CONCORDIA UNIVERSITY OF EDMONTON

November 9, 2021

Special Call for Research Projects COVID-19

Executive Report

SCRP
Covid-19

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Purpose

The purpose of this report is to release a compilation of the investigations led by faculty members at Concordia University of Edmonton, funded through the Special Call for Research Projects on COVID-19. Our academic community rallied to conduct activities aimed at understanding the complex problem posed by the pandemic of the Coronavirus Infection Disease-19 (COVID-19). A concurrent concern that our researchers identified was related to mental health in the community, aggravated by the isolation and sense of vulnerability that COVID-19 brought along.

It is our hope that this Executive Report can contribute to improve our readiness, management of and response to a subsequent pandemic, should it arise again. This document has been tailored for various audiences: internal, local, provincial and national. The efforts of our researchers have yielded important results in their fields, which CUE wishes to make available to potential stakeholders, so that they can be used in the development of future plans and policies.

We are thankful for the solidarity, engagement and resilience of our research community.

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DR. RAMSES ILARRAZA
ASSISTANT VICE-PRESIDENT RESEARCH

The Special Call for Research Projects on COVID-19

Origins

Concordia University of Edmonton is part of an international community that has been affected by the COVID-19 pandemic. Lives have been endangered and lost; the world economy has been damaged; academic activities and calendars have been disrupted; and regular life and transit were put on hold.

In April, 2020, following the declaration of the COVID-19 pandemic, we realized the impact that the existing situation would have, not just on research activities on campus, but on the lives of students, faculty, and staff. CUE Research created and presented the Special Call for Research Projects on COVID-19, also known as the SCRP COVID-19 grant.

Purpose

We believed there was interest from our academic community in contributing to the effort of understanding how the pandemic started and evolved, and in creating and providing insights and instruments that may allow us to be more vigilant and responsive to subsequent threats. The SCRP COVID-19 grant was created to provide support and funding for CUE faculty members pursuing research in this timely and relevant field.

Areas of Research

For this special call, CUE supported projects under one or more of the following areas of research:

- Education
- Emergency Management Strategies
- Health: Public Health, Psychology, Immunology
- Management: Private Sector, Government, Public Education (K-12, Postsecondary)
- Science: Mathematics, Environmental Sciences, Biological Sciences, Virology
- Social Sciences: Communications, History, Political Sciences
- Technology: Information Security, App and Software Development, Telecommunications

Projects outside these areas of research could be considered if the adjudication committee considered the justification(s) offered by the applicants to warrant an exemption.

Details of the Special Call

The call, open to all faculty members, was released on April 6, 2020, with a deadline of May 15. Guidelines specific for the SCRP COVID-19 were developed and published along with the call. There was particular interest on certain lines of research:

- Changes to policy for food and other service providers
- Cyberattacks and safe work-from-home practices
- Disruption of the production and distribution of goods
- Effects of prolonged quarantine on mental health
- Fighting misinformation
- Handling health emergencies in Indigenous communities
- Mathematical modelling of epidemiological data to predict outbreak burden to the health system

- Socioeconomic impacts
- Transition from in-person to virtual classroom teaching

We received ten eligible proposals, which were adjudicated by the Research and Faculty Development (RFDC) based on the rubric published with the Guidelines during the meeting on June 3rd, 2020. The results were published on Inside CUE on June 9th, 2020.

Special considerations for the SCRP COVID-19

Applications for SCRP COVID-19 were adjudicated on their ability to contribute to the goal of the call. While the research from this call could become the foundation for emerging lines of research, SCRP are expected to be short-lived. An application under this stream had to demonstrate self-sufficiency from start to end, and have a high likelihood of generating the results needed to produce an Impact Report, which was a requirement for this grant.

Training the Next Generation of Investigators

Applicants were encouraged to include Research Assistants in their project and budget, as their contributions would enrich the research, and so training was included in the evaluation criteria. During the closure of CUE's campus due to COVID-19, Research Assistants worked from home, where they conducted literature reviews, data analyses, document development, and other research activities.

Budget

The SCRP COVID-19 was funded from the Internal Research Grants budget, and included funds from other awards that had been recalled due to COVID-19. Funds were available to investigators for a maximum of twelve months. Travel restrictions made it impossible for some award recipients to fulfill the goals of their existing awards under CUE's Seed and Impact grant streams (February 2020 competition), and these funds were recalled and transferred to the budget of this call. Altogether, Concordia University of Edmonton provided $23,911 for six successful applications under the SCRP COVID-19 stream, $4,910 of which was sourced from recalled awards. No extensions were provided to the term of the SCRP COVID-19 awards due to the timeliness of the research work funded by this grant, and to avoid any delay in the release of the information contained in this report.

List of Awards under the SCRP COVID-19 call

SCRP COVID-19 Awards			
Name	**Faculty**	**Title**	**Award**
Arth, Carmen	Arts	Exploring Ways People Thrive during a Pandemic	$4,953
Bukutu, Cecilia	Science	Health information-seeking and health behavior among post-secondary students during the COVID-19 pandemic	$4,010
Marjanovic, Zdravko	Arts	Exploring the relationship between threat arising from the COVID-19 pandemic and posttraumatic growth, values congruent behaviour, and prosocial behaviour	$2,771
Saha, Baidya	Science	Machine Learning based Rapid Self-Assessment and Understanding of COVID-19 Disease Progression to Support Public Policy Decisions	$2,350
Smythe, Elizabeth*	Arts	Food Security and prospects for the transformation to a re-localized food system in the wake of the pandemic: The Alberta case	$5,000*
Yochim, Lorin	Education	Exploring impacts of the COVID-19 pandemic on caregivers in the transition from in-person to virtual classroom teaching: A case study of one Edmonton neighbourhood	$4,828

*The activities under the project led by Dr. Smythe could not be started. Due to the pressing nature of the SCRP, no extensions could be granted. No funds from this award (CRG-SCRP-2005-08) were used.

Executive Summaries

Investigations that received funding under the Special Call for Research Projects on COVID-19 were carried out between May 15ᵗʰ, 2020 and May 14ᵗʰ, 2021. During this time, six research teams worked under adverse conditions caused by the pandemic. Existing public health restrictions had negative effects on the execution of some projects, resulting in one project not executed in time. For projects that involved the collection of data from participants, approval by Concordia University of Edmonton's Research Ethics Board was a requirement for the release of funds, and for the initiation of research activities.

The investigators participating in the completed projects prepared Impact Reports that included an Executive Summary in lay language, aimed at disseminating the findings from the research to potential knowledge users at the following levels:

- Concordia University of Edmonton
- Other Post-Secondary Institutions
- Local communities and the City of Edmonton
- The Province of Alberta
- Canada

This document is a compilation prepared with information provided by the research teams, and is meant to assist in the dissemination of their research findings.

Project CRG-SCRP-2005-01. Exploring Ways People Thrive during a Pandemic

Team Members – Dr. Carmen Arth[1], Dr. Dorothy Steffler[1], Dr. Alison Kulak[1], Dr. Holli-Anne Passmore[1]
[1]Department of Psychology, Faculty of Arts, Concordia University of Edmonton

Executive Summary

The study, Exploring Ways People Thrive in a Pandemic addresses how the COVID-19 pandemic affects our lives and how the situation may actually contribute to mental well-being and thriving in unexpected ways. Thriving is a foundational concept in positive psychology and can be defined as adaptation to challenges that leads to positive growth. Thriving is of vital importance, as research demonstrates that people who thrive are at lower risk for developing various medical conditions. Whereas positive psychology often examines thriving in typical life circumstances, our study investigates thriving in an atypical context uniquely shared world-wide. The key research question is: what are the factors that support people in thriving during a pandemic? This study draws from 205 participants aged 18-83, with the majority from Canada and the US.

The research was conducted online in two phases: first, a survey with demographic questions, 5 inventories and 5 interview questions; second, a digital interview sent 4.5 months later, to explore ongoing pandemic-related life changes. Demographic questions include gender & sexual identity, income & employment status before/during the pandemic, financial concern before/ during pandemic, social interactions & relationships, pets, and engagement with nature. We measured multiple facets of thriving, such as relationships, autonomy, meaning, optimism, subjective wellbeing, feeling supported and respected, safety & belonging. We also measured dimensions of resilience, personal growth, connectedness to nature, openness to new situations, and stretching toward learning & growth.

Findings indicate personal growth is the strongest predictor of thriving, whether people live with others or alone, regardless of income. Personal growth relates to self-efficacy, internal locus of control, and assertiveness. Resilience is the second strongest predictor on every dimension of thriving. Congruent with previous research, the sexually diverse sample fared less well than non-diverse on measures of relationship and subjective wellbeing dimensions of thriving. Of note, the relationship dimension measured connectedness to community, support, trust, respect, loneliness, belonging. Wellbeing relates to life satisfaction and positive or negative emotions. Findings suggest pets ease loneliness, are 'trusted companions' and motivators for healthy activity during the pandemic. Data reveals a dominant theme that non-obligated time has irrefutable value in providing space for creativity, personal growth, learning, reflection and recommitment to their passion, values and relationships. Responses reveal central themes of re-prioritizing, self-connection & self-care, valuing of relationships & connectivity (friends, family, pets), the impact of nature on wellbeing, and the recognition that personal growth & self-efficacy grows through meeting challenges.

Funding details

Training the Next Generation of Researchers

In this project, two CUE students were recruited as Research Assistants to learn and actively participate in research activities, including data collection and analysis. Both students participated in the 2021 Student Research Forum, and one won First Place in the Undergraduate Student category.

Take-home message: Potential Applications of the Findings

Potential knowledge users for the research findings				
Concordia University of Edmonton	Other Post-Secondary Institutions	Local community and City of Edmonton	Province of Alberta	Canada
Support students' ability to engage in reflection and self-compassion practice which is central to wellbeing, creativity, and learning Non-obligated time, allowing for the emergence of creativity and divergent thinking, leading to greater productivity Focus on community building and connectivity for sexual and gender diverse students, staff and faculty Facilitating an environment of positive regard in which open and non-dualistic conversations can take place Resilience training for students, staff, and faculty Provide training for faculty to provide positive, growth-oriented feedback to students Provide training for peer-support volunteers in positive, strength-oriented communication Developing clubs that support nature connectedness for students, staff, and faculty Positive-oriented inquiry, focusing on the growth-aspect of personal experience and challenges	Providing social spaces for people to connect with one another Focus on community building and connectivity for sexual and gender diverse people Facilitating an environment of positive regard in which open and non-dualistic conversations can take place Developing clubs that support nature connectedness Maintain parks, trails, protected spaces that honour the environment Support initiatives that provide natural spaces for people to connect with and engage in activity in nature	Preserve the natural environment and provide resources that will support people's need to engage with nature as a means to support mental and physical health and wellbeing Support a living wage to accommodate people to have non-obligated time Support spaces of health and wellbeing within community-living residences that foster resilience, growth, and connectivity	Preserve the natural environment and provide resources that will support people's need to engage with nature as a means to support mental and physical health and wellbeing Support a living wage to accommodate people to have non-obligated time Support universal child-care regardless of income to accommodate access to non-obligated time Support strategies that foster resilience, growth, and connectivity

Take-home message: Recommendations for Policy Development

Recommendations for Policy Development			
Concordia University of Edmonton	**Local community and City of Edmonton**	**Province of Alberta**	**Canada**
Policy that supports non-obligated time, allowing for the emergence of creativity and divergent thinking, leading to greater productivity Policy supporting community building and connectivity for sexual and gender diverse students, staff and faculty Provide a Mastery in Teaching course for new instructors that addresses how to create a respectful and inclusive attitude toward students	Policy to ensure the maintaining of parks, trails, protected spaces that honour the environment Maintain budgetary support of initiatives that provide natural spaces for people to connect and engage with nature	Policy to ensure the maintaining of parks, trails, protected spaces that honour the environment Policy to preserve the natural environment and provide resources that will support people's need to engage with nature as a means to support mental and physical health and wellbeing Policy to support a living wage to accommodate people to have non-obligated time Policy for universal child-care regardless of income to accommodate access to non-obligated time Provide budget to support initiatives and strategies that foster resilience, growth, and connectivity	Policy to preserve the natural environment and provide resources that will support people's need to engage with nature as a means to support mental and physical health and wellbeing Policy to support a living wage to accommodate people to have non-obligated time Policy for universal child-care regardless of income to accommodate access to non-obligated time Provide budget to support initiatives and strategies that foster resilience, growth, and connectivity

Project CRG-SCRP-2005-02. Health information-seeking and behaviour among post-secondary students during the COVID-19 pandemic

Team Member – Dr. Cecilia Bukutu[1]

[1]Department of Public Health, Faculty of Science, Concordia University of Edmonton

Executive Summary

Post-secondary students in Alberta were surveyed between March and April 2021 to determine the types of COVID-19 and health-related information they needed, their preferred information sources, their purposes of seeking information and efforts to maintain a healthy lifestyle during theCOVID-19 pandemic. Using convenience sampling a link to a pre-validated questionnaire was posted on Alberta based post-secondary institutions online social media platforms (Facebook, LinkedIn).

Demographic information

Overall, 556 responses were received from students in Alberta. Respondents were: aged 18-25 years (64%), female (82%), single (68%), living in shared accommodation with adults (77%), and domestic students (88%). Ethnicity distribution was as follows: Caucasian (59%), Asian (22%), Black/African (7.6%), Indigenous (5.4%), Other (e.g., mixed) (6%).

Education & work

The majority of the respondents were studying full-time (91%), registered in a health-related program (64%) and worked either full-time or part time in a voluntary or paid position (59%). Of those working a high proportion (71%) reported that their jobs required 'a lot' of in person contact with the public. Academic learning delivery mode was reported as online (61%), hybrid meaning a combination of in-person and online (35%) and 3% in person.

Health Behaviour during COVID

The majority (465) of students reported that their consumption of healthy food products had stayed the same during COVID pandemic, while 38% reported an increase in consumption of fast food/processed food and use of natural health products (32%). A high proportion of students (73.6%) reported that their stress and anxiety levels had increased, while 53% reported increased mental health awareness. Over 35% students reported that their medical services were cancelled or postponed during the pandemic.

COVID-19 Beliefs/Perceptions

When asked about their perceptions in relation to COVID-19 the students' responses were: 71.7% perceived COVID-19 as a severe threat; 68.2% thought COVID-19 pandemic would continue for a long time until 2022; 36.6% were confident they would never get sick until the pandemic was over, 57.4% were sure someone they knew might get sick from the COVID-19 this year

COVID-19 the disease and vaccines

Almost all the students (90%) had heard about the new COVID-19 strains, with 48% of the students indicating they were more concerned about these new strains than the first strain. Over 49% of students reported having a family member or friend who tested positive for COVID-19. Just over 31% of students reported experiencing COVID-19 like symptoms and 8% reported testing positive for COVID-19. When asked if students planned to get the COVID-19 vaccine, (71.9%) responded yes, 11.3% answered no, and 12.4% responded not sure. When asked whether vaccines were safe, students responded: no (9%), unsure (26%) and yes (65%).

Training the Next Generation of Researchers

In this project, two students were recruited as Research Assistants and participated in the following activities:

- Conducting literature searches, identifying past papers and surveys aligned with the study
- Helping to draft the ethics application including consent forms, adverts
- Developing the cross-sectional survey instrument (web-based online - using Google forms)
- Conducting cross-sectional survey pre-testing among 8 volunteer students from various CUE faculties to assess comprehension of questions and response items and to examine questions with invalid or poor responses
- Interviewing the 8 volunteers for survey feedback
- Reviewing the feedback session material and helping to revise and finalize the survey
- Identifying online sites to post the link to the cross-sectional survey.

Take-home message: Potential Applications of the Findings

Potential knowledge users for the research findings				
Concordia University of Edmonton	Other Post-Secondary Institutions	Local community and City of Edmonton	Province of Alberta	Canada
Understand student's perception of COVID-19 and how their physical and mental health can be improved during this pandemic and future pandemic. 73.6% of students stated that their anxiety and stress have increased during COVID-19. CUE Wellness can use this information to improve student wellbeing and social support by enhancing services that support students' mental health and wellbeing. 52.7% students stated that the pandemic had affected their academic performance and learning online was hectic (63.7%). Creative ways of improving online learning for students (with focus on flexibility, adaptation and mode of delivery). Information from this study is relevant to faculty and all units so they understand the challenges students are facing and can continue to be flexible and innovative in how classes are delivered. Recording lectures allows students that do not have reliable internet connection access recorded classes. Over 23.7% of students reported being unsure or would not get the COVID-19 vaccine, 35% either believe vaccines are unsafe or are unsure. These students present an opportunity for the health professional and postsecondary institutions to understand their fears and engage them through culturally appropriate health promotional activities. As post-secondary institutions and public health professionals prepare for in-person classes, after a year of predominantly online learning these results	Understand student's perception of COVID-19 and how their mental health can be improved during this pandemic and future pandemic. 73.65% stated that their anxiety and stress have increased during COVID-19. Other post-secondary institution's Wellness can use this information to improve student wellbeing and social support by creating services that support students' mental health and wellbeing. Creative ways of improving online learning for students (with focus on flexibility, adaptation and mode of delivery). Information from this study is relevant to faculty and all units so they understand the challenges students are facing and can ensure they provide services like a recording of lectures with understanding and where possible make some adjustments. Some students that do not have a reliable internet connection can have access to recorded classes. 52.7% stated that the pandemic has affected their academic performance and learning online was hectic (63.7%); other post-secondary institutions can create a multitude of services to support student's academic and personal success. Over 23% of students reported being unsure or would not get the COVID-19 vaccine, 35% either believe vaccines are unsafe or are 'unsure'. These students present an opportunity for the health	COVID-19 affects some groups more than others. Research and data show that Blacks/African Americans, Hispanics/ Latinos, and American Indians/Alaska Natives are more affected by COVID-19. COVID-19 studies need to include people in different communities as certain groups may be more or less exposed to COVID-19. This research has shed light on the perceptions of different backgrounds on how they have been impacted by COVID-19. Data from this research can be used to address misinformation and communication on COVID-19 expressed by some participants of diverse backgrounds. Based on data from this research, some students stated they "mistrust everything these days (politicians, WHO, businesses, media, etc.)".	This study has revealed that 22.7% of post-secondary students unsure or won't get the COVID-19 vaccine, 35% unsure or believe the vaccine is unsafe; 22.3% unsure or do not perceive COVID-19 as a significant 'threat or risk' – but rather seeing this as a problem for seniors or those with underlying conditions, given the fatalities reported among these groups. 72% of employed students work directly with the public and can easily catch and spread the virus to high-risk groups especially if they live in multigenerational family households (living with the elderly) or belong to communities disproportionately affected by the pandemic. Recent reports show increases in new infections, severe illness and hospitalizations among youth due to new COVID-19 variants. This research provides information that the province of Alberta can use COVID-19 vaccination campaigns that engage/target diverse youth so that the province can achieve high rates of COVID-19 vaccination.	Suggestions regarding how information might be disseminated included the use of social media. Understanding the student's perspective about the COVID-19 vaccine and supporting their health engagement and consciousness may be helpful in planning adequate response and multidisciplinary educational strategies, including the psychological perspective on vaccine hesitancy underlying factors in a post-pandemic period. Creating employment avenues or programs to relieve the burden of the pandemic and future pandemic by understanding the economic impact of the virus on students

Potential knowledge users for the research findings				
Concordia University of Edmonton	Other Post-Secondary Institutions	Local community and City of Edmonton	Province of Alberta	Canada
provide baseline information that can be used to plan and communicate appropriate interventions (e.g., targeted vaccination campaigns) and support strategies that mitigate COVID-19 outbreaks and keep students informed and healthy. 59% of students in the survey worked either full-time or part time in a voluntary or paid position and of these 71% reported that their jobs required 'a lot' of in person contact with the public. As these students work directly with the public they can easily catch and spread the virus to high-risk groups especially within their social network (including other students on campus). Recent reports show increases in new infections, severe illness and hospitalizations among youth due to new COVID-19 variants. The above underscores the need for COVID-19 vaccination promotion campaigns.	professional and postsecondary institutions to understand their fears and engage them through culturally appropriate health promotional activities. As post-secondary institutions and public health professionals prepare for in-person classes, after a year of predominantly online learning these results provide baseline information that can be used to plan and communicate interventions (e.g., targeted vaccination campaigns) and support strategies to mitigate the COVID-19 outbreak			

Take-home message: Recommendations for Policy Development

Recommendations for Policy Development		
Concordia University of Edmonton	**Local community and City of Edmonton**	**Province of Alberta**
The research shed light on some challenges that students face during a pandemic. Existing policies on mental health can be updated to reflect the current crisis. For instance, before the pandemic, learning accommodation was created for students with disabilities, this can be expanded to include students with children and flatmates as some students expressed difficulty to do online learning living in a household with other people and little privacy. Some students also expressed concerns about online bullying/shaming during in-class chats. Policies on class conduct can be updated to reflect comments made during class to reflect chat shaming. Teachers' preparedness to support digital learning - some students perceived teachers were not adequately prepared for online learning. Students indicated that they liked the idea of a hybrid system going forward. CUE can consider incorporating hybrid programs. Some students also indicated: some professors were not taking internet issues seriously. Based on this feedback, CUE can use this as a roadmap to create or update any relevant existing policies. As universities open in Fall for in person learning the results from this survey can help inform guidelines for conduct on campus as they related to COVID-19 transmission.	The research has highlighted that students also face economic hardship during a pandemic, (55.5%) responded that their income has decreased during the pandemic. This research can drive policies that look at student's welfare during a pandemic at the local level. Some student comments: *'There is little to no support for students financially anymore'* *'Students need more financial aid!'* *'Financial stress is a big thing'* *'It is so hard to survive financially'* *'I am stressed and broke all the time'*	This research has shed light that students need access to provincial student loans and grants due to the financial crisis they were facing as a result of COVID-19. Some quotes indicated: *'The CERB program and federal support were invaluable but I am extremely disappointed with the provincial government'* *'The provincial government is not supportive at all'* *'That budget cuts made by the provincial government have really hurt student's* *'Being a student, I suffered more financially'* Students expressed the need to readily access mental health resources as they felt their mental health had declined significantly during the pandemic due to being isolated and being financially stressed. They however reported long waiting times to access help lines such as 811. 'super busy phone lines, e.g. 811'. This underscores the importance of increasing mental health services during pandemics.

Project CRG-SCRP-2005-06. Exploring the relationship between threat arising from the COVID-19 pandemic and posttraumatic growth, values congruent behaviour, and prosocial behaviour

Team Members – Dr. Zdravko Marjanovic[1], Dr. Thea Comeau[1]
[1]Department of Psychology, Faculty of Arts, Concordia University of Edmonton

Executive Summary

The COVID-19 pandemic presents an opportunity to study collective trauma during a global health crisis. Collective trauma refers to an event or period of time during which large numbers of people are exposed to threat that impacts the beliefs or narratives of the group indefinitely. Collective experiences of trauma can yield negative outcomes, but can also catalyze positive psychological outcomes (PPO) for survivors. This project studied participants' perceived sense of threat, financial threat, disruption of their core beliefs by the pandemic, and PPO arising from exposure to the COVID-19 pandemic, specifically resilience, posttraumatic growth (PTG), and engagement in values congruent and prosocial behavior. To guide this inquiry, this study was founded on several research questions:

• What is the relationship between sense of threat and PPOs in participants during the COVID-19 pandemic?

• What is the relationship between sense of financial threat and PPOs for participants during the COVID-19 pandemic?

• What are the relationships between the reported PPO's during the COVID-19 pandemic?

• How do these relationships change between time 1 & time 2 for participants during the COVID-19 pandemic?

Participants were recruited through the Concordia University of Edmonton (CUE) Undergraduate Research Participant Pool and through the Amazon MTurk platform. Participants completed a range of surveys exploring the variables in question. Preliminary findings are as follows:

• In the CUE sample, at both time 1 and time 2, significant correlations were found between participants' perceived threat and the disruption of core beliefs, as well as PTG. Similarly, at both time 1 and time 2 significant correlations were found between participants' perceived financial threat and the presence of core belief disruption, however financial threat did not demonstrate a significant correlation to PTG at time 1 or time 2 in this population.

• Preliminary repeated measures ANOVAs suggest participant sex impacted responding patterns in both resilience and consistency of values-congruent behaviour in the CUE sample.

• The MTurk sample demonstrated many significant correlations, both at time 1 and time 2. At time 1, sense of threat and sense of financial threat both demonstrated a significant positive correlation with all PPO outcomes. At time 2, sense of threat was significantly positively correlated with resilience, PTG, and the importance of values congruent behaviour, but was no longer significantly positively correlated with the consistency of values congruent behaviour, nor prosocial behaviour.

• Preliminary repeated measures ANOVAs suggest there was a significant effect of time on sense of threat, financial threat, and core belief disruption. The impact of time on PTG did not attain statistical significance. This suggests that participants may have maintained consistent levels of PTG throughout the study duration.

Funding details

Training the Next Generation of Researchers

One student participated as a Research Assistant (RA) in this project. In this capacity, the RA contributed to the literature review, which guided conceptualization of the data. The RA also contributed to the recruitment of participants, and to the writing of the Impact Report.

Take-home message: Potential Applications of the Findings

Potential knowledge users for the research findings				
Concordia University of Edmonton	Other Post-Secondary Institutions	Local community and City of Edmonton	Province of Alberta	Canada
Within the CUE community, our preliminary findings have several applications. First, results obtained from CUE students demonstrated a correlation between their sense of threat, both of catching the virus and financial threat, and core belief disruption. According to the core belief disruption literature, individuals only report core belief disruption during highly challenging times. This has two implications for the CUE community. First, it underscores the importance of ensuring students have access to mental health supports throughout the pandemic, as this study's findings suggest that students found the pandemic sufficiently distressing to illicit changes in their core belief structures. Secondly, it may be important for the institution to explore how it assesses and reports on student performance in a time which appears to have been exceedingly difficult for our students. Secondly, at both Time 1 and Time 2 CUE students reported a correlation between core belief disruption and posttraumatic growth (PTG). This relationship is in the expected positive direction, based on previous research, such that as their beliefs were more disrupted, they reported greater growth. As such, while CUE students struggled during this pandemic, it also created an opportunity for growth, upon which they capitalized. This growth can result in many changes for students, and it may be beneficial for students to have access to additional guidance with respect to course and career planning should their pandemic-related growth result in changes to future plans and goals.		For the local, provincial, national, and international communities, this research underscores what has been shown in the context of other traumas, namely that exposure to traumatic events can yield positive outcomes which must be explored and supported. For example, in this study, findings suggested that at both time points, during the COVID-19 pandemic, both samples indicated moderate willingness to engage in prosocial behaviours. Furthermore, this willingness to engage in prosocial behaviour did not significantly differ across the duration of the study. Therefore, it may be an important part of coping with pandemic related stressors. It may be beneficial for community organizations, academic organizations, and other systems to foster prosocial behaviour, or create opportunities for individuals in pandemic climates to engage in prosocial behaviour. This prosocial behaviour was also positively correlated with all other study variables in the first time point for the MTurk sample, and all positive psychological outcomes in time 2 in the same sample, which suggests that as participants engage in prosocial behaviour, they may be more likely to experience growth, resilience and engage in values congruent actions. Therefore, one salient application of this work is for prosocial behaviour, such as volunteerism, to be explored as a source of coping and fostering positive outcomes in long-duration collective traumas such as the COVID-19 pandemic.	In order to support Albertans in coping through the remainder of this pandemic, it may be helpful for the province of Alberta, and nation of Canada in general, to explore ways to highlight the positive outcomes which have arisen from this pandemic. To do so would require nuance, as it is important to ensure research such as this is not manipulated to imply that individuals should experience positive outcomes of the pandemic, but rather to enable Albertans and Canadians to engage in positive and prosocial behaviours which may contribute to their well-being in this pandemic. It is possible that many citizens may not know of suffering's capacity to improve well-being and contribute to other positive outcomes, so applying this research may enable the sharing of this information.	

Take-home message: Recommendations for Policy Development

Recommendations for Policy Development			
Concordia University of Edmonton	**Local community and City of Edmonton**	**Province of Alberta**	**Canada**
While there is a multiplicity of findings from this data set, one finding which may serve to influence policy at CUE is the positive correlation between students' willingness to engage in prosocial behaviour and other positive psychological outcomes such as posttraumatic growth and engagement in or prioritization of values congruent behaviour. While this correlational data does not clearly indicate a causal direction in this relationship, these significant positive correlations suggest that it may be beneficial at CUE to develop policies which support students in engaging in prosocial behaviour to support the development of other positive psychological outcomes, especially during trying times such as the COVID-19 pandemic. With respect to policy, this may include the enactment of policies which facilitate or require students to engage in prosocial behaviours during their tenure at CUE. Specifically, such policies may require students to complete a small number of volunteer hours in their tenure at CUE prior to graduating. Further, policies could be enacted which may allow for course credit to be earned through engaging in specific types of prosocial behaviours.

Secondly, participants in the CUE sample of this study reported a moderate amount of posttraumatic growth at both time 1 and time 2. While further analyses are required to further elucidate the specific types of growth reported, growth is typified by changes in how someone sees themselves, their relationships, and their priorities and values. As such, after living through this COVID-19 pandemic some students at CUE experiences changes in their priorities and values which result in a desire to change the focus of their academic studies. It may be beneficial for CUE to enact policies which enable students to make such changes more easily, at various points in their academic training. For example, one policy which may benefit CUE students who have experienced growth as a result of the pandemic is to implement more breadth in the selection of electives, such that if students do choose to change majors, they are able to apply more of their completed coursework towards the newly selected major. | The following policy suggestions could be implemented at local, provincial, and/or federal levels of government. They will be presented under the for Canada section, but apply in both previous sections as well. In our general population sample derived from MTurk, prosocial behaviour was also consistently and positively correlated with positive psychological outcomes, such as growth, resilience, and values congruent living. Therefore, it may be beneficial for policies to be implemented at the national (and provincial level) which facilitate prosocial behaviour with the hope of contributing to other positive psychological outcomes. It may be beneficial for local, provincial, and/or federal governments to set policies which make prosocial behaviours, such as volunteering, more accessible for the general population. For example, policies enabled individuals to receive tax deductions for volunteered time, in addition to other charitable contributions, this may make individuals more likely to engage in prosocial behaviours during times of struggle. Policy could also be used to create grant programs to fund individuals who are facing pandemic related hardships, like unemployment, to engage in prosocial behaviours such as volunteering. Such policies could create a range of benefits, both for the individuals engaging in more prosocial behaviours and for the people and communities benefiting from these behaviours. | | |

Project CRG-SCRP-2005-07. Machine Learning based Rapid Self-Assessment and Understanding of COVID-19 Disease Progression to Support Public Policy Decisions

Team Members – Dr. Baidya Saha[1]

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Executive Summary

The impact of COVID-19 outbreak, to Canada and the world as a whole is unprecedentedly enormous. Rational policy making in the context of radical uncertainty in which human lives and the economy are at stake has been extremely challenging which lead to multiple waves of COVID-19 across the country. This research explores the usage of machine learning and artificial intelligence-based tools in different research directions to reduce the stress of the policy makers and health care system. Typically, policy makers use the number of daily infections, number of hospitalizations, and rate of positivity to support public policy measures which are manifested as lagging factors by this research. In addition, this research discovers that machine learning and artificial intelligence-based markers such as reproductive numbers, growth factor, doubly times are manifested as leading factors which can avoid stress on the healthcare system and save precious lives.

In addition, many COVID-19 infection have included respiratory illness manifesting as fever, and cough, developing pulmonary symptoms like chest discomfort and shortness of breath and clinically resembling viral pneumonia which preserves the hallmark characteristics of COVID-19 infection as peripheral ground-glass and consolidative pulmonary opacities on chest Computed Tomography (CT). However, CT is very expensive, time consuming, and inaccessible in remote hospitals. This research investigates that Deep Learning (DL) based Artificial Intelligence (AI) tools would enable to triage patients by automatically excavating COVID-induced pneumonia from inexpensive and simple frontal chest X-ray (CXR) and respiratory biomarkers (visual imaging phenotypes) on CXR accountable for developing severe acute respiratory syndrome who need scarce medical resources such as hospital beds, ICU, ventilators, and thus help to manage the pandemic.

Last but not least, this research also develops AI based models to measure the mental health stress of the citizens which can be adopted by the government to avoid socio-economic damages.

The proposed indelible model is inherently very generic in nature which could make significant contributions for other infectious disease modeling and improve preparedness and response for the future pandemic. This research envisages moving one step ahead, toward advances in fundamental computational tools development for epidemiological research.

Funding details

This project was awarded $2,350 for twelve months.

Training the Next Generation of Researchers

During the activities of this project, three students in the MSc (IT) program were recruited as Research Assistants. Two of these Research Assistants received competitive awards for their research presentations related to this project, including recognitions at the 2021 Undergraduate Research in Science Conference of Alberta and the ICTCON 2021 conference. These findings are also part of the MSc (IT) final research projects for these students.

Take-home message: Potential Applications of the Findings

Potential knowledge users for the research findings				
Concordia University of Edmonton	Other Post-Secondary Institutions	Local community and City of Edmonton	Province of Alberta	Canada
The data and algorithms developed as a part of the research could be useful for next generation researchers of CUE. The knowledge generated from this research has valid potential to include in the teaching curriculum of machine learning and artificial intelligence-based courses.	Models developed by CUE researchers as a part of this research could be compared and validated with the models developed by other post-secondary institutions as a part of their pandemic based research activities. As a part of the knowledge mobilization plan, collaboration will be conducted with the University of Alberta researchers to advance the researches in near future.	Deep learning-based models developed to measure mental health status can be fine-tuned with the data collected from the local communities and at a smaller scale, community wise mental health issues could be studied. in addition, epidemiological markers such as reproduction number, growth rate which have been shown as a leading factor for determining public policy measures such as lockdown, school closures can be calculated within a local community and local measures could be implemented in only severely affected regions and avoid several socio-economic damages due to the effects of global safety measures.	Public policy decisions by the Province of Alberta has been mainly carrying out by the number of daily infections, number of hospitalizations and number of positivity rates which are demonstrated as lagging factors by this research. All Artificial Intelligence based biomarkers such as reproduction number, doubly times, growth factors which are manifested as leading factors by this research could be used to support rational public policy decisions and minimize the number of deaths and number of hospitalizations. In addition, provincial healthcare system can reduce healthcare cost by facilitating deep learning enabled x-ray machines to detect pneumonia from chest X-ray and save precious lives as well.	COVID-19 poses significant difficulties to Canadian lives and livelihood and raises a serious concern on their mental health. This research demonstrates that machine learning based models can measure mental health status of the citizens using social media data. Though more accurate findings could be received from interview and survey, it is very expensive and time consuming. However, analyzing large volume of online social media data could provide initial glimpse of the mental health status of the citizens very rapidly and government can adopt preliminary measures to avoid severe damage until the report after analyzing the survey data is available.

Take-home message: Recommendations for Policy Development

Recommendations for Policy Development	
Province of Alberta	**Canada**
As we already mentioned, the outcomes of the researches as a part of this project lead to developing novel machine learning and artificial intelligence (AI) algorithms which has far-reaching impacts beyond COVID-19. All AI based biomarkers such as reproduction number, doubly times, growth factors which are manifested as leading factors could be useful for the government for handling other infectious disease such as HIV, STI, Hepatitis, Measles and such many others. In addition, provincial government can get benefitted by taking initiative to encourage OEM (original equipment manufacturers) companies for incorporating deep learning algorithms in the existing X-ray machines. Computed Tomography (T) scans can produce subtle biomarkers associated with COVID induced respiratory infections. However, the CT scans are very expensive, and there is substantial shortage of technicians capable of capturing CT scans. Deep learning enabled X-ray machines can successfully detect pneumonia from chest X-ray which are inexpensive and can reduce the healthcare cost significantly.	As already mentioned, machine learning based models can measure mental health status of the citizens from analyzing large scale of social media data. Social media data could provide initial insights of the mental health status of the citizens very rapidly and government can adopt preliminary measures to avoid severe socio-economic damage which can be later verified by analyzing survey reports and interviews.

Project CRG-SCRP-2005-11. Exploring impacts of the COVID-19 pandemic on caregivers in the transition from in-person to virtual classroom teaching: A case study of one Edmonton neighbourhood

Team Members – Dr. Lorin Yochim[1], Zane Hamm[2], Dr. Christine Martineau[1], Dr. Muna Saleh[1]
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Executive Summary

This research explored the impacts of schooling-at-home on caregivers as they negotiated their personal and professional lives during the early phases of the COVID-19 pandemic. Beginning in March of 2020, all schools in the province of Alberta were closed, with students moved to "emergency remote learning." Parents and caregivers, presumably, were to take up the task of supervising learning, if not ultimate responsibility for teaching mandated curriculum.

Our aim in this research was to investigate the impacts of the COVID-19 pandemic on the field of education, especially the effects on and responses of parents and caregivers in the transition from in-person to virtual classroom teaching.

In terms of policy impacts, we hoped to generate findings and follow-up activities appropriate to the production of recommendations for policy and practice in teacher education programs. We aimed to establish *ad hoc* advisory bodies that would conduct a review and enhancement of courses in CUE's Bachelor of Education and Master of Education degrees, as well as in undergraduate programming in the Faculty of Education.

Our research focused on a single Edmonton neighbourhood using a simple survey and one-on-one interviews to generate data.

Funding details

This project was awarded $4,828 for twelve months.

Training the Next Generation of Researchers

During their investigations, the research team recruited an undergraduate student as a Research Assistant, who was involved in design and distribution of the survey. This Research Assistant was also involved in the work of the *ad hoc* committees, which developed the students' capacity to work with community members.

Take-home message: Potential Applications of the Findings

Potential knowledge users for the research findings		
Concordia University of Edmonton	Other Post-Secondary Institutions	Local community and City of Edmonton
The proposed research contributes to the goal of the call by contributing rigorous, empirically grounded knowledge of how the suspension of regular schooling is affecting caregivers as they adjust to schooling-at-home under social isolation. It explores how this radical change to daily life impacts the lives of caregivers. It aims to mobilize the research findings to improve policies and practices in teacher education. In the longer term, mobilization of this knowledge through teacher education has the potential to improve the capacity of schools and school leaders as we move into a period of intermittent schooling-at-home. This research aimed to produce knowledge of immediate practical application and significance. While these research activities aimed to generate data bearing upon the research questions, the primary impetus for this work was to directly impact policy and practice. Data generation and preliminary findings are now serving to inform the activities of two complementary advisory groups, each of which contributes to a review and enhancement of CUE Faculty of Education programs and courses. To this point in the research, effort has been focused on creating the structures necessary to generate recommendation for changes in courses outlines. These recommendations will be proposed through the summer months of 2021 and proposed in Faculty Council meets in early fall.	The committee structures proposed above in relation to review of pre-service teacher education might serve as a model for other post-secondary institutions. Program design in teacher education is typically proposed and carried out by faculty members as part of their regular duties. The community committee enhances CUE Faculty of Education's current program advisory model, one that has made the BEd After Degree program a top performer.	The research introduced a new model for community input into the "black box" of teacher education. Teacher education programs tend to be driven by the concerns and interests of the formal institutions of education. Our model introduces community and parental input into the teacher education progress. We believe that such participation not only impacts teacher education positively, but validates parent and community concerns about education by inserting community members directly into the process.

Take-home message: Recommendations for Policy Development

Recommendations for Policy Development	
Concordia University of Edmonton	**Local community and City of Edmonton**
This research aimed to produce knowledge of immediate practical application and significance. While these research activities aimed to generate data bearing upon the research questions, the primary impetus for this work was to directly impact policy and practice. Data generation and preliminary findings are now serving to inform the activities of two complementary advisory groups, each of which contributes to a review and enhancement of CUE Faculty of Education programs and courses. The following courses in the BEd After Degree are community facing, and are therefore particularly suited to review using the insights generated by this project: • EDUC503 Advanced Planning for the Elementary Classroom (Technology and Communication Processes) • EDUC561 Teaching & Schooling in Western Civilization While these courses are particularly suited to this review, the community consultation model suggests a different way of thinking about pre-service teacher education design. All courses are in theory subject to review under this model.	The *ad hoc* advisory committee model suggests a new role for community leagues to engage in the structures of education at the post-secondary level. Such participation might be a valuable new mode of community participation in crucial areas of public policy. Community leagues are typically involved in the provision of basic community services, such as playgrounds and leisure activities and consultation on community development. Our model suggests increased involvement in a non-traditional area of policy development.

Final Considerations

The Special Call for Research Projects (SCRP) on COVID-19 was successful. It was important for CUE to encourage its researchers and students to engage in meaningful inquiries that will aid our collective understanding of how events such as this pandemic occur, and that may provide tools to internal and external stakeholders to better handle such events in the future. We understand how disruptive COVID-19 has been to the lives of our community members, and we have a moral obligation to contribute to efforts to reduce the burden that the pandemic has imposed on everyone.

For the SCRP COVID-19 grants, the time between conceptualization, approval, and launch was short; within a couple of weeks, the budget, guidelines, and forms were created and released. CUE faculty members were quick to respond to this call, eager to contribute research findings regarding this pandemic that could assist in the improved control and prevention of pandemics, and to provide insight into how to better handle the disruption to everyone's lives.

Sixty percent of eligible submitted applications received funding under this call. Despite being conducted under adverse conditions, five of the six funded projects were carried out as planned, and yielded results.

The success of this call extends beyond CUE's faculty members: nine CUE students were recruited as Research Assistants, and they provided substantial contributions to the research projects. In the process, these students received first-hand training in how research is conducted. Their efforts and achievements are testament to the resilience of our students and good predictors of the future achievements by this new generation of researchers.

Altogether, the findings and recommendations included in this report are tangible products of CUE's sense of community. It is our hope that the information contained in this report serves CUE's community and leadership in the future, by helping to shape our prevention plans and improve our response to these life-changing events.

We can sit in the back. But at CUE, someone will always invite us to the front.

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