Wellness Center Utilization, Adolescent Mental Health, and School Attendance

Rebecca Dudovitz, MD, MSHS; Christopher Biely, MS; Michelle Gallardo, BA; Nicholas Jackson, PhD

Background: The US Surgeon General recently issued an advisory to raise awareness regarding the growing youth mental health crisis (https://www.hhs.gov/sites/default/files/surgeon-general-youth-mental-health-advisory.pdf). Rates of depression, anxiety, and other mental health needs have only increased in the last decade, and it is hypothesized that poor adolescent mental health has been exacerbated by the Covid-19 pandemic.[1-3] Poor mental health has been consistently shown to be associated with poor short- and long-term academic and health outcomes.[4,5] Further, there are huge disparities in access to mental health services, with low-income, Black, and Latine teens less likely to connect to mental health care despite high needs.[6-8] School-based health services have been hypothesized to address many of the barriers to accessing mental health care.[9,10]

However, it remains unknown who is likely to access school-based health services, particularly during COVID-related school closures and ongoing pandemic, and whether these school-based services, including mental health services, improve academic outcomes. The Los Angeles Unified School District is the largest public school system in California and the second largest district in the United States. Studying student engagement in school-based healthcare, including mental health services, and its impact on academic performance can yield critical information to support future investments in school-based healthcare.

Objectives: We sought to 1) compare SBHC utilization before and after pandemic-related school closures across Wellness Centers affiliated with LAUSD; and 2) Determine whether SBHC utilization was associated with improved school attendance among LAUSD students accessing SBHCs for any services and for mental health services.

Methods: We conducted a secondary analysis of The LA Trust Data xChange, a de-identified dataset containing demographic and encounter data extracted from electronic health records from 16 SBHCs and demographic and attendance data from LAUSD on all enrolled students from 2015-2021.

For our first objective, we analyzed data from the 12 Wellness Centers that remained open during the COVID-19 Pandemic, including patient demographics and ICD diagnosis and CPT billing codes. We used the Clinical Classifications Software Refined (CSSR) to identify encounters for common conditions sensitive to primary care or represented in the National School Based Health Alliance National Quality Indicators. Chi-square analysis with p-values obtained using cluster-robust variance estimation to account for clustering within clinics compared demographic characteristics and diagnoses before (July 1, 2015-February 29, 2020) and during (from March 1, 2020-March 31, 2021) pandemic-related school closures.

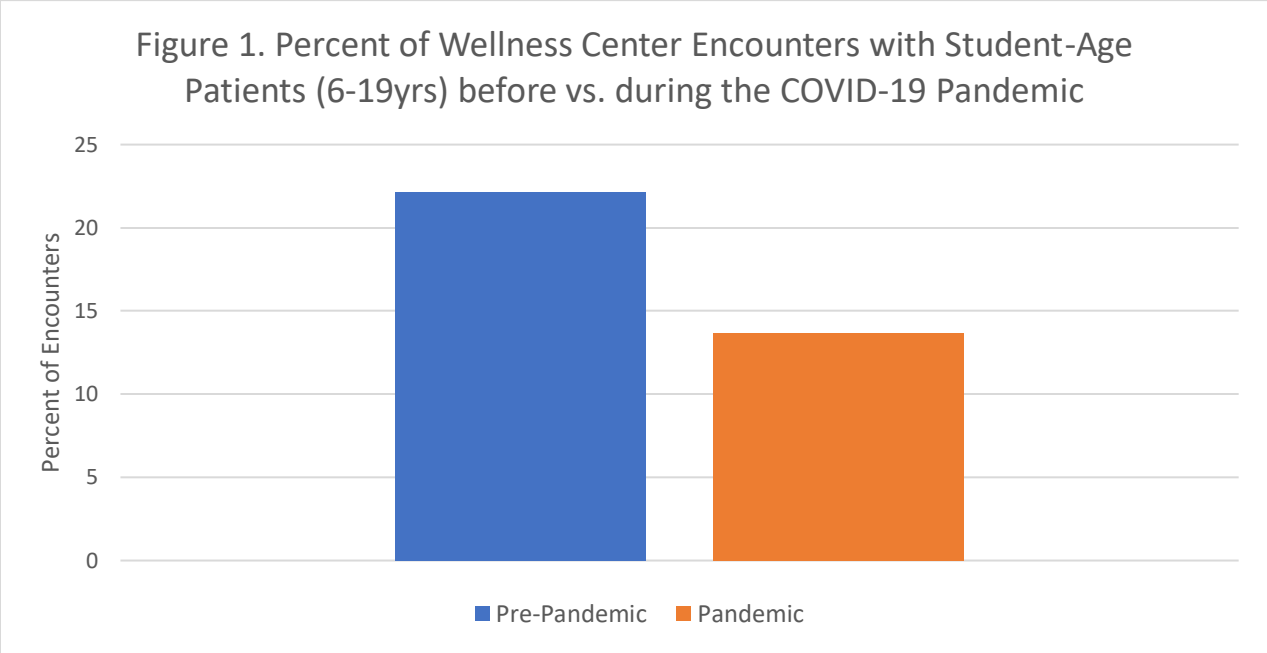
For our second objective, we analyzed demographic and attendance data from all LAUSD students who had at least one encounter at a school-based health center from July 1, 2015-March 31, 2021. We compared the trajectories in the proportion of full-days present at school each month during the school years prior to students' first SBHC visit to the attendance trajectory after the first visit to the SBHC. We used linear regression models accounting for repeated measures within students over time and controlling for SBHC site with an interaction term to test whether the attendance trajectory prior to the first visit was significantly different

from the trajectory after the first visit. Sensitivity analyses explored whether results were similar after controlling for student age, gender, race and ethnicity and when the sample was limited to those with 6 and 12 months of attendance data before and after the first SBHC visit. Similar models tested whether a SBHC encounter for mental health services was associated with a change in attendance trajectory.

Results: During the pandemic, study SBHCs conducted 52,530 encounters and maintained ~4,040 encounters/month. Compared to the pre-pandemic period, during the pandemic, smaller percentage of encounters were with student-aged patients, ages 6-19 (13.7% vs. 22.1%, p=0.001 Table 1, Figure 1).

Table 1. Differences in Encounters with Student-Aged Patients before vs. during the COVID-19 Pandemic

	Pre-Pandemic (7/1/15-2/29/20) % (N)	**Pandemic** (3/1/20-3/31/21) % (N)	**p-value** (cluster-robust variance estimation)
Students	22.14 (50,092)	13.70 (7,197)	**< 0.001**
Non-Students	77.86 (176,121)	86.30 (45,333)	
Total Encounters	N = 226,708	N = 52,537	



Among student-aged patients, the percent of encounters with boys increased during the pandemic (Table 2), while among adult patients, the percent of encounters with seniors increased during the pandemic. As seen in Table 3, the frequency of encounters for annual preventative health exams increased for school-aged patients (32.5% vs. 25.7%, p=0.04 Table 3) but decreased for other age groups (17.9% vs. 24.6%, p=0.01 Table), while the frequency of encounters for mental health problems increased for both school-aged patients (10.0% vs. 3.7%, p<0.001 Table 3) and other age groups (13.6% vs. 8.1%, p<0.001 Table 4).

Table 2. Differences in Demographic Characteristics for Wellness Center Encounters before and during the COVID-19 Pandemic						
	Students % (N)			**Non-Students** % (N)		
	Pre-Pandemic (7/1/15-2/29/20) N=50,092	**Pandemic** (3/1/20-3/31/21) N=7,197	**p-value** (cluster-robust variance estimation)	**Pre-Pandemic** (7/1/15-2/29/20) N=176,121	**Pandemic** (3/1/20-3/31/21) N=45,333	**p-value** (cluster-robust variance estimation)
Sex			**0.015**			0.938
Female	61.74 (30,921)	57.11 (4,110)		64.64 (113,840)	64.61 (29,285)	
Male	38.26 (19,164)	42.89 (3,087)		35.36 (62,265)	35.39 (16,044)	
Race/Ethnicity			0.135			0.127
Asian	0.65 (304)	0.73 (47)		0.77 (1,282)	1.03 (437)	
Black	17.19 (8,045)	14.72 (951)		15.76 (26,230)	17.73 (7,493)	
Latine	78.06 (36,544)	79.59 (5,143)		79.16 (131,749)	76.96 (32,528)	
White	3.95 (1,849)	4.86 (314)		4.24 (7,063)	4.18 (1,766)	
Two or more	0.15 (72)	0.11 (7)		0.06 (101)	0.10 (43)	
Age			0.074			**0.01**
0-5	0 (0)	0 (0)		7.24 (12,751)	6.75 (3,061)	
6-12	25.31 (12,680)	36.81 (2,649)				
13-19	74.69 (37,412)	63.19 (4,548)				
20-64	0 (0)	0 (0)		85.58 (150,726)	84.58 (38,346)	
65+	0 (0)	0 (0)		7.18 (12,644)	8.67 (3,929)	

Table 3. Differences in Diagnoses for Wellness Center Encounters before and during the COVID-19 Pandemic						
	Students % (N)			**Non-Students** % (N)		
	Pre-Pandemic (7/1/15-2/29/20) N=50,092	**Pandemic** (3/1/20-3/31/21) N=7,197	**p-value** (cluster-robust variance estimation)	**Pre-Pandemic** (7/1/15-2/29/20) N=176,121	**Pandemic** (3/1/20-3/31/21) N=45,333	**p-value** (cluster-robust variance estimation)
Well Child Exam/ Preventative Health Maintenance Exam			**.042**			**.012**
No	74.26 (37,196)	67.47 (4,856)		75.36 (132,717)	82.10 (37,219)	
Yes	25.74 (12,896)	32.53 (2,341)		24.64 (43,404)	17.90 (8,114)	
Diabetes			.262			.785
No	99.79 (49,989)	99.72 (7,177)		85.05 (149,798)	84.55 (38,329)	
Yes	0.21 (103)	0.28 (20)		14.95 (26,323)	15.45 (7,004)	
Hypertension			.377			.429
No	99.86 (50,020)	99.76 (7,180)		86.55 (152,440)	84.51 (38,310)	
Yes	0.14 (72)	0.24 (17)		13.45 (23,681)	15.49 (7,023)	
Hyperlipidemia			**.001**			.122
No	98.36 (49,271)	96.82 (6,968)		89.21 (157,116)	86.14 (39,049)	
Yes	1.64 (821)	3.18 (229)		10.79 (19,005)	13.86 (6,284)	
Obesity			.260			.594
No	89.85 (45,008)	88.09 (6,340)		84.09 (148,100)	81.92 (37,136)	
Yes	10.15 (5,084)	11.91 (857)		15.91 (28,021)	18.08 (8,197)	
Sexually Transmitted Infection			.088			.655
No	99.46 (49,824)	99.67 (7,173)		99.56 (175,345)	99.55 (45,127)	
Yes	0.54 (268)	0.33 (24)		0.44 (776)	0.45 (206)	
Mental Health			**<.001**			**<.001**
No	96.33 (48,256)	90.01 (6,478)		91.89 (161,832)	86.44 (39,186)	
Yes	3.67 (1,836)	9.99 (719)		8.11 (14,289)	13.56 (6,147)	

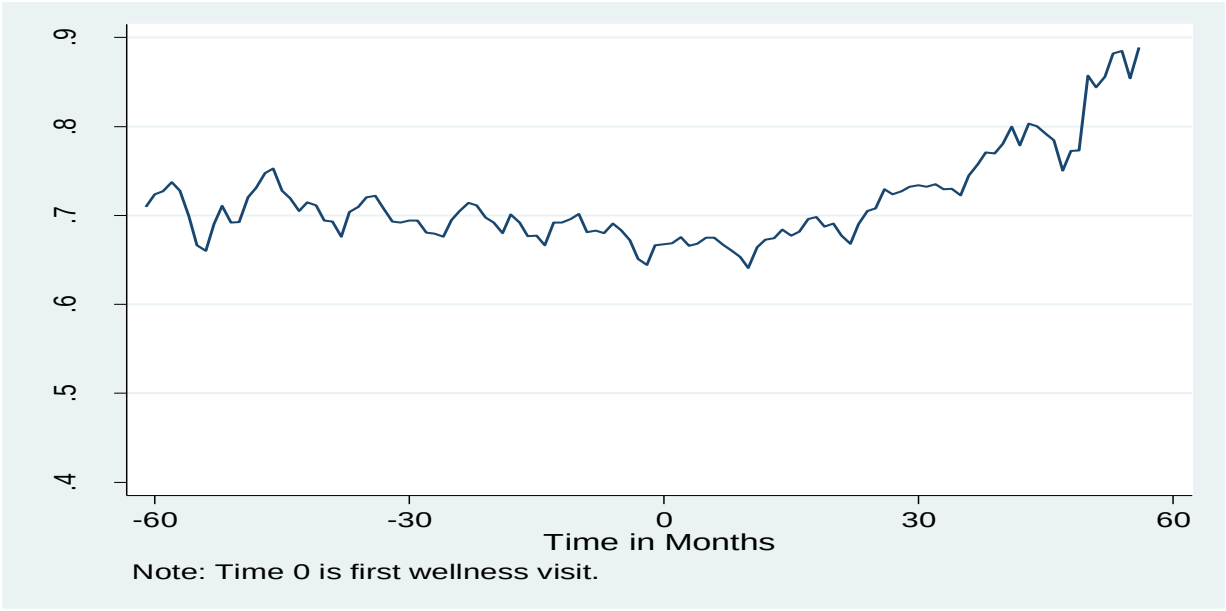
We compared students who had at least one school-based health center visit for a mental health concern with those who visited a school-based health center for other concerns. As seen in Table 4, students who visited a school-based health center for a mental health concern were of similar sex and age to those who visited for other reasons. However, those with a mental health visit were more likely to identify as Latine and less likely to identify as Asian, Black, White, or multi-racial/multi-ethnic.

Table 4. Demographic Characteristics of Students with a Mental Health Visit Versus Students with Only Non-Mental Health Visits

	Mental Health Visit (N=1,203) % (N)/Mean (std. dev)	No Mental Health Visit (N= 15,259) % (N)/Mean (std. dev.)	P-value
Sex			0.300
Female	53.62% (645)	56.58% (8,633)	
Male	46.38% (558)	43.42% (6,624)	
Race/Ethnicity			**<0.001**
Asian	0.18% (2)	0.72% (101)	
Black	18.77% (204)	20.23% (2,827)	
Latine	76.91% (836)	73.18% (10,229)	
White	4.05% (44)	5.59% (782)	
Two or more	0.09% (1)	0.27% (38)	
Mean Age in Years	13.57 (4.82)	13.27 (4.56)	0.382

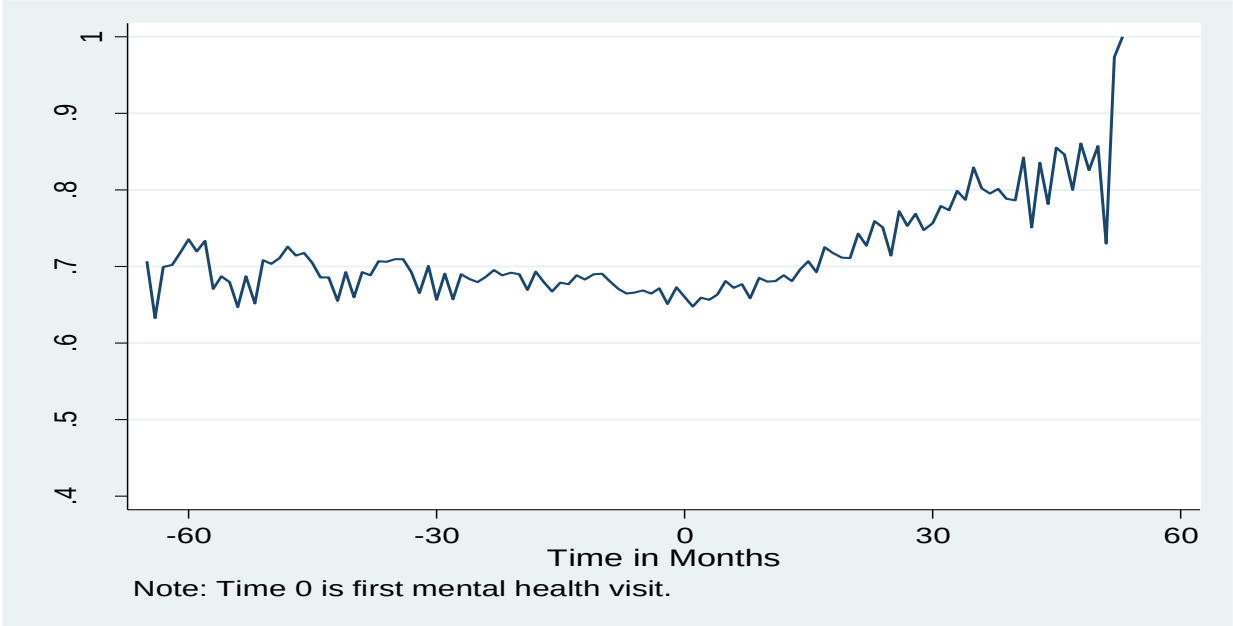
With regards to attendance, we found that, on average, the proportion of full days present in school was declining for students prior to their first school-based health center visit. However, after the first visit to a school-based health center, the proportion of full days present increased over time. The difference in the slope of attendance trajectory before versus after the first visit to a school-based health center was statistically significant (p<.001). These results were similar and remained statistically significant on all sensitivity analyses.

Figure 2. Proportion of Full Days Present Over Time Relative to the First Visit to a School-Based Health Center



Similarly, we found that, on average, the proportion of full days present in school was declining for students prior to their first mental health encounter at a school-based health and increased over time following their first mental health encounter at a school-based health center. The difference in the slope of attendance trajectory before versus after the first mental health encounter was statistically significant (p<.001). These results were similar and remained statistically significant on all sensitivity analyses.

Figure 3. Proportion of Full Days Present Over Time Relative to the First Mental Health Visit to a School-Based Health Center



In summary, we found that despite pandemic-related school closures, SBHCs appeared to play a critical role in providing care to many students and their families, particularly with respect to well-child care and mental healthcare. In addition, visiting a SBHC was associated with improved school attendance over time.

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