Sleep and Well-Being During the COVID-19 Pandemic: Remote and In-Person Learning for College Students With and Without Disabilities

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Abstract

In an email-based questionnaire study, we investigated chronotype, sleep, and well-being among junior/community college students with (n = 52) and without disabilities (n = 27) during remote (COVID-19–related) and subsequent in-person learning periods. Overall, we found no significant differences between students with and without disabilities either in chronotype or in sleep quality. Morningness and intermediate chronotypes were related to better sleep quality during both the remote and in-person periods. We also found that sleep quality was better during the remote period than during the in-person period. This finding was robust as we identified this both in quantitative and qualitative results. We also discovered that, surprisingly, students had little concern with the possibility of catching the COVID-19 virus. Findings on well-being during the remote and in-person periods were mixed, although we noted mainly negative experiences during the in-person period. The findings make it clear that return to “in person” was not “return to normal.”

Introduction

With the announcement of the COVID-19 pandemic in the Spring 2020 semester, there was an immediate transition from in-person to remote teaching and learning in many Canadian colleges and universities. Faculty had to pivot to online teaching—something with which most were not familiar—and students had to transition to remote learning with which they, too, were unfamiliar. During this time, there were many changes that affected post-secondary students’ sleep and well-being.

Understanding the impact of chronotype and disability on sleep in the context of the remote-learning period of the COVID-19 pandemic and its aftermath in the return to in‑person learning is vital to fill a knowledge gap in sleep and well-being research and to improve academic policies and planning.

Sleep and Well-Being During the Remote and the Return to In-Person Periods

The COVID-19 pandemic officially began in Canada in March 2020. It sent much of the country, including post-secondary students, home. With the exception of essential services, many jobs, including post-secondary teaching, pivoted to remote-learning platforms (Perreaux, 2020). The COVID-19–related quarantine and the transition from normal life to suddenly living with the danger of an unknown virus caused much disruption of daily lives. The pandemic affected Canadians’ sleep quality and their well-being (e.g., Osiogo et al., 2021) in the form of increased stress and anxiety. Greater social isolation due to the physical-distancing policies (Nwachukwu et al., 2020) also took its toll on loneliness, social connection, and psychological well-being (Smith & Lim, 2020).

In Québec, Canada’s second largest province, the pivot to remote learning in the province’s 49 junior/community colleges took place during a two-week period in March 2020 (Perreaux, 2020). Return to face-to-face learning did not occur until the Fall 2021 semester (Lowrie, 2022). A review of the literature shows that both the remote period (i.e., March 2020–August 2021) and the subsequent return to exclusively in-person learning a year and a half later brought their own stresses.

Remote-Learning 2021 Period

During the remote period, the literature shows that poor sleep was prevalent in most countries and across all ages (e.g., Hyun et al., 2021, Saguem et al., 2022). Like others, post-secondary students experienced problems with sleep, such as insomnia (Al Miskry et al., 2021; Kayaba et al., 2023; Marelli et al., 2021). They also had difficulties with well‑being, including social isolation (Gogoi et al., 2022), decreased physical activity (Thiria et al., 2022), bad mood and poor quality of life (Barone Gibbs et al., 2021). In addition, they experienced increased stress and worry, changes in eating patterns (Al Miskry et al., 2021), and difficulty socializing (Slack & Priestley, 2023). Students also reported concerns about their own health and that of loved ones (Son et al., 2020). However, some positive changes were also reported, including decreased sleep debt and less daytime sleepiness (Kayaba et al., 2023).

The remote period also led to reduced interactions during the day. With the COVID‑19 virus limiting social encounters during leisure time, well-being was affected negatively for many (Barone Gibbs et al., 2021). Barbieri et al. (2021) reported that the social encounters in their study population decreased by 50%. Furthermore, decreased mobility due to the COVID-19 restrictions and the use of online platforms for courses resulted in a marked decrease in physical activity for many, with subsequent adverse effects on sleep and well‑being (Massar et al., 2021). For post-secondary students specifically, there was increased anxiety and sedentary time, as well as decreased physical activity (Thiria et al., 2022).

Return to In-Person Learning

Across different countries and regions, COVID-19 infection rates increased and diminished at different times, and there were differences in vaccine availability and policy. Once COVID-19 cases diminished and research provided a better understanding of the virus, vaccines became available to protect the population. In Québec, all junior/community colleges returned to in-person education in Fall 2021 (Lowrie, 2022). With the COVID-19 virus still circulating at that time, it was mandatory that masks be worn in class and that social distancing requirements be followed (Labbé, 2021), even though the population had a high rate of access to and acceptance of vaccination.

Studies showed that the return to in-person teaching led to earlier bedtimes and wake‑up times as well as decreased sleep time (Massar et al., 2021; Salfi et al., 2022), an increased rate of physical activity but also of self-reported stress (Massar et al., 2021) and advanced wake-up times, shortened sleep duration, increased sleep debt, worsened insomnia, and increased daytime sleepiness during the return to in-person learning (Kayaba et al., 2023).

Despite the fact that the social interactions of Barbieri et al.’s (2021) study population had decreased by half during the remote period, they almost fully recovered with the return to in-person activities. In a recent report, Wolters (2023) reported that relationship anxieties were a top issue among those under age 24 who were accessing a text helpline.

Students With Disabilities

In Canada, between 18% and 34% of college and university students have a disability (Canadian University Survey Consortium, 2020, 2021). The most common disabilities reported were psychological disorders, attention deficit hyperactivity disorder (ADHD), learning disabilities (LD), and chronic health problems (Fichten et al., 2018, 2022).

It is well known that delayed sleep phase disorder and other sleep difficulties are particularly common among individuals with certain disabilities. For example, research has shown increased levels of sleep difficulties among those with psychiatric disorders (Baglioni et al., 2016) and with ADHD (Becker, 2020; Gregory et al., 2017; Kwon et al., 2020; Wajszilber et al., 2018), as well as those with pain, chronic health conditions, and physical disabilities (de la Vega et al., 2019). Many individuals who are blind have sleep problems related to circadian regulation (Skene & Arendt, 2007).

The sleep and well-being of students without disabilities in various countries during the remote and in-person periods were affected in similar ways. But what about students with disabilities? The literature has typically dealt with difficulties that students with disabilities experienced during the remote period in accessing online courses and using the new technologies, along with issues related to academic accommodations and challenges both in Canada (Fichten et al., 2022) and the United States (Gin et al., 2021; Madaus et al., 2022). Another topic examined has been what academic activities and resources should be retained from the remote period once students are back to in-person learning (Faggella-Luby et al., 2023).

Chronotypes

Students’ sleep is typically affected by their *chronotype* (i.e., preference for sleep and activity at certain times during a 24-hour time frame; Adan & Natale, 2002). Diurnal preference is usually classified into three groups: eveningness, morningness, and intermediate, with the largest segment of the population being classified as intermediate.

There is a strong age-related aspect to chronotype, with those of post-secondary student age typically being of the eveningness chronotype (Fischer et al., 2017). Bakotic et al. (2017) found that university students with an eveningness chronotype self-reported more sleep debt and higher levels of daytime sleepiness. Morningness and intermediate chronotypes have been associated with better functioning (Walsh et al., 2022; Zhou et al., 2021). For example, Sun et al. (2019) demonstrated that medical students who were intermediate or morning types tended to have a lower risk of poor sleep quality than students with evening chronotypes.

The only study we found that investigated chronotype and sleep during both the remote and the return to in-person periods was a large investigation that showed that “younger” and older participants had similar total sleep times during the remote period but that evening‑type participants had a larger reduction of total sleep time during the return to in-person period (Salfi et al., 2022). Similarly, a recent study in France of individuals’ sleep both before and during Covid-19–related lockdown showed that, although sleep duration increased during lockdown, sleep quality decreased, especially among those with an eveningness chronotype (Bessot et al., 2023).

Disability, Chronotype, and Sleep Quality

Some disabilities can be linked to certain chronotypes and to a decrease in sleep quality, but it is important to analyze disabilities individually, since their symptomatology varies greatly. For example, in a study by Heikkala et al. (2022), individuals with an eveningness chronotype were found to be more sensitive to the effects of musculoskeletal pain than morning types. Also, people with autism have been shown to have more problematic sleep, with poorer sleep quality and longer sleep onset latency at night (Jovevska et al., 2020). Looking at mental health problems, eveningness chronotypes have been associated with anxiety and mood disorders, as well as with attentional difficulties (Taylor & Hasler, 2018). Also, post-secondary students with ADHD have been shown to be more likely to have an eveningness chronotype than other students (Becker et al., 2023).

We have been unable to find any studies investigating chronotype and sleep or well-being among students with disabilities either during the remote or the return to in-person periods. Therefore, we conducted this descriptive study comprised of both quantitative and qualitative phases.

Present Study

In a quantitative study, we examined sleep quality and chronotype among students with and without disabilities during both the remote and the in-person learning periods. The study population of this mixed-methods cross-sectional study attended a large metropolitan junior/community college. In parallel, we also explored the impact of the remote and in‑person periods on students’ sleep and well-being in a qualitative study in order to elicit more emotionally nuanced data to complement the quantitative approach.

For the quantitative study, we constructed three hypotheses as follows:

**Hypothesis 1.** We predicted that the sleep quality of students with disabilities would be worse than that of students without disabilities as the literature shows that sleep difficulties are common among those with ADHD (Becker, 2020); those with pain, chronic health conditions, and physical disabilities (de la Vega et al., 2019); and individuals with mental health–related disorders (Baglioni et al., 2016).

**Hypothesis 2.** Consistent with the results of Salfi et al. (2022) and Kayaba et al. (2023), we predicted that the remote and in-person periods would affect sleep differently, with better sleep during the in-person than during the remote periods.

**Hypothesis 3.** We hypothesized that individuals with an eveningness chronotype would have relatively better sleep quality during the remote period than during the in‑person period since the remote period better accommodated individuals with an eveningness type (Genta et al., 2021). Since research has shown that those with a morningness chronotype are better adapted to early waking than those with an eveningness chronotype (Li & Yang, 2023), we also expected that participants with a morningness chronotype would have relatively better sleep quality than those with other chronotypes during the in-person semester.

Method

Participants

Participants included 79 junior/community college students, 55 females, 19 males, and 5 who indicated a non-binary gender. Fifty-two students self-reported a disability (34 females, 14 males, 4 non-binary); 27 (21 females, 5 males) did not. Participants could self‑report one or more of the disabilities listed in Table 1, which shows that mental health, ADHD, LD, and autism were the most common disabilities that students self-reported. Although we did not ask, none of the students indicated that they had experienced a COVID-19 infection.

Table 1

Disability, Sleep Quality – In-Person Learning Semesters, and Chronobiology

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Disability | *n* | Sleep quality –in-person1 | | Chronotype total score2 | | Chronotype category |
|  |  | Mean | *SD* | Mean | *SD* |  |
| No disability | 27 | 4.87 | 1.63 | 12.32 | 3.98 | Intermediate |
| All with a disability | 52 | 5.18 | 1.63 | 13.03 | 4.03 | Intermediate |
| Specific disabilities |  |  |  |  |  |  |
| Mental health | 29 | 4.91 | 1.76 | 11.72 | 4.26 | Eveningness |
| Attention deficit hyperactivity disorder | 26 | 4.67 | 1.77 | 12.19 | 4.52 | Intermediate |
| Learning disability | 16 | 4.22 | 1.96 | 11.73 | 4.59 | Eveningness |
| Autism | 11 | 5.64 | 2.16 | 11.86 | 4.74 | Eveningness |
| Sensory | 6 | 4.50 | 2.07 | 12.00 | 6.54 | Intermediate |
| Prefer not to say | 3 | 7.00 | 2.65 | 15.33 | 3.21 | Intermediate |
| Chronic health | 2 | 5.50 | 2.12 | 7.75 | 0.35 | Eveningness |
| Mobility | 1 | 5.00 | N/A | 15.00 | N/A | Intermediate |

*Note*. There were 52 students with disabilities. 1Higher scores indicate better sleep quality. 2Chronotype score: <12 = eveningness, 12–17 = intermediate, > 17 = morningness.

Of those who indicated a disability, 22 indicated a single disability and 28 indicated two or more disabilities. The most common comorbidity was ADHD / mental health, followed by ADHD/LD, ADHD/autism, and LD/mental health. One participant reported autism/ mental health, one reported autism/LD, and one reported ADHD/sensory disability.

Although the gender composition of the two groups (disability/no disability) was not significantly different, χ2(1, 74) =.35, *p* = .87, students with disabilities were significantly older (*M* = 20.27, *SD* = 5.11, range = 18 to 43, mode = 18) than students without disabilities (*M* = 18.26, *SD* = 1.48, range = 18 to 24, mode = 18), *t*(77) = 2.00, *p* = .049.

Measures

Demographic Information

We collected information regarding gender, age, and the presence or absence of a disability, as well as self-report of the type of disability.

Reduced Morningness-Eveningness Questionnaire

Adan and Almirall’s (1991) five-item adaptation of Horne and Östberg’s (1976) original 19-item chronotype questionnaire (preference for sleep and activity at certain times) was used. The Reduced Morningness-Eveningness Questionnaire (rMEQ) has adequate internal consistency and high test-retest reliability (Randler, 2013). It also accurately categorizes individuals across the morningness-eveningness spectrum (Chelminski et al., 2000). Scores range from 4 to 25, with higher numbers indicating more morningness. We used scores on the rMEQ to group respondents into three categories: eveningness type (score between 4 and 11), intermediate type (score between 12 and 17), and morningness type (score 18 and 25).

Sleep Quality

Two 10-point Likert-type questions (1 = *very poor*, 10 = *very good*) evaluated sleep quality during the student’s last remote-learning semester (between March 2020 and summer 2021) and during their most recent (i.e., Fall 2021 on) in-person learning semester. The measure has good test-retest reliability and predictive validity (Bailes et al., 2023).

Qualitative Sleep and Well-Being Measures

Two open-ended questions asked participants about the positive and negative factors that affected their sleep and well-being during the remote and the in-person periods.

1. What were positive and negative factors that affected your sleep and well-being during the remote-learning period?
2. What were positive and negative factors that affected your sleep and well-being during the return to in-person learning period?

Procedure

During the remote period, all education in Québec’s junior/community colleges occurred exclusively online, mainly by Zoom. Starting in Fall 2021, students returned to in-person learning.

The host institution’s Research Ethics Board approved the protocol for this study. Participant recruitment took place in the Spring 2023 semester. We recruited current students with disabilities by asking the coordinator of the Student AccessAbility Centre to send invitations to all 688 students with disabilities registered for accommodations with the college. The students were asked to email a member of the research team if they had been enrolled in the college during at least one remote semester. To recruit other students, we used class presentations in five social-science courses of approximately 40 students in each. Again, we invited students to contact the researchers by email if they had been present in the college during at least one remote semester and they were interested in participating. We sent all interested students an information and consent form as well as the email-based questionnaire, which contained the Demographic Information, Sleep Quality, and rMEQmeasures*.*

We also invited students who indicated that they had been enrolled in the college during at least one remote semester to participate in one of two 1-hour Zoom focus groups during which they were asked about the impact of the remote and in-person learning periods on their sleep and well-being (Qualitative Sleep and Well-Being measures). We asked students who were unable to attend either focus group the same questions in an interview. A total of 21 students participated: 16 with a disability, 5 without a disability, 17 in a focus group, 4 in an interview. Focus groups lasted 1 hour, interviews 0.5 hour.

Two research team members took focus-group notes and combined their versions. One team member took notes during the individual interviews. We developed a coding manual to categorize participant responses (Jorgensen et al., 2023). Two team members conducted group thematic coding (cf. Braun & Clarke, 2006). We categorized the bulleted notes into either a sleep or a well-being category with either a positive or a negative valence (see Exhibit 1). Once we had coded all the responses, we analyzed the frequencies of each category for both the remote and in-person periods.

Exhibit 1

Sleep and Well-Being Coding Categories – Examples of Positive and Negative Responses From Participants

|  |  |  |  |
| --- | --- | --- | --- |
| Sleep or well-being – remote and in‑person | Category includes | Positive examples | Negative examples |
| Anxiety and stress | Covid-related concerns to do with the virus | “Less Covid stress so slept better” | “Would think about Covid at night and would be really stressed” |
| Commute | Commuting / Travel to and from college | “Relief of not having to travel to school” | “Had to wake up an hour earlier to get to class” |
| School | Course and school related activities | “Loved remote learning – left more time for other things” | “The stress of going online affected my sleep” |
| General | Relevant responses that did not fit into the other categories | “Slept well during Covid” | “I developed bad sleep habits during Covid” |

As compensation for participation, we gave all participants who had not been enrolled during a remote semester but who had completed the emailed questionnaires a $10 Amazon gift card. We sent those students who had completed the full study protocol a $30 Amazon gift card as a token of our appreciation.

Results

Sleep Quality

Testresults and Table 2 show no significant difference between the sleep quality of students with and without disabilities during the in-person period, *t*(77) = .76, *p* = .449.

Table 2

Relationship Between Disability and Sleep Quality – Remote and In-Person Learning Periods

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Remote period | | In-person period | |
| Group | *Mean* | *SD* | *Mean* | *SD* |
| With a disability | 6.02 | 2.80 | 5.64 | 1.93 |
| No disability | 6.86 | 1.22 | 4.21 | 2.20 |

*Note.* Higher scores indicate better sleep quality.

A 2-way mixed design analysis of variance (ANOVA; 2 Group (Disability / No Disability) x 2 Period (Remote / In-Person)) and means, presented in Table 2, show that sleep quality during the remote period was significantly better than during the in-person period, *F*(1, 26) = 4.93, *p* = .035, partial eta squared (*ηp2*) = .159. Neither the group effect nor the interaction was significant.

Chronotype

Means in Table 1 and *t*-test results show no significant difference in Chronotype total score between students with and without disabilities, *t*(77) =  .83, *p*=  .412. Mean Chronotype scores in Table 1 show that most students, both with and without disabilities, fell into the intermediate category, with several falling into the eveningness category. Among students with disabilities, 31% fell into the eveningness category, 58% into the intermediate category, and 11% into the morningness category. Among students without disabilities, the corresponding values were 34%, 56%, and 10%.

To explore the relationship between Chronotype and Sleep Quality, we carried out a series of Pearson correlations. These showed that for students With a Disability, younger age was significantly related to lower (i.e., eveningness) Total Chronotype score *r*(50) = .357, *p* = .009, and that lower Total Chronotype score was related to poorer Sleep Quality, during both the in-person and remote periods, *r*(50) = .453, *p* = .001 and *r*(19)=.409, *p* = .070, respectively. We obtained the same results when we added students Without Disabilities to the analysis. This suggests that younger students had lower morningness Chronotypes and that those with a more eveningness Chronotype had poorer Sleep Quality.

We also expected that participants with a morningness Chronotype would have relatively better sleep quality during the in-person period than those with an eveningness Chronotype and that the Sleep Quality of those with an eveningness Chronotype would be relatively better during the remote period. ANOVA test results and means presented in Table 3 show, again, that Sleep Quality during the remote period was significantly better than Sleep Quality during the in-person period, *F*(1, 25) = 4.25, *p* = .049, and that Chronotype significantly affected Sleep Quality, *F*(1, 25) = 4.79, *p* = .017. The interaction was not significant. Post hoc tests showed that Sleep Quality of eveningness individuals was significantly worse than that of morningness individuals (*p* = .026), with the Sleep Quality of morningness and intermediate participants not being significantly different (*p*= .066).

Table 3

Sleep Quality by Chronotype Category – Remote and In-Person Periods

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Chronotype category | Remote | | In-person | |
|  | Mean | *SD* | Mean | *SD* |
| Eveningness | 5.11 | 2.37 | 4.22 | 1.79 |
| Intermediate | 6.34 | 2.36 | 5.81 | 2.05 |
| Morningness | 9.00 | 1.73 | 5.67 | 2.31 |

*Note*. Higher scores indicate better sleep quality

Qualitative Sleep and Well-Being Measures

Figure 1 presents the numbers of participants out of the 28 (21 with a disability and 7 without a disability) who had been enrolled during the remote period and who made open-ended comments concerning the negative and positive impact of the remote and in‑person periods on Sleep (Figure 1a) and Well-Being (Figure 1b). This shows that, generally, there were relatively more negative and fewer positive impacts on sleep during the in-person period in the various sleep categories. Interestingly, there were relatively few negative comments about the impact of the COVID-19 virus on participants’ General Sleep or related Anxiety during the remote period. An outlier is the positive impact on Sleep‑related aspects of Lifestyle during the return to in-person learning.

A screenshot of a computer

Description automatically generatedFigure 1: Positive and Negative Impacts of the Remote and In-Person Semesters on Sleep (1a) and Well- Being (1b)

To obtain a better overall view of the positive and negative impact of the remote and in‑person semesters on Sleep, we combined the category scores. We did the same for Well‑Being. Figure 2 suggests that students had relatively worse Total Sleep experiences during the in-person period than during the remote period. The results for well-being are more difficult to interpret.

Figure 2: Total Number of Positive and Negative Comments About Sleep and Well-Being



*Note****.*** Numbers reflect the sum of the number of different responses in the five positive and the five negative coding categories. Maximum score = 5 categories X 28 participants = 140.

To enable statistical analyses that reflect both positive and negative experiences, we converted the frequency scores in Figure 2 to states of mind (SOM) ratios (Amsel & Fichten, 1990). This involves dividing the number of positive codes by the sum of positive and negative codes, with a correction of 1 in case either the negative or the positive frequency is 0. The larger the number, the more favourable the experience.

Table 4 shows the results of a series of paired *t*-tests on sleep and on well-being during the remote and in-person periods, with the results showing that students had significantly worse overall Sleep during the in-person period, *t*(17) = 2.14, *p* = .047. Although the direction of the findings is in the same direction, the Well-Being SOM ratio was not significant.

Table 4

Sleep and Well-Being States of Mind (SOM) Ratios – Remote and In-Person Periods

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Remote period | | In-person period | |
| Mean | *SD* | Mean | *SD* | Mean |
| Sleep SOM ratio | 0.490 | 0.1666 | 0.391 | 0.095 |
| Well-Being SOM ratio | 0.506 | 0.148 | 0.439 | 0.125 |

*Note*. The higher the value, the more favourable the experience

Discussion

Summary

We found no significant differences between students with and without disabilities either in chronotype or in sleep quality. Morningness and intermediate chronotypes were related to better sleep quality during both the remote and in-person periods. We also found that sleep quality was better during the remote period than during the in-person period, and again we found no differences between students with and without disabilities. We also found that students had little concern with the possibility of contracting COVID-19.

Sleep

Although first and second-year students have been shown to prefer in-person learning (Photopoulos et al., 2023), and although many investigations found poor sleep during the remote period (Al Miskry et al., 2021; Kayaba et al., 2023; Marelli et al., 2021), students in our study slept better during the remote-learning period than the in-person period. This was a robust finding, evident using both quantitative and qualitative techniques.

Once students returned to in-person learning, they reported poorer sleep quality, likely related in part to the need to wake up earlier to get to school. Thus, our results are contrary to Hypothesis 2. The only category where students reported more favourable comments related to the impact of return to in-person learning was lifestyle.

Even though students with disabilities experienced more academic difficulties than their nondisabled peers during the remote period (Fichten et al., 2022; Madaus et al., 2022), we found no differences in the sleep of students with and without disabilities. Although we had predicted (Hypothesis 1) that the sleep of students with disabilities would be worse than that of students without disabilities, this was not the case.

Overall, our findings suggest that, should there be another event that results in crisis-based remote learning, the sleep of students, whether they have a disability or not, should not be of concern. Also, as is the case with employees (Krajčík et al., 2023), universities may wish to provide course sections that are remote as well as those that are in person, thereby allowing students to choose based on their chronobiological status. That this is a reasonable strategy is shown in Kelly’s (2022) report that indicates that close to 50% of students want hybrid classes.

Well-Being

Figures 1b and 2 show open-ended responses of students to the question about how the remote and the in-person periods affected their well-being. We let participants define what they meant by well-being.

We should note that there were more comments related to the well-being category than to the sleep category. It is not surprising that, with the exception of the need to commute, most well-being comments were negative for both the in-person and the remote periods. It is surprising that, unlike results reported by Massar et al. (2021) and McMaughan et al. (2021), there was minimal anxiety related to the possibility of contracting the COVID-19 virus during both the remote and the in-person periods. Again, hybrid classes could provide the best option as we found that students’ lifestyles could benefit from this. Table 5 contains sample negative and positive comments about general well-being during the remote learning period and Table 6 about the in-person learning period.

Table 5

Sample Qualitative General Well-Being Comments – Remote Period

|  |  |
| --- | --- |
| Negative | Positive |
| I didn’t go out and my routine was disrupted  I have no schedule or structure  I really dislike being constantly at home  The days blended together – I wouldn’t remember what day it was  I would go for a day or two without showering  I was procrastinating and not engaged with school  I woke up, turned on the Zoom and went back to sleep  Not as motivated during the class  Not really ready for class because I woke up so close to the start time  I rolled out of bed still hung over and had to go to class  Someone would forget that I’m doing a class, and they would come into my room at a bad time  It is harder to interact on Zoom  I got up a minute before classes started – this created an unhealthy routine  I was really anxious because of having to talk to people on Zoom  Eyes would get tired looking at the screen all the time  Online I didn’t want to be in school – I couldn’t care less – I just wanted to get it over with | Isolation made me feel comfortable  I went to the gym regularly  I could take it easy when I needed to, and I could move around when I wanted to  I don’t have hours of time lost getting ready for school and getting to school  I was able to do more things during the remote  I could just show up 5 minutes before class online  I didn’t have to worry about getting lost at school  I had more time to do homework without the commute  I didn’t have any anxiety or worry – I just stayed home and enjoyed studying at home  I can spend the time I would be on the train to study  I was fine staying at home and being in my room  I loved online learning – I wasn’t getting distracted by a bunch of things |

Table 6

Sample Qualitative General Well-Being Comments – In-Person Period

|  |  |
| --- | --- |
| Negative | Positive |
| I felt really paranoid when I was out in public about catching Covid  I had to get supplies to school but would forget because I was so used to having these next to me when I was at home  Eating at school was more difficult and more expensive  I felt tired all the time  I was really anxious and paranoid now that I was back in the public  I was nervous and anxious about competition with classmates  Not as much time in the evening to do things | Getting back into routine was positive  I would be more excited – going out doing things I enjoy  Having to go to school imposed a schedule – that’s good  I was able to interact with my classmates  I really need the separation  My eyes are feeling better – no longer burned out from reading on the screen  Nice to see people and not just talk to them online  It is easier to have human interaction in person |

Table 6 continued

|  |  |
| --- | --- |
| Negative | Positive |
| I felt really paranoid when I was out in public Not as much time in the evening to do things  First semester back I was always late to class  Everything feels rushed in the morning  It’s really busy and tiring now that things are in-person  In-person return was mostly negative  School related stress from traveling back and forth – there is less time to do homework  There are more challenges in person  It’s hard to get back to in-person | Once I was back to school I put more effort into my appearance  My social life is thriving  My mental health improved because I wasn’t cooped up anymore  I had a routine  I could see my classmates and have more social interactions  Classmates help each other  In-person it’s 100% better for me – I don’t even need to think about it |

Chronotype

Again, we found no differences between students with and without disabilities. We did find, as have others (e.g., Mecacci et al., 1986), that older individuals were more likely to have a morningness chronotype and that individuals with an eveningness chronotype slept more poorly than those with morningness or intermediate chronotypes during both the remote and in-person periods.

We expected those with a morningness chronotype to have less difficulty adjusting to the return to in-person learning (Li & Yang, 2023), and we expected that those with an eveningness chronotype would sleep especially well during the remote period. However, our data did not reflect this. Thus, we did not confirm Hypothesis 3**.**

Limitations

It is important to mention that the sample size was relatively small and consisted mainly of female participants, that the order of sleep-quality questions was invariant, and that responses concerning the remote period were retrospective and took place long after the beginning of the COVID-19 remote-learning period. Also, sleep quality was measured using self-report, and well-being was self-defined. In addition, we did not obtain information on whether participants had had a COVID-19 infection. These limitations set limits on the generalizability of the findings.

Implications

Perhaps the most important implications of our findings are that students with and without disabilities were very similar in their views about the impact of the remote and in-person periods on sleep and that students were not concerned about the impact of the COVID-19 virus on their own health, either during the remote period or after the return to in-person learning. In addition, our findings show that chronotype had no specific impact on sleep during the remote or in-person periods.

Another issue relates to the topic of the return to in-person classes and studying. It is clear from the students’ comments that the return to in-person studies did *not* mean “return to normal” (i.e., the way things used to be). Although the literature has shown that students prefer in-person learning, their views about the impact of the return to in-person studies were mainly negative. As our findings in Table 4 (SOM ratio score = .391) show, students’ views about the impact of the return to in-person studies had more negative than positive impacts on their sleep. In addition, while the impact of the return to in-person learning on their well-being also had positive elements, Table 4 (SOM ratio = .439) also shows that the impact was mostly negative.

Favourable aspects of students’ experiences during the remote period are bound to have had an impact on the future “normal.” This includes the possibility of making online courses available for those who have lengthy commutes or those whose disability makes travel inconvenient, especially during the Canadian winter.

Our findings on chronotype are also important. As Fischer et al. (2017) noted, students show a peak in eveningness around 19 years, and they shift to an earlier chronotype thereafter. Thus, schedules in junior/community colleges and in the first year of university should take this phenomenon into account and ensure the availability of later schedules as these are likely to benefit students’ sleep quality and circadian alignment.

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