HIGH SCHOOL EDITION
Journal of Student Research
Volume 10 Issue 4 (2021)

Health Habits and Attitudes of Adolescents during the COVID-19 Pandemic

Eugene Reicher[1] and Jessica Ricci[#]

[1]Sierra Canyon School, Los Angeles, CA, USA
[#]Advisor

ABSTRACT

The ongoing COVID-19 pandemic has significantly impacted adolescent health and lifestyle. This study aims to evaluate adolescent physical and mental health, and behaviors and attitudes related to the COVID-19 pandemic. We surveyed 7-12th grade students in one Los Angeles independent suburban school (Sierra Canyon School) and statistically analyzed their anonymous responses. Two surveys were administered: Survey 1 in March 2021, when the school had been closed to in-person learning for approximately one year, and Survey 2 in May 2021, about six weeks after the school had opened for voluntary in-person learning. Survey 2 included additional demographic questions about gender, political affiliation, and race/ethnicity to evaluate the correlation between these factors and COVID-related issues. We used linear regression to analyze correlations between parameters characterizing various aspects of health habits, attitudes, and behaviors and evaluated the statistical significance of the differences using Student's *t*-test. We were most interested in analyzing the impact of school reopening by comparing the data in Survey 1 to Survey 2. The main result is that the return to in-school learning had a pronounced positive effect not only on the education quality but also on a number of various aspects of adolescent health and behavior. In addition, the survey showed interesting, sometimes surprising, correlations between distinct parameters, for example, the effects of gender on physical and mental health; or political affiliation on COVID-related attitudes and behavior.

Introduction

In March of 2020, the WHO declared the Coronavirus Disease 2019 (COVID-19) a pandemic. Several days later, California became the first US state to institute a statewide stay-at-home order (Helsel, 2020), which required all non-essential workers to severely limit daily activities and social interaction. This order and subsequent other mandates were in concordance with WHO and CDC guidelines that recommended masking, maintaining six-feet social distance, and frequent hand washing (CDC, 2021). As a result of these safety protocols, schools shifted towards virtual learning, significantly impacting adolescent health and lifestyle. Although not specifically focusing on adolescents, past research during the SARS pandemic of 2002-2004 showed higher rates of depression and PTSD in people in quarantine (Hawryluck, 2004).

While there have been published reports on public attitudes towards pandemic developments such as vaccines, school closures, and quarantine (Largent, 2020; Mirahmadizadeh, 2020; Song, 2020), as well as overall adolescent physical and mental health (Moitra, 2020; Patafio, 2021), there are limited data on the changes in health habits, behaviors, and attitudes of adolescents during the COVID-19 pandemic, particularly in the US.

The COVID-19 pandemic will have a formative effect on adolescents, and therefore it is important to evaluate its short and long-term ramifications. A more detailed evaluation of adolescent behavior, mental health, physical activity, diet, adherence to and attitudes towards COVID-related safety measures, and vaccination can help educators, health experts, and political leaders develop programs to assist adolescents during and after the pandemic. To address these issues, we administered two surveys (Appendix 1) to Sierra Canyon middle and

high school students. Survey 1 was administered in March 2021, when the school had been closed to in-person learning for about a year; Survey 2 in May 2021, about six weeks after the school had opened for voluntary in-person learning. To our knowledge, this is the first COVID-related survey given to adolescents in one particular school (based on a May 2021 PubMed search using the keywords "adolescent," "COVID-19," "health," "mental health," and "high school"). Sierra Canyon School has a diverse student population of a similar socioeconomic status (middle-high income), provides a rich learning environment, and is among the top schools in the Greater Los Angeles area. As detailed in Appendix 1, we sought to analyze different aspects of physical health and activities (regular exercising, taking a shower, etc.), dietary habits (having regular meals, eating fruits and vegetables, etc.), psychological wellbeing, social interactions; and COVID-related attitudes and behaviors (maintaining social distancing, attitudes towards vaccination, etc.).The analysis of surveys' responses showed that the return to in-school learning had a positive effect on various aspects of adolescent physical and mental health.

Methods

The project consists of self-administered surveys given to Sierra Canyon middle and high school students through Google Forms (Appendix 1). Survey 1 was made available on March 3rd, 2021, and Survey 2, on May 6th, 2021, to students attending a Sierra Canyon science class. The majority of students answered both surveys as they received an extra credit point, at their teacher's discretion, on their class grade as an incentive for survey completion. Only participating teachers knew the identity of the respondents, while the responses themselves were unknown to the teachers. Surveys 1 and 2 (Appendix 1) shared questions investigating the participants' physical health and dietary habits (questions (Q)3 to 7), mental health (Q8 and 9), social interaction (Q10 and 11), and COVID-related attitudes and behaviors (Q12 to 21). The physical health section encompasses participant behaviors regarding physical activity, personal hygiene, sleep, and time spent outside. The mental health section utilizes the Patient Health Questionnaire (PHQ-9; question Q8) and asks a related question about the difficulty to perform daily functions (Q9) (Spitzer, 1999). Other related questions are the frequency and quality of social interaction, e.g., with friends (Q10 and 11). COVID-related questions (Q12 to 21) cover participants' behaviors and attitudes to pandemic safety precautions, restrictions, and vaccines. Participants in both surveys stated their grade level, while Survey 2 also included demographic questions (Q22 to 24) such as gender, political affiliation, and race/ethnicity. The survey uses several types of questions, including multiple-choice, matrix, and linear scales. The total number of respondents to Survey 1 questions was 488; to Survey 2, 320.

Both surveys had three categories of participants with regard to in-person school-related interactions (Q2): none, some, or regular. The "no in-person interaction" subgroup included students who were exclusively distance learners. The "some" subgroup encompassed distance learners who occasionally came to school for extracurricular activities, for example, theater rehearsals. Importantly, however, the "regular in-person interaction" had a qualitatively different meaning in Survey 1 versus Survey 2. In Survey 1, when school was still closed, this subgroup included mostly athletes who came to school regularly for training. However, in Survey 2, "regular in-person interaction" encompassed students that returned to school. This difference is critical when analyzing the impact of school opening by comparing the responses to Surveys 1 and 2, particularly in the "regular in-person interaction" subgroup.

For statistical analyses, we first "digitized" the written answers, as detailed in Appendix 1, and created a "cumulative score" by summing the answers of individual respondents to all sub-questions in a given category. For example, the individual respondent's answers to questions 3, 4, and 7 were summed to generate their physical health cumulative score. For PHQ-9 (mental health), we followed the standard scoring system (Stanford Medicine). The range for the scores for different questions is stated in Appendix 1 and in Figure tables. For most parameters, the greater score denotes the better outcome, for example, a higher level of physical activity. By contrast, in the mental health questions (e.g., PHQ-9 cumulative scores 0-27), the greater score denotes a

more negative outcome. In the dietary habits Q6 score, bad habits (e.g., eating junk food) were assigned negative values, subtracting from the cumulative score.

We used Excel and Prism8 (GraphPad Prism, San Diego, CA) tools for statistical analysis. Correlation between different categories (e.g., physical and mental health) was analyzed by linear regression; the difference between the answers to a particular question (e.g., Survey 1 versus 2) was evaluated by Student's *t*-test. When correlation was negative, we stated R-values as negative. $p<0.05$ was considered statistically significant.

Results and Discussion

For each question, we have quantified the responses as a percent distribution of the total (Appendix 1); the figures show representative results of statistical analyses. Figure 1 presents examples of descriptive statistics illustrating changes (or lack thereof) in habits and behavior of the student population between Survey 1 (school closed) and Survey 2 (school reopened). In particular, school reopening had little effect on personal hygiene (Figure 1B), dietary habits (Figure 1C,D), or sleep patterns (Figure 1E). However, there were positive trends towards COVID vaccination in the student population (Figure 1F). Of note, the corresponding questions (Q21 in Appendix 1) were formulated differently in Survey 1 and 2 because vaccination was not made available to students' age group in early March of 2021. The percentage of high school students who resolved not to get vaccinated in Survey 1 (21%) decreased to 16% in Survey 2, with school reopened. More significantly, the percentage in Survey 1 of high schoolers committed to getting vaccinated (55%) increased in Survey 2 to the combined 68% of those who either got vaccinated by May 2021 (33%) or planned to get vaccinated (35%). In other words, after COVID vaccines were made available to adolescents, more than 50% of the eligible student population planned to be vaccinated or already had been.

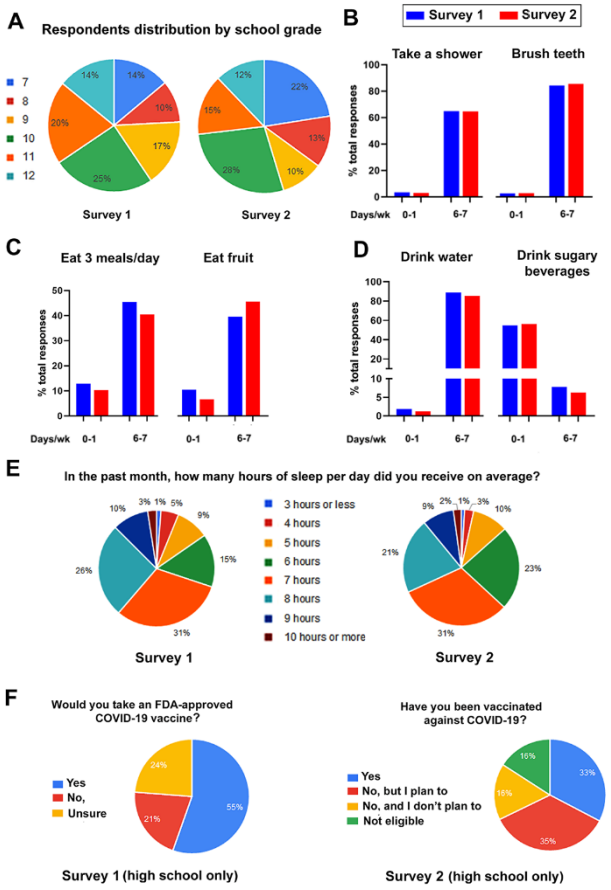


Figure 1. Descriptive statistics illustrating parameters of Surveys 1 and 2 (Appendix 1) characterizing physical health, dietary habits, and attitudes towards COVID vaccination. (**A**) Respondents' distribution according to school grade level. (**B**) Personal hygiene habits. (**C**,**D**) Dietary habits. (**E**) Sleep patterns. (**F**) COVID vaccination attitudes of high school students.

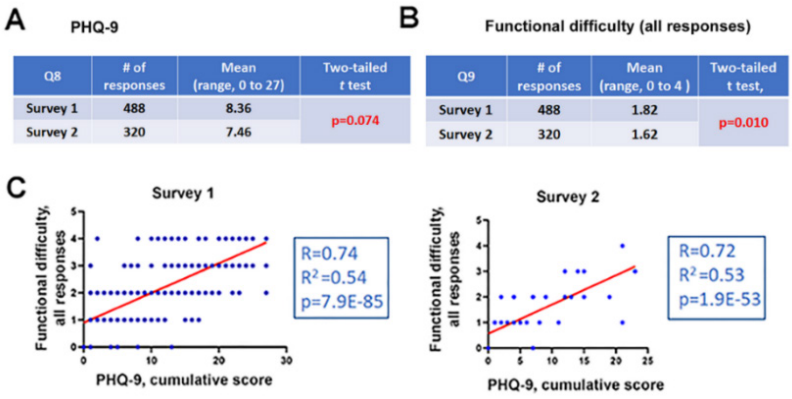
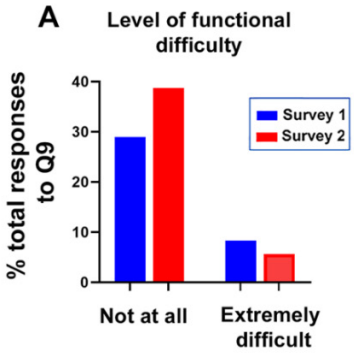


Figure 2. Parameters of psychological wellbeing in student population. (**A,B**) Student's *t*-tests for PHQ-9 and functional difficulty cumulative scores. (**C**) Linear regression for PHQ-9 and functional difficulty.

The surveys addressed an important question of how the COVID pandemic and school closure and reopening affected students' psychological wellbeing (Figures 2-4). School reopening positively impacted students' mental health as assessed by the commonly used Patient Health Questionnaire (PHQ-9; Spitzer, 1999), although the trend did not reach statistical significance (p=0.074; Figure 2A). In particular, there was a significant decrease in the difficulty of performing daily functions (Figure 2B). (Note that higher scores on PHQ-9 (Q8 in Appendix 1) or functional difficulty (Q9) questions signify a worse mental health condition.) That these two parameters of psychological wellbeing are tightly correlated is demonstrated by their linear regression (Figure 2C). Tellingly, the mean value of the PHQ-9 cumulative score we obtained (Figure 2A) is classified as mild depression (Stanford Medicine).

As another illustration of the changes, the percentage of students who reported extreme difficulty in performing daily functions decreased with school reopening, while that of students with no functional difficulty increased (Figure 3A). The data in Figure 2 and Figure 3A relate to the whole student population surveyed. Interestingly, the analysis showed an even greater improvement in performing daily functions within the "regular in-person contacts" subgroup (Figure 3B, top table), which in Survey 2 encompassed students who returned to school. In contrast, there was no improvement (and even an upward trend) in functional difficulty among students in the "no in-person school contacts" subgroup (Figure 3B, bottom table), which in Survey 2 consisted of those who continued staying at home.



B Functional difficulty (subgroups)

Regular in-person contacts			
Q9	# of responses	Mean (range, 0 to 4)	Two-tailed *t* test
Survey 1	256	1.78	p=0.0013
Survey 2	193	1.47	

No in-person contacts			
Q9	# of responses	Mean (range, 0 to 4)	Two-tailed *t* test
Survey 1	187	1.82	p=0.401
Survey 2	48	2.00	

Figure 3. Changes in the level of functional difficulty with school reopening. (**A**) Effect of school reopening on the lowest and highest levels of difficulty performing daily functions. (**B**) Changes in the level of functional difficulty within the subgroups of students with regular or no in-person school contacts (*t*-test).

A related aspect of students' psychological wellbeing is how the respondents assessed the quality of their social interactions (e.g., with friends). This parameter markedly improved with school reopening (Figure 4A). The effect was even more pronounced (almost two-fold increase; Q11 in Appendix 1) among students who specified the highest quality of social interaction (Figure 4B). Interestingly, the (negative) correlation between the quality of social interaction and mental health (PHQ-9) scores was only moderately tight (Figure 4C); it became stronger in Survey 2, i.e., with school reopening.

Compared with marked effects of school reopening on students' mental health, there was lesser change in the parameters of their physical health, including personal hygiene and dietary habits, and sleep patterns. In fact, the surveys did not show any significant effect on the above parameters (Figure 1B-E). The overall/cumulative score for students' physical health (based on Q3,4,7), however, did improve significantly between Survey

1 and 2 (Figure 5A). Linear regression analyses (Figure 5B,C) showed a moderately strong positive correlation between the overall physical health and good dietary habits, and a somewhat stronger (negative) correlation with parameters of mental health (PHQ-9 cumulative score). One, quite expected, factor contributing to improved physical health habits has been the increased time spent outside (Figure 5D), particularly among students with the highest rate of outside activities (Figure 5E). Of note, the overall level of students' physical health was quite high in both surveys (mean cumulative score of 12.1-12.7 out of 15; Figure 5A), contrasting the mild-depression level of their mental health (mean PHQ-9 cumulative score of 7.5-8.4 out of 27; Figure 2A).

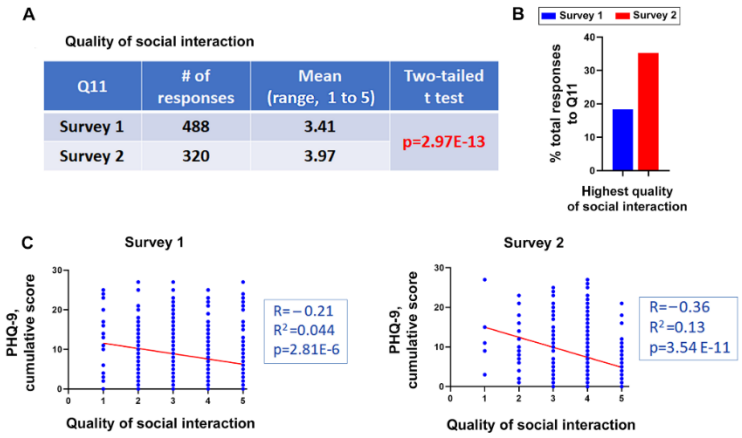


Figure 4. Changes in the quality of students' social interactions with school reopening. (**A,B**) Effects of school reopening on the overall (**A**; *t*-test) and the highest (**B**; score 5) level of social interaction quality. (**C**) Linear regression between the quality of social interaction and mental health (PHQ-9).

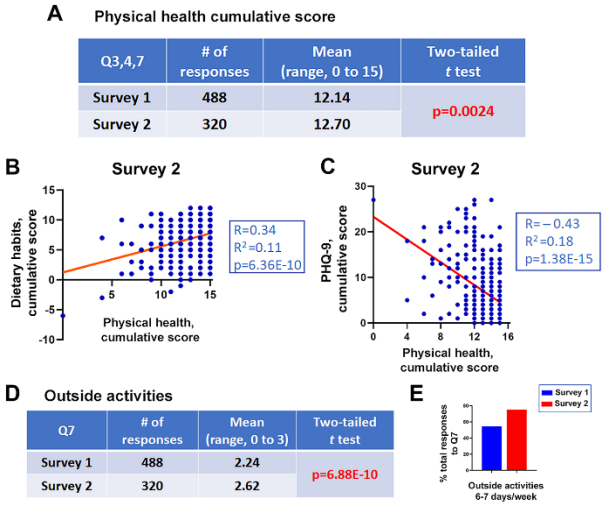


Figure 5. Changes in physical health habits with school reopening. (**A,D**) Effects of school reopening (*t*-test) on (**A**) the overall physical health score and (**D**) the rate of outside activities. (**B,C**) Linear regression analyses for the correlations of the overall physical health with dietary habits scores (positive), or with PHQ-9/mental health cumulative score (negative). (**E**) Percentage of students reporting the highest outside activity rate.

The analyses of various aspects of COVID-related attitudes and behavior, as well as data on vaccination, are presented in Figures 6-8. Overall, student attitudes towards COVID-related governmental measures (questions Q14-16 in Appendix 1), including their support for school closure (in Survey 1) and reopening (in Survey 2), became more positive with time (Figure 6A). On the other hand, COVID-related behavior (Q12; social distancing, masking, etc.) became somewhat more "relaxed," as shown by decreased mean score (Figure 6B), likely in response to school reopening and increased vaccination rate (Figure 1E,F) at the time of Survey 2. Note, however, that this was before the more infectious Delta variant of the virus became prevalent. The correlation between COVID-related attitudes and behavior (Figure 6C; linear regression analysis of Survey 1 data) was rather modest; in Survey 2 that correlation was even weaker (not illustrated). Panels D–F in Figure 6D present examples of statistics for specific COVID-related questions, such as the opinions on the effectiveness of government's strategies and restrictions at reducing the pandemic spread (Q14 in Appendix 1). Compared to Survey 1, the percentage of those who answered "not effective" decreased almost by half in Survey 2, while that of the most favorable "very effective" answer increased by 70%, indicating a pronounced shift towards a more positive attitude. Interestingly, whereas 10.9% of all Survey 1 respondents were against school closure (Q15 in Appendix 1), only 3.1% of students were against school reopening (Q16) at the time of Survey 2 (Figure 6E; the "not at all supportive" data). Correspondingly, the percentage of students who were somewhat or very supportive of school closure (55.1%) was less than of those (64.1%) with similarly positive attitudes towards school reopening (Figure 6E). Perhaps the most clear expression of students' attitudes towards school closure and reopening is their answers to Q20 about the effect on the quality of learning (Figure 6F). The percentage of students in Survey 2 who thought that their education quality significantly worsened with school reopening (8.8%) was 2.4-fold smaller than of those who expressed the same opinion about school closure (21.3%) in Survey 1 (Figure 6F). Conversely, the percentage of students in Survey 2 who thought that their education quality significantly improved with school reopening (20.0%) was 2.7-fold greater than of those who considered that school closure had a beneficial effect (7.4%) in Survey 1 (Figure 6F).

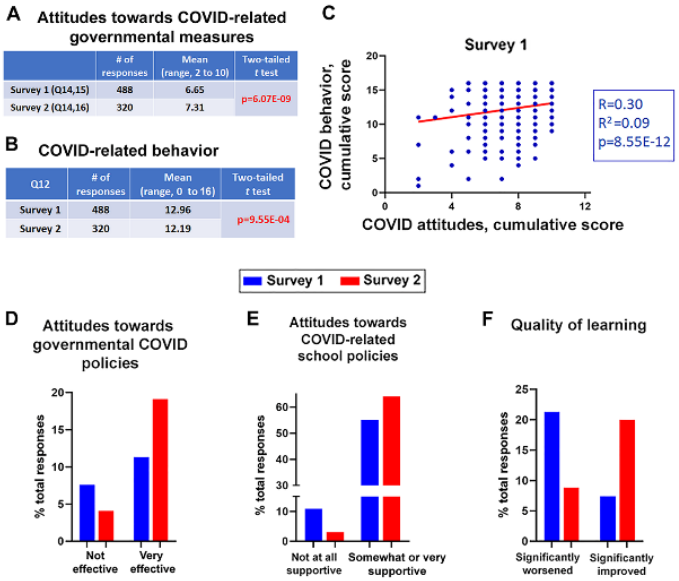


Figure 6. COVID-related attitudes and behavior. (**A,B**) Changes in student (**A**) attitudes towards the effectiveness of government's strategies at reducing pandemic spread and (**B**) COVID-related behavior (*t*-test).

(**C**) Correlation between COVID-related attitudes and behavior (linear regression of Survey 1 cumulative scores). (**D–F**) Trends in student responses to specific questions regarding (**D**) attitudes towards governmental COVID-related policies, (**E**) support for school closure or reopening, and (**F**) effects of school closure and reopening on the quality of learning.

Survey 2 included questions about gender, race/ethnicity, and political affiliation (i.e., identifying as Democrat, Republican, independent, etc.). Figure 7 presents the analyses of students' responses to COVID-related questions testing the potential impact of their political affiliation. This was interesting and relevant in view of the widespread skepticism, even misinformation, among US citizens identifying themselves as Republicans with regard to COVID protective measures (such as masking, avoiding large gatherings, etc.) and vaccination. Students identifying as Republicans did, indeed, adhere less to the recommended COVID-protective measures (Figure 7A), such as social distancing or masking (Q12 in Appendix 1). However, to the credit of the Sierra Canyon student population, there was no statistically significant difference (*t*-test results) between self-identified Democrats and Republicans with regard to planned or actual vaccination (Figure 7B) or in COVID-related attitudes (not illustrated). The responses to COVID-related attitudes questions (Q14-16 in Appendix 1) did not show significant difference even when tested as Democrats versus Republicans plus Independents (not illustrated). On the other hand, students identifying as Republicans were more likely than Democrats (Figure 7C) to participate unmasked in public activities, such as indoor dining or attending sports games, after being vaccinated (Q17 in Appendix 1).

A COVID-related behavior

Q12	# of responses	Mean (range, 0 to 16)	Two-tailed *t* test
Affiliated with Democrats	154	12.97	p=0.0028
Affiliated with Republicans	35	10.54	

B Vaccination practices

Q21	# of responses	Mean (range, -1 to 2)	Two-tailed *t* test
Affiliated with Democrats	154	0.83	NS
Affiliated with Republicans	35	0.54	

C Participate in public activities if vaccinated

Q17	# of responses	Mean (range, 1 to 5)	Two-tailed *t* test
Affiliated with Democrats	154	3.48	p=1.41E-04
Affiliated with Republicans	35	4.43	

Figure 7. COVID-related attitudes and behavior: impact of political affiliation. Analyses of Survey 2 data (*t*-test) on the differences between responses of students self-identified as Democrats or Republicans with regard to (**A**) COVID-related behavior, (**B**) attitudes towards vaccination and the respondents' vaccination status, and (**C**) the likelihood of participating in public activities without masks if vaccinated.

A Physical health cumulative score

Q3,4,7	# of responses	Mean (range, 0 to 15)	Two-tailed *t* test
Male	163	13.34	p=1.72E-06
Female	152	12.15	

B Physical exercise

Q3	# of responses	Mean (range, 0 to 3)	Two-tailed *t* test
Male	163	2.25	p=2.08-06
Female	152	1.75	

C Dietary habits

Q6	# of responses	Mean (range, -6 to 12)	Two-tailed *t* test
Male	163	7.38	p=0.0005
Female	152	6.21	

D Mental health (PHQ-9)

Q8	# of responses	Mean (range, 0 to 27)	Two-tailed *t* test
Male	163	4.78	p=2.81E-12
Female	152	10.01	

E COVID-related behavior

Q12	# of responses	Mean (range, 0 to 16)	Two-tailed *t* test
Male	163	11.85	p=0.076
Female	152	12.5	

Figure 8. Gender effects on students' health habits and COVID-related behavior. Male versus Female differences (*t*-test) in Survey 2 responses regarding the overall physical health (**A**), physical exercise (**B**) and dietary (**C**) habits, mental health (**D**; PHQ-9 cumulative score), and COVID-related behavior (**E**).

The survey also revealed gender effects, sometimes quite large and surprising, on various aspects of students' health, attitudes, and behavior (Figure 8). Males scored statistically significantly better than females with regard to overall physical health (Figure 8A) and, specifically, exercising (Figure 8B) – possibly, because of a higher prevalence of male athletes or a difference in season schedules. Perhaps more surprisingly, the mean dietary habits cumulative score was also greater (i.e., more positive) for males than females (Figure 8C). But the most pronounced gender effect was manifested in mental health parameters, resulting in strikingly worse PHQ-9 cumulative score for females than males (Figure 8D). In fact, the mean value of this score for the female student population (10.01; Figure 8D) is classified as moderate depression (Stanford Medicine). At the same time, the survey did not show a significant difference (*t*-test) between male and female student population with regard to COVID-related behavior (Figure 8E) or attitudes (not illustrated). In fact, the trend in COVID-related behavior was more favorable for female students, almost reaching statistical significance (Figure 8E).

Conclusion

The two surveys we administered addressed three main categories of issues: physical health (including personal hygiene and dietary habits), mental health, and COVID-related attitudes and behavior. The mental health section, in particular, included PHQ-9 questionnaire that is commonly used to evaluate depression (Spitzer, 1999) and questions on satisfaction with social interactions (e.g., with friends). The COVID-related questions assessed participants' adherence to safety measures, such as masking and social distancing, and their attitudes and behavior regarding vaccination. Comparing the responses in Survey 1 versus Survey 2 allowed us to assess the effects of school reopening; while analyzing the responses to demographic questions (in Survey 2) revealed interesting, sometimes surprising, effects of gender or political affiliation on student habits, attitudes, and behavior.

Our study provides a detailed "snapshot" of adolescents' health habits, attitudes and behavior during the COVID-19 pandemic, based on the data from student population of one particular Southern California School. Overall, judged from the parameters we analyzed, there was little change in students' physical health, particularly hygiene and dietary habits, between the "school closed" and "school open" conditions (except for the expected increase in outdoor activities). In contrast, school reopening had a pronounced positive effect on the parameters of mental health. That this improvement was, indeed, due to school reopening is supported by the data that the difficulty of performing daily functions decreased only in the "regular in-person contacts" subgroup (that is, for students who returned to school) but not for students who remained at home (the "no in-person contacts" subgroup). The quality of social interaction is another parameter which improved with school reopening; the importance of this parameter is illustrated by its negative correlation with the PHQ-9 cumulative score indicating depression. Perhaps not surprisingly, the majority of respondents thought that their quality of learning improved with school reopening while it worsened with school closure.

The surveys also showed that after school reopening, students had more favorable attitudes towards governmental COVID policies, including school policies, with the majority of respondents being supportive of California's school reopening guidelines. There was no overall significant difference in COVID-related attitudes between the students identifying as Democrats or Republicans, although we found statistical difference with regard to certain aspects of COVID-related behavior (such as participating in public activities unmasked after being vaccinated). Importantly, however, the majority (68%) of eligible students, irrespective of their political affiliation, intended to get vaccinated or already had been by May 2021.

Interestingly, female students appeared to adhere more than their male schoolmates to safer COVID-related behavior (although the difference was not statistically significant). What was surprising is that the survey showed a pronounced gender effect on physical and mental health parameters, with female students faring worse, especially on the PHQ-9.

In conclusion, the main result of our study is that the return to in-school learning had a pronounced positive impact on various aspects of adolescent health and behavior during the COVID-19 pandemic.

Limitations

Our study was done in one particular school, which obviously limits its general relevance but also presents certain advantages of the student population being diverse while relatively homogeneous in terms of socioeconomic status (middle-high income level) and dedication to academic and athletic excellence. As specified in the Introduction, a major incentive for responding to the surveys was that they were administered through science classes (based on graduation requirements, all Sierra Canyon middle and high school students are expected to take at least 3-year science courses) and assigned as extra credit. However, one cannot exclude voluntary response and under-coverage bias, especially regarding personal hygiene or mental health questions. A limitation of the study is that Survey 1 was administered in the middle of the pandemic, not at the beginning, which would have allowed for a longer interval between the surveys and larger time period for the potential effects of school closure. Another limitation is that, for technical reasons, Survey 2 had to be administered relatively soon (about six weeks) after school reopening. To help making the responses more precise, questions were designed to span shorter, defined periods of time, mostly referring to respondents' experiences during the past one to four weeks. Unfortunately, Survey 1 did not include questions about gender, race/ethnicity and political affiliation, which would have allowed the analyses of how, for example, school reopening affected male versus female habits, attitudes, and behavior. More importantly, if the participants' responses were linked between Survey 1 and 2 (while remaining anonymous), this would have provided the opportunity for individual, not aggregate, "longitudinal" analyses of students' health habits, attitudes, and behavior.

Acknowledgments

I would like to thank Dr. J. Ricci, my school mentor, for her guidance that was crucial for the fulfillment of this project, and Dr. A.S. Gukovskaya (UCLA) for helpful discussion and advice on presenting the data and statistical analyses, particularly on the use of GraphPad Prism software.

References

Centers for Disease Control and Prevention. (2021). *How to Protect Yourself & Others.* Available at https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/prevention.html.

Hawryluck, L., Gold, W. L., Robinson, S., Pogorski, S., Galea, S., & Styra, R. (2004). SARS control and psychological effects of quarantine, Toronto, Canada. Emerging infectious diseases, 10(7), 1206–1212. https://doi.org/10.3201/eid1007.030703

Helsel, P. (2020, March 19). California issues statewide stay-at-home order in coronavirus fight. *NBC News.* https://www.nbcnews.com/news/us-news/california-issues-statewide-stay-home-order-coronavirus-fight-n1164471

Largent, E. A., Persad, G., Sangenito, S., Glickman, A., Boyle, C., & Emanuel, E. J. (2020). US Public Attitudes Toward COVID-19 Vaccine Mandates. JAMA Network Open, 3(12). https://doi.org/10.1001/jamanetworkopen.2020.33324

Mirahmadizadeh, A., Ranjbar, K., Shahriarirad, R., Erfani, A., Ghaem, H., Jafari, K., & Rahimi, T. (2020). Evaluation of students' attitude and emotions towards the sudden closure of schools during the COVID-19 pandemic: a cross-sectional study. BMC Psychology, 8(1). https://doi.org/10.1186/s40359-020-00500-7

Moitra, P., Madan, J., & Shaikh, N. I. (2020). Eating habits and sleep patterns of adolescents with depression symptoms in Mumbai, India. Maternal & Child Nutrition, 16(S3). https://doi.org/10.1111/mcn.12998

Patafio, B., Miller, P., Baldwin, R., Taylor, N., & Hyder, S. (2021). A systematic mapping review of interventions to improve adolescent mental health literacy, attitudes and behaviours. Early Intervention in Psychiatry. https://doi.org/10.1111/eip.13109

Song, W., Sawafta, F. J., Ebrahem, B. M., & Jebril, M. A. (2020). Public attitude towards quarantine during the COVID-19 outbreak. Epidemiology and Infection, 148. https://doi.org/10.1017/S0950268820002204

Spitzer, R. L., Kroenke, K., & Williams, J. B. (1999). Validation and utility of a self-report version of PRIME-MD: the PHQ primary care study. Primary Care Evaluation of Mental Disorders. Patient Health Questionnaire. JAMA, 282(18), 1737–1744. https://doi.org/10.1001/jama.282.18.1737

Stanford Medicine. *Patient Health Questionnaire (PHQ-9).* Available at https://med.stanford.edu/fastlab/research/imapp/msrs/_jcr_content/main/accordion/accordion_content3/download_256324296/file.res/PHQ9%20id%20date%2008.03.pdf