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Jessica Monahan

University of Delaware Center for Disabilities Studies

Laurie Ackles

Rochester Institute of Technology

Amy D. Edwards

Drexel University

Brian Freedman

University of Delaware Center for Disabilities Studies

Pamela Withers Lubbers

University of Delaware Center for Disabilities Studies

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Autistic College Students and COVID-19: Anxiety, Support Needs and Responses by Specialized Programs

Cover Page Footnote

Jessica Monahan¹, Laurie Ackles², Amy Edwards³, Brian Freedman¹, Pamela Withers Lubbers¹, Sara Sanders Gardner⁴, Cherie Fishbaugh⁵, and Jane Thierfeld Brown⁶ 1 University of Delaware 2Rochester Institute of Technology 3Drexel University 4 Bellevue College 5 West Chester University 6 New Haven, CT
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Authors

Jessica Monahan, Laurie Ackles, Amy D. Edwards, Brian Freedman, Pamela Withers Lubbers, Sara Sanders Gardner, Cherie A. Fishbaugh, and Jane Thierfeld Brown

Autistic College Students and COVID-19: Anxiety, Support Needs and Responses by Specialized Programs

Jessica Monahan¹, Laurie Ackles,² Amy D. Edwards,³ Brian Freedman,¹
Pamela Withers Lubbers,¹ Sara Sanders Gardner,⁴ Cherie A. Fishbaugh,⁵ and
Jane Thierfeld Brown⁶

¹University of Delaware, Newark, DE

²Rochester Institute of Technology, Rochester, NY

³Drexel University, Philadelphia, PA

⁴Bellevue College, Bellevue, WA

⁵West Chester University, West Chester, PA

⁶New Haven, CT

Plain Language Summary

Many college students with autism have had to learn online because of COVID-19. We sent a survey to autistic college students in the summer of 2020. The questions were about COVID-19 and going back to school. The students talked about getting sick with the virus or getting other people sick. They were not scared to wear masks or social distance. Students wanted help with classes and making friends. They also wanted help with mental health. We end the paper with things autism programs can do to help students.

Individuals with autism are enrolling in institutions of higher education (IHE) at increasing rates (Baio et al., 2018; McDermott & Nachman, 2020). One third of individuals with autism who do not have a co-occurring intellectual disability attend some form of postsecondary education within 8 years of exiting high school (Shattuck et al., 2012; Wei et al., 2013). Because trend lines indicate increasing enrollment in college for this population and considering the later-in-life diagnoses and self- diagnoses (Lewis, 2017), it is believed more autistic individuals attend college than captured in recent data.

Many students with autism benefit from support beyond what is typically offered through disability support services and the Americans with Disabilities Act Amendment Act of 2008 (ADAAA, 2008). Given the increasing number of autistic students enrolling in postsecondary education, several universities have created or expanded programs supporting the unique strengths and needs of autistic college students (Cox et al., 2020). The services provided by autism support programs are far reaching and cover various components of college life. While program support differs, a recent report of 60 autism-specific programs indicates 93% of

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Correspondence concerning this article should be addressed to Jessica Monahan, University of Delaware Center for Disabilities Studies, 125 Academy St. Newark, DE 19701. Email: jimon@udel.edu

programs provide life skills support, 88% provide social skills training, and 85% offer peer mentoring (Cox et al., 2020). In addition, 48% of programs also offer tutoring and 47% offer mental health support (Cox et al., 2020). Many programs focus on working collaboratively with support staff available to all students (like tutoring and mental health services) to ensure they are accessible to autistic students instead of replicating these services within their programs.

Novel Coronavirus: COVID-19 Global Pandemic

In the spring of 2020, the novel coronavirus (COVID-19) pandemic shut down many IHEs and forced all learning, services, and supports, including autism support services, to transition into an online environment. Both professionals and students, not only in this field, but across all IHEs, needed to adjust to a new way of providing and receiving support and instruction with little to no notice or preparation. The pandemic increased feelings of anxiety and decreased psychological well-being among the general population (Vindegard & Benros, 2020) and was especially difficult for autistic individuals (Ameis et al., 2020). Chronic uncertainty, along with disruptions to routine and loss of structure, heavily impacts those with autism who often depend on consistent, reliable schedules and predictable environments (Colizzi et al., 2020).

Autistic individuals are disproportionately impacted by co-occurring mental health and chronic health conditions, magnifying the impact of COVID-19 (Lai et al., 2019; Tyler et al., 2011). According to research, 40% of people with autism struggle with anxiety, and the worries associated with a global pandemic can play a significant role in deteriorating mental health (den Houting, 2020; van Steensel et al., 2011). Loss of self-care routines used as coping mechanisms, and difficulty accessing remote support networks, can also escalate anxiety and leave autistic individuals feeling increasingly stressed and isolated (den Houting, 2020; Pellicano et al., 2020). College students who are required to self-quarantine or shelter-in-place have become more socially isolated, which, in turn, further impacts their mental health (Son et al., 2020). Students who live on campus and become ill or have been exposed to COVID-19 may be required to relocate to special quarantine housing (Centers for Disease Control and Prevention [CDC], 2020a; Lederman, 2020). Transitioning to and navigating a new environment while adjusting to new rules and protocols can further increase stress and anxiety for autistic college students, ultimately impacting their academic success in college and general quality of life (Colizzi et al., 2020).

Individuals with many chronic health conditions are at increased risk of fatal complications from COVID-19 (CDC, 2020b). Given the higher risk of co-occurring chronic health conditions among people with autism, this might also explain why people with developmental disorders, including autism spectrum disorder, are three times more likely to die from COVID-19 (FAIR Health, West Health Institute, 2020). It is possible that the increased risk some college students with autism face may impact their overall anxieties related to COVID-19.

Problem Statement

While we are beginning to understand the multiplicative impact of the pandemic on the autistic community, there has yet to be a study in which college students with autism are the sole focus. Given the distinctiveness of the setting and the unique challenges faced by autistic college students, this particular focus is warranted. The current research seeks to explore the unique challenges experienced by autistic college students in the face of COVID-19. Additionally, the research considers the targeted supports that can be offered as students begin to transition back to campus. In this exploratory study, we sought to answer the following research questions.

1. How has the COVID-19 global pandemic impacted the anxiety levels of autistic college students in the United States?
2. What are common concerns that autistic college students experience related to online learning and in-person learning amidst the global pandemic?
3. What can institutions of higher education (IHEs) and autism support programs do to increase the likelihood that autistic college students are successful?

Methods

A group of collegiate autism support program leaders developed a survey to better understand students' anxieties and support needs related to returning to campus in the fall of 2020 amidst the COVID-19 global pandemic. Quantitative survey data were analyzed with descriptive statistics. Qualitative responses were analyzed using thematic analysis. The Institutional Review Board at the University of Delaware approved this study.

Instrument Development and Dissemination

Following the challenges observed during the initial campus shutdowns in spring 2020, program leaders sought to understand how students with autism were processing the return to college in the fall to ensure that provided support addressed the concerns felt by this community. Over the course of several meetings, the team identified potential areas that students with autism may feel anxious about regarding school resumption. Ideas were based on interactions that team members had with students in their support programs in the spring when the global pandemic initially shut down most IHEs and over the summer as students prepared to return.

The survey included 15 demographic questions, two questions about student housing before and after the pandemic, and an option for students to indicate if they planned to continue enrollment in the fall. The survey included eight Likert scale questions referencing student anxiety levels related to various topics, detailed in Table 1. The Likert scale ranged from "Not anxious at all" to "Very anxious." Finally, the survey included three open-ended questions, allowing students to describe (a) ways that support programs and universities can support them emotionally, socially, and academically; (b) concerns about online classes; and (c) concerns about in-person classes.

Table 1*Instrument Items: Anxiety*

Rating	Please identify your levels of anxiety about the following:
	Going to in person classes
	Taking online classes
	Wearing masks
	Social distancing
	Getting sick from COVID-19
	Getting someone else sick from COVID-19
	Transportation to classes if they are offered in person
	Needing to quarantine

The survey was created using an anonymous university Qualtrics account. Before mass distribution, each team member sent the survey to select students in their respective programs, requesting feedback about the length of time it took to complete, clarity of the items, and general feedback on the content. Overall, students had favorable feedback, and the survey was distributed widely. One team member sent the survey and a request for dissemination to approximately 50 autism support program staff across the country, as well as to autism specific and higher education focused listservs.

Analysis

Survey results were downloaded and shared with the lead author. Descriptive statistics for participant demographics and anxiety levels were calculated using SPSS Statistics (Version 26). The qualitative data were analyzed using a thematic analysis, as our goal was to systematically organize and make sense of the data to answer our research questions (Braun & Clarke, 2012). It was important that the survey results be disseminated as quickly as possible to guide other programs in developing and revising their support services amidst the pandemic. Therefore, a thematic analysis was conducted for the three open-ended questions using Rapid Analysis (Gale et al., 2019). First, the data were compiled and reviewed by two coders to determine initial themes. Next, each coder independently coded all of the data and met to discuss discrepancies or variations in the coding data. Coders then collectively decided on subthemes and calculated the frequency that each subtheme was mentioned. Finally, definitions of subthemes were created based on the responses coded for each.

Results

When the survey closed, 100 individuals had opened or begun the survey. Of those, 10 participants did not plan to re-enroll in the fall of 2020. The nonreturning students were asked

why they did not plan to re-enroll, after which the survey terminated. The reasons for not returning included concerns about getting sick with COVID-19, getting someone else sick with COVID-19, not feeling comfortable with in-person learning, and various reasons not related to COVID-19 (e.g., graduation, transferring, leave of absence, not ready to live on their own, and general anxiety). One participant identified themselves as nonautistic and was removed from the sample. Overall, 76 participants answered all or most of the questions.

Participant Demographics

The full report of participant demographics is presented in Table 2. Participants reported residence across 14 states: Pennsylvania ($n = 38$), Michigan ($n = 9$), Delaware ($n = 6$), New Jersey ($n = 5$), Illinois ($n = 4$), New York ($n = 4$), Virginia ($n = 3$), and California, Connecticut, Indiana, Maryland, Ohio, West Virginia, and Wisconsin ($n = 1$ each). The majority of participants reported being supported by their university autism support program (69.7%). Participants were also asked about their living situation before the COVID-19 related shutdowns (spring 2020) and their residential plans for fall of 2020 (Table 3).

Survey Results

Overall, students were most concerned about getting sick with COVID-19, getting someone else sick with COVID-19, and managing academics in an online learning environment. Students were least worried about mask-wearing and following social distancing guidelines. The following section describes the quantitative and qualitative results of this study in detail.

Quantitative Results

Quantitative data were collected regarding preference for receiving autism support and anxiety levels related to a variety of topics. Fifty-three respondents provided feedback about their preferences related to the delivery of autism support services. Almost 21% of students preferred online delivery of services, 15.1% preferred in-person services, 50.9% indicated they would prefer a mix of online and in-person support services, and 13.2% of participants indicated they had no service delivery preference. Table 4 details the means and standard deviations of anxiety scores across the following areas: in-person classes, online classes, wearing a mask, getting COVID-19, getting someone else sick with COVID-19, transportation to in-person classes, and needing to quarantine. Only 66 participants responded to questions regarding anxiety levels for in-person classes, and 64 participants responded to questions about transportation to in-person classes. The remaining categories had between 74 and 76 respondents. Participants rated their anxiety level for each category on a scale from 0 to 3, with a 0 equaling not anxious at all and a 3 corresponding to very anxious. Students reported the highest levels of anxiety for getting sick with COVID-19 ($M = 1.63$) and getting someone else sick with COVID-19 ($M = 1.79$), while the lowest levels of anxiety were for wearing a mask ($M = 0.39$) and needing to socially distance ($M = 0.63$).

Table 2*Participant Demographics*

Variable	n	%
Age (<i>n</i> = 76)		
Under 18	18	23.7
19-24	57	75.0
25-29	1	1.3
Over 30	0	0
Ethnicity ^a (<i>n</i> = 69)		
Asian	4	5.3
Black/ African American	4	5.3
White	56	73.7
Multi-ethnic	5	6.6
Gender (<i>n</i> = 75)		
Female	21	27.6
Male	51	67.1
Non-binary	3	3.9
Transgender	0	0
Other	0	0
Year (<i>n</i> = 76)		
First	23	30.3
Second	18	23.7
Third	18	23.7
Fourth	10	13.2
Fifth	3	3.9
Other	2	2.6
Graduate	2	2.6
Fall 2020 Credits (<i>n</i> = 75)		
1-6	6	7.9
6-9	4	5.3
10-12	13	17.1
13-15	29	38.2
16-18	17	22.4
Above 18	3	3.9
On co-op/Internship	3	3.9
Transfer Student (<i>n</i> = 76)		
Yes	9	11.8
No	67	88.2
GPA (<i>n</i> = 72)		
Below 1.8	0	0
1.9 - 2.5	6	7.9
2.6 - 3.0	18	23.7
3.1 - 3.5	15	19.7
3.6 or above	33	43.4
Autism Support Program (<i>n</i> = 75)		
Yes	53	69.7
No	5	6.6
I don't know	16	21.1
Prefer not to answer	1	1.3

Note. Percentages calculated on total sample (*N* = 76).

^a Participants could choose all that applied, other ethnicities reported 0% and are not listed.

Table 3*Residential Status*

Residential status	Pre-COVID (<i>n</i> = 75)		Fall 2020 plans (<i>n</i> = 75)	
	<i>n</i>	%	<i>n</i>	%
On campus- single	12	15.8	13	17.1
On campus- roommate	21	27.6	14	18.4
Off campus- alone	2	2.6	2	2.6
Off campus- roommate	3	3.9	3	3.9
At home- family	37	48.7	36	47.4
I don't know	0	0	7	9.2

Table 4*Means and Standard Deviations for Anxiety-Related Items*

Topic	<i>n</i>	<i>M</i>	<i>SD</i>
Going to in person classes	66	1.23	1.093
Taking online classes	74	1.26	1.073
Wearing masks	75	0.39	0.695
Social distancing	73	0.63	0.936
Getting sick from COVID-19	76	1.63	1.164
Getting someone else sick from COVID-19	75	1.79	1.142
Transportation to classes if they are offered in person	63	0.83	1.009
Needing to quarantine	74	1.19	1.119

Qualitative Results

The responses to the open-ended questions were analyzed separately for each question. The main findings for the qualitative portion of the survey indicate that students who seek academic and generalized support from IHEs and autism support programs were most concerned about keeping up with academics, managing online learning logistics, and contracting COVID-19 if required to attend in-person classes. The themes, frequency counts, and definitions for each question are detailed in Tables 5, 6, and 7.

Table 5*Qualitative Results for Requested Support from Universities and Support Programs*

Theme	Frequency	Definition
Academic support and considerations	28	Concern with keeping up academically and requested support with things like tutoring, accessing online learning, and support with time management.
General support	17	Need for general check-ins and support on an as-needed basis.
Social support	14	Create opportunities for students to engage socially in a remote environment. Students also reported wanting instructions and support in navigating social life (i.e., making friends, learning social skills, etc.).
Mental health support	9	Need for mental health support specific to anxiety, depression, and loneliness.
Miscellaneous	6	Variety of responses: counseling related to academic advising, concerns over tuition and financial aid, and asking for specific support like “wake up calls.”
Don’t know	6	Not knowing how the university or autism programs could support them.
Accommodations	4	Ensure that accommodations will be available and accessible.
Adjusting to college	3	Need for support adjusting to college or navigating the campus.
Campus experience	2	Want the university to help them feel like they were still in college, despite the circumstances.

Table 6*Qualitative Results for Concerns Related to Online Learning*

Theme	Frequency	Definition
Attendance and work completion	26	Ability to attend, participate in, and complete work for online classes. Common concerns included difficulty with time management, concentration, and motivation.
Logistics	24	Logistics of learning online. Specifically, students were worried about technology, the format of delivery for online courses, and understanding how to actually access classes and supports online.
Quality of learning	21	Quality of learning in an online class versus an in-person class. These concerns were about the student’s ability to learn new information meaningfully.
Lack of support or connection to others	10	Receiving support from professors as well as feeling connections with other students in class.
No concerns	6	No concerns about online learning.
Mental health	3	Mental health being negatively impacted by taking online classes.
Accommodations	2	Availability of accommodations in an online learning environment.
Tuition	2	Paying full tuition for an online learning experience.

Table 7*Qualitative Results for Concerns Related to In-Person Learning*

Theme	Frequency	Definition
Catching COVID-19	19	Concerns about the possibility of contracting the COVID-19 virus.
Miscellaneous/don't know	15	Responses were not common enough to create a theme. Concerns included holding in-person classes, tuition costs, unexpected changes in delivery format, and lack of planning from government and IHEs
Others following safety procedures	11	Concerns about other students on campus following safety procedures like wearing a mask and social distancing.
No concerns	9	No concerns about in- person courses. Some responses may be due to no in-person classes scheduled.
General anxiety or concerns	8	Anxiety about in-person classes not specific to COVID-19, e.g., worries about social situations or focusing in large classes.
Spreading COVID-19	6	Concerns about the possibility of infecting others with COVID-19.
Hold in person classes	4	General statements about strong preferences for classes to be held in person.
Following safety procedures (self)	2	Concerns with being able to follow safety procedures.

Institutions of higher education and autism program support. Overall, 62 participants (81.5%) responded to the question: *“What are some ways your support program or university can help you be successful (academically, socially, and emotionally) during the semester?”* Students reported a need for academic support from their IHEs and programs (cited 28 times; this number is not the number of participants who cited the subtheme, but the number of times the theme was cited). More specifically, students expressed concerns about keeping up academically and felt they needed support in tutoring, time management, and accessing online learning. Also, students reported varying preferences for the delivery of academic content, ranging from a desire for in-person learning to a preference for online learning. Some students did not want any synchronous (or live) classes, while others preferred only synchronous classes. The second most common type of support students reported was a need for general support (cited 17 times). Within this theme, students discussed the need for general check-ins and support on an “as-needed basis.” Many students reported that they would like their autism support services to continue remotely, but also expressed the need for clear communication and explicit messages from support staff.

The third most commonly cited theme was the desire for social support (cited 14 times). Students requested that IHEs and autism support programs create opportunities for students to engage socially in a remote environment. For example, students requested online meetups or other group social activities. Additionally, students reported wanting instruction and support in navigating social relationships (i.e., making friends, learning social skills).

The fourth most cited theme was support for mental health (cited nine times). Students expressed a need for mental health support specific to anxiety, depression, and loneliness. Many students referenced a need for long-term support related to the pandemic and the negative psychological effects that might be brought on by subsequent shutdowns. While not as commonly cited, students also reported the following: a lack of awareness about what they needed the IHEs and support programs (cited six times); a need for assistance with understanding and obtaining accommodations (cited four times); not knowing how to adjust to college life (cited three times); and a need for assurance that they would still have a genuine college experience (cited two times).

Concerns with online learning. Forty-five students (59%) reported online learning concerns, with the primary concerns being attendance and work completion, the logistics of how learning online works, and the quality of their learning. The most commonly cited theme related to online learning was concerns about attendance and work completion (cited 26 times). Students expressed concerns regarding their ability to attend, participate in, and complete work for online classes. Common apprehensions included difficulty with time management, concentration, and motivation. The second most commonly cited concern with online learning was logistics (cited 24 times). Specifically, many students were worried about technology, the delivery format for online courses, and anticipated difficulty understanding how to access classes and support online. Almost as frequently cited as logistics (21 times) was the students' concerns with the quality of online instruction. Students were worried that they would not learn as much online as they would in-person. While not as commonly cited, other themes related to online learning were the lack of support or connections to others (10 times), concerns related to mental health (three times), and worries about accommodation usage (two times) and tuition (two times). Finally, some students expressed no concerns related to online learning (cited six times).

Concerns with in-person learning. There were 41 respondents for the question related to concerns with in-person learning. The top worry about in-person learning was the risk of becoming sick with COVID-19 (cited 19 times). Students also expressed concern with getting other people sick; however, this theme was only cited six times. Some students identified no concerns about going to in-person classes (cited nine times), while others reported more generalized anxieties that were not specific to COVID-19 (cited eight times [i.e., social situations, ability to focus in large classes]). A number of students expressed a preference for in-person classes (cited four times). The open-ended formatting of concerns for in-person learning led to a sizeable miscellaneous theme (cited 15 times), composed of answers that could not be grouped in a meaningful way. Some of the responses in this category related to not wanting in-person classes to resume, not knowing what they were worried about related to in-person classes, concerns with tuition or the sudden need to move to a fully online model after in-person has begun, and the lack of planning or response from IHEs or the federal government.

Discussion

In this exploratory study, 76 autistic college students provided quantitative and qualitative data related to COVID-19 and the return to college. Overall, students rated their

anxiety levels highest for becoming sick with COVID-19 and spreading COVID-19 to others. Their lowest rated anxieties were related to mask-wearing and following social distancing guidelines. When asked about the types of support universities and autism support programs could provide, students reported needing assistance in academic support, general support, and social functioning. Concerning online learning, respondents were most concerned with attendance and work completion, logistics of learning online, and the quality of learning they might receive. Finally, when asked about concerns with in-person learning, students were most concerned with the risks of becoming ill from COVID-19. This discussion will outline specific recommendations for autism support programs based on the survey results and examine the shift in model delivery and the implications related to those shifts.

Of note in our study is that some students reported having no concerns about in-person learning, and some reported no concerns about online learning. While the sample size was modest, there is a lack of consensus among autistic students when discussing the mode of learning they are most comfortable with during the pandemic. Similarly, when asked about their preference for receiving autism support services during the pandemic, students had mixed preferences. About one half of those who responded indicated they would prefer a combination of in-person and online supports. Not only does this highlight the need for individualization, but it also addresses an essential consideration for providing services once it is safe to resume in-person activities (discussed in *Shift to Model Delivery*). It is possible that allowing only the traditional in-person method of providing support may create barriers for some students that are easily removed by offering the option of virtual support.

The need to collect data about the autistic students supported by specialized autism support programs was highlighted by the fact that some of our study results were contradictory to what we expected, or what others had experienced anecdotally. For example, we anticipated that many students might be highly anxious about wearing a mask mainly due to sensory concerns; however, the data showed that mask wearing was rated as the lowest anxiety for students in this sample. Additionally, some students reported concerns about in-person learning that were not related to COVID-19 (e.g., sensory concerns in large classes, meeting new people), highlighting that students are still working through worries and anxieties unrelated to the pandemic.

Program Recommendations

Based on findings of this study, existing literature on effective supports for young adults with autism, and experience of the authors—who oversee college-based support programs—this section describes recommendations for practice in the following domains: academics and executive functioning, mental health support, and socialization and connections with others. The most recent review of interventions for individuals with autism spanned the ages of birth to 22 (Steinbrenner et al., 2020), the purpose being to provide an update to identified evidence-based practices (EBP) for autistic individuals. While there was no mention of college or postsecondary education, the authors did identify EBPs by age group. There are very few interventions that have enough empirical evidence to be considered EBPs for autistic individuals aged 19-22

(Steinbrenner et al., 2020) and it is important to note that there are no EBPs that have been identified for supporting autistic individuals specifically in the college setting (Anderson et al., 2019).

While researchers are working to build this literature base, program staff who are actively working with students with autism are left to refer to EBPs in other settings. Specifically, many programs use components of EBPs for autistic children and youth or transition services for students with disabilities. Summaries of recommendations for programs are in shown and discussed later in this section. Tables 8, 9, and 10. Overall, we recommend that programs offer individualized online supports and in-person options for students when it is deemed safe to do so.

Academic Recommendations

Many autistic students have difficulty with executive functioning tasks (e.g., time management, working memory, self-control), which can hinder academic success. In this study, students expressed concern about academic performance in online learning, specifically attendance, work completion, and online learning logistics, all of which require strong executive functioning skills. We recommend that program staff consider executive functioning support for students who are learning online. For example, students may benefit from learning to self-monitor the creation and evaluation of short, specific, measurable, and attainable goals (Shogren et al., 2019). Another recommendation is to employ the use of scaffolding, especially in the online environment. Scaffolding is a process in which a task that would otherwise be outside of the student's current ability is supported, and supports are gradually removed until they can complete the task without assistance (Wood et al., 1976). A recent study by Doo et al. (2020) showed that scaffolding in an online higher education environment had a significant positive effect on student outcomes. A specific example of scaffolding provided to college students is a digital calendar with task lists. A staff member could create a digital calendar with specific tasks based on one course's syllabus and due dates that would be created with the student present online, while the staff member models. The student would then create the calendar for another class, and the staff member would observe and correct it as needed. This will help the student through COVID-19 and after the pandemic.

Students were concerned with the quality of learning in the online environment. To this end, we recommend that staff support students in navigating the process of advocating with professors to discuss their learning needs (including accommodations) and accessing academic supports offered by the IHE. Creating and providing students with visual supports and resources about how to access institution-offered academic supports, like a graphic organizer or flow chart (Dexter & Hughes, 2011; Steinbrenner et al., 2020), may help students struggling to get connected. Additionally, students may benefit from having sample scripts (Steinbrenner et al., 2020) for emailing or discussing concerns about the quality of learning with professors. Table 8 highlights other areas to consider when supporting students academically in the online environment.

Table 8

Academic Recommendations

Provide	Purpose	Tip, tool or resource
Executive functioning support	Providing an easy way for the student to plan the term, set academic and other goals, break down each course and integrate into a total plan for the term that includes all courses; reviewing progress as the term continues	Planning apps or processes (e.g., Google Docs, Sheets, Calendar; My Study Life, LMS Assignment Trackers, Goal setting, Backwards Planning)
Access to staff	Keeping lines of communication open; reaching a support person in case of urgent need; getting answers to questions that feel urgent; supporting access to campus and other (e.g., community mental health) resources	<ul style="list-style-type: none"> • Schedule appointments online • Text Message app • Virtual Office Hours • Support person available via chat during work hours • Create a Google voice number and forward your office telephone number to google voice number on your cell phone
Tutoring opportunities	Facilitating access to tutoring services; encouraging use of existing academic supports; determining barriers that may exist; supporting student in scheduling and attending tutoring	<ul style="list-style-type: none"> • Academic Support Services • Online Tutoring • Faculty Office Hours • Teaching Assistants/GA
Check-ins	Creating scheduled weekly or bi-weekly individual or group virtual check-ins to ensure the student is on the right track and understands their weekly plan, has the opportunity to connect with others, and the opportunity to build responsibility and interdependence	<ul style="list-style-type: none"> • Virtual meeting platforms • Breakout rooms for personal information sharing or teamwork • Visual supports such as checklists, calendars, agendas, whiteboards, and applicable handouts

Wellness and Mental Health Recommendations

In our study, students requested that IHEs and support programs offer more extensive mental health support. Mental health concerns were also cited a few times when students were asked about online learning. As seen in the Pellicano et al. (2020) study, autistic individuals had mental health concerns related to COVID-19 shutdown. Cox et al. (2020) highlighted that specialized mental health supports are not routinely offered in higher education, even by colleges that have specialized programs for autistic students. Given the high rates that individuals with autism experience co-occurring mental health disorders (Ung et al., 2015) and limited availability, even pre-pandemic, of long-term support offered through college counseling centers (Center for Collegiate Mental Health, 2020), autism support programs must find ways to encourage positive mental health practices for students.

While there is a paucity of research related to mental health interventions and supports

for autistic college students, programs should consider implementing practices from relevant literature regarding mental health and interventions for autistic young adults that show initial evidence of efficacy. For example, programs may offer students weekly mindfulness activities remotely (Hofmann & Gómez, 2017; Spek et al., 2013). Twenty minutes a week a staff member or peer mentor may lead a virtual call doing mindful breathing, yoga, or guided meditation. Additionally, program staff may review self-care routines that encourage positive habits with students and encourage the development (or adjustment) of routines that encourage positive habits related to sleep, nutrition, and exercise (Wong et al., 2013). Table 9 outlines a number of recommendations for programs to consider when supporting their students’ mental health needs.

Table 9

Wellness and Mental Health Recommendations

Provide	Purpose	Tip, tool or resource
Anxiety management	Teaching strategies for helping the student to manage anxiety that might otherwise hinder their success	<ul style="list-style-type: none"> • Professional counseling • Mindfulness (e.g., meditation, breathing, yoga, apps) • Identify triggers and calming strategies • Self-Care Routine (e.g., Sleep, nutrition, movement)
Mental breaks	Encouraging study breaks and relaxing activities on a regular schedule to help prevent feelings of drained or overwhelmed	<ul style="list-style-type: none"> • Activity (e.g., exercise, change of scenery, journaling, drawing) • Schedules for breaks (e.g., focus keeper, Pomodoro focus timer) • Social connection (e.g., call, talk, text, video chat)
COVID-19 preparedness	Providing reassurance, information, and resources about COVID and related university safety plans	<ul style="list-style-type: none"> • University’s on-line training re COVID-19 precautions and trusted sources (e.g., CDC) • Discussion, workshops, information-sharing about staying healthy during the pandemic

Socialization Recommendations

Pellicano et al. (2020) found that it is a common misconception that autistic people do not crave social interaction. Respondents who reported positive experiences during lockdown valued the added time they could spend with their family members and pets. Those who described challenges with lockdown also expressed the need for personal interaction with friends, classmates, support providers, and, for some, periodic interaction with ambient groups as they traveled through everyday life. Participants were looking forward to social interaction

again (Pellicano et al., 2020). In our study, many students expressed that they wanted the IHE and autism support programs to provide social engagement opportunities in a remote environment. Specifically, students who responded were interested in engaging in online meetings, group activities, and receiving support in navigating social relationships to develop friendships.

We recommend that autism support staff think critically and creatively about engaging their students in meaningful social interactions. As with any support and interventions involving autistic young adults, it is crucial to engage students in this process to ensure that the planned activities are engaging, accessible, and of interest to students. Programs may ask students individually what types of social support they seek or send a short survey to students requesting input on social activities that they may be interested in. Table 10 outlines several resources and ideas for social engagement.

Table 10

Social Recommendations

Provide	Purpose	Tip, Tool or Reference
Virtual engagement events	Staying connected and socially engaged	<ul style="list-style-type: none"> • Gaming platforms (e.g., Kahoot, Jackbox, Scribio, xbox-live) • Group Chats (e.g., Group Me, Discord) • Watch parties (e.g., Netflix, Disney+)
Social networks	Staying active and connecting with peers who have similar interests	<ul style="list-style-type: none"> • Campus Clubs/Organization (e.g., interest, service, Greek life) • Campus events and activities (e.g., Campus Life, Residence Life) • Connections with academic groups and peers with similar majors (e.g., study groups, academic clubs)

Shift in Model Delivery

In the spring of 2020, when many IHEs and subsequent autism support programs had their in-person services and support moved remotely, the authors of this paper needed to think strategically about how to ensure that their programs still met the needs of the students they serviced. The pandemic exacerbated existing mental health concerns for college students because of the lack of social connectivity and financial hardship to their lives (Lederer et al., 2021). In addition, it is well documented that transitions of any kind can be especially challenging for autistic people (Pinder-Amaker, 2014). This section begins with a discussion of the ways that

the authors adapted their service models in response to the need for virtual support. All four programs immediately sought to understand their students' needs given the sudden shifts and changes to their routines and daily life using online surveys or individual conversations with students. They also began regular one-on-one sessions with students virtually through teleconferencing platforms like Zoom, and like many IHEs across the country, this frequency of support was increased compared with what had been offered before the pandemic (Brown, 2020).

Armed with the knowledge that college students with autism already faced increased social difficulties and challenges (Elias & White, 2017), program staff explored creative ways to keep students socially connected (Davis, 2020). For example, some social relationship groups held in-person shifted to an online environment and focused on relationship building while socially distancing or quarantining. Others created new social engagement groups, and students were empowered to host game nights using various technologies. While all programs had already been considering their students' mental health needs, there was a greater focus during individual sessions and in the creation of group activities (e.g., weekly virtual mindfulness activities). Finally, programs worked to ensure that students' career development was not sacrificed, as the COVID-19 pandemic has hurt much of the workforce and those pursuing employment (Capelle-Blancard & Desroziers, 2020).

For most, the shift to remote learning and support has multiple impacts on students and those who support them. The pandemic has required flexibility in how to ensure access to these services. Most students indicated that they would prefer an online or a combination of in-person and online support from their autism support programs in our sample. While this model is helpful during the COVID-19 pandemic for safety purposes, students may benefit from this model long-term, after it is safe to resume in-person activities. First, the option of remote or in-person support will increase access for students moving forward, allowing students to choose the method of support that best suits their preferences or needs. As Pellicano et al. (2020) reported, many people with autism and their families cited that people with disabilities have been advocating for the ability to access education and services remotely for years and that the pandemic has shown that this is, in fact, possible.

While the shift to remote support has potential impacts on students, one must also consider the impact this shift may have on staff within these programs. While our study did not explore the effect on staff, many authors are direct support providers and have experienced these ramifications firsthand. Following the switch to online, many staff had to learn new technologies and needed to pivot to different methods of supporting students to address the individualized needs of those who struggle with online learning and experienced barriers to accessing services and supports (Gillis & Krull, 2020). Similarly, staff needed to be creative about ways to intervene with students who became disengaged or entered a mental health crisis (Hoyt et al., 2021; Wang et al., 2020) while re-thinking engagement with families, as many students moved back to their primary homes (Ackles et al., personal communication, December 7, 2020). This is a heavy task without the added complexity of confidentiality practices in higher education, which prohibit discussion of student progress with families (unless allowed by the student; Family

Educational Rights and Privacy Act [FERPA], 1974).

While the increase in support and services for students is necessary, it is crucial to highlight the fact that for many, this meant an increase in workload with no increase in resources or support staff. Many programs are already understaffed and under-funded, creating anxieties around job security for those working in them. Support staff are also living in the pandemic and face personal fears and anxieties around the COVID-19 pandemic, much like the world's population (Torales et al., 2020). When considering how to best support students with autism, we cannot ignore the fact that these recommendations impact those who implement them.

Limitations and Future Research

As with any study, it is important to discuss the limitations of the research, the implications these limitations have on interpreting findings, and areas of future research. Conducting research with autistic college students has a number of challenges, one of which is recruitment. Because of the time-sensitive nature of our study, we decided to move forward with a sample of 76 to quickly analyze and disseminate the results to share them with programs and allow the results to inform their programming. We must use caution when interpreting the results of this study because of the low sample size. Additionally, our sample was heavily skewed toward White males, which has a number of implications related to generalizability. While it is true that many students who participate in autism support programs are White males (which reflects diversity challenges within these programs themselves), there are a variety of gender identities and races represented throughout the country who are not reflected in this sample. Finally, there is the possibility of self-selection bias; that is, the idea that participants could choose to participate (Lavrakas, 2008). The individuals who chose not to participate may have answered questions differently.

To address the limitations in this study and to explore new questions that were developed based on findings, we propose a number of areas of future research. Future studies related to COVID-19 should make a concerted effort to engage with students of color and female, transgender, or non-binary students. Additionally, future studies should engage autistic college students to understand the long-term impacts that the pandemic, subsequent shutdown, and model delivery shift have had on their academic success, social experiences, and mental health. In these studies, researchers should understand the support and services that were most impactful and helpful to students. We also suggest that studies examine the impact that the shutdown and model delivery shift has had on the staff within IHEs who support students with autism.

Conclusion

The COVID-19 pandemic and subsequent shutdowns have impacted how autistic students access support in the postsecondary setting. Before returning to campus in the fall of 2020, students were anxious about getting and spreading COVID-19, least anxious about wearing masks and social distancing, and were hoping to find support from their universities and autism

programs across academic, social, and mental health domains. We recommend that programs work individually with students to assess their needs and provide academic, mental health, and socialization support.

References

- Ameis, S. H., Lai, M.-C., Mulsant, B. H., & Szatmari, P. (2020). Coping, fostering resilience, and driving care innovation for autistic people and their families during the COVID-19 pandemic and beyond. *Molecular Autism, 11*(1). <https://doi.org/10.1186/s13229-020-00365-y>
- Americans with Disabilities Act Amendment Act of 2008, 42 U.S.C. § 12101 et seq. (2008). <https://www.eeoc.gov/statutes/ada-amendments-act-2008>
- Anderson, A. H., Stephenson, J., Carter, M., & Carlon, S. (2019). A systematic literature review of empirical research on postsecondary students with autism spectrum disorder. *Journal of Autism and Developmental Disorders, 49*(4), 1531-1558. <http://dx.doi.org/10.1007/s10803-018-3840-2>
- Baio, J., Wiggins, L., Christensen, D. L., Maenner, M. J., Daniels, J., Warren, Z., Kurzius-Spencer, M., Zahorodny, W., Rosenberg, C. R., White, T., Durkin, M. S., Imm, P., Nikolaou, L., Yeargin-Allsopp, M., Lee, L., Harrington, R., Lopez, M., Fitzgerald, R. T., Hewitt, A., ... Dowling, N. F. (2018). Prevalence of autism spectrum disorder among children aged 8 years: Autism and developmental disabilities monitoring network, 11 Sites, United States, 2014. *Morbidity and Mortality Weekly Report Surveillance Summaries, 67*(6), 1-23. doi: [10.15585/mmwr.ss6706a1](https://doi.org/10.15585/mmwr.ss6706a1)
- Braun, V., & Clarke, V. (2012). Thematic analysis. In H. Cooper, P. M. Camic, D. L. Long, A. T. Panter, D. Rindskopf, & K. J. Sher (Eds.), *APA handbook of research methods in psychology, Vol. 2. Research designs: Quantitative, qualitative, neuropsychological, and biological* (pp. 57–71). American Psychological Association. <https://doi.org/10.1037/13620-004>
- Brown, S. (2020, November 10). Meet Covid-19's freshman class. *The Chronicle of Higher Education*. <https://www.chronicle.com/article/meet-covid-19s-freshman-class>
- Capelle-Blancard, G., & Desroziers, A. (2020). *The stock market and the economy: Insights from the COVID-19 crisis*. <https://voxeu.org/article/stock-market-and-economy-insights-covid-19-crisis>
- Center for Collegiate Mental Health. (2020). *2019 Annual Report* (Publication No. STA 20-244). https://ccmh.psu.edu/assets/docs/2019-CCMH-Annual-Report_3.17.20.pdf
- Centers for Disease Control and Prevention. (2020a). *Colleges, universities, and higher learning: Plan, prepare, and respond*. <https://www.cdc.gov/coronavirus/2019-ncov/community/colleges-universities/index.html>
- Centers for Disease Control and Prevention. (2020b). *COVID-19: People with certain medical conditions*. <https://www.cdc.gov/coronavirus/2019-ncov/need-extra-precautions/people-with-medical-conditions.html>
- Colizzi, M., Sironi, E., Antonini, F., Ciceri, M. L., Bovo, C., & Zocante, L. (2020). Psychosocial and behavioral impact of COVID-19 in autism spectrum disorder: An online parent survey. *Brain Sciences, 10*(6), 341. <https://doi.org/10.3390/brainsci10060341>

- Cox, B. E., Kepple, C. R., Francis, C. B., & Griffing, O. M. (2020). *Autism-specific college support programs: National report*. <https://collegeautismnetwork.org/wp-content/uploads/2020/10/ASP-Survey-National-Report-2020-09-16.pdf>
- Davis, Z. (2020, May 15). Inclusive programs show resilience. *UDaily*. <https://www.udel.edu/udaily/2020/may/spectrum-scholars-autism-shift-remote-learning-teaching/>
- den Houting, J. (2020). Stepping out of isolation: Autistic people and COVID-19. *Autism in Adulthood*, 2(2), 103–105. <https://doi.org/10.1089/aut.2020.29012.jdh>
- Dexter, D. D., & Hughes, C. A. (2011). Graphic organizers and students with learning disabilities: A meta-analysis. *Learning Disability Quarterly*, 34, 51–72. <https://journals.sagepub.com/doi/10.1177/073194871103400104>
- Doo, M. Y., Bonk, C., & Heo, H. (2020). A meta-analysis of scaffolding effects in online learning in higher education. *The International Review of Research in Open and Distributed Learning*, 21(3). <https://doi.org/10.19173/irrodl.v21i3.4638>
- Elias, R., & White, S.W. (2017). Autism goes to college: Understanding the needs of a student population on the rise. *Journal on Autism and Developmental Disorders*, 48, 732–746. <https://doi.org/10.1007/s10803-017-3075-7>
- FAIR Health, West Health Institute. (2020, November 11). *Risk factors for COVID-19 mortality among privately insured patients: A claims data analysis*. <https://s3.amazonaws.com/media2.fairhealth.org/whitepaper/asset/Risk%20Factors%20for%20COVID-19%20Mortality%20among%20Privately%20Insured%20Patients%20-%20A%20Claims%20Data%20Analysis%20-%20A%20FAIR%20Health%20White%20Paper.pdf>
- Family Educational Rights and Privacy Act (FERPA) of 1974, 20 U.S.C. § 1232g (1974). <https://www2.ed.gov/policy/gen/guid/fpco/ferpa/index.html>
- Gale, R. C., Wu, J., Erhardt, T., Bounthavong, M., Reardon, C. M., Damschroder, L. J., & Midboe, A. M. (2019). Comparison of rapid vs in-depth qualitative analytic methods from a process evaluation of academic detailing in the Veterans Health Administration. *Implementation Science*, 14, 11. <https://doi.org/10.1186/s13012-019-0853-y>
- Gillis, A., & Krull, L. M. (2020). COVID-19 remote learning transition in spring 2020: Class structures, student perceptions, and inequality in college courses. *Teaching Sociology*, 48(4), 283–299. <https://doi.org/10.1177/0092055X20954263>
- Hofmann, S. G., & Gómez, A. F. (2017). Mindfulness-based interventions for anxiety and depression. *The Psychiatric clinics of North America*, 40(4), 739–749. <https://doi.org/10.1016/j.psc.2017.08.008>
- Hoyt, L. T., Cohen, A. K., Dull, B., Castro, E. M., Yazdani, N. (2021). “Constant stress has become the new normal”: Stress and anxiety inequalities among U.S. college students in the time of COVID-19. *Journal of Adolescent Health*, 68(2), 270-276. <https://doi.org/10.1016/j.jadohealth.2020.10.030>
- Lai, M.-C., Kassee, C., Besney, R., Bonato, S., Hull, L., Mandy, W., Szatmari, P., & Ameis, S. H. (2019). Prevalence of co-occurring mental health diagnoses in the ASD population: A systematic review and meta-analysis. *Journal of the American Academy of Child & Adolescent Psychiatry*, 58(10, Supplement), S155. <https://doi.org/10.1016/j.jaac.2019.08.049>

- Lavrakas, P. J. (2008). *Encyclopedia of survey research methods*. Sage. <https://dx.doi.org/10.4135/9781412963947>
- Lederman, D. (2020, September 17). COVID-19 roundup: Quarantines of all types. *Inside Higher Ed*. <https://www.insidehighered.com/news/2020/09/17/covid-19-roundup-colleges-embrace-various-kinds-quarantine>
- Lederer, A. M., Hoban, M. T., Lipson, S. K., Zhou, S., & Eisenberg, D. (2021). More than inconvenienced: The unique needs of U.S. college students during the COVID-19 pandemic. *Health Education & Behavior*, 48(1), 14–19. <https://doi.org/10.1177/1090198120969372>
- Lewis, L. F. (2017). A mixed methods study of barriers to formal diagnosis of autism spectrum disorder in adults. *Journal on Autism and Developmental Disorders*, 47, 2410–2424. <https://doi.org/10.1007/s10803-017-3168-3>
- McDermott, C. T., & Nachman, B. R. (2020). United States college programs for autistic students. <https://collegeautismnetwork.org/wp-content/uploads/2020/10/Nachman-McDermott-2020-Autism-College-Programs-PPT-5.28.2020.pdf>
- Pellicano, E., Brett, S., den Houting, J., Heyworth, M., Magiati, I., Steward, R., Urbanowicz, A., & Stears, M. (2020). “I want to see my friends”: The everyday experiences of autistic people and their families during COVID-19. Sydney, Australia. <https://www.sydney.edu.au/dam/corporate/documents/sydney-policy-lab/everyday-experiences-of-autistic-people-during-covid-19---report---july-2020.pdf>
- Pinder-Amaker, S. (2014). Identifying the unmet needs of college students on the autism spectrum. *Harvard Review of Psychiatry*, 22(2), 125-137. [doi: 10.1097/HRP.0000000000000032](https://doi.org/10.1097/HRP.0000000000000032)
- Shattuck, P. T., Narendorf, S. C., Cooper, B., Sterzing, P. R., Wagner, M., & Taylor, J. L. (2012). Postsecondary education and employment among youth with an autism spectrum disorder. *Pediatrics*, 129(6), 1042-1049. <https://doi.org/10.1542/peds.2011-2864>
- Shogren, K. A., Raley, S. K., Burke, K. M., & Wehmeyer, M. L. (2019). *The self-determined learning model of instruction teacher’s guide*. Lawrence, KS: Kansas University Center on Developmental Disabilities.
- Steinbrenner, J. R., Hume, K., Odom, S. L., Morin, K. L., Nowell, S. W., Tomaszewski, B., Szendrey, S., McIntyre, N. S., Yücesoy-Özkan, S., & Savage, M. N. (2020). *Evidence-based practices for children, youth, and young adults with autism*. The University of North Carolina at Chapel Hill, Frank Porter Graham Child Development Institute, National Clearinghouse on Autism Evidence and Practice Review Team. <https://ncaep.fpg.unc.edu/sites/ncaep.fpg.unc.edu/files/imce/documents/EBP%20Report%202020.pdf>
- Son, C., Hegde, S., Smith, A., Wang, X., & Sasangohar, F. (2020). Effects of COVID-19 on college students’ mental health in the United States: Interview survey study. *Journal of Medical Internet Research*, 22(9). <https://doi.org/10.2196/21279>
- Spek, A. A., van Ham, N. C., & Nyklíček. (2013). Mindfulness-based therapy in adults with an autism spectrum disorder: A randomized controlled trial. *Research in Developmental Disabilities*, 34, 246-253. [http://dx.doi.org/10.1016/j.ridd.2012.08.009](https://dx.doi.org/10.1016/j.ridd.2012.08.009)

- Torales, J., O'Higgins, M., Castaldelli-Maia, J. M., & Ventriglio, A. (2020). The outbreak of COVID-19 coronavirus and its impact on global mental health. *International Journal of Social Psychiatry*, *66*(4), 317–320. <https://doi.org/10.1177/0020764020915212>
- Tyler C. V., Schramm S. C., Karafa M., Tang A. S., Jain A. K. (2011). Chronic disease risks in young adults with autism spectrum disorder: Forewarned is forearmed. *American Journal of Intellectual and Developmental Disabilities*, *116*(5), 371-80. <https://doi.org/10.1352/1944-7558-116.5.371>
- Ung, D., Selles, R., Small, B.J., & Storch, E. A. (2015). A systematic review and meta-analysis of cognitive-behavioral therapy for anxiety in youth with high-functioning autism spectrum disorders. *Child Psychiatry and Human Development*, *46*, 533–547. <https://doi.org/10.1007/s10578-014-0494-y>
- van Steensel, F. J. A., Bögels, S. M., & Perrin, S. (2011). Anxiety disorders in children and adolescents with autistic spectrum disorders: A meta-analysis. *Clinical Child and Family Psychology Review*, *14*(3). <https://doi.org/10.1007/s10567-011-0097-0>
- Vindegaard, N., & Benros, M. E. (2020). COVID-19 pandemic and mental health consequences: Systematic review of the current evidence. *Brain, Behavior, and Immunity*, *89*, 531–542. <https://doi.org/10.1016/j.bbi.2020.05.048>
- Wang, X., Hegde, S., Son, C., Keller, B., Smith, A., & Sasangohar, F. (2020). Investigating mental health of U.S. college students during the COVID-19 pandemic: Cross-sectional survey study. *Journal of Medical Internet Research*, *22*(9). <https://www.jmir.org/2020/9/e22817>
- Wei, X., Yu, J. W., Shattuck, P., McCracken, M., & Blackorby, J. (2013). Science, technology, engineering, and mathematics (STEM) participation among college students with an autism spectrum disorder. *Journal of Autism and Developmental Disorders*, *43*(7), 1539-1546. [doi:10.1007/s10803-012-1700-z](https://doi.org/10.1007/s10803-012-1700-z)
- Wong, M. L., Lau, E. Y. Y., Wan, J. H. Y., Cheung, S. F., Hui, C. H. & Mok, D. S. Y. (2013). The interplay between sleep and mood in predicting academic functioning, physical health and psychological health: A longitudinal study. *Journal of Psychosomatic Research*, *74*, 271–277. <http://dx.doi.org/10.1016/j.jpsychores.2012.08.014>
- Wood, D., Bruner, J., & Ross, G. (1976). The role of tutoring in problem solving. *Journal of Child Psychology and Child Psychiatry*, *17*, 89-100. <https://doi.org/10.1111/j.1469-7610.1976.tb00381.x>