



Students at risk with the implementation of pandemic lockdown practices

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Abstract

The evidence overwhelming suggests that the COVID-19 pandemic, its associated public health measures, and the consequences of these measures negatively affected the mental health and well-being of post-secondary students; however, few studies have examined which subsets of this population were most adversely affected on a global scale. This study sought to identify which subsets of post-secondary student populations were most impacted by COVID-19-related public health measures. Data from a large global survey were used to identify levels of stress and quality of life. These data were assessed against demographic variables to identify correlational relationships and odds-ratios. Results highlighted that student who identified as being from a low-income family, having special needs or living with non-COVID health issues, and/or self-reported as female or other gender, reported higher increases in stress and greater decreases in quality of life. The implications of these findings suggest that post-secondary institutions can proactively identify at-risk students and support them through these challenges. Such practices may reduce the negative impacts that adversities have on stress levels and quality of life of these populations, and mitigate the negative consequences associated with decreased mental health and well-being

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1. Introduction

For decades, the mental health and well-being of students has been a concern of post-secondary institutions worldwide (Storrie, Aheren, & Tuckett, 2010). Post-secondary students are at a higher risk than the general population of experiencing symptoms of anxiety, depression, psychosocial stress, and suicidality (Eisenberg et al., 2007; Ibrahim et al., 2013; Ozen et al., 2010; Rotenstein et al., 2016; Stallman, 2010). The rates of mental illness across this population varies throughout the literature, ranging from 12% - 67.4% in any given year (Auerbach et al., 2019; Auerbach et al., 2018; Harrer et al.,

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2019; Stallman, 2010). Regardless of the prevalence, the experience of these symptoms has been associated with lower academic achievement, higher rates of disability, and reduced earning potential (Clark, 1994; Levinson et al., 2010; Pinyopornpanish et al., 2010; Stallman, 2010). The vulnerability of post-secondary students to emotional disorders has led researchers to examine how the COVID-19 pandemic has impacted the mental health and wellbeing of student populations. The outbreak of the novel coronavirus SARS-CoV-2 led governments worldwide to implement national public health measures to reduce transmission. In addition to travel and social restrictions, as well as closures to public spaces, these measures led to the closure of educational institutions, leading many post-secondary students in 191 countries to leave their accommodations, move back home, and transition to online learning (UNESCO, 2020).

1.1. Current literature

Preliminary research suggests that the COVID-19 pandemic, its associated health measures, and the transition resulting from these measures negatively affected the wellbeing and mental health of post-secondary students. Savage et al. (2020) examined changes to mental wellbeing prior to and during government-imposed lockdowns on post-secondary students in the United Kingdom. They found that the perceived stress of students increased after five weeks of lockdown. Furthermore, these students experienced a 4-point decline in mental wellbeing as evaluated by the Warwick Edinburgh Mental Well-Being Scale, exceeding the 3-point change indicating a meaningful decline. These findings are consistent with other similar studies that were conducted in Sub-Saharan Africa, Slovenia, India, the United-States, and Pakistan (Aborode et al., 2020; Aristovnik et al., 2020; Kapasia et al., 2020; Kecojevic et al., 2020; Meo et al., 2020; Karani & Mary, 2022).

The literature suggests multiple factors could be contributing to the decrease in mental health and wellbeing felt amongst post-secondary students over the course of the COVID-19 pandemic. The transition to online learning may be contributing to the decrease in the emotional well-being of students. A study focused on Lebanese students found the transition to online learning led to decreases in student satisfaction (Fawaz & Samaha, 2020). This decrease was correlated to an increased prevalence of depression and anxiety disorders across the student population, suggesting the transition to online learning negatively affected student mental health and wellbeing. (Fawaz & Samaha, 2020). Decreases to accessibility may also be contributing to the decreases in post-secondary student mental health and wellbeing. A study in the United-Kingdom found that 17% of students surveyed reported having either insufficient or not-at-all sufficient access to a suitable study space (Montacute & Holt-White, 2020). Similarly, 9% reported the inability to access a laptop, while 7% reported not having a stable enough internet connection (Montacute & Holt-White, 2020). The stress resulting from lack of accessibility could be negatively impacting student mental health and wellbeing. In

addition, studies suggest financial stressors resulting from COVID-19-related public health measures may be affecting the mental health and wellbeing of students. A study in the United Kingdom reported that 30% of students surveyed were less able to afford to study because of COVID-19-related public health measures, while a further 22% of students reported that pandemic decreased the financial support available to them by their parents (Montacute & Holt-White, 2020). The same study found 34% of students surveyed had lost a job, had reductions to paid working hours, or had not been paid for completed work due to the COVID-19 related public health measures (Montacute & Holt-White, 2020). The amalgamation of the challenges faced by students may be leading to increased stress, resulting in the rising prevalence of symptoms of mental illnesses, and the decreases to mental health and wellbeing.

The evidence overwhelming suggests that the COVID-19 pandemic, its associated public health measures, and the consequences of these measures negatively affected the mental health and well-being of post-secondary students (Elmer et al., 2020; Ro et al., 2021; Tasso et al., 2021; Wathélet et al., 2020); however, few studies have examined which subsets of this population were most adversely affected on a global scale. Studies on general populations have found populations who are already at risk of poor mental health were more likely to experience decreases in mental health and wellbeing (Banks & Xu, 2020; Epifanio et al., 2021; Ramiz et al., 2021). A survey performed by the WHO on the prevalence and distribution mental disorders across post-secondary students found students who identify as female, single, low-income, and/or belonging to a minority group, have unmarried and/or deceased parents, no religious affiliation, and/or a low secondary school ranking are more likely to experience poor in mental health and wellbeing. Despite the growing body of evidence, questions remain about whether the mental health and wellbeing of various student populations were more likely to be affected by COVID-19-related public health measures remains to be seen. Identifying which subsets of the student population are at risk is critical to the creation of supports and policies that mitigate decreases to mental health and well-being. Therefore, the aim of this study was to identify which post-secondary student populations were most impacted by the imposition of COVID-19-related public health measures during the early days of the pandemic.

2. Method

The data from this study is a subset of a larger study by London School of Economics and Political Science and the University of Toronto, called *The LockedDown Project*. A global research initiative, the aim of the project was to understand the impact of the public health measures and isolation protocols on the lives of post-secondary students, faculty and staff. An online questionnaire was developed by *The LockedDown Project* research team members, which evaluated participants' self-reported stress levels and

quality of life changes during the pandemic. In addition, demographic variables, such as age, sex and gender, employment status, residence, geographic location, family income, physical activity, social life, relationship status, and employment status were collected. The survey was translated into sixteen languages and distributed to one hundred fourteen (n=114) partner post-secondary institutions. Data were collected between April and November 2020.

The target population for the survey was staff, faculty, and students of post-secondary institutions; however, for the purpose of this paper, only student data were analyzed. Analysis was done using STATA version 13.0 (StataCorp, 2013). All variables were categorical except for age, with missing values imputed with the median value of age. Since the sample was large, complete cases analysis were performed, excluding missing values of categorical variables. Levels of stress and quality of life were self-reported and measured with a question asking about changes in quality of life before and after the lockdown. Increases in stress levels and decreases in quality of life were separately analyzed as binary outcome variables, using chi-square test at the bivariate level, and multiple logistic regression at the multivariate level. Adjusted odds ratios and their 95% confidence intervals are reported as the independent variables in each model. Exact *p*-values are reported as appropriate; however, level of significance is considered at $p \leq 0.05$. Models were checked for goodness of fit, and multi-collinearity was checked using variance inflation factor (VIF).

3. Results

A total of 17,258 students from one hundred and fourteen countries participated in the global online survey. Majority of participants were from European countries (71.8%), and self-reported as female (60.4%), full-time, (80.2%) and undergraduate (70.1%) students. The mean age was 23.9 years (SD 6.3). Participants predominantly resided in large cities (60.4%), reported being from middle-income families (64.3%).

3.1. Levels of stress

In response to questions about levels of stress during the first five weeks of the lockdown, a total of 6,183 students (39.8%) reported that their stress levels increased. Table 1 shows numbers and percentages of those reporting or not reporting increased stress levels, and factors which were significantly associated with reported increases in stress levels. Specifically, increases in stress levels were reported more among students whose social lives were negatively affected (56.9%), whose relationships suffered (53.5%), who were unable to exercise as before (46.7%), who self-identified as 'other' gender (48.3%) or living with special needs (53.5%), who lived with non-COVID related health issues (44.7%), who came from a low-income family (45.4%), who were younger age groups (42.1%), and who resided in a city (40.1%).

Table 1. Self-reported increased stress level during the lockdown by various factors

Characteristics		Stress level increased		X ² , p
		Yes, Number (%)	No, Number (%)	
Age group	Under 21	2520 (42.1)	3464 (57.9)	22.6, >0.001
	22-29	3024 (38.4)	4858 (61.3)	
	30 and over	619 (37.9)	1014 (62.1)	
Gender	Male	2248 (28.5)	3583 (61.5)	
	Female	3787 (40.3)	5616 (59.7)	
	Other	128 (48.3)	137 (51.7)	
Residence	City/Town	5420 (40.1)	8106 (59.9)	4.2, 0.04
	Countryside/suburb	743 (37.7)	1230 (62.3)	
Family income	High Income	706 (34.8)	1322 (65.2)	54.0, <0.001
	Low income	1064 (45.4)	1278 (57.6)	
	Middle Income	3964 (39.7)	6030 (60.3)	
	Prefer not to say	429 (37.8)	706 (62.2)	
Social life	Has been great	582 (20.7)	2230 (79.3)	1100, <0.001
	Was impacted but I cope	2750 (35.7)	4962 (43.1)	
	Was negatively impacted	2831 (56.9)	2144 (43.1)	
Relationships	Improved	516 (29.7)	1219 (70.3)	305, <0.001
	Suffered/ fell apart	1313 (53.5)	1142 (46.5)	
	Was not affected	1538 (35.1)	2843 (64.9)	
Exercise	Do sufficient/more	1911 (32.7)	3941 (67.3)	249.1, <0.001
	Don't exercise, no change	1244 (39.0)	1944 (61.0)	
	Couldn't do as before	3008 (46.7)	3451 (53.4)	
Have non-COVID health issue	No	4092 (37.8)	6742 (62.2)	64.6, <0.001
	Yes	2028 (44.7)	2506 (55.3)	
Special needs student	No	5684 (39.1)	8846 (60.9)	58.5, <0.001
	Yes	379 (53.5)	329 (46.5)	

The factors in Table 1 were entered into a multiple logistic model results of which are shown in Table 2 (only the statistically significant results). Those who reported that their social lives were negatively impacted were more likely to report increases in stress levels in comparison to those who reported a positive social life. Similarly, students whose relationships suffered or fell apart were more likely to report increases in stress levels compared to those who reported stable or improved relationships. In terms of exercise, students who could not do sufficient exercise as they did prior to the pandemic were more likely to report increases in stress. Females and students that self-identified as other gender had higher odds of reporting increases in stress levels in comparison to males. Lastly, students with special needs and who identified as being from a low-income family were more likely to report increases in stress. The model explained 8% of the variation in the outcome, goodness of fit test was not significant indicating good fit and the mean VIF was 1.58 indicating no multi-collinearity.

Table 2: Logistic regression for increased stress level among students

Characteristics		Adjusted Odds Ratio	95% Conf. Interval		z	P value
Age	30 and over	Reference				
	17-21	1.23	1.06	1.43	2.72	0.007
Gender	Male	Reference				
	Female	1.24	1.12	1.37	4.2	<0.001
	Other	1.5	1.01	2.23	2.01	0.044
Residence	Countryside/ suburb	Reference				
	Big city/Town	1.15	1	1.33	1.94	0.052
Family income	High	Reference				
	Low	1.39	1.16	1.66	3.65	<0.001
Social life	Has been great	Reference				
	Impacted but I cope	2	1.74	2.31	9.65	<0.001
	Negatively impacted	4.09	3.5	4.77	17.93	<0.001
Relationships	Improved	Reference				
	Suffered/ fell apart	1.87	1.63	2.15	8.79	<0.001
	Not affected	1.19	1.04	1.34	2.64	0.008
Exercise	Do sufficient/more	Reference				

	Don't exercise, no change	1.21	1.04	1.34	2.85	0.004
	Couldn't do as before	1.48	1.33	1.64	7.23	<0.001
Have non-COVID health issue		1.11	1.01	1.23	2.11	0.035
Special needs student		1.3	1.05	1.6	2.43	0.015
Constant		0.064	0.041	0.098	-12.45	<0.001
<i>Model statistics: n=8430, Log likelihood = -5203.30, LR $X^2 = 889.1$, $p < 0.001$, Pseudo $R^2 = 0.08$</i>						

3.2. Quality of life

A total of 5,652 students (36.2%) reported that their quality of life (QoL) decreased in the weeks following the pandemic lock down. Table 3 shows numbers and percentages of those who reported or did not report decreases to quality of life, and which factors were checked for association with this decrease. Decreased QoL was reported more among students whose social lives were negatively affected (56.9%), whose relationships suffered (49.8%), who were unable to exercise as before (44.3%), who came from low-income families (44.5%), and who lived with non-COVID related health issues (41.4%).

Table 3. Self-reported decrease in quality of life by various socio-demographic and other factors

Characteristics		Quality of life decreased		X^2 , p
		Yes, (%)	Number	
Age group	Under 21	611 (37.2)	1033 (62.8)	4.1, 0.13
	22-29	2921 (36.7)	5042 (63.3)	
	30 and over	2120 (35.2)	3904 (64.8)	
Gender	Male	3396 (35.9)	6064 (64.1)	0.82, 0.67
	Female	2158 (36.5)	3752 (63.5)	
	Other	98 (37.6)	163 (62.4)	
Residence	City/Town	4998 (36.6)	8644 (63.4)	10.6, 0.001
	Countryside/suburb	654 (32.9)	1335 (67.1)	
Family income level	High Income	982 (33.1)	1376 (66.9)	
	Low income	1042 (44.5)	1302 (55.5)	86.6, <0.001
	Middle Income	3550 (35.2)	6535 (64.8)	

	Prefer not to say	378 (33.0)	766 (67.0)	
Social life	Has been great	448 (15.5)	2441 (84.5)	
	Was impacted but I cope	2371 (30.5)	5394 (69.5)	
	Was negatively impacted	2833 (56.9)	2144 (43.1)	1600, <0.001
Relationships	Improved	471 (27.1)	1268 (72.9)	
	Suffered/ fell apart	1223 (49.8)	1231 (50.2)	193.9, <0.001
	Was not affected	1453 (32.1)	3015 (67.9)	
Exercise	Do sufficient/more	1617 (27.4)	4286 (72.6)	
	Don't exercise, no change	1150 (35.8)	2066 (64.2)	
	Couldn't do as before	2885 (44.3)	3627 (55.7)	383.8, <0.001
Have non-COVID health issue	No	3718 (34.0)	7229 (66.0)	
	Yes	1882 (41.4)	2669 (58.6)	76.1, <0.001
Special needs student	No	5210 (35.6)	9447 (64.4)	
	Yes	344 (36.1)	9813 (63.9)	48.9, <0.001

The factors in Table 3 were entered into a multiple logistic model, statistically significant results of which are shown in Table 4. Students who reported that their social life was negatively impacted by the lockdown were more likely to report a decrease in quality of life compared to those who reported a positive and healthy social life. Similarly, students whose relationships suffered or fell apart were significantly more likely to report a decrease in quality of life compared to those who reported improved relationships. In terms of exercise, highest odds of decreased quality of life were observed for students who could not do sufficient exercise. Females and individuals from low-income families were more likely to report a decrease in quality of life in comparison to males and students from high income families. The model explained 10% of the variation in the outcome, goodness of fit test was not significant indicating good fit, and the mean VIF was 1.57 indicating no multi-collinearity.

Table 4: Logistic regression for decreased quality of life among students

Characteristics		Adjusted Odds Ratio	95% Conf. Interval		z	P value
Gender	Male	Reference				
	Female	1.11	1.01	1.23	2.06	0.04
Family income	High	Reference				
	Low	1.33	1.11	1.6	3.15	0.002
Social life	Has been great	Reference				
	Impacted but I cope	2.26	1.94	2.63	10.5	<0.001
	Negatively impacted	5.73	4.87	6.74	2.96	<0.001
Relationships	Improved	Reference				
	Suffered/ fell apart	1.69	1.47	1.95	7.18	<0.001
	Not affected	1.15	1.01	1.31	2.06	0.04
Exercise	Do sufficient/more	Reference				
	Don't exercise, no change	1.38	1.21	1.58	4.67	<0.001
	Couldn't do as before	1.63	1.46	1.82	8.82	<0.001
Constant		0.074	0.047	0.12	-11.5	<0.001
<i>Model statistics: n=8490, Log likelihood = -5015.6, LR $X^2 = 1070.2$, $p < 0.001$, Pseudo $R^2 = 0.1$</i>						

4. Discussion

This study sought to understand which post-secondary student populations were most impacted by the imposition of lockdowns during the early days of the COVID19 pandemic. Not surprisingly, the data identified similar subsets of student populations of students reporting increase in stress and a decrease in quality of life in the early months of the pandemic. Specifically, students who identify as: being from a low-income family, having special needs or living with other non-COVID19-related health issues, or self-identified as female or other genders reported higher increase in stress and lower decrease in quality of life. Additionally, students whose social lives were negatively

impacted or had their exercise practices negatively impacted were also reporting higher rates of stress due to the pandemic. The literature on stress and anxiety, as presented in the introduction, has suggested that the emotional burden of illness can have a negative impact on students' academic performance (Sahu, 2020; Savage et al., 2020). We hypothesized that there is a specific population of students at higher risk because of the pandemic, and therefore likely had a harder time successfully completing academic activities.

The COVID19 pandemic presented an ideal opportunity to deepen our understanding of many social and environmental factors that impact post-secondary students. It is therefore not surprising that many researchers around the world have conducted similar studies to this present study, and there have been a multitude of similar online surveys assessing post-secondary students' opinions of how the pandemic has impacted their lives. The literature has suggested that students with undocumented parents are less likely to report mental and physical health symptoms (Ro et al., 2021). Additionally, students with mental health symptoms were found to more often distrust the government led preventative measures (Tasso et al., 2021). One group of researchers identified that being female and increases in social isolation are correlated with a negative mental health trajectory (Elmer et al., 2020), which is similar to the results found in this study. Even further to reflect in the findings of this study, another group of researchers identified that being female or non-binary, living with a mental health condition, social isolation, and living in low-quality housing increased mental health issues amongst students (Wathelet et al., 2020). These findings are by no means an exhaustive list of the significant literature on this topic, and it leads to a future research opportunity for a meta synthesis of the various surveys that have been completed.

It is critical to determine how to put these findings into practice. Students, like other communities around the world, have experienced increases in stress and decreases in quality of life as a result of the COVID-19 pandemic. The role of educators is foremost to educate students; however, we can no longer ignore the impact mental health has on academic performance. By supporting students to ensure their health, social, and economic needs are met, we can improve their potential to perform well academically. Post-secondary academic institutions should become the sole providers of health, social and economic services; however, if these institutions can proactively identify at risk students, and support them through these challenges, it may reduce the negative impacts that adversities have the stress levels quality of life of students. Additionally, even with virtual classrooms and online learning, educators can create informal opportunities for student social connectedness during class and at break.

5. Conclusions

The COVID19 pandemic has only heightened concerns surrounding student well-being across post-secondary institutions worldwide (Storrie, Aheren, & Tuckett, 2010). The results of this study showed that a specific subset of post-secondary students reported an increase in stress levels and a decrease in quality of life in the months following the onset of the COVID19 pandemic. Specifically, students who identified as being from a low-income family, having special needs or living with non-covid health issues, and/or self-reported as female or other gender, reported higher increases in stress and greater decreases in quality of life. This evidence can be used to inform post-secondary institutions of which student populations are most at risk when public health isolation measures are put in place. Proactive solutions should specifically target these sub-populations to ensure equity to high quality education.

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