and increased well-being during this pandemic [7, 39]. The present study suggests medical practitioners/psychologists to be part of online classes. They may use resilience and mindfulness resources with students. As COVID-19 pandemic have brought up negative emotions like anxieties and burnouts, students should resort to talk therapy, yoga, meditation and relaxation techniques [51]. Campus counselling units must inform the students regarding the importance of these protective tools during this pandemic outbreak. This can minimize the fear, anxieties and subsequent burnouts. Campaigns on convincing information and improving health responses can reduce the fear of COVID-19. Sufficient measures and plans are needed to improve the standard of living, eating habits and living conditions of the students. Government should also provide sufficient internet access with low tariffs and sufficient bandwidth to students. These strategies could help them to cope up the impacts of the hardships faced by the pandemic.

It is therefore recommended that the educational institutions, private bodies, government agencies and Non-Governmental Organisations (NGOs) must urgently prioritise and design accurate measures to alleviate these ill effects which harm the psychological health and wellbeing of the students. A civilization which does not prioritize young student’s health and mental wellbeing in the present puts their future in complete jeopardy. Thus findings of the studies may be used by government and education sectors to design programs on psychological supports for students to combat fear, academic anxieties and burnouts in students.

6. Limitation and future research

Future research must continue to explore more variables and give more dimensions of COVID-19 fear, associated variables and relationships. Studies on protective and risk factors can be future

Table 3
Standardized Regression weights.

|                          | Standardised Estimates | p       | Result    |
|--------------------------|------------------------|---------|-----------|
| Total effect             | 0.641                  | 0.006   | Significant |
| Direct effect            | 0.519                  | 0.003   | Significant |
| Indirect effect          | 0.125                  | 0.008   | Significant |

Table 4
Direct & Indirect effects paths.

| Path                                      | Standardised estimates | p       | Result    |
|-------------------------------------------|------------------------|---------|-----------|
| Direct Effect                              |                         |         |           |
| Fear of a third wave of COVID-19 -> Academic Anxiety | 0.54                   | 0.004   | Significant |
| Academic Anxiety -> COVID-19 Burn out      | 0.23                   | 0.002   | Significant |
| Fear of a third wave of COVID-19 -> COVID-19 Burnout | 0.51                   | 0.003   | Significant |
| Indirect effect                           |                         |         |           |
| Fear of a third COVID-19 third wave -> Academic Anxiety -> COVID-19 Burnout | 0.125                  | 0.008   | Significant |

*Bootstrap sample size=5000; Performance bootstrap and bias corrected confident interval (95%) were selected to assess the significance level.
areas to be explored. Quantitative and qualitative studies on students who have experienced the worst side pandemic may bring in deeper understanding of the fear, academic anxieties and burnouts.

Findings of the study cannot be generalised from K1 to higher education. The present study was conducted only to students doing post-graduation/graduation studies. As the data were assessed during the peak of 2nd wave of COVID-19 in India using a cross sectional study, it might make difficult to draw causal inferences in relation to the directions of the variables during a later stage of the pandemic in India. Longitudinal studies will help to bridge this gap. With a possibility of more waves of COVID-19 in India, future studies are highly recommended identifying the long-term effects of anxiety and burnouts among individuals. Future studies can also take sociodemographic aspects of the participants. These sociodemographic dimensions would throw more light on the nuances of academic anxieties and burnouts interwoven with fear of COVID-19. Such studies will prove to serve a better guide in relation to the prevention and mitigation measures for the most vulnerable and dynamic people, i.e., students.

7. Conclusion

This study provided evidence that students tend to have more burnouts depending on how much fear and academic anxieties have made them uncomfortable during COVID-19 pandemic. As students’ mental wellbeing is crucial, the study also provides various suggestions to stakeholders to address the burnout of the students.

There is an acute need to design intervention techniques that reduce the negative impact of the current outbreak on students. The study’s findings may help the policymakers to design resilience strategies in improving the mental well being of the students. Maintaining COVID protocols, the colleges and Universities may organise short outings with the students. Such social involvements may decrease the burnout of online educations. Learning, remembering, and employing effective coping strategies is essential. Such strategies will reduce the anxieties, and fear in students. This will also boost the morale, emotional control and self-contentment. Students may be encouraged to practice reading physical books on self motivation, engage in chasing their hobbies and add address the emotions with close friends and relatives. Such strategies will help to improve the mental hygiene of the student communities.

Disclosure of interest

The author declares that he has no competing interest.
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