



The Psychological Effects of the COVID-19 Pandemic on Young Adults: A Self-Determination Theory Perspective

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Abstract

Self-Determination Theory (SDT) is a psychological body of work that investigates how certain social conditions promote or inhibit human development through the satisfaction or frustration of psychological needs. With the unforeseen emergence of COVID-19, combined with its rapid spread throughout the world, it was quickly declared as a pandemic by the World Health Organization. In this study, we used SDT to investigate how the uncertainty of the March 2020 lockdown impacted university students. The present study used a 6-wave longitudinal design to examine the trajectory of need satisfaction and depressive symptoms throughout the academic calendar. Our results illustrated that the more a person's needs were thwarted, the higher their levels of depressive symptoms. We believe that public health restrictions such as lockdowns played a significant role in students' needs being thwarted. With the limitation of movement, closure of recreational activities, and mandatory lockdowns, students' need for autonomy was severely affected. Unsurprisingly, the need for relatedness was also negatively affected, a finding which may have been due to the loss of most in-person interactions. Interestingly enough, the need for competence was satisfied during the lockdown. We hypothesize that this may have been due to the reduced academic pressure stemming from the temporary closure of university operations. Altogether, the present investigation suggests a possible causal connection between need frustration and the development of depressive symptoms.

Keywords: COVID-19, Needs Satisfaction, Depression, Self-Determination Theory

Introduction

Pandemics and infectious diseases have been present throughout human history (McMichael, 2004). Throughout the centuries, humans have attempted to contain the spread of illnesses and through the advancement of modern medicine, have been able to cure and treat many (Drexler, 2010). The COVID-19 pandemic has had several consequences including massive economic downturns, global lockdowns, school closures, and a significant rise in mental health issues (Unesco, 2020; Connor, 2020; U.S. Census Bureau 2020b). The present study used self-determination theory (SDT) to analyze how the COVID-19 pandemic impacted university students' need satisfaction and depressive symptoms throughout the academic year. This was achieved by comparing two longitudinal studies taken in consecutive years: the pre-pandemic sample (2018-2019) and the pandemic sample (2019-20). With the various pandemic-incurred public health restrictions, we hypothesized that students in the pandemic sample will have had all three of their psychological needs thwarted, particularly their need for relatedness (feeling close to others and belonging to a group). These three needs will be addressed in more detail below. Previous research has shown that the thwarting of people's psychological needs results in increased negative affect and depressive symptoms (Reis et al., 2000; Ryan, Bernstein, & Brown, 2010).

COVID-19

COVID-19 (SARS-CoV2) is a highly infectious disease that originated out of Wuhan, China in late December 2019 (WHO, 2020a). The first reported case outside of China was in Thailand on the 13th of January 2020, and by March 11th, 2020 it was declared a pandemic by the WHO (2020b). The spread of the pandemic resulted in international lockdowns that led to the closure of over 70% of schools, and the complete shutdown of 39% of international borders. In total, over 3 billion were people locked in their country as the global economy came to a halt (Unesco, 2020; Connor, 2020). Whilst this was going on, norms pertaining to individual conduct in public were drastically altered. Issues of how to protect yourself and others arose; social distancing, mask usage, reduction of unnecessary travel and mass disinfection were heavily encouraged in most countries, if not mandated in others. This deviation from "normal life" was compounded with mandatory quarantines, self-isolation if sick, loneliness, and avoidance of crowded spaces and contact with at risk-loved ones (CDC, 2020). Furthermore, the unemployment rate and the reduction of economic activity that took place during the COVID-19 recession was comparable to that of the Great Depression in the 1930s (Wheelock, 2020).

These adjustments not only took a toll on the economy, but also on the mental health of those living under these conditions. The U.S. Census Bureau conducts the

Household Pulse Survey on a yearly basis in which they collect data on adults living in the USA as part of an annual census. Part of this data collection estimates the prevalence of anxiety and depression amongst adults, and when comparing the results from this year to the previous one, the differences are staggering. The mean symptoms for anxiety of US adults ($n = \sim 10,000$ adults weekly) from April 23rd to September 14th, 2020 was 31.76%, compared to 11.2% in 2019 ($n = 31,997$) (U.S. Census Bureau 2020a; U.S. Census Bureau 2020b). These statistics exemplify significant increases in mental health issues, as depression and anxiety have increased five-fold and three-fold, respectively.

Self-Determination Theory and the Basic Psychological Needs

Self-Determination Theory (SDT) is an empirically-based theory of human behaviour (Deci & Ryan, 2017). This theory revolves around the idea of basic psychological needs that can be satisfied or thwarted, leading to observable consequences (i.e., maladaptive behaviour). Psychological needs are comparable to physiological needs. In order to survive, humans need adequate nutrition, clean water, and shelter to avoid privation. The same is true for psychological needs; humans need a sense of autonomy, competence, and relatedness to adequately sustain their well-being and development. The need for autonomy can be defined as the need for a person to regulate their environment in order to personalize their actions and experiences (Deci & Ryan, 2017). In essence, the need for autonomy involves acting volitionally (Deci & Flaste, 1996). The need for competence

involves feeling efficacious and proficient (Deci & Ryan, 2017). To feel like effective agents in the world, individuals need to feel a sense of mastery over their environments to achieve personally desired outcomes (Deci & Flaste, 1996). The third need, relatedness, pertains to feeling socially connected to others (Deci & Ryan, 2017). Like the other two needs, the need for relatedness can be evoked internally, when a person feels that they are cared for, loved for, and belong to a group. Importantly, this need is not a one-way street; it is of equal importance that the individual also cares for and loves others and feels that their presence is significant to the group they belong to (Deci & Ryan, 2017). Notably, need satisfaction is not static; it can fluctuate on a short-term basis, and conversely, stabilize over longer periods. For example, a friend passing away would be a short-term/immediate fluctuation that would severely decrease relatedness. On the flipside, getting a PhD, followed by securing a stable job after graduation would be a long-term stabilization, increasing all three needs. In essence, how satisfied a person's needs are is indicative of how much autonomy, competence and relatedness they feel at any given moment. The satisfaction of these is affected by their environment. This person can select specific environments to increase the satisfaction of those needs, but unforeseen and uncontrollable events can also thwart that satisfaction, irrespective of their personal efforts.

Need satisfaction is therefore necessary for optimal well-being, and when these needs are thwarted, maladaptive behaviour and adverse reactions frequently arise (Deci & Ryan, 2017; Ryan & Deci,

2008). Bartholomew et al. (2011) demonstrated this by studying how different coaching methods for a basketball team affected players' need satisfaction. When players received autonomous support (individuated, fair, nuanced and supportive coaching) from their coach, all three needs were satisfied, which increased their positive affect and well-being. Conversely, when the coaches were controlling (unfair, generalized and overly negative), all three needs were unsurprisingly thwarted, which led to increases in negative affect (i.e., depressive and anxious symptoms). In addition, the three needs, while highly intercorrelated, can have individual fluctuations that can possibly influence the development of certain psychological conditions. For example, severe thwarting of the need for autonomy could possibly explain why people with introjective depression (depression stemming from unattainable standards and unreasonably critical self-evaluations) feel compelled to behave in accordance with unrealistic expectations (Deci & Ryan, 2017; Deci & Ryan, 1985; Blatt, 2004; Ryan, Deci, et al., 2006; Swallow & Kuiper, 1988). Furthermore, it is also believed that a lack of self-regulation occurring during binge eating episodes, could play a role in the maintenance of eating disorders (Strauss & Ryan, 1987; Anderluh, et al., 2003). Moreover, Kaap-Deeder et al. (2014) found that patients receiving therapy for severe anorexia nervosa saw a significant decrease in restricted eating and an increase in body-mass index when they were behaving autonomously. All of these findings reinforce the importance of needs satisfaction in

protecting against the adverse effects of need frustration.

The Present Investigation

The present research examined the trajectory of depressive symptoms and need satisfaction during the pandemic (2019-2020) and pre-pandemic year (2018-2019). Depressive symptoms were evaluated in September, December, March, and May while need satisfaction was assessed in September and March. We compared the two samples expecting students to show higher levels of depressive symptoms in May than at prior time points. We also expected to find a similar pattern for need satisfaction. Previous studies have shown that drops in need satisfaction result in increased levels of depressive symptoms (Bartholomew, et al., (2011); Ryan et al., 1993) We therefore predicted that changes in need satisfaction would predict changes in depressive symptoms.

As a supplementary analysis, we compared the results for the three basic psychological needs of autonomy, competence, and relatedness. We hypothesized that the COVID-19 lockdowns might have had a particularly strong effect on the need for relatedness.

Methods

Participants and Procedure

A 6-wave prospective longitudinal study was conducted during the pre-pandemic and pandemic year and included a total of 295 McGill University students (83% female; $M(\text{age}) = 20.82$, $SD = 3.40$). Participants in both samples were predominantly of European descent (46%). Participants were recruited through online advertisements and posters placed on the university campus and were compensated \$50 for completing the entire study, or partial compensation for partial completion. This study was approved by the McGill Research and Ethics Board.

All measures were taken through the online survey software Qualtrics. The first survey (T1) was conducted in September at the beginning of the school year. The present study focuses on data collected at baseline (T1), in December (T2), in March, when the lockdown was first initiated (T3), and at the end of the school year in May (T4). Participants had one week to complete each survey and received two reminders. The studies had a greater than 80% retention rate at all time points. For the purposes of our study, we compared the pandemic sample to the pre-pandemic sample ($n = 379$) to evaluate the trajectory of need satisfaction and depressive symptoms over the course of both school years. The measures and procedures were identical in both samples.

Measures

Depressive Symptoms

The Centre for Epidemiologic Studies Depression Scale Revised (CESD-R 10) was used to assess symptoms of depression at the beginning of the academic year (T1), and at the end of the school year (T6) (Andresen et al., 1994). The CESD-R 10 is a validated and

reliable self-report measure of depression symptoms that focuses on the affective component of depressed mood (Andresen et al., 1994). The scale included items such as “I could not get going” and “I was bothered by things that usually don’t bother me”. It is measured on a four-point Likert scale ranging from one, *rarely or none of the time (<1 day)*, to five, *most or all the time (5 - 7 days)*. A depressive symptoms score was computed by totaling the ten items. The reliability of this scale was $\alpha > .80$ at each time point.

Psychological Need Satisfaction

The satisfaction of the needs for autonomy, competence and relatedness was assessed using the balanced measure of psychological needs scale (BMPN; Sheldon & Hilpert, 2012). The scale included 18 items, six items per need with half reflecting need satisfaction and the other half, need frustration. The scale was adapted to assess participants’ experiences from the past 2 weeks. Items were rated on a one (*not at all true*) to seven (*very true*) scale. An example of an item assessing autonomy satisfaction is “I was free to do things my own way.” An example of an item assessing relatedness satisfaction is “I had warm interactions with people”, and an example of an item assessing competence item is “I felt like I was successful at tasks”. The BPNS has demonstrated excellent reliability and validity (e.g. Milyavskaya et al., 2013; Tsang et al., 2014)

Results

To examine the trajectory of depressive symptoms and need satisfaction across the academic calendar, we conducted multiple repeated measures analysis of variance (ANOVA) tests with month as the within-subject factor and year as the between-subject factor. Results yielded a highly significant quadratic main effect for month, $F(1,499) = 86.42, p < .0001$. Table 1 shows that across both samples, levels of depressive symptoms increased from September to December and then diminished by May. The ANOVA also yielded a significant interaction effect between month and year, $F(1,499) = 6.17, p = .01$, suggesting that the trajectory of depressive symptoms was different between samples. Table 1 shows that in the pre-pandemic year, depressive symptoms peaked in December and returned to baseline in March and May. In contrast, depressive symptoms during the pandemic year increased from September to December, just like in the previous year, but they increased further in March and leveled out at the end of the school year. These results supported our hypothesis that the pandemic resulted in elevated levels of depressive symptoms in both March and May.

The ANOVA for need satisfaction also yielded a significant interaction between month and year, $F(1,499) = 6.17, p < .01$. Table 2 shows that in the pre-pandemic year, need satisfaction remained constant between September and March. However, during the pandemic year, there was a significant drop in need satisfaction from September to March. Our hypothesis that the lockdown would undermine the satisfaction of students'

basic psychological needs was, therefore, supported.

Supplemental Analyses

Next, we evaluated the relationship between need satisfaction and depressive symptoms as well as whether certain needs were more thwarted by the pandemic. To do so, we calculated a difference score for the satisfaction of each need between September and May, to assess whether need satisfaction diminished across the school year. We then conducted a one-way ANOVA comparing the pre-pandemic and pandemic samples, the results of which are displayed in Table 2. Results indicate that participants in the pandemic sample experienced a significantly greater decrease in autonomy and relatedness satisfaction than participants in the pre-pandemic sample. The effect was particularly strong for autonomy. Surprisingly, there was a marginally significant effect in the opposite direction for competence. That is, participants in the pandemic sample reported an increase in competence satisfaction across the year, with this increase being marginally stronger than the one reported in the pre-pandemic sample.

Lastly, we sought to determine whether the change in need satisfaction from September to March was associated with the change in depressive symptoms from September to May. To do so, we conducted a hierarchical linear regression with May depressive symptoms as our dependent variable. September levels of depressive symptoms as well as autonomy, relatedness, and competence satisfaction were entered into our first block. March levels of need

satisfaction were entered into our second block to look assess change in need satisfaction from September to March. The regression yielded a significant multiple R of .42, $F(5, 233) = 9.41$, $p < .001$. Results showed that need satisfaction in September was unrelated to May depressive symptom levels. Of the three needs, only decreases in autonomy satisfaction were significantly associated with increasing levels of depressive symptoms from September to May, $\beta = .24$, $t = 3.48$, $p < .001$.

Discussion

The present study used a SDT framework to investigate how the COVID-19 pandemic affected need satisfaction and depressive symptoms among university students. We examined the trajectory of depressive symptoms and need satisfaction across the academic calendar by comparing two samples, one taken in 2018-19 (pre-pandemic), and one taken in 2019-20 (pandemic). Our study yielded three notable findings. First, depressive symptoms were significantly higher in the pandemic sample than those reported in the pre-pandemic sample, with the greatest between-sample difference occurring in March. Second, participants in the pandemic sample experienced a significant decrease in autonomy and relatedness satisfaction. Surprisingly, students in the pandemic sample evidenced a marginally significant increase in relatedness satisfaction across the academic calendar. Finally, results from a hierarchical linear regression indicated that the decrease in autonomy satisfaction in the pandemic sample was associated with an increase in depressive symptoms.

Regarding need satisfaction, the pandemic surprisingly had a more negative effect on students' need for autonomy than on relatedness. While it is true that the lockdown did prevent nearly all forms of physical interaction between friends and family (which would inevitably lower the satisfaction of relatedness), there were several ways in which people were able to compensate. Through virtual solutions, such as increasing the usage of social media, video calls, and phone calls with friends and family, people found ways to approximate lost in-person interactions. Autonomy, on the other hand, is much more challenging to approximate. With the closure of most public spaces (e.g., restaurants, cinemas, bars, gyms, etc.) and the emergence of online school, most students were confined to their own homes without the ability to engage in activities they did in the past. As a result, the restrictions from the lockdown were likely more detrimental to people's sense of autonomy than their feelings of relatedness.

In terms of students' depressive symptoms, our results from the pandemic sample supported our hypothesis. Specifically, students experienced higher levels of depressive symptoms after the onset of the pandemic compared to before it. Indeed, it is probable that students' decreased autonomy and relatedness satisfaction across the academic calendar played a role in the emergence of depressive symptoms. Our results support previous studies which have shown that environments which thwart the needs for relatedness and autonomy lead to increases in depressive symptoms (Baard, 2002; Deci et al. 2001; Deci & Ryan, 2017).

The one finding that ran counter to expectations was that during the pandemic, students' satisfaction of their need for competence increased across the academic calendar. This finding can potentially be explained by changes to McGill's operations. First, as a result of the pandemic, McGill University was shut down for two weeks. Additionally, students were given the option of retroactively using the satisfactory/unsatisfactory grading option. Lastly, most classes allowed students to access their notes during exams which remained open for 72 hours as opposed to the usual three-hour time limit. Altogether, these changes removed much of the stress and pressure generally associated with exams allowing students to more fully focus on their studies. As a result, students likely felt a greater sense of control over their grades, therefore, increasing their perceived competencies.

Taken together, our findings demonstrate the influence of people's basic psychological needs on their mental health. As stated previously, the literature outlines a clear relationship between depression and need satisfaction (Baard, 2002; Deci et al. 2001; Deci & Ryan, 2017). At the present moment, there is a paucity of research concerning COVID-19 and self-determination theory. The present study contributes to the existing literature about need satisfaction and depression, while simultaneously expanding on the literature surrounding COVID-19. Indeed, our results illustrate how the COVID-19 pandemic has

influenced university students' need satisfaction and depressive symptoms.

Limitations

Despite its strengths, our study had several limitations. First, both samples were relatively homogeneous consisting of predominantly female university students. Second, we exclusively used self-report measures. While self-report is a more flexible and convenient method of data collection than most other instruments, there exist several potential sources of bias (e.g., social desirability & recall bias) which cannot be overlooked and must always be taken into account when evaluating the data (Althubaiti, 2016). Third, our investigation did not control for the presence of international students. Considering that a significant portion of international students returned home after the announcement of lockdowns, their living conditions may have differed from those of Canadian students. Subsequent investigations should take these variables into account to better understand the relationship between need satisfaction and depressive symptoms in the context of the COVID-19 pandemic and its associated health restrictions.

The present study used the self-determination theory framework to investigate the relationship between need satisfaction and depressive symptoms during the COVID-19 pandemic. Results showed that the trajectory of depressive symptoms was differed between the pandemic (2019-2020) and the pre-pandemic year (2018-2019). Indeed, depressive symptoms were highest in March of the pandemic year.

Likewise, the trajectory of need satisfaction differed between samples. Students had significantly lower levels of need satisfaction during the pandemic year, with levels being the highest in September and lowest in March. Results demonstrated a year by month interaction showing that students' need satisfaction significantly decreased from September to March in the pandemic but not the pre-pandemic year. Students' need for

relatedness and autonomy both decreased across the year. Surprisingly, competence actually increased across the pandemic sample, a finding which could be due to the pandemic alleviating some of the normally felt academic pressure. Future research is needed to see how international students coped with the pandemic and to see if their needs and depressive symptoms would reflect the results we obtained.

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Table 1.*Depressive Symptoms & Need Satisfaction Score*

Depressive Symptoms	Pre-Pandemic	Pandemic	Combined Samples
September	20.21	21.4	20.80
December	22.74	23.33	23.09
March	20.48	24.55	22.55
May	20.26	22.94	21.61
Need Satisfaction	Pre-Pandemic	Pandemic	Combined samples
September	11.11	8.45	9.78
March	11.70	4.86	8.28

Table 2*Changes in Need Satisfaction from September to March by Year*

Psychological Needs	Pre-Pandemic Year	Pandemic Year	F-Test	P
Autonomy	-0.96	-4.81	10.57***	.001
Relatedness	-0.21	-2.97	4.27*	.05
Competence	2.99	8.37	2.99	.08

***p < .001, *p < .01.

Appendix A

Statement of Contribution

The current project used data collected from two goal studies conducted during 2018-2019 and 2019-2020. It was of shared interest between myself and Dr. Koestner to focus in on the sample's need satisfaction during the pandemic period (2019-2020 sample) and compare it to the previous year to gain further perspective on how the pandemic impacted students. While it was impossible to predict the societal outcomes of the pandemic, we could not have hoped for a richer data-set.

During the whole process, I have received extensive help and guidance from my supervisor, Dr. Koestner – for which I am very grateful. At the same time, I was helping with the data coding and we brainstormed in detail about the significance and interpretation of our data. The paper was written up entirely by me, with the exception of the results section being heavily edited by Dr. Koestner. Extensive literature review was conducted in order to properly establish a context to our findings, as well as to find an accurate timeline assessing the COVID-19 pandemic (as it is still an ongoing issue). Outside of my research paper, I was involved in several meetings with Dr. Koestner and his PhD. student, Shelby Levine, to discuss the findings of this data-set and how we can use it for future studies.