COVID-19 and Physical Activity in University of Florida Students: A Survey Study

Noah Towbin

College of Health and Human Performance, University of Florida

Danielle E. Jake-Schoffman, Ph.D., Department of Health Education & Behavior

Abstract

Background: COVID-19 disruptions may have impacted physical activity (PA) levels, especially among undergraduates relying on campus resources. The objectives of this project were to investigate how COVID-19 disruptions impacted PA in University of Florida (UF) undergraduates and to assess interest in digital PA interventions.

Design: Full-time, residential UF students ages 18-24 without physical limitations to PA were eligible to participate. An online survey asked about PA levels at three timepoints: before COVID-19 (February 2020; T1), during initial disruptions (June 2020; T2), and at the time of the survey (December 2020; T3). Participants reported PA enjoyment, interest in digital PA interventions, and demographics. Data are summarized descriptively, and chi-square tests explore the relationship between PA enjoyment and meeting PA recommendations.

Results: Participants with complete data (n=200) are included in analyses. On average, they were 19.8 years old with a BMI of 22.9 kg/m²; 71.0% female, 70.0% white, and 77.0% non-Hispanic. More participants met PA guidelines at T1 (52.0%) than at T2 (49.5%) or T3 (43.5%); >50% maintained similar PA levels across all timepoints. At T2, most participants transitioned to independent (89.0%), at-home (82.5%) workouts. Participants reporting high PA enjoyment were more likely to meet PA guidelines than those with low enjoyment at each timepoint (ps<0.05). Participants preferred app-based (78.2%) digital PA interventions containing workout ideas (71.9%) and maps of local trails (76.1%).

Conclusions: Given changes in PA characteristics, additional research could explore the impacts of vaccination and COVID-19 variants on PA levels and the implementation of digital PA interventions.

Keywords: COVID-19, physical activity, digital health, university students

Introduction

Physical activity (PA) supports optimal mental and physical health, including cardiorespiratory fitness and mitigation of chronic conditions (e.g., Type 2 diabetes, metabolic syndrome) (Ruegsegger & Booth, 2018). The PA Guidelines for Americans suggest that healthy adults should complete ≥150 minutes of moderate-intensity aerobic PA or 75 minutes of vigorous-intensity aerobic PA (or a combination) every week and muscle-strengthening exercises
on ≥2 days each week (U.S. DHHS, 2018). In 2018, national survey data indicated that 37.4% of US adults met the aerobic PA guidelines, and only 24.0% also met the muscle-strengthening activity guidelines (Office of Disease Prevention and Health Promotion, 2020); however, the COVID-19 pandemic may have led to decreases in these percentages.

COVID-19 symptom severity is related to PA, and adults who are not meeting PA recommendations have higher hospitalization rates than those who consistently meet PA guidelines (Sallis et al., 2021). Additionally, the COVID-19 mortality rate was found to be 2.49 times greater for physically inactive patients than individuals who met PA guidelines (Sallis et al., 2021). Among international university students, mild PA levels (i.e., walking) declined by up to 365.5%, most significantly in Italian undergraduates, during stay-at-home orders (López-Valenciano et al., 2021), a significant drop for an already sedentary population. One study from before the pandemic using the Global Physical Activity Questionnaire found that 49% and 69% of US college females and males, respectively, demonstrated sedentary behavior (Vainshelboim et al., 2019).

By March 2020, around 20% of the global population was under some form of stay-at-home mandate to mitigate the spread of COVID-19 (Davidson, 2020). Data from an international survey of over 1,000 participants found that, after the stay-at-home orders (as compared to before), daily sitting time increased and PA levels declined (Ammar et al., 2020). This decrease in PA was accompanied by gym class bookings falling by 85%, and 54% of memberships being frozen or canceled (Davalos, 2021). In Florida, specifically, Executive Order 20-71 mandated gym closures in March 2020 (Exec. Order No. 20-71, 2020). The University of Florida (UF) closed all campus recreation centers on March 20, 2020, classes transitioned online, and students were encouraged to go home (University of Florida, n.d.). As students returned to campus in Fall 2020, UF required that students be tested for COVID-19 every two weeks to attend in-person classes or utilize recreation centers, which had reopened and required social distancing and masks—strategies that reduced infectivity but limited participation in everyday activities and PA (Ammar et al., 2020).

Given these changes, the aim of this project was to understand the impact of COVID-19 on PA levels of UF students and factors that might support or hinder ongoing PA. As enjoyment is a predictor and result of PA (Mullen et al., 2011), this survey assessed this variable to see if it related to the likelihood of meeting PA recommendations during the pandemic. This project also
examines how UF students’ PA levels, access to PA resources, and PA enjoyment were related to COVID-19 disruptions (e.g., social distancing, stay-at-home orders, and mask ordinances). Additionally, the survey investigated openness of students to trying digital PA interventions.

**Materials and Methods**

**Participants and Procedure**

**eligibility.**

Eligible participants were between the ages of 18 and 24 years old, attended UF as full-time (enrolled in ≥12 credits), residential (i.e., traditional, in-person, on-/off-campus, not UF Online) undergraduate students, and were able to participate in PA without physical limitations or medical conditions (e.g., heart disease, chest pain, or dizziness) assessed by a subset of the Physical Activity Readiness Questionnaire (Warburton et al., 2011).

**recruitment.**

Participants were recruited via word of mouth and emails sent through club and organization Listservs. Interested participants were directed to an online survey in REDCap where they reviewed the study details and provided electronic informed consent. After a brief screening, eligible participants proceeded to the survey. This study was approved by the UF Institutional Review Board.

**incentive.**

Participants with complete survey data were invited to provide their email addresses to be considered for an incentive. The incentives ($30 gift cards) were administered to every 50th participant (4 in total) who provided their email address.

**Measures**

Participants were asked the same series of questions about their PA habits at the time of the survey administration (December 2020), as well as recalling their PA at two points in the past year—during the first period of COVID-19 disruptions (June 2020), and before COVID-19 (February 2020).

**participant characteristics.**
Participants reported their height, weight, age, gender, ethnicity, race, and current employment status. At each timepoint, participants also noted the locations where they exercised, if they had exercised independently or with a group, if they lived in Gainesville, and if they lived on- or off-campus.

**Physical activity.**

Each of the six categories in the Stanford Leisure-Time Activity Categorical Item (L-Cat) indicates a different degree of adherence to the American College of Sports Medicine and American Heart Association’s PA recommendations: one inactive choice, one light-intensity, two moderate-intensity, and two vigorous-intensity choices rated by increasing metabolic equivalents (Haskell et al., 2007). Choices one through three are below these recommendations, while choices four through six are at or above the recommendations (Kiernan et al., 2013). The L-Cat has excellent test-retest reliability and adequate concurrent criterion validity with body mass index (BMI), pedometer steps, and weight loss. Additionally, it was coded if participants met PA recommendations at any timepoint or never met them. Participants reported the number of days and average minutes per day spent engaging in moderate and vigorous activity at each timepoint with questions from the Physical Activity and Physical Fitness Questionnaire (CDC, 2013). At the end, participants were asked to think back on how COVID-19 changed their overall PA levels in an open-ended question.

**Physical activity enjoyment.**

PA enjoyment was measured with a validated 8-item version of the Physical Activity Enjoyment Scale (PACES-8) (Mullen et al., 2011). The PACES-8 is a shortened measure with a strong correlation to the original 18-item version of the survey and adequate longitudinal invariance (Mullen et al., 2011). Participants were asked to select from two options (e.g., I find it pleasurable; I find it unpleasurable) in eight questions to determine overall outlook toward PA. These data were dichotomized for analysis so that those with ≥5 positive responses to PA were considered to mostly enjoy PA, and those with scores of <5 were considered to generally not enjoy PA.

**Digital intervention.**
Participants reported how likely they would be to engage with a digital PA intervention offered by UF on a scale of 0 (not very likely) to 100 (very likely) and could provide open-ended comments. Participants rated their interest in five digital intervention features (e.g., workout ideas, exercise tracking, and social support) and six delivery mechanisms (e.g., app, website, and social media) on a scale from 0 (not very interested) to 100 (very interested) with the option to explain their responses.

analyses.

Data were cleaned to remove outlying or implausible responses (e.g., >7 days per week or >4 hours per moderate PA session). Participant responses were included in the final analysis dataset if they had data for all quantitative questions.

All analyses were conducted in SAS 9.4 (SAS, Inc; Cary, NC). Descriptive statistics were calculated for demographics, PA levels, locations of PA, time spent engaging in moderate and vigorous PA, and interest in digital intervention features and delivery mechanisms. Chi-square tests were used to examine the relationship between PA enjoyment and meeting PA recommendations at each timepoint. A t-test was used to explore the likelihood of engagement with a digital intervention among participants that did not meet PA recommendations across all timepoints. A qualitative analysis of the open-ended questions was conducted using an emergent themes approach.

Results

Participant Flow and Survey Responses

A total of n=336 participants began the survey, and n=334 participants agreed to participate after reading the informed consent. Thirty participants were ineligible during screening (n=3 outside age range, n=23 not full-time UF students, n=25 not able to engage in PA). In total, n=200 participants had complete survey data and were included in the analyses.

Demographic Characteristics

The majority of participants were female (71.0%), white (70.0%), and non-Hispanic (77.0%), the average age of participants was 19.8 (SD=1.2) years old, and the average BMI was 22.9 (SD=3.9) kg/m². Table 1 shows additional population characteristics divided based on whether
the participant met the PA recommendations at the time of survey administration (December 2021).

### Table 1. Demographic Data for Participants (N=200)

<table>
<thead>
<tr>
<th></th>
<th>All Participants (N=200) N (%) or Mean (SD)</th>
<th>Met PA Recommendations in December (N=87) N (%) or Mean (SD)</th>
<th>Did Not Meet Physical Activity Recommendations in December (N=113) N (%) or Mean (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>BMI</td>
<td>22.9 (3.9)</td>
<td>22.9 (3.5)</td>
<td>23.0 (4.2)</td>
</tr>
<tr>
<td>Age</td>
<td>19.8 (1.2)</td>
<td>19.8 (1.2)</td>
<td>19.8 (1.3)</td>
</tr>
<tr>
<td>Male</td>
<td>55 (27.5)</td>
<td>27 (31.0)</td>
<td>28 (24.8)</td>
</tr>
<tr>
<td>Female</td>
<td>142 (71.0)</td>
<td>59 (67.8)</td>
<td>83 (73.5)</td>
</tr>
<tr>
<td>Hispanic/ Latino</td>
<td>46 (23.0)</td>
<td>17 (19.5)</td>
<td>29 (25.7)</td>
</tr>
<tr>
<td>White</td>
<td>150 (75.0)</td>
<td>69 (79.3)</td>
<td>81 (71.7)</td>
</tr>
<tr>
<td>Black or African</td>
<td>9 (4.5)</td>
<td>3 (3.5)</td>
<td>6 (5.3)</td>
</tr>
<tr>
<td>American Native</td>
<td>1 (0.5)</td>
<td>0 (0.0)</td>
<td>1 (0.9)</td>
</tr>
<tr>
<td>Asian</td>
<td>32 (16.0)</td>
<td>10 (11.5)</td>
<td>22 (19.5)</td>
</tr>
<tr>
<td>Other</td>
<td>6 (3.0)</td>
<td>4 (4.6)</td>
<td>2 (1.8)</td>
</tr>
<tr>
<td>Employed</td>
<td>73 (36.5)</td>
<td>37 (42.5)</td>
<td>36 (31.9)</td>
</tr>
<tr>
<td>Work for fewer than 20 hours per week</td>
<td>59 (80.8)</td>
<td>29 (78.4)</td>
<td>30 (83.3)</td>
</tr>
<tr>
<td>Work for 20-39 hours per week</td>
<td>14 (19.2)</td>
<td>8 (21.6)</td>
<td>6 (16.7)</td>
</tr>
</tbody>
</table>

**Note.**
BMI = Body Mass Index (kg/m²)
PA = Physical Activity
SD = Standard Deviation

### Physical Activity Levels

Across the timepoints, average L-Cat scores (3.8 in February, 3.5 in June, and 3.4 in December) indicated that participants generally were not meeting the PA recommendations (score ≤4). There were marked decreases in the number of minutes of moderate PA (49.2 to 42.6) and vigorous PA (37.3 to 29.6), as well as decreases in the percentages of participants exercising at indoor gyms (66.5% to 13.0%) and with a group (38.0% to 11.0%) between February and June (see Table 2). Conversely, there were increases in the number of participants exercising at home (37.5% to 82.5%) and by themselves (52.0% to 89.0%) during this time. Between June and December, exercise at indoor gyms increased from 13.0% to 39.0%, home exercise decreased from 82.5% to 68.0%, and the percentage of participants living in Gainesville
increased from 17.0% to 79.0%. Participants that reported that they mostly enjoyed PA (≥5 on PACES-8) were more likely to meet PA recommendations at all timepoints (ps<0.01).

Table 2. PA Levels and Modalities at Each Time Point

<table>
<thead>
<tr>
<th>PA Recommendations</th>
<th>February N (%) or Mean (SD)</th>
<th>June N (%) or Mean (SD)</th>
<th>December N (%) or Mean (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stanford L-Cat Score</td>
<td>3.8 (1.5)</td>
<td>3.5 (1.7)</td>
<td>3.4 (1.7)</td>
</tr>
<tr>
<td>Meeting PA</td>
<td>104 (52.0)</td>
<td>99 (49.5)</td>
<td>87 (43.5)</td>
</tr>
<tr>
<td>Recommendations</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not Meeting PA Recommendations</td>
<td>96 (48.0)</td>
<td>101 (50.5)</td>
<td>113 (56.5)</td>
</tr>
<tr>
<td><strong>Locations/Tendencies of PA</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exercised at indoor gym or recreational facility</td>
<td>133 (66.5)</td>
<td>26 (13.0)</td>
<td>78 (39.0)</td>
</tr>
<tr>
<td>Exercised at outdoor gym or recreational facility</td>
<td>37 (18.5)</td>
<td>20 (10.0)</td>
<td>26 (13.0)</td>
</tr>
<tr>
<td>Exercised at public park</td>
<td>38 (19.0)</td>
<td>56 (28.0)</td>
<td>68 (34.0)</td>
</tr>
<tr>
<td>Exercised at home</td>
<td>75 (37.5)</td>
<td>165 (82.5)</td>
<td>136 (68.0)</td>
</tr>
<tr>
<td>Exercise at other location</td>
<td>26 (13.0)</td>
<td>11 (5.5)</td>
<td>13 (6.5)</td>
</tr>
<tr>
<td>Exercised independently</td>
<td>124 (62.0)</td>
<td>178 (89.0)</td>
<td>176 (88.0)</td>
</tr>
<tr>
<td>Exercised in groups</td>
<td>76 (38.0)</td>
<td>22 (11.0)</td>
<td>24 (12.0)</td>
</tr>
<tr>
<td><strong>Residency in Gainesville</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lived in Gainesville</td>
<td>159 (79.5)</td>
<td>34 (17.0)</td>
<td>158 (79.0)</td>
</tr>
<tr>
<td>Lived on campus</td>
<td>65 (40.9)</td>
<td>2 (5.9)</td>
<td>47 (29.8)</td>
</tr>
<tr>
<td>Lived off campus</td>
<td>94 (59.1)</td>
<td>32 (94.1)</td>
<td>111 (70.3)</td>
</tr>
<tr>
<td><strong>Time Spent Engaging in PA</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Days with moderate exercise</td>
<td>3.8 (1.9)</td>
<td>3.4 (2.1)</td>
<td>3.2 (1.9)</td>
</tr>
<tr>
<td>Minutes of moderate exercise per session</td>
<td>49.2 (31.5)</td>
<td>42.6 (26.8)</td>
<td>45.1 (28.1)</td>
</tr>
<tr>
<td>Days with vigorous exercise</td>
<td>2.2 (2.0)</td>
<td>2.2 (2.1)</td>
<td>1.96 (2.0)</td>
</tr>
<tr>
<td>Minutes of vigorous exercise per session</td>
<td>37.3 (32.7)</td>
<td>29.6 (28.2)</td>
<td>30.3 (32.5)</td>
</tr>
<tr>
<td>Days with muscle strengthening exercises or resistance training</td>
<td>2.0 (2.0)</td>
<td>2.0 (2.2)</td>
<td>1.9 (2.2)</td>
</tr>
</tbody>
</table>

*Note.*
PA = Physical Activity  
SD = Standard Deviation  
Stanford L-Cat (Leisure-Time Activity Categorical Item) scores range from 0 to 6 with a score of 4 or higher indicating that a participant is meeting PA guidelines

Most participants (52.0%) had consistent patterns of PA (i.e., meeting or not meeting recommendations) across all timepoints. In total, 49 participants (24.5%) continued to meet
guidelines with a rating of ≥4 on the L-Cat at each timepoint while 55 participants (27.5%) scored ≤3 and did not meet the guidelines at any timepoint. Thirty-seven participants (18.5%) went from meeting recommendations in February to not meeting them during the COVID-19 disruptions in June, and 32 participants (16.0%) began meeting PA guidelines in June after not meeting them in February.

**Interest in a Digital Intervention**

Participants’ average interest score in a digital PA intervention was 49.6 (on scale of 0-100). Table 3 displays participant interest in different features and mediums of digital interventions. In the overall sample, the highest interest was in app-based (78.2%) programs involving workout ideas (71.9%) and maps of local trails (76.1%). Descriptively, there were no significant differences in preference for participants below the PA recommendations or with low PA enjoyment compared to the overall sample. There was no significant difference in interest in engaging with a digital intervention between participants who did not meet PA recommendations at any timepoint (50.7 out of 100) compared to those who met recommendations at least once (49.1 out of 100).

**Table 3. Interest in Digital Intervention Features and Potential Delivery Mechanisms**

<table>
<thead>
<tr>
<th>Digital Intervention Features</th>
<th>Below PA Recommendations Mean (SD)</th>
<th>Low PA Enjoyment Mean (SD)</th>
<th>Overall Sample Mean (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Workout Ideas</td>
<td>73.5 (25.0)</td>
<td>70.9 (22.2)</td>
<td>71.9 (27.0)</td>
</tr>
<tr>
<td>Exercise Tracking</td>
<td>64.2 (29.7)</td>
<td>63.1 (31.9)</td>
<td>64.1 (31.3)</td>
</tr>
<tr>
<td>Social Support</td>
<td>49.5 (30.3)</td>
<td>51.8 (32.3)</td>
<td>44.8 (31.8)</td>
</tr>
<tr>
<td>Workout Videos</td>
<td>66.4 (30.4)</td>
<td>60.0 (31.8)</td>
<td>61.8 (32.0)</td>
</tr>
<tr>
<td>Maps of Local Trails</td>
<td>75.7 (28.7)</td>
<td>68.4 (34.4)</td>
<td>76.1 (28.5)</td>
</tr>
</tbody>
</table>

**Potential Delivery Mechanisms**

| App                          | 80.4 (22.5)                        | 81.7 (22.6)                | 78.2 (24.7)              |
| Website                      | 45.4 (29.5)                        | 49.9 (31.0)                | 45.0 (30.9)              |
| Social Media                 | 42.9 (29.8)                        | 38.9 (31.3)                | 41.2 (30.4)              |
| Message Board                | 29.2 (27.5)                        | 27.7 (29.6)                | 25.6 (25.5)              |
| Email                        | 28.9 (27.4)                        | 29.6 (30.1)                | 27.8 (27.3)              |
| Text Message                 | 37.4 (29.2)                        | 31.4 (30.8)                | 31.0 (28.6)              |

**Note.**
PA = Physical Activity  
SD = Standard Deviation  
Data from December 2020; scores range from 0-100 (100=highest interest)
Open-Ended Question Themes

open-ended perceptions on physical activity change.
When asked to reflect on whether their PA levels had changed since before COVID-19, two main themes emerged: participants who reported becoming more active and participants who reported decreasing PA levels.

Among participants who reported that they had become more active, common themes included the effects of increased free time, the usefulness of online workout resources, and the ability to participate in more outdoor aerobics. The following illustrative quotes demonstrate these themes:

“With more free time during quarantine, I started daily exercises with at home workouts.”

“I shifted focus from weights and improvements in strength to body weight exercises, cardio, yoga, and toning.”

The other participants reported decreased PA due to diminished motivation and mental health, reduced access to gyms, lack of reason to walk without in-person classes, being uncomfortable in public, and the halting of sports practices. The following illustrative quotes highlight these themes:

“COVID has made me tired and unmotivated.”

“Online classes have decreased my PA level.”

open-ended perceptions on a digital intervention for physical activity.
When asked to explain their willingness to engage in a digital PA intervention for UF students, two themes were apparent: participants that were likely to use it and those who were not.

Participants willing to use a digital intervention reported that it would help improve their motivation to be active. The following quotes demonstrate this trend:

“It motivates one to be active as a student.”
“I think any motivation offered to help keep us moving would be very much appreciated.”

Interested participants had the option to highlight what they thought would be most helpful in a UF digital PA intervention. Common answers included incentives, balanced meal ideas, competition with other students, daily activity reminders, diversity in fitness options, free videos from personal trainers, and goal-setting.

Among participants who responded that they would not be likely to use a digital intervention, common themes included having an existing PA routine and losing interest after a short time. The following illustrative quotes contain these common opinions:

“I have a good exercise routine already.”

“I’d be interested in trying the program but I’m not sure I would stick with it.”

**Discussion**

The purpose of this study was to evaluate the impacts of the 2020 COVID-19 disruptions on the PA levels of UF students during and after that time period while also exploring opportunities for future university investment into digital fitness interventions. Across all timepoints, the average UF student in our sample was not meeting national guidelines for aerobic PA, and there were decreases in the proportion of participants meeting the guidelines between February and December. Steep declines in exercise involving groups or the use of indoor facilities and increases in independent home workout routines became apparent and were likely attributable to the closure of gyms (Davalos, 2021) and participants’ realization that indoor activity involving crowded, confined places is connected to increased coronavirus transmission (Gupta-Smith, 2021).

The results of this survey indicate that most participants continued to maintain similar levels of PA across all three timepoints. Some qualitative responses indicated that increases in free time and availability of online resources led to increases in their PA levels, while others reported that COVID-19 undermined their motivation to be active and limited access to gyms.

A significant relationship between participant enjoyment of PA and their likelihood of meeting the PA guidelines was observed, and this aligns with the idea that finding pleasure in
Exercising could increase willingness of participation in a digital fitness intervention (Mullen et al., 2011). For universities reintroducing in-person learning and allowing students to return to campus, this could be important when considering the effectiveness of digital interventions to increase PA levels and student fitness. Increasing student enjoyment of PA could be important for developing successful digital interventions in future research efforts. On average, participant responses towards digital fitness interventions were in the middle, with the mean interest at around 50 out of 100; however, including the most highly rated feature ideas (e.g., workout ideas and maps of local trails) using the most highly rated delivery mechanisms (e.g., app) may increase the likelihood of students using the intervention.

There appeared to be some interest in a digital intervention amongst survey participants. Development of an application that accounts for the preferences of the students included in this survey may be a useful strategy for UF and other academic institutions. With new surges of COVID-19 attributable to virus variants becoming apparent as K-12 schools reopen (Cha, 2021), such digital interventions may become useful if schools are forced to return to virtual learning amid growing concerns about the disease. Prior research indicates that effective digital interventions should utilize various education tactics and allow users to set PA and diet goals with the option for self-monitoring (Rose et al., 2017).

Other studies indicate that mobile applications may encourage increases in PA as the pandemic progresses. While moderate and vigorous PA was found to decrease among adults in the US during the COVID-19 pandemic, PA app usage was associated with smaller decreases in minutes of PA (Yang & Koenigstorfer, 2020). Further, national survey data revealed that adults using digital PA interventions (e.g., subscriber fitness programs or apps, facilitated Zoom classes, online training programs) have higher adherence to PA guidelines than those who did not, indicating that mainstream PA platforms could be used to encourage PA in certain populations (Parker et al., 2021).

This survey was administered at UF towards the end of 2020, before the U.S. Food and Drug Administration issued its first emergency use authorization for the Pfizer-BioNTech COVID-19 vaccine (FDA, 2020). It is possible that vaccination efforts since then may have impacted PA levels of participants after participation in this project. Further research could be conducted to evaluate PA levels in university students as vaccination efforts progress and new variations of COVID-19 (e.g., the Delta and Omicron variants) emerge. Additionally, the present findings...
about preferences for a digital PA intervention could be put into practice through program development and implementation.

**Limitations**

There were four main limitations to this survey that may affect the generalizability of the results. First, given how the survey was distributed through specific Listservs, most participants likely belonged to a narrow range of academic disciplines (e.g., pre-health). Second, the majority of participants were female and white, limiting our knowledge of the responses of other groups. While the sample had varied levels and characteristics of PA, future research is needed with a sample fully representative of the UF student body to conduct further subgroup analyses. Third, inherent survey bias in self-reporting lifestyle behaviors could have skewed the data, particularly around PA levels. Fourth, the PACES-8 instrument was simplified from Likert scales to binary multiple-choice questions with the option to select a favorable or unfavorable opinion about PA. This may have reduced the degree of specificity typically provided by the PACES.

**Conclusion**

While survey participants largely maintained their pre-pandemic PA levels across all three timepoints, their means of participating in PA shifted during the pandemic. PA enjoyment was related to meeting PA recommendations, and other participant characteristics (e.g., lack of motivation) were correlated with declines in participant PA. Development of a digital fitness intervention informed by the results of this survey could prove useful should similar situations arise in the future.

**Acknowledgments**

I would like to thank Dr. Danielle E. Jake-Schoffman for her mentorship, Melinda Rajoria for her help with REDCap, and the EXHALE lab for their support.

**References**

COVID-19 AND PHYSICAL ACTIVITY IN UNIVERSITY OF FLORIDA STUDENTS: A SURVEY STUDY


