



Research Article

Business Administration

**A STUDY ON STUDENT'S WELL-BEING STRESS AND MENTAL HEALTH DURING
RETURN TO COLLEGE IN PANDEMIC PERIOD**

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ABSTRACT

We aimed to assess whether college students 'well - being, mental health and learning changed during the COVID-19 pandemic as adolescents transitioned from learning online back to studying in person. We conducted an anonymous online cross-sectional survey study at Sengamala Thayaar Educational Trust Women's college, sundarakottai, Mannargudi, after they were reopened. Students provided subjective views on their study quality, their health as well as daily life while studying either virtually or in person and completed the Beck depression inventory (BDI), the Generalized anxiety scale-7 (GAD-7) and the Pittsburgh sleep quality index (PSQI). Among 628 (70.4% female) respondents, 268 (42.7%), 342 (54.5%) and 398 (63.4%) are suspected to have depression, an anxiety disorder or poor sleep, respectively. Students reported better study quality ($Z = -12.435$, $p < 0.001$) and physical health ($Z = -9.176$, $p < 0.001$), but worse sleep quality ($Z = -19.489$, $p < 0.001$), shorter sleep duration ($Z = -19.509$, $p < 0.001$) and worse self-reported mental health ($Z = -2.220$, $p < 0.05$) while learning in person. However, higher scores of in-person study quality and physical health were associated with lower depression and anxiety levels as well as better sleep. Our study suggests that the reopening of colleges may exacerbate sleep and mental health-related issues among college students but also be beneficial for their academic development and levels of physical activity.

Keywords: Adolescents, anxiety, physical health.

INTRODUCTION

After the worldwide spread of SARS-CoV-2 was declared a pandemic in March 2020, many countries employed nationwide lockdowns to prevent the collapse of their medical systems. One of the restrictive measures enforced during lockdowns was college closures. They were thought to limit the transmission of SARS-CoV-2 among adolescents and prevent them from infecting relatives at home. After transitioning to online learning, students faced a completely different daily routine that changed their

learning experience, sleep patterns and social interactions. However, there remains little data on how students perceive the return to live education after several months of online learning. In recent years, the view of health being a state of "complete well-being" shifted towards a dynamic definition of health, which revolves around the capacity to "react to all kinds of environmental events having the desired emotional, cognitive, and behavioral responses and avoiding those undesirable ones". Similarly, recent conceptualizations of mental

health emphasize that it is “a dynamic state of internal equilibrium which enables individuals to use their abilities in harmony with universal values of society”. Self-rated single-item measures of overall mental health or the evaluation of scales used to detect selected clinical entities (e.g., anxiety, depression or poor quality of sleep) can help to quantify the benefits and disadvantages that the COVID-19 pandemic had for the health of the youngest generations of individuals in our societies. Moreover, the pandemic, which was a major global environmental event, offers a unique opportunity to review in-person teaching from a public health perspective and raise the possibility of changing college schedules or using widely available online tools to improve the health and daily lives of adolescents.

We report data of a cross-sectional survey conducted at Sengamala Thayaar Educational Trust women’s College (Autonomous), Sundarrakkttai, Mannargudi. The aim of our study was to assess how students perceive their (1) students well - being (2) mental health, (3) physical health and (4) learning experience during COVID-19 lockdowns and after school reopening.

Objectives of the Study

- To students perceive their sleep quality to be better and sleep duration to be longer during school closure.
- To students report worse mental and physical health during lockdowns.
- Online learning is perceived to be of lower quality than learning in person.
- After College reopening, the relationship between quality of sleep and the perceived quality of studies is mediated by symptoms of anxiety and depression.

REVIEW OF LITERATURE

Kelly schwatz, Carrly A Micmorris et al., Students have been multiply impacted by the COVID-19 pandemic: threats to their own and their family’s health, the closure of Colleges and pivoting to online learning in March 2020, a long summer of physical distancing, and then the challenge of returning to college in fall 2020. As damaging as the physical health effects of a global pandemic are, much has been speculated about the “second wave” of mental health crises, particularly for school-aged children and adolescents. Yet, few studies have asked students about their experiences during the pandemic. The present study engaged with over

two thousand (N = 2,310; 1,288 female; M age = 14.5) 12- to 18-year-old Alberta (Canadian) students during their first few weeks of return-to-college in fall 2020. Students completed an online survey that asked about their perceptions of COVID-19, their fall return-to-college experiences (84.9% returned in-person), their self-reported pandemic-related stress, and their behavior, affect, and cognitive functioning in the first few weeks of September. The majority of students (84.9%) returned to college in person. Multivariate analysis showed that stress indicators were positively and significantly correlated with self-reported behavioral concerns (i.e., conduct problems, negative affect, and cognitive/inattention), and that stress arousal (e.g., sleep problems, hyper vigilance) accounted for significant variance in behavioral concerns. Results are discussed in the context of how colleges can provide both universal responses to students return to college during COVID-19 knowing that most students are coping well, while some may require more targeted strategies to address stress arousal and heightened negative affect

Holm-Hadalla R.M., Kilimov et al.,

During the COVID-19 pandemic, a decrease in well-being and an increase in mental health problems were registered in medical and psychotherapeutic practices, counseling centers, and clinics. According to previous studies, younger people and women seemed to be particularly affected. The aim of this study was to describe mental health problems of students and to draw consequences for the further handling of pandemics and other crises. **Method:** Students at the University of Heidelberg, a typical German “full university,” were surveyed online using internationally comparable screening instruments like the Well-Being Index (WHO-5) and the Patient Health Questionnaire (PHQ). In addition, the students had the opportunity to describe in a narrative form their well-being and to make suggestions how to improve their situation. **Results:** Out of a population of 27,162 students who were contacted by email, 2,137 students completed the questionnaire. The salient finding is that according to the WHO-5 Well-Being Index, 72.2% of the respondents feel seriously impaired in their well-being. This corresponds to the finding that 75.8% of the respondents in the PHQ-D show indications of at least one syndrome diagnosis. Depression was found in 41.8% of the respondents in the PHQ-D.

Indications of moderate to severe and severe depressive syndromes were present in 31.8%. Signs of somatoform syndromes are found in 25.4% and of anxiety syndromes in 20.0%. 1,089 students gave narrative reports on how they were feeling and made suggestions for improvement. About 75% reported severely reduced well-being. Their main complaints were loneliness and depression and lack of recognition for their specific academic and life situation during the pandemic. By far, the largest proportion of students supposed that their mental health issues were caused and/or intensified by the pandemic-related social contact restrictions. The vast majority of them made reasonable suggestions for controlled relaxation of contact restrictions. **Conclusions:** Students suffer severely from the pandemic-related social restriction. In respect to future pandemic outbreaks or other crises leading to social isolation, the dramatic consequences of social lockdowns should be taken into account. Under pandemic conditions, we especially should support persons lacking social networks.

National Status

Reena Rachel John *et al.*, Introduction The whole world is under the effects of the COVID-19 pandemic which has put all nations in a unique lockdown situation to contain the disease. Though the environment got ameliorated with low pollution levels, this unexpected lockdown has taken a toll on humans' mental health. As the effects of after lockdown can affect college students due to fear, anxiety and stress, this study intends to assess the attitude of the university students. Methodology An online questionnaire survey comprising 15 questions was conducted among four South Indian state university students. Their responses were recorded through Google Forms. The submitted responses were analysed using SPSS software version 17. Results In total, 1241 responses were recorded from university students belonging to various faculties. Though 43% considered this lockdown as a convenient break, 60% could not focus on their studies. The importance of renewing relationships was felt by 47%, and 83% tried to learn a new skill. Students from Tamil Nadu were looking forward towards a brighter future after the lockdown. Conclusion This survey conducted in the effects of after lockdown indicated that the university students were not anxious about the long-term effects of the pandemic but showed a decline in their academic performance

Saraswati K *et al.*, COVID-19, the most severe public health problem to occur in the past 10 years, has greatly impacted people's mental health. Colleges in China have reopened, and how to prevent college students from suffering secondary damage due to school reopening remains elusive. This cross-sectional study was aimed to evaluate the psychological impact of COVID-19 after school reopening and explore via machine learning the factors that influence anxiety and depression among students. Among the 478 valid online questionnaires collected between September 14th and September 20th, 74 (15.5%) showed symptoms of anxiety (by the Self-Rating Anxiety Scale), and 155 (32.4%) showed symptoms of depression (by Patient Health Questionnaire-9). Descriptive analysis of basic personal characteristics indicated that students at a higher grade, having relatives or friends who have been infected, fearing being infected, and having a pessimistic attitude to COVID-19 easily experience anxiety or depression. The Synthetic Minority Oversampling Technique (SMOTE) was utilized to counteract the imbalance of retrieved data. The Akaike Information Criterion (AIC) and multivariate logistic regression were performed to explore significant influence factors. The results indicate that exercise frequency, alcohol use, school reopening, having relatives or friends who have been infected, self-quarantine, quarantine of classmates, taking temperature routinely, wearing masks routinely, sleep quality, retaining holiday, availability of package delivery, take-out availability, lockdown restriction, several areas in school closed due to COVID-19, living conditions in the school, taking the final examinations after school reopening, and the degree to which family economic status is influenced by COVID-19 are the primary influence factors for anxiety or depression. To evaluate the effect of our model, we used 5-fold cross-validation, and the average area under the curve (AUC) values of the receiver operating characteristic (ROC) curves of anxiety and depression on the test set reached 0.885 and 0.806, respectively. To conclude, we examined the presence of anxiety and depression symptoms among college students after school reopening and explored many factors influencing students' mental health, providing reasonable school management suggestions.

Scope of the Study

This study is important due to the

insights provided, that will help the students to address and devise strategies to overcome the pandemic-induced negative impact students' mental health.

This study identifies the key factors affecting students and their learning during the lockdown period and helps to understand adjustments needed for the "new normal" learning environment.

The change to an online or hybrid mode of learning will be the "new normal" for teaching, and, hence, we need to explore and find evidence for students to effectively deal with and learn in an online and hybrid environment.

- Enrich the application of prior student wellbeing research and provide a theoretical framework that helps to understand the mechanism of College support on student well-being.
- New strategies and resources need to be developed to improve student well-being in the online or hybrid environment.
- To find effective strategies and resources, colleges, and universities have to identify and understand which factors and mechanisms through, which return to college during COVID-19 affects student well-being.
- Student well-being has become a concern for many colleges and universities globally as they acknowledge the importance of a balance between psychological, social, emotional, and physical aspects of student lives.
- Educational Institution and students to understand the emotional responses and impacts on student well-being of the sudden and dramatic changes to the learning experience of an unexpected global crisis.

MATERIALS AND METHODS

Subjects and Procedure An online anonymous questionnaire was distributed through closed communication groups among students of Sengamal Thayaar Educational Trust Women's College, Mannargudi, from 20 October 2021 to 20 November 2021. Data were collected based on their academic performance in the academic year 2020/2021—a non-random convenience sample was sought from the STET Women's college. The inclusion criteria were being enrolled and having completed and submitted answers to each item of the

questionnaire. Only responses to open-ended survey items judged to be intentionally misleading were excluded from the analysis

Measures

The questionnaire consisted of ten parts:

- Demographic data (age, sex, grade);
- Items rated on a scale from 0 to 10: (a) the quality of studies, (b) psychological health, (c) physical health, (d) sleep quality, (e) overall well-being (exhausted vs. well-rested) either at the time of the survey (i.e., while learning in person) or during studies online (i.e., retrospectively);
- The perceived advantages and disadvantages of online learning (multi-choice);
- COVID-19-related questions: being diagnosed with COVID-19 by polymerase chain reaction (PCR), being in isolation, using masks in the classroom, being vaccinated;
- Causes of pandemic-associated anxiety (multi-choice);
The Beck depression inventory (BDI, scores from 0 to 63 with higher score indicating more expressed symptoms of depression). A cut-off score of ≥ 16 for the BDI has been proposed to differentiate between adolescents with and without relevant symptoms of depression (73.0% sensitivity, 80.3% specificity) . The Cronbach α of the scale was 0.915;
- The Generalized anxiety scale-7 (GAD-7, scores from 0 to 21, with a higher score indicating more expressed symptoms of anxiety). A cut-off score of ≥ 8 for the GAD-7 provides 77% sensitivity and 82% specificity for detecting any anxiety disorder [29,30].
The Cronbach α of the scale was 0.914;
- The Pittsburgh sleep quality index (PSQI, scores from 0 to 21, with a higher score indicating worse sleep quality). A cut-off score of >5 for the PSQI provides 89.6%

sensitivity and 86.5% specificity to detect poor sleep quality.

Statistical Analysis

A sample of at least 172 was needed to include up to 10 independent variables in a multiple linear regression model with $\alpha = 0.05$, $1 - \beta = 0.95$ and $f^2 = 0.15$ (computed by entering respective input parameters in G*Power 3.1.9.7). Data analysis was carried out in IBM SPSS Statistics 26 (IBM, Chicago, IL, USA). The Kolmogorov–Smirnov test was used to assess the normality of the continuous variables. The Wilcoxon test was applied to compare two paired groups for variables measured at two time points: (1) at the time of the survey (i.e., while learning in person) and (2) during studies online (i.e., indicated retrospectively). The Kruskal–

Wallis H and the Mann–Whitney U tests were employed for comparisons of independent subgroups. A path analysis was conducted in Amos Graphics 22 to define the mediating role of anxiety and depression in the relationship between the perceived quality of studies (while learning in person) and the quality of sleep.

RESULTS

There were 643 responses, of which 628 (97.7%) comprised the final study sample (individuals who provided inappropriate and/or implausible answers were excluded). The main characteristics of the sample are presented in Table 1. There were 268 (42.7%) individuals who scored 16 on the BDI, 342 (54.5%) who scored 8 on the GAD-7 and 398 (63.4%) who scored >5 on the PSQI.

Table 1: General characteristics of the participants in the study.

Characteristic	n (%) or Mean (SD)
Number of respondents	172
COVID-19 PCR+	69 (11.0)
COVID-19 Hospitalization	2 (0.3)
Wears masks at College	173 (99.8)
Class had to isolate since September 2021	39 (6.2)
Days in isolation	0.6 (2.4)
In isolation during survey	6 (1.0)
Had only classes in person during the past month	107 (89.6)
Vaccinated against COVID-19	74(84.4)
Parents agreed (or would agree) with COVID-19 vaccination	113 (90.6)
BDI	15.4 (11.3)
GAD-7	9.2 (5.9)
PSQI	6.9 (3.3)

BDI—the Beck depression inventory; GAD-7—the Generalized anxiety scale-7; PCR+—a positive polymerase chain reaction test; PSQI—The Pittsburgh sleep quality index.

Table 2: A comparison of health and daily-life-related factors during classes online and in-person.

Characteristic	Classes Online	Classes in Person	Wilcoxon Test Statistic
Quality of studies ^a	7 (0–10)	8 (0–10)	–12.435 ***
Mental health ^a	7 (0–10)	6 (0–10)	–2.220*
Physical Health ^a	7 (0– 10)	8 (0–10)	–9.176***
Sleep Quality ^a	9 (0– 10)	5 (0– 10)	–19.489***
Well-being (exhausted vs. rested) ^a	8 (0– 10)	4 (0– 10)	–14.733***

a — value on a scale from 0 (worst) to 10 (best); median (range);

*— $p < 0.05$; ***— $p < 0.001$.

Respondents were more favorable towards the quality of studies on- line ($H(3) = 25.90.001$), reported better psychological as well as physical health during lockdowns ($H(3) = 9.13$,

$p = 0.028$ and $H(3) = 10.79$, $p = 0.013$, accordingly). They also had better sleep ($H(3) = 14.24$, $p = 0.003$), reported higher levels of energy ($H(3) = 9.73$, $p = 0.021$) and exercised

more ($H(3) = 8.30, p = 0.040$). Students had less favorable views towards online ($Z = 2.86, p = 0.004$) but not in-person ($Z = 0.68, p = 0.497$) learning. They also regarded their physical and mental health as well as their sleep quality and well-being to be worse both while learning online and in-person ($p < 0.05$). Female respondents scored higher on the BDI (Mdn = 16 vs. Mdn = 9, $Z = 8.08, p < 0.001$),

GAD-7 (Mdn = 10 vs. Mdn = 5, $Z = 8.11, p < 0.001$) and PSQI (Mdn = 7 vs. Mdn = 5.5, $Z = 5.57, p < 0.001$) as well. There was no difference in these measures between individuals who reported COVID-19 infections and the ones who did not opinions about studying online and reported COVID-19-related problems are presented in Table 3.

Table 3: The outlook of high college students towards online learning and the COVID-19 pandemic.

Characteristic	N	%
Advantages of online learning		
More time to sleep	152	88.7%
Better teaching quality	54	8.6%
It is safer during the pandemic	136	74.7%
More free time	120	67.2%
Easier to keep a good diet	78	45.0%
No need to wear a mask	134	77.9%
No need to commute	132	72.3%
A more comfortable learning environment	79	45.6%
Disadvantages of online learning		
Impossible to meet friends	118	68.4%
Impossible to attend extracurricular activities	52	26.8%
Lack of help from teachers	82	47.8%

Table 4. Cont.

Characteristic	n	%
Lack of interaction with teachers and school staff	71	41.8%
Lack of physical activity	69	40.5%
Worse teaching quality	101	58.9%
A less comfortable learning environment	42	24.5%
Causes for anxiety: the impact of the pandemic on....		
learning and gain of new knowledge	110	63.3%
my family's health	76	44.1%
my health	72	41.0%
future studies and career	73	41.4%
my relationships with friends	65	37.4%
my relationship with family members	14	14.0%
the social and economic situation of my family	45	26.1%
Reported causes for not vaccinating a		
Previous COVID-19 infection	20	11.8%
Because of possible side-effects	32	18.7%
My parents/guardians do not agree with me being vaccinated	31	18.6%
I do not believe the vaccine is effective to stop the spread of COVID-19	14	08.3%
I do not believe the vaccine is effective against COVID-19	13	07.3%
I cannot be vaccinated as confirmed by a physician	4	2.1%
Student-reported effects of wearing face masks		
Lack of air	72	42.7%
Headache	53	29.8%
Increased fatigue	52	36.8%
Skin problems	92	53.6%
No effects	44	25.5%

a—the percent of unvaccinated individuals is indicated.

Measures of anxiety ($r_s = 0.57, p < 0.001$) and depression ($r_s = 0.62, p < 0.001$) were correlated with sleep quality (Figure 1) and associated with

subjective estimates of health and daily-life-related aspects during studies in person (Table 4).

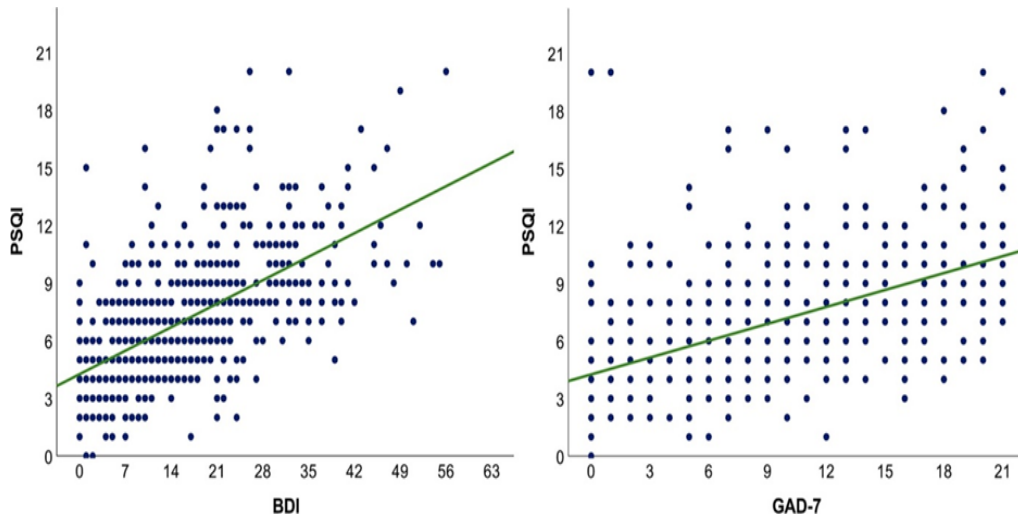


Figure 1: The relationship between sleep quality and symptoms of depression or anxiety. A linear

Re- gression fit line is presented in green. BDI—the Beck depression inventory; GAD-7—the Generalized anxiety scale-7; PSQI—The Pittsburgh sleep quality index. A mediation analysis revealed that the association between the perceived quality of studies and sleep quality (standardized direct effect 0.23, $p < 0.001$) is mediated by indirect effects of anxiety and depression (combined standardized indirect effect: 0.19, $p < 0.001$).

DISCUSSION

General Findings

We report the results of an online cross-sectional survey involving 628 college students in Sengamala Thayaar Educational Trust Women’s College (Autonomous), Sundarakkottai, Mannargudi. The study sample was predominantly female; however, it had an even distribution of respondents from STET students. Students also had relatively high vaccination rates, and the vast majority were able to keep studying in person one month before completing the survey. It is of note that vaccination for COVID-19 was widely available in the country and alternative measures of infection control (e.g., rapid antigen or pooled PCR testing) were installed in collage to complement mask use, disinfection, social distancing and ventilation. Overall, we were able to fully confirm three of

our hypotheses: college students reported better and longer sleep during lockdown (H_1); they perceived online learning to be of inferior quality as compared to learning in person (H_3); and the relationship between the quality of sleep and the perceived quality of studies was mediated by symptoms anxiety and depression after college reopening (H_4). Moreover, while students reported worse physical health during lockdowns, their evaluation of mental health was higher during college closures, thus only partially confirming H_2 . In summary, the survey confirmed previous findings that college reopening leads to decreased sleep duration and increased physical activity (i.e., changes opposite to those observed after the initiation of lockdowns) but did not support the alleviation of mental health issues (measured as a self-rated mental health status) post-lockdown. To the best of our knowledge, the study is also the first to address the relationship between the quality of learning, anxiety, depression and the mental health after college reopening.

Differences in Health and Quality of Learning during Online and In-Person Studies

Before the time of our study, STET students had experienced two simultaneous COVID-19-associated lockdowns and college closures

(March–June 2020 and November 2020–June 2021) and returned to learn in person in September 2021. After college reopening in September 2021, participants of our study reported improved quality of their studies as well as physical health and spent more time studying or being physically active. On the other hand, sleep quality, energy levels and mental health were subjectively evaluated to be worse. Such results suggest that a “trade-off” may exist between (a) good academic experience and physical activity (learning in person) and (b) optimal sleep quality and good mental health (learning online). However, our data does not indicate that the two groups of variables (a and b) are mutually exclusive. For instance, correlation analysis provided evidence that well-evaluated studies do not preclude good sleep quality and low levels of depression and anxiety: in fact, the more students appreciated their studies in person, the less they scored on the PSQI, BDI and GAD-7. A path analysis suggested that better study quality is also related to better sleep through a negative association with both the BDI and the GAD-7. Further, more hours of physical activity and better self-rated physical health were both associated with better sleep quality and lower levels of depression and anxiety. Therefore, bad sleep quality and persisting mental health issues after college reopening are most likely determined by other factors than improved study quality and increased physical activity. Among them could be changes in college schedules (e.g., the need to wake up earlier to attend classes) and daily commutes, which may decrease sleep hours and be detrimental for students whose endogenous circadian cycles trend towards later awakening. Longer study hours and the continuous risk of COVID-19 may increase anxiety. It is noteworthy that anxiety, depression and bad sleep may also have a bidirectional interaction. While the cross-sectional design of our study does not allow direct comparison of depression or anxiety levels and sleep quality during and after lockdown, two in five students could be suspected to have a significant depressive disorder, more than half to have an anxiety disorder, while almost two-thirds surpassed the PSQI threshold for poor sleep at the time of the survey (i.e., while learning in person). Further studies are required, however, to reveal adjustments (e.g., later college start times, student counseling) that could be beneficial in

improving students’ sleep as well as mental health after returning to college.

The Possible Influence of Demographic Factors on Unfavorable Views of Online Learning

In our study, students had a more positive outlook towards online learning. They represent individuals who were in lower secondary education (i.e., the 8th grade) at the start of the pandemic and competed to enter high schools during the lockdown in 2020. Because of the public health crisis, students that year were selected based on previous merit rather than results of entrance exams. On average, however, students were aware that the quality of their studies worsened during national lockdowns. It is noteworthy that our survey was based in some of the best colleges in the country and the pandemic’s impact on learning and gain of new knowledge was the most frequent cause for respondents’ anxiety. Therefore, the critical evaluation of online teaching may be explained by both high students’ expectations and the professors’ unpreparedness to rapidly transfer and adapt the curriculum for virtual teaching. It can be argued that the online form of teaching itself does not compromise the quality of education as long as students’ technological needs are met and studying is made a social and engaging process. However, more than half of all students missed interactions with their peers or tutors and reported insufficient assistance from the teachers during virtual studies. It is thus important to remember that schools are also valuable social environments and should welcome students back as soon as adequate safety measures are available.

Practical Applications

Practical implications of our study concern the applicability of online learning in colleges as well as possible modifications to the current framework of studying in person. The results of our survey support the argument that lockdowns, which mostly simulated a situation of later college start times, were beneficial for the sleep of students. It should also be noted that novel college policies (e.g., later college start times, the introduction of online courses) implemented specifically for students to sleep longer could have positive consequences for their mental and physical well-being. However, students in our study were also aware of the substandard quality of their studies during lockdowns. As our findings indicate, the

reduction in the quality of studies may itself be associated with symptoms of anxiety and depression or poor sleep. Thus, the complex relationship between mental health, physical well-being and learning should be acknowledged before implementing any new policies that could risk undermining high academic standards.

Limitations and Future Directions

Limitations of the current study are largely determined by its cross-sectional design: longitudinal data are needed to better define factors associated with poor sleep and mental health issues among college students throughout the pandemic. The results presented cannot be generalized to student populations of dissimilar social and economic backgrounds. Participation bias may have influenced results as students with no interest in their health or study quality were possibly less likely to participate. Finally, the current study relied only on subjective self-reported information and objective methods of data collection, such as actigraphy to determine sleep-related variables and structured interviews to investigate mental health problems, are needed to confirm our findings.

Future controlled trials are also required to better define the psychological and physical outcomes among students learning online (or in a hybrid way) compared to those attending live classes. In our study, only estimates of self-rated mental and physical health were compared while studying online during lockdowns versus learning in person after college reopening. Single-item self-reported measures are increasingly appreciated as tools that reflect future morbidity; however, they do not address the presence of distinct treatable conditions. It is therefore important that the quality of sleep and symptoms of anxiety and depression are investigated in the setting of teaching online (or in a hybrid way) after the COVID-19 pandemic. Such studies could help determine, what are the positive and negative health effects of online learning in colleges in the absence of a global pandemic.

CONCLUSIONS

The results of the current study suggest that the reopening of colleges during the COVID-19 pandemic was beneficial for the quality of teaching and students' physical health but had negative effects on their sleep and mental health. Around half of the college students reported significant levels of anxiety,

while almost two-thirds reported having poor sleep. Online learning was perceived to be of worse quality than studying in person, and problems gaining new knowledge were the primary cause for anxiety. Poor study quality after college reopening was related to worse quality of sleep both directly and through symptoms of anxiety and depression. In summary, our findings indicate that students could potentially benefit from new college policies aimed to improve student sleep while respecting high educational standards. Future studies should investigate options to improve students well-being and mental health among college students while ensuring study quality and students' safety.

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