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A Study of the Cognitive Effects of COVID-19 Amongst Indian College Students

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Abstract

Along with anxiety, depression, and eating problems, college students are often considered a vulnerable group. As a consequence, their mental health suffers when their college experience is dramatically changed, as it was during the COVID-19 epidemic. Recognise sociodemographic, lifestyle, and awareness of COVID-19-infected individuals risk factors that may enhance learners' likelihood of experiencing these consequences. We used web-based surveys to collect data from seven Indian institutions. The surveys were scheduled to take place between mid-March and early May 2020, when the majority of coronavirus sheltering in place orders were in force. We got 2,534 completed responses from males (61%), women (41%). (79 percent). 20% of the total Using latent profile analysis, we identified learners with a high (45% of the sample), a moderate (40%) or a low (14%) cognitive effect. Males and Indians with fair/poor health, lower relative family income, and knowledge of someone with COVID-19 had more cognitive pain. These students were less likely to suffer from cognitive discomfort. Being a woman, having poor overall health, being between the ages of 18 and 24, spending eight or more hours a day on screens, and knowing someone who was infected were all associated with an increased risk of cognitive injury. College students' failure to disclose mental health issues during a pandemic may have long-term health and educational repercussions.

Keywords: Cognitive effects, Indian College Students, COVID-19

1 Introduction

Numerous studies demonstrate that severe acute respiratory syndrome and COVID-19 have a detrimental impact on the mental health and behaviour of individuals [1–5]. While a large portion of India was quarantined in April owing to the disease, mental health hotlines increased 1,000% [7]. Suicides exceed COVID-19 infections in certain hospitals [8]. COVID-19 will see a significant relapse, with long-term economic and health consequences [9]. In spite of the fact that COVID-19 impacts all groups, college students are particularly vulnerable [10]. Anxiety, depression, psychosomatic illnesses, drug misuse, and suicidality increased [11]. The disease's physical and mental health effects may need extra resources and treatments. Administrators can better assist students if they understand COVID-19's cognitive impacts and risk factors. These consequences need

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urgent mental health treatments [12]. Student underuse mental and counselling services [13, 14]. It may help create tailored treatments, treatment plans, and coping strategies to identify populations most vulnerable to cognitive effects. COVID-19 has been shown to influence college students' cognitive health [15]. Anxiety and depression are exacerbated by the unpredictable nature of college education, technical difficulties connected with online courses and time away from home. These impacts have been seen at colleges worldwide [10]. Because COVID-19 research focus on specific institutions, their generalizability is restricted [10, 16, 17]. We are unaware of any pandemic research involving Indian college students. They add to the unique environment of higher education. India teaches many foreigners [18, 19]. More culturally homogenous student populations may suggest a number of risk factors [24]. Within weeks of the present research, India had the lowest worldwide recovery rate–or death rate post-infection [25]. The Global North's highest incidence and mortality rate [26]. The disease's cognitive effects affect both ill and healthy people [1]. The cognitive effects of COVID-19 and related risk factors were studied in seven Indian institutions. Our goals are threefold: Create profiles describing the epidemic's predicted cognitive effect on students. Examine COVID-19 risk variables' socio-demographic, lifestyle, and awareness aspects that may increase students' exposure to these impacts.

2.0 Methods

2.1 Sample Size

In 2020, 14174 students from 17 institutions were recruited cross-sectionally. The online survey requires signed permission from all subjects. The poll got 2,534 answers from 5,174 students, enough for most descriptive statistics and bivariate relationships. 10% of respondents had incomplete or incorrect race/ethnicity and gender data. Thus, full data for multivariate analyses were available for 2,140 students.

2.2 Evaluation of Cognitive impacts

Qualitative analysis

We anticipated evaluating COVID-19's varied impacts on youngsters would be difficult. So, we used an open-ended questionnaire item that asked, "How has the COVID-19 epidemic affected your mood and behaviour?" What are the first three ideas? A fourth option was made available. This was initially requested to avoid priming and order effects [27, 28]. Nine survey questions were chosen based on prior research and new interview data. Along with COVID-19 compulsive behaviours, we assessed stress, concern, and time constraints. We have previously discussed the cognitive impact of past large-scale disasters on the general population [29]. These studies defined COVID-19's effect on college students. The present study's corresponding author interviewed individuals about their early COVID-19 pandemic experiences. They were questioned in February 2020.

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The interviews evoked emotions. The survey included four negative items. Each question addressed one of the PANAS' four basic negative emotions (fear, annoyance, guilt, and sadness) [30]. The VAS gathered data from 1–100 with little participant burden. Respondents were asked to rate their emotions towards the epidemic. Two additional poll items were worry and stress. Also, VAS-measured. The prompts asked respondents to describe their emotions about the epidemic. Anxiety arousal was evaluated in another poll. It was measured using the Penn State Worry Questionnaire (PSWQ) with a correlation coefficient of 0.80 [32]. So, this one item fully captures anxiety arousal. We utilised one-sided Likert scale answers. Other queries measured time needs. These are from an eating disorder survey [33]. We asked them how much time/thought they put into the epidemic, and how much time/thought they really put into it. An agree-disagree Likert-type scale was employed again. It was characterised as coronavirus responses rather than generic cognitive processes.

2.2.2 Hazard Factors

The self-reported socio-demographic data showed possible gender, age, race/ethnic origin, SES, and academic status differences in effect levels (undergraduate vs. graduate-seeking). Each family's relative wealth was assessed by seven questions [34, 35]. We asked whether respondents were undergraduate or graduate students. So, we looked at general health indicators like general health and BMI to determine whether there were (BMI). On a 5-point scale, "overall health" was rated [36]. Their BMI was calculated. Cognition and BMI of COVID-19 [37, 38]. Time usage and sedentism. For this purpose, we used a recent Indian Time Consumption Survey memory framework [39]. A phone/computer, TV, or online gaming were all questioned about in three questions (rapid walking, running, etc.). COVID-19 victims' family and community awareness were evaluated as risk factors [42].

2.3 Investigations

Analysis of open-ended responses [43, 44]. Two researchers looked for patterns and codes in the data [43]. The kappa (94.94%) agreement between Kaplan-Meier curves [45, 46]. The second goal was phased. One was profiling. Missing data were imputed using a regression tree model [48]. Quantitative data imputed 5.2 percent. This was done using EFA with oblimin rotation [49]. Scee plots and VSS criteria were used to count variables [50]. A change in goodness of fit as extracted components grow. Finally, we used EFA composite scores to detect LPA latent components [51]. The statistical soundness of the solution determined the number of profiles [52]. These are all information criteria types (53). Reduced values increased model fit. For classification accuracy, entropy criteria were employed [54]. More straightforward approaches with fewer profiles improved LPA interpretability [53]. Z-scores were used to interpret profiles. Basing our evaluations on prior research [53]. COVID-19 cognitive impact scores moderate, high and low. The third

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objective was accomplished by modelling bivariate and multivariate risk factor-profile correlations. A binary outcome variable was utilised to categorise learners' cognitive impact profiles. Those from high impact profiles were more relevant and actionable than findings from low impact profiles. Universities may prioritise mental health programmes for students at risk of cognitive decline. Using unadjusted data was more informative than using a multinomial regression model. Chi-squared risk assessed unadjusted risk. The risk factor effect was examined using residuals (i.e., more or less likely, a group was classified to a higher impact profile than another profile). Bonferroni adjustments reduced Type I Error. These were classified using data distributions and therapeutically relevant values. Body mass index (BMI) ranges from 18.5 to 30.0. Health has two tiers [53]. Screen time was defined as less than or equal to eight hours [57]. One and a half to two hours [58, 59]. Thirty minutes or more [60]. Below, average, and above were also classified. A four-year college degree was regarded as high education [61]. Adjusting for random (grouping) effects by institution enhanced results. To avoid SES interference. VIF multicollinearity testing was calculated using R2 coefficients (conditional and marginal). Marginal R2 does not incorporate the random effect of institutional participation. The logistic regression model was evaluated on a college responder sample. This enabled us to gauge the nation's resilience. This study uses Excel 16.38 and R 3.6.2.

3.1 Affects the Array

Various COVID-19-related emotions and behaviours were shown in open-ended answers. These effects were felt more acutely than before the epidemic. "I am usually very motivated and have never had depression, but lately, I have been feeling sluggish and depressed," one of the kids said. "I feel trapped," said another lonely teen. I am homeless because I cannot socialise and have academics!

Nevertheless, fundamental limitations and ideas still entrap me." Post-epidemic students showed greater social distance, academic modifications, and reduced socialising. In addition, there were issues with hygiene, sleep, housing, work, personal finances, and caring. "I am BANKRUPT," said one kid. Due to the epidemic, I lost my work and now cannot afford food." Some students have concerns about online colleges. Is my exam recorded on the computer? Did I miss any instructor posts? A lack of internet connection may result in my failing to finish an assignment. Benefits from the COVID-19 pandemic are few and far between. In the research, participants said they had a stronger sense of empathy for their society and could adapt to any circumstance.

3.2 Artefact of Cognitive Effect

The EFA selected eight questions from the cognitive impact survey. Disconnection (h2 =.21) rules out culpability. It was usual (S1 Fig). The Tucker Lewis indicator was 0.95, while the MSA for KMO factor sufficiency was.89 [65]. One-factor (.89) and three-factor

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(.94) solutions have the greatest VSS [50]. (S1, S2) To indicate its negative effects, the first component was named "Emotional Distress" (afraid, irritable, sad, preoccupied and stressed). Concern, time, and time were the three components of the second component. Women's profiles were lower (RES = -7.54, p.001), whereas men's profiles were higher (RES = 8.02, p.001). Men did the exact opposite. Age (2(4) = 15) but not academic status (2(2) =.3). RES = 3.81, p =.0013), while RES = -3.03, p =.0002. No other significant age-group differences by profile (p >.05. [66] Emotional Distress =.83 Cronbach's Alpha

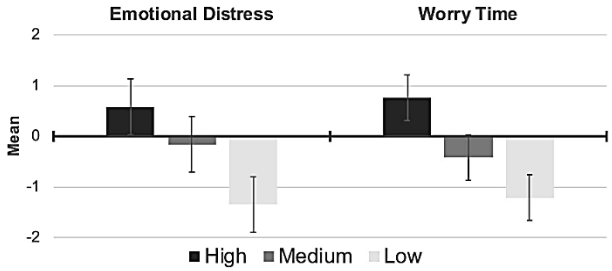

Fig. 1: COVID-19 psychological impact profiles created reducing z-scores of eight measures to two components using data from 2,534 Indian college students.

3.3 Threats

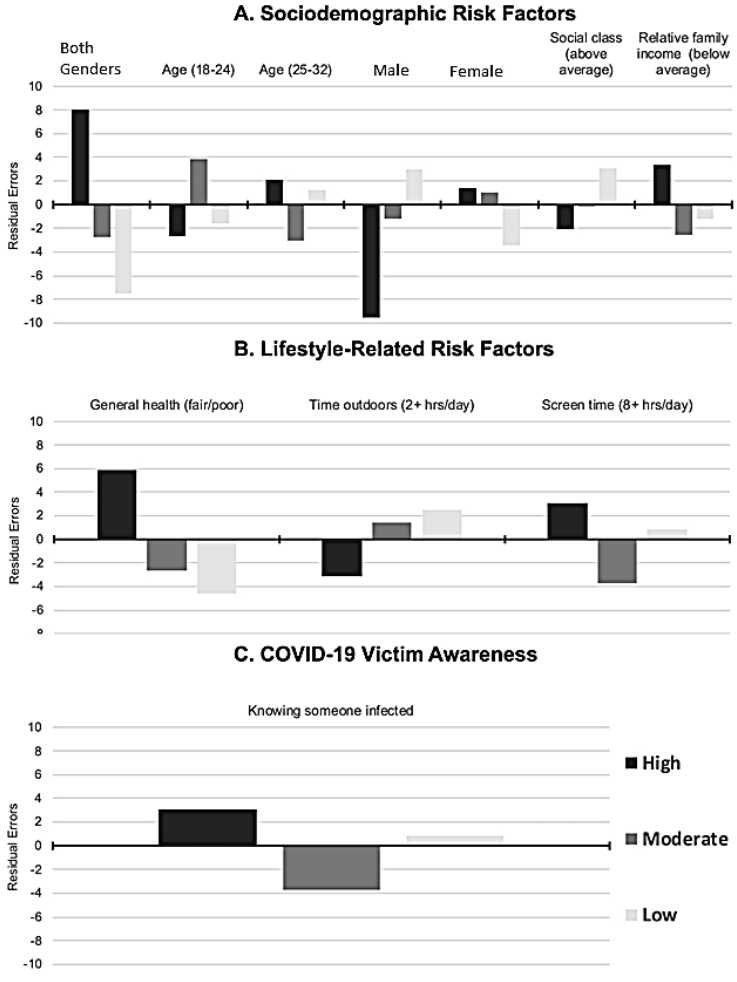

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Fig. 2: Severe variables are recorded (p.05). These males have designated reference groups because they are over 32, have an average/above average SES (social class and relative family income), are in good/excellent/excellent health, spend less than two hours outside, and spend less than eight hours on screens each week (COVID-19). Adolescents with high, moderate, and low psychological impact profiles (a-c) in India. Pearson's chi-squared residuals show the probability of profile membership depending on the risk factor.

4 Discussion

4.1 Conclusions and Recommendations

We polled 2,500 students from seven Indian universities in May 2020. Respondents said COVID-19 affected their mental health and lifestyle. A lack of drive and decreased socialisation are other factors. Another study found an increase in sedentism, anxiety, and depression among Indian college students [16]. One study found academic and professional problems, boredom, worry, and discontent [10]. Less anger, sadness, anxiety and dread in China [67]. Students in Switzerland reported decreased social interaction, increased anxiety, and loneliness [68]. During the COVID-19 pandemic quarantine, adults reduced physical activity, increased food intake, and reduced binge drinking [69]. India provides less financial assistance to students than the Global North [70].

The majority of learners' open-ended responses (worry, tension, and fear) were collected statistically. COVID-19 cognitive responses were classified as follows: low (14%), moderate (40%), and high (45 percent). Unadjusted models showed that knowing a family/community member with COVID-19 had a higher cognitive impact. These students had a reduced risk of depression. Age, gender, general health, screen use, and infection awareness were statistically significant risk factors. Screen time was not a significant risk factor in the representative sampling subsample. Other case studies at Indian institutions identified similar risk factors. There was an upsurge in anxiety and depression symptoms in April 2020 [17]. Disruption of male daily routines was more severe. Anxiety and despair were shown to be lower among Indian students. Student anxiety, sadness, and inactivity rose among 217 new undergraduates [16]. COVID-19 risk factors for college students are comparable globally.

This pandemic is more likely to affect men [1, 10, 21, 71–77]. Males are more susceptible to infection than females [77], but they are also more affected by the pandemic's cognitive effects. Gender differences in fear processing may exacerbate symptoms in men who already have psychopathology [78]. For online learning, male students are more confident in their computer skills [10]. Males value intellectual and professional abilities higher than females [10]. Men showed greater emotional expressiveness, a lower tolerance for ambiguity, and less efficient coping techniques [75]. A rise in "emotional hunger" during COVID-19 isolation may lead to weight gain and poor mental health [73].

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Many COVID-19 groups have poor overall health [79, 80]. Aside from the comorbidity of mental and physical health, those with mental health problems suffer more [81]. Younger kids are more vulnerable for several reasons. College is a significant concern for young people (18-24] [10]. The pandemic used social media more than older people [12, 82]. The COVID-19 pandemic may cause anxiety and poor mental health [16, 75].

These individuals have higher levels of COVID-19 [10]. Indians face online prejudice [83]. Access to and use of mental health services has always been problematic [84]. Screen usage may be detrimental to mental health [85]. Some COVID-19 survivors fear reading about the virus in the news, increasing anxiety and screen time [82]. Regular exercise and outdoor recreation are reduced by sedentism. “Green time” is beneficial to kids’ mental health, according to our research. In multivariate models, outdoor time did not predict COVID-19 cognitive effects. Also, see the College’s risk assessment. This includes psychological and eudemonic health [88, 89]. Infection and mortality are reduced by park and green space access [92, 93]. COVID-19 cognitive effects are more likely when someone is ill. Infection risk perception and health problems like COVID-19 mortality may improve with familiarity [79].

A lack of mental health and excessive smartphone use has been related to COVID deaths [82]. SES may affect pupils’ mental health in a pandemic. Student and family finances [10]. [10, 74–98] SES is linked to COVID-19 phobia and mental health issues. Food and shelter may be more critical to low-income pupils [99]. COVID-19 [98] affects poorer households. Thus, students may worry about their families.

4.2 Admission Recommendations

In light of the large percentage of students with severe cognitive problems, institutions should address all mental health concerns. Telemedicine/counselling visits and virtual group exercises are also offered [99]. It may help decrease anxiety and loneliness. Anxiety, depression, and suicidal thoughts may be utilised to assess student risk. Chen et al. [100] propose a six-step approach. Fighting the pandemic meant boosting family ties, etiquette, and academics. Colleges should focus on retaining good attitudes rather than reducing stress [101]. Throughout the epidemic, exposure anxiety and depression increased [17]. It may help decrease tension [102, 103]. A positive attitude and fresh opportunities may help “toughen” pupils [104, 105]. Adaptive mindsets may also help students connect deeper and adapt to new learning methods [106]. Adaptive thinking may assist college students and adults who lack motivation, productivity and focus. For example, a family member becoming ill or a pandemic changing college policies [107, 108].

Developing collegiate social interaction tools, many college students want social interaction [109–111]. Students’ opportunities for social interaction were restricted early

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in COVID-19. Many people missed vital milestones, including "getting out" (graduation, final sports event). COVID-19 students often communicated online with family or roommates [10]. Physical distance is not social distance [101]. Synchronous and asynchronous online interactions have improved bonding and social connection [112–115]. In warm weather, a comparable plan may be made online or outdoors [116]. Virtual movie, game, quiz, and happy hour nights have also worked [99]. Organising virtual social events for students may increase their availability.

Furthermore, institutions have a moral obligation to help those in danger of severe COVID-19 cognitive consequences [14]. Males, those under 18, those with health issues, those who spend more than a third of their day on screens, and those with infected family or acquaintances are in danger. Counselling services need predictive and acute symptom treatment [80]. Colleges may also personalise courses and exams to increase virtual social interaction. Involvement in these programmes may assist at-risk groups in achieving academically [117]. During pandemics, students reacted with concern and anxiety. Peer mentoring and virtual town halls have been proven to improve academic performance [104]. These students were more likely to be on scholarship than those who disliked the College's reaction. Many pupils were unaffected by the shift since they loved digital learning and new technologies [118]. Some pupils struggle to use new software [10].

5 Conclusion

Female gender, younger age, poor/fair overall health, screen time, and knowledge of someone infected with COVID-19 have all been identified as risk factors for higher cognitive effects during the COVID-19 pandemic among college students in India. Female students who had a better socioeconomic status or spent at least two hours outside had less cognitive Distress. Despite this, every student surveyed stated that the pandemic negatively influenced them, with 59% having a significant cognitive effect. At the time of data collection, COVID-19 affected the education of roughly 1.5 billion pupils worldwide [126]. Cognitive Distress was experienced by 90% of pupils [17, 127]. Students must "Maslow before they can Bloom," or satisfy their basic physiological, cognitive, and safety needs before focusing on academic life–much less excel [99]. We encourage college administrators to support their students' mental health and academic performance at all times, but particularly during times of uncertainty and crisis, such as the COVID-19 pandemic.

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