BRIEF

The Impact of COVID-19-Related Transitions on Student Well-being

Nicholas E Hagemeier, PharmD, PhD, KariLynn Dowling-McClay, PharmD, MPH

East Tennessee State University, Gatton College of Pharmacy

Corresponding Author: Nicholas E Hagemeier, East Tennessee State University, Gatton College of Pharmacy Box 70657, Johnson City, TN 37614. Tel: 423-439-6239. Email: hagemeier@etsu.edu

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Objective. To characterize the impact of COVID-19 transitions on first professional year (P1) students' domain-specific and overall well-being.
Methods. All P1 students (N=74) enrolled at one college of pharmacy self-reported their career, community, financial, physical, social, and overall well-being on a weekly basis from January 6, 2020 through April 27, 2020. Parametric statistical tests and effect sizes were used to compare well-being scores pre-COVID-19 and post-COVID-19 and to compare well-being scores to a previous cohort of P1 students.
Results. Mean well-being scores decreased when comparing pre-COVID-19 vs post-COVID-19 scores with effect sizes ranging from d_{av}=.16 for financial well-being to d_{av}=.84 for social well-being. The average percent of students reporting struggling increased by 86.1% (16.8% vs. 31.2%) post-COVID-19, and the average percent of students who reported suffering post-COVID-19 was 351% higher (1.3% vs. 6%) than pre-COVID-19.
Conclusion. Pharmacy students' domain specific and overall well-being significantly decreased with COVID-19-related transitions. The percentage of students reporting struggling or suffering significantly increased post-COVID-19.
Keywords: well-being, COVID-19, pharmacy student, thriving, suffering

INTRODUCTION

The well-being of student pharmacists is increasingly a topic of interest in the Academy. An *AJPE* "well-being" keyword search notes over 100 publications since 2016, with 20 publications in the first few months of 2020 alone. The American Association of Colleges of Pharmacy (AACP) and the Accreditation Council for Pharmacy Education (ACPE) emphasize the importance of student well-being through policy statements and accreditation standards, respectively.[1, 2] Likewise, pharmacist associations and stakeholders within the profession have affirmed the importance of well-being among pharmacists and pharmacy students.[3-5]

The Centers for Disease Control and Prevention (CDC) defines well-being as "the presence of positive emotions and moods (eg, contentment, happiness), the absence of negative emotions (eg, depression, anxiety), satisfaction with life, fulfillment and positive functioning."[6] Well-being research points to the positive impact of possessing it as well as the negative aspects of lacking it.[7-9] In their evaluation of population level and individual well-being, Gallup categorizes well-being as thriving, struggling, and suffering using the 11-point Cantril Self-Anchoring Scale.[7, 10, 11] Gallup uses five domains to conceptualize well-being.[7] Career/purpose well-being is liking what one does each day. Community well-being captures the extent to which one likes where (s)he lives and takes pride in the community. Financial well-being addresses the security of one's finances. Physical well-being is defined as having good health and enough energy to get things done daily. Finally, social well-being is defined as having supportive relationships and having love in one's life.

Transition periods are critical periods from a well-being perspective.[12] While pharmacy student research is limited, research across health professions education notes decreases in well-being, or elements thereof, during transition periods and the need for targeted interventions during these periods.[13-16] Our recent work that longitudinally examined the well-being of first-professional year (P1) students noted significant decreases in multiple well-being domains during the P1 year, especially during the transition semester.[17]

The coronavirus disease of 2019 (COVID-19) undoubtedly precipitated a transition period within the Academy as faculty, staff, and students transitioned from in-person to remote teaching and learning in a matter of days in early 2020. A number of peer-reviewed articles were published shortly thereafter emphasizing the real and perceived negative impact of COVID-19 transitions on college student, health care worker, and societal well-being.[18-23] Gallup data for the United States (US) reported 46.4% of US adults thriving in April 2020, the lowest percentage since the Great Recession.[24] Having recently published a longitudinal analysis of well-being across the P1 academic year, we were not planning to

share the well-being data for the current cohort of P1s.[17] However, the natural experiment inherent in the COVID-19 pandemic presented an opportunity to examine the impact of pandemic-related transitions on student well-being.

METHODS

This study received exempt approval from the East Tennessee State University (ETSU) Institutional Review Board. This study employed a longitudinal design, and the sample consisted of P1 students enrolled in the ETSU Gatton College of Pharmacy during the Spring 2020 semester (N=74). As part of a required P1 course, students rated their overall well-being and domain-specific well-being using a 7-point response scale (1=extremely poor, 2=poor, 3=somewhat poor, 4=neutral, 5=somewhat good, 6=good, 7=extremely good) on a weekly basis. Students were familiar with the Gallup well-being domains because they participated in required curricular and co-curricular sessions during the Fall 2019 semester that explained Gallup's conceptualization of well-being, the Cantril Self-Anchoring Scale, and the 7-point study response scale. Students had also completed well-being assessments weekly during the Fall semester and developed individual action plans to optimize well-being across Gallup well-being domains. Individual action plans were evaluated by the course coordinator to confirm student understanding of each well-being domain.

Given the COVID-19 pandemic, ETSU notified students on Thursday March 12, 2020 that from Monday March 23 to April 9, 2020, all face-to-face classes would be moved to online classes. Spring Break week was March 16-20, 2020. On Friday March 20, 2020, the university announced that spring semester classes would be held online through the remainder of the semester. Prior to moving to remote learning on March 23 (pre-COVID-19), students reported their well-being via audience response software during Monday class sessions. Pre-COVID-19 student responses were identifiable. Thereafter (post-COVID-19), weekly well-being surveys were administered via the institution's learning management system. Post-COVID-19 reporting was anonymous. Given the overarching emphasis of the course on personal and professional development, well-being assessments were part of students' participation grades throughout the course.

To elicit well-being perceptions, students were asked, "On a scale from 1 (extremely poor) to 7 (extremely good), *over the past 7 days*, I would describe my overall well-being as…". In addition to overall well-being, students responded to the same item for all well-being domains (career, community, financial, physical, and social), for a total of six items weekly. Recognizing the limitations inherent in representing a domain with only one survey item and having invested in previously mentioned efforts to face validate the survey instrument with the students and previous P1 cohorts, we sacrificed methodological rigor to make longitudinal, weekly assessment of well-being feasible in the educational environment. Once the transition to remote learning occurred, each student was given one week to respond to the well-being items. For example, the well-being assessment for March 23, 2020 was open from 9am local time March 23, 2020 through 8:59am March 30, 2020. An analysis of response data indicated that a large majority of students responded to the weekly well-being survey on the Monday the survey opened. Only one week of well-being items was open to students at any point in time. Data were not collected during the week of the Martin Luther King, Jr holiday (January 20, 2020) and during spring break (March 16, 2020).

Given the anonymity of responses during the remote learning period, we were unable to link post-COVID-19 responses with pre-COVID-19 responses at the individual student level. Likewise, demographic variables could not be linked to post-COVID-19 data. Data were analyzed using IBM SPSS Statistics version 25 (IBM Corp, Armonk, NY). Multiple imputation techniques were employed to handle missing data. Weekly mean scores were calculated for overall and domain specific well-being and thereafter used to calculate an aggregate mean pre-COVID-19 and post-COVID-19 score for each domain. Using the aggregate scores and standard deviations, we calculated Cohen's d_{av} to determine effect size for wellbeing changes pre- and post-COVID-19.[25] Cohen's d_{av} uses average standard deviations of repeated measures to calculate the standardized mean difference of an effect in a within-subjects design. Cohen's d_{av} is interpreted in the same manner as other Cohen's d effect size calculations. As a comparator, we performed the same calculation with the Class of 2021 data using spring break as an index point to reflect the timing of COVID-19 in the Class of 2023. Paired t-tests were used to evaluate differences in mean pre- and post-COVID-19 scores across wellbeing domains. A $p<.05$ was considered significant for all statistical analyses. To evaluate the cohort using Gallup's thriving, struggling, and suffering categories, an additional variable was constructed using the weekly overall well-being ratings. On the original 0-10 Cantril scale, the cutoff for thriving was 7, struggling 4-6.9, and suffering less than 4. Using these parameters as a guide, student ratings of 1-2 were considered suffering, 3-4 struggling, and 5-7 thriving.

RESULTS

Data were collected for all students in the P1 cohort (N=74). The cohort was 65% female, 70% white, 12% African American, and 10% Asian/Pacific Islander with a mean age of 24. Nearly half (48%) had earned a bachelor's degree or higher upon matriculation. The average weekly response rate pre-COVID-19 was 87% (range 77%-100%) and post-COVID-19 was 76% (range 41%-91%). Figure 1 presents the weekly mean well-being scores across the spring

semester. Weekly descriptive statistics are provided as a supplemental file. Table 1 presents mean well-being scores pre-COVID-19 and post-COVID-19 and compares results to those obtained from the Class of 2021 using spring break as an index point to represent the timing of COVID-19 transitions. Mean well-being scores decreased when comparing pre-COVID-19 vs post-COVID-19 scores with effect sizes ranging from d_{av}=.16 for financial well-being to d_{av}=.84 for social well-being. Comparatively, for the Class of 2021, no statistically significant decreases in well-being domains were noted pre- and post-spring break and effect sizes ranged from d_{av}=-.18 for physical well-being to d_{av}=.09 for social well-being.

Table 2 presents pre-COVID-19 and post-COVID-19 average student responses for each well-being domain and overall well-being. Overall, responses shifted towards the somewhat poor/poor/extremely poor end of the response scale post-COVID-19. For example, the range of somewhat poor/poor/extremely poor career well-being responses post-COVID-19 ranged from 3% to 18% of students as compared to a range of 2% to 6% pre-COVID-19. On average, 28% of students reported somewhat poor/poor/extremely poor community well-being post-COVID-19 as compared to an average of 6% responding the same across pre-COVID-19 weeks. The percentage of students who reported somewhat poor/poor/extremely poor financial well-being ranged from 12% to 20% pre-COVID-19 as compared to a range of 17% to 29% post-COVID-19. Post-COVID-19, 25% to 39% of students reported somewhat poor/poor/extremely poor physical well-being as compared to 11% to 21% pre-COVID-19. In the first week after COVID-19-related transitions (3/23), nearly 40% of students reported somewhat poor/poor/extremely poor social well-being. The minimum percentage of students reporting somewhat poor/poor/extremely poor social well-being post-COVID-19 was 26% on 4/27. Conversely, the percentage of students reporting somewhat poor/poor/extremely poor social well-being pre-COVID-19 ranged from 3% to 7%. Finally, the percent of students who reported somewhat poor/poor/extremely poor overall well-being post-COVID-19 ranged from 9% to 16% as compared to a range of 1% to 7% pre-COVID-19. Pre-COVID-19, one or more students reported poor or extremely poor overall well-being during four of the nine weeks assessed. Poor or extremely poor overall well-being was reported in every week post-COVID-19.

When considering students' overall well-being from Gallup's thriving, struggling, suffering perspective, downward trends in student thriving and corresponding increases in students struggling and suffering were noted post-COVID-19 (Figure 2). The average percent of students who reported thriving decreased from 81.9% of students pre-COVID-19 to 62.8% of students post-COVID-19. The average percent of students reporting struggling increased by 86.1% (16.8% vs. 31.2%) pre-COVID-19 to post-COVID-19, and the average percent of students who reported suffering post-COVID-19 was 351% higher (1.3% vs. 6%) than pre-COVID-19.

DISCUSSION

Student transitions amidst the COVID-19 pandemic were associated with decreases in domain specific and overall well-being in our cohort of P1s. Likewise, and in alignment with overall US data, the percentage of students reporting thriving post-COVID-19 plummeted. Our findings demonstrate both the dynamic nature of well-being and the extent to which an unprecedented disruption such as COVID-19 can negatively impact students.

When comparing the Class of 2023 to our previous findings involving the Class of 2021, notable differences were observed in spring semester weekly mean well-being scores.[17] The Class of 2021 was able to maintain or improve well-being scores across their spring semester and ended on an upswing across all well-being domains. This was not the case for the Class of 2023 amidst the COVID-19 pandemic. While other mid- to late-semester variables could have influenced the downward trend in wellbeing for the Class of 2023, such as falling behind in course work, the same variables would have influenced the Class of 2021. While Figure 1 visualizes the significant drop in social and community well-being post-COVID-19, anecdotal conversations with students revealed loneliness that is difficult to quantify with mean scores. For many students, remote learning and quarantine requirements necessitated social isolation. Also apparent in conversations with students was the extent to which suffering or struggling social well-being influenced their ability to engage fully in their coursework. Literature affirms the negative consequences of loneliness and social isolation and the relationship between social isolation and cognitive processes.[26, 27] The recent American Perspectives Survey noted that young people (18-29 years old) were the most likely to report feeling lonely during COVID-19 as compared to older cohorts.[28] Our data indicate pharmacy students are likely similar.

While the results of the research are perhaps expected, we perceive there to be value in sharing them with the Academy. As COVID-19 continues to impact upcoming learning periods, we encourage colleges and schools to assess student well-being and to use their student data to inform intentional investments in well-being promoting interventions across well-being domains. Beginning in Fall 2020, we began tracking weekly well-being across the P1, P2, and P3 cohorts. Faculty champions for each cohort reach out to students who report extremely poor, poor, or somewhat poor overall well-being. While only a recent intervention approach, students overwhelmingly appreciate faculty reaching out. We are therefore using the brief well-being assessment as more of a proactive early alert conversation starter with students as opposed to waiting until students reach out or display downstream consequences of struggling or suffering well-being.

As the Academy prepares for additional COVID-impacted semesters, bolstering mental health resources and/or awareness thereof for students may be warranted. Moreover, fostering proactive connectedness with a counselor, mentor, or other individual may warrant consideration as opposed to reactively encouraging conversations once social well-being is struggling or suffering. Given that incoming students will have experienced COVID-19 in some form, they may already be experiencing low social well-being, and/or may perceive COVID-19 to be a traumatic event in their lives.[29] Trauma-informed resources such as the document developed by Trauma Informed Oregon may need to be developed/revised at the college or institutional level.[30]

Finally, our findings demonstrate the value of face-to-face connectedness. Regardless if learning is on-campus or remote, colleges and schools should consider how to safely and effectively promote social connectedness and hence social well-being while observing social distancing guidelines, which may be more aptly called "physical distancing" guidelines. Finally, perhaps at no time has it been more important to ensure faculty and staff are equipped to respond to mental health concerns among students and peers.

This study has several limitations. First, results represent one cohort of students at one institution. The extent to which the results are generalizable to other students is unknown. Second, students could have misinterpreted well-being constructs and therefore responded inaccurately. The use of single items to represent well-being domains is also a limitation. Finally, the transition from identifiable well-being responses pre-COVID-19 to anonymous responses post-COVID-19 could have influenced students' responses.

CONCLUSION

Pharmacy students' domain specific and overall well-being significantly decreased during COVID-19-related transitions. The percentage of students reporting struggling or suffering significantly increased post-COVID-19. Timely research is warranted to understand and effectively promote student well-being as COVID-19 continues to impact colleges' and schools' traditional learning environments.

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Table 1. First Professional Year (P1) Student Mean Well-being Scores Pre-index and Post-index[+]

Well-being Domain	Cohort	Pre-Index Mean (SD)	Post-Index Mean (SD)	Cohen's d_{av}	*p*-value
Career					
	2021	5.2 (1.0)	5.2 (1.1)	.02	.819
	2023	5.3 (1.1)	4.9 (1.3)	.33	.007*
Community					
	2021	4.8 (1.2)	4.8 (1.1)	.01	.952
	2023	4.9 (1.1)	4.2 (1.4)	.59	<.001*
Financial					
	2021	4.6 (1.3)	4.5 (1.2)	.08	.325
	2023	4.9 (1.3)	4.7 (1.5)	.16	.019*
Physical					
	2021	4.6 (1.2)	4.8 (1.1)	-.19	.019*
	2023	4.8 (1.4)	4.2 (1.6)	.38	<.001*
Social					
	2021	5.2 (.98)	5.1 (1.1)	.09	.288
	2023	5.4 (1.3)	4.3 (1.5)	.84	<.001*
Overall					
	2021	5.1 (.95)	5.1 (.97)	.03	.708
	2023	5.4 (.97)	4.8 (1.2)	.54	<.001*

+ The pre/post-index cutoff was COVID-19-related transitions that occurred mid-March for the Class of 2023 and pre-spring break for the Class of 2021

$d_{av}=d_{average}$

*Paired t-test was used to determine significance, defined as $p<.05$

Table 2. First-professional Year Student Average Well-being Responses Pre-COVID-19 and Post-COVID-19 (N=74).

Well-being Domain	Response	Pre-COVID-19 % (range)	Post-COVID-19 % (range)
Career			
	Extremely Good	8 (2-15)	6 (3-9)
	Good	46 (28-59)	35 (29-39)
	Somewhat Good	28 (20-34)	28 (20-33)
	Neutral	14 (8-18)	20 (16-25)
	Somewhat Poor	1 (0-3)	4 (0-8)
	Poor	1 (0-2)	4 (0-7)
	Extremely Poor	2 (1-4)	3 (1-4)
Community			
	Extremely Good	2 (0-4)	2 (0-3)
	Good	31 (22-42)	18 (15-21)
	Somewhat Good	32 (22-42)	21 (15-31)
	Neutral	30 (16-46)	32 (28-39)
	Somewhat Poor	3 (0-5)	14 (11-19)
	Poor	1 (0-3)	12 (8-15)
	Extremely Poor	2 (0-4)	3 (0-6)
Financial			
	Extremely Good	5 (0-10)	8 (5-11)
	Good	34 (31-38)	27 (24-31)
	Somewhat Good	29 (20-34)	21 (17-26)
	Neutral	18 (12-30)	22 (19-24)
	Somewhat Poor	9 (4-17)	13 (6-21)
	Poor	3 (0-7)	6 (2-9)
	Extremely Poor	3 (0-5)	3 (0-4)
Physical			
	Extremely Good	7 (3-13)	5 (2-8)
	Good	29 (16-39)	20 (11-28)
	Somewhat Good	26 (16-31)	25 (17-30)
	Neutral	22 (13-30)	20 (17-26)
	Somewhat Poor	10 (8-13)	13 (12-14)
	Poor	4 (2-6)	14 (11-17)
	Extremely Poor	3 (0-5)	5 (1-8)
Social			
	Extremely Good	12 (7-24)	5 (3-8)
	Good	43 (37-51)	20 (15-25)
	Somewhat Good	25 (17-35)	24 (12-32)
	Neutral	15 (9-24)	20 (14-24)
	Somewhat Poor	3 (0-5)	19 (12-24)
	Poor	1 (0-4)	12 (9-15)
	Extremely Poor	0 (0-4)	1 (0-2)
Overall			
	Extremely Good	4 (0-10)	2 (0-3)
	Good	51 (42-60)	30 (27-33)
	Somewhat Good	27 (17-33)	31 (25-38)
	Neutral	14 (6-19)	26 (20-30)
	Somewhat Poor	3 (0-7)	6 (3-7)
	Poor	1 (0-5)	4 (3-6)
	Extremely Poor	0 (0-2)	2 (0-6)

Figure 1 Title

Figure 1. Doctor of Pharmacy Students' Scores for Career, Community, Financial, Physical, Social, and Overall Well-being Across the Spring 2020 Semester of the First Professional Year.

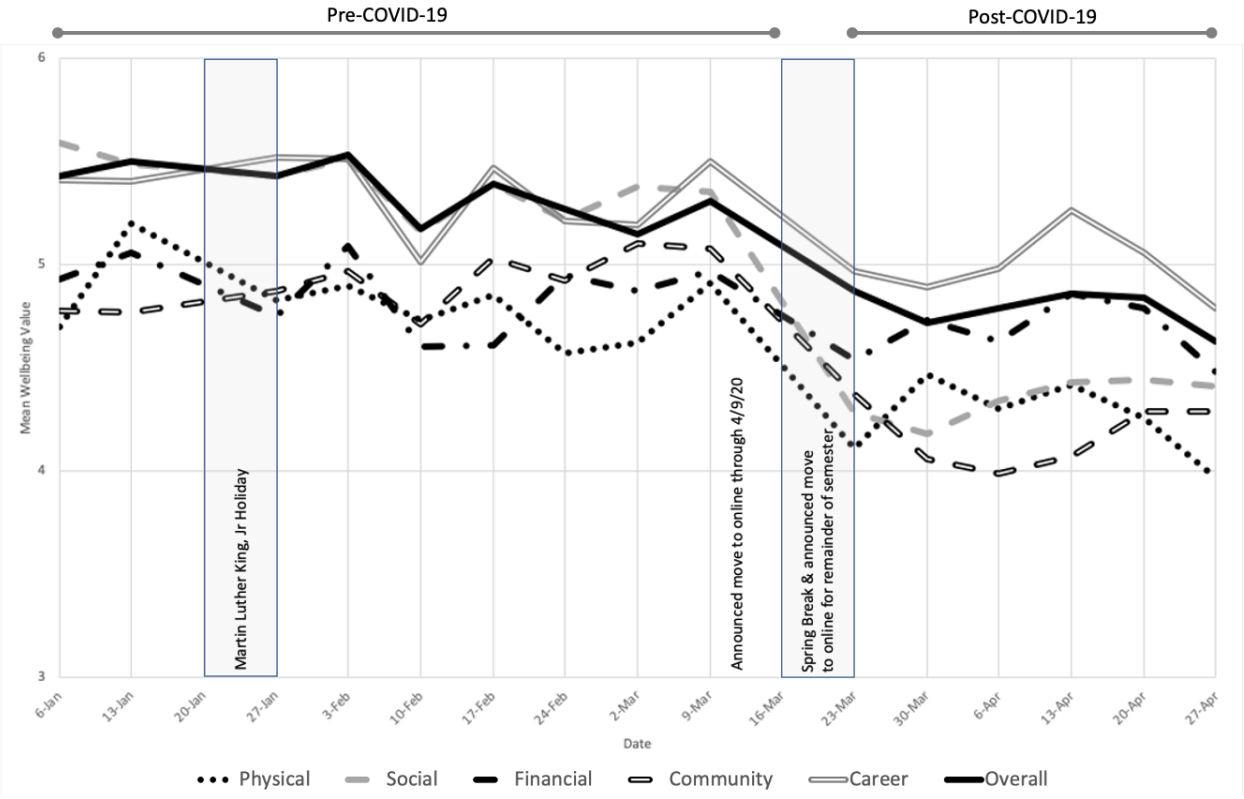
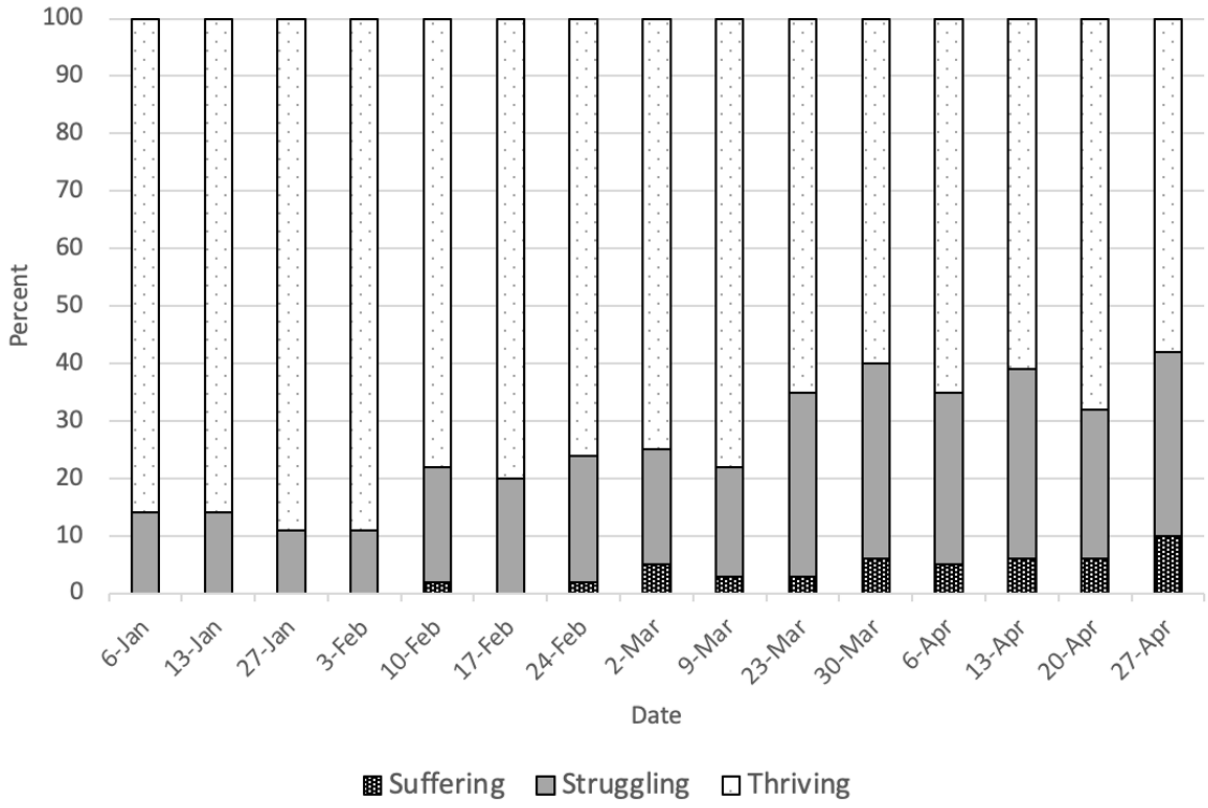


Figure 2 Title

Figure 2. Percent of first professional year (P1) students thriving, struggling, and suffering during the Spring 2020 semester (N=74).



Supplemental Table. First Professional Year Student Weekly Mean (SD) Well-being Scores, Spring Semester 2020 (N=74).

	Date														
Well-being Domain	01/06	01/13	01/27	02/03	02/10	02/17	02/24	03/02	03/09	03/23	03/30	04/06	04/13	04/20	04/27
Career	5.40 (1.15)	5.40 (1.04)	5.45 (1.01)	5.45 (1.05)	4.98 (1.16)	5.45 (1.09)	5.26 (1.31)	5.15 (1.19)	5.46 (1.10)	4.96 (1.37)	4.88 (1.32)	4.82 (1.39)	5.29 (1.13)	5.00 (1.31)	4.76 (1.45)
Community	4.77 (1.00)	4.77 (1.17)	4.85 (1.03)	4.94 (1.01)	4.70 (1.04)	4.99 (1.05)	4.86 (1.17)	5.04 (1.03)	5.01 (1.07)	4.28 (1.21)	4.10 (1.39)	4.05 (1.43)	4.06 (1.51)	4.28 (1.33)	4.27 (1.43)
Financial	4.92 (1.45)	5.06 (1.36)	4.77 (1.47)	5.09 (1.40)	4.57 (1.36)	4.63 (1.28)	4.93 (1.26)	4.88 (1.38)	4.98 (1.07)	4.59 (1.55)	4.66 (1.35)	4.59 (1.37)	4.86 (1.54)	4.72 (1.48)	4.46 (1.51)
Physical	4.71 (1.41)	5.17 (1.21)	4.77 (1.41)	4.81 (1.54)	4.79 (1.22)	4.85 (1.28)	4.54 (1.43)	4.63 (1.55)	4.87 (1.31)	4.11 (1.65)	4.44 (1.44)	4.23 (1.59)	4.45 (1.51)	4.19 (1.58)	4.02 (1.70)
Social	5.61 (1.18)	5.47 (.99)	5.41 (1.04)	5.49 (1.05)	5.22 (1.22)	5.38 (.93)	5.26 (1.18)	5.32 (1.05)	5.41 (1.14)	4.34 (1.62)	4.17 (1.45)	4.26 (1.47)	4.34 (1.40)	4.39 (1.39)	4.36 (1.46)
Overall	5.42 (.87)	5.50 (.87)	5.47 (.75)	5.51 (0.93)	5.19 (1.05)	5.35 (1.00)	5.13 (1.10)	5.16 (1.13)	5.28 (1.00)	4.86 (1.06)	4.74 (1.12)	4.73 (1.16)	4.81 (1.23)	4.88 (1.15)	4.62 (1.41)

SD=standard deviation