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Sense of control and positive mental health outcomes among adults in Canada during the COVID-19 pandemic

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ABSTRACT

Background

During the COVID-19 pandemic in Canada, there was a decrease in population positive mental health (PMH); however, many individuals still reported high levels of PMH. One potential protective factor could be a sense of control, which involves perceptions of personal mastery and minimal perceived constraints. Limited Canadian research has been conducted on the link between sense of control and PMH during the pandemic.

Data and methods

This study used cross-sectional data from the 2020 and 2021 Survey on COVID-19 and Mental Health, which included adults (18 years and older) living in the 3 territorial capitals and 10 provinces in Canada. Two facets of sense of control were measured with the Sense of Mastery Scale: personal mastery and perceived constraints. Three PMH outcomes were measured using single-item measures of self-rated mental health (SRMH), community belonging, and life satisfaction. Regression analyses were conducted to examine associations between the two sense of control facets and the three PMH outcomes.

Results

Higher personal mastery was associated with higher average life satisfaction and a greater likelihood of high SRMH and strong community belonging. In contrast, greater perceived constraints were associated with lower average life satisfaction and a lower likelihood of high SRMH and strong community belonging. Sociodemographic differences on the facets were observed.

Interpretation

Adults in Canada with a higher sense of control during the pandemic tended to have better PMH than those who felt like they had less control. Further research on mental health promotion efforts involving sense of control is needed.

Keywords

COVID-19, internal-external control, protective factors, mental health, social cohesion, personal satisfaction, adult, Canada, public health, positive psychology.

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What is already known on this subject?

- Although overall decreases in positive mental health have been observed in the Canadian population during the COVID-19 pandemic, many individuals still reported high levels of positive mental health.
- Pre-pandemic research suggests that a higher sense of control (i.e., perceptions of personal mastery and minimal perceived constraints) is associated with positive mental health, but limited studies have been conducted on this relationship during the pandemic in Canada.

What does this study add?

- Sociodemographic differences in levels of personal mastery and perceived constraints were observed.
- Statistically controlling for those sociodemographic factors, adults in Canada with higher personal mastery and lower perceived constraints during the pandemic were more satisfied with their life on average and more likely to report excellent or very good mental health and a very or somewhat strong sense of community belonging.
- This study highlights sense of control as a potential target for mental health promotion initiatives and justifies the ongoing monitoring of it.

The COVID-19 pandemic was a challenging time for many. Indeed, there are indications that some aspects of the population's positive mental health in Canada declined during the pandemic.^{1,2,3,4,5} Positive mental health is defined by the Public Health Agency of Canada as “the capacity of each and all of us to feel, think, [and] act in ways that enhance our ability to enjoy life and deal with the challenges we face.”⁶ Various indicators can be used to monitor different aspects of positive mental health for public health surveillance and research purposes.^{7,8} National surveillance data showed that fewer adults in Canada reported high self-rated mental health and strong community belonging in late 2020 compared to 2019,¹ with further declines documented in early 2021.² Similar decreases in mean life satisfaction have also been observed.^{1,2,3} While these positive mental health outcomes may have lowered at the population level, there were still many who reported experiencing high levels of positive mental health during the pandemic. For a strength- or asset-based understanding of what may distinguish these individuals from others and to highlight potential avenues for mental health promotion, it is important to identify protective factors of positive mental health.^{9,10}

A sense of control is one possible protective factor. It involves a person's beliefs about the likelihood of producing desired outcomes and preventing undesired ones, including perceptions of one's ability to influence these outcomes (e.g., personal mastery) and the presence or absence of obstacles (e.g., perceived constraints).^{11,12,13,14} Sense of control was recognized as an individual determinant of positive mental health during the development of the Public Health Agency of Canada's Positive Mental Health Surveillance Indicator Framework (PMHSIF) based on a review of the literature and existing mental health frameworks and consultations with experts and stakeholders.^{7,8} Pre-pandemic meta-analyses show that a higher

sense of control is associated with lower mental distress or illness (e.g., anxiety and depression)^{15,16} and higher subjective well-being (e.g., life satisfaction).¹⁷ Moreover, in Canada before the pandemic, positive mental health outcomes—including higher self-rated mental health, happiness, life satisfaction, and belonging—have been linked to a higher sense of control.^{18,19}

During the pandemic, a higher sense of control was associated with better positive mental health in international studies, such as in China and the United States.^{20,21,22,23} Initial pandemic research in Canada found that adults with a higher sense of control were less likely to screen positive for major depressive disorder.²⁴ Moreover, other analyses revealed that adults in Canada were less likely to report that their mental health had worsened during the pandemic if they had a high sense of control.²⁵ However, limited Canadian research has explored the relationship between sense of control and positive mental health during this time. As positive mental health and mental distress or illness are distinct constructs,^{8,26} this is an evidence gap.

Objective control over certain aspects of life was restricted during the COVID-19 pandemic, making individual differences in subjective control a potentially important predictor of Canadians' positive mental health during that time.¹⁴ For instance, Canadians with a high sense of control during the COVID-19 pandemic may have been able to adapt more effectively to the novel situation by focusing on what they could still control, such as engaging in health-promoting and health-protective behaviours, while those with a low sense of control may have felt more helpless and passive in response to the virus and the various public health restrictions intended to minimize its spread. Indeed, a higher sense of control has been associated with more problem-focused and accommodation coping

Table 1
Weighted estimates of sociodemographic characteristics, positive mental health outcomes, and sense of control facets, household population aged 18 years and older, Canada, late 2020 to early 2021

Variable	Weighted %	95% confidence interval	
		from	to
Gender (n = 18,900)			
Man	49.3	49.2	49.3
Woman	50.7	50.7	50.8
Age (years) (n = 18,936)			
18 to 34	26.5	25.8	27.2
35 to 49	25.7	24.9	26.5
50 to 64	25.6	25.2	26.0
65 and older	22.2	22.2	22.2
Household income tertile (n = 17,174)			
Low (Less than CAN\$55,000)	35.7	34.7	36.8
Middle (CAN\$55,000 to CAN\$103,000)	31.0	29.9	32.1
High (more than CAN\$103,000)	33.3	32.2	34.4
Population group (n = 18,751)			
Racialized ¹	23.8	22.8	24.8
Indigenous ²	2.4	2.1	2.8
Non-racialized, non-Indigenous	73.8	72.8	74.8
Immigrant status (n = 18,853)			
Yes	27.3	26.3	28.3
No	72.7	71.7	73.7
Educational attainment (n = 18,892)			
High school diploma or less	30.2	29.2	31.3
Postsecondary	69.8	68.7	70.8
Place of residence (n = 18,781)			
Rural area	17.8	17.1	18.5
Population centre	82.2	81.5	82.9
Geographic location³ (n = 18,936)			
Ontario	39.4	...	...
Quebec	22.8	...	...
British Columbia	13.6	...	...
Prairie provinces	17.5	...	...
Atlantic provinces	6.5	...	...
Territorial capitals	0.1	...	...
Self-rated mental health (n = 18,925)			
High	55.7	54.6	56.8
Low or moderate	44.3	43.2	45.4
Community belonging (n = 18,881)			
Strong	60.5	59.4	61.6
Weak	39.5	38.4	40.6
		95% confidence interval	
	Weighted mean	from	to
Life satisfaction⁴ (n = 18,906)	7.05	7.00	7.10
Perceived constraints⁵ (n = 18,607)	1.52	1.50	1.54
Personal mastery⁵ (n = 18,782)	2.79	2.77	2.81

... not applicable

1. The concept of racialized population is measured with the visible minority variable in this study. The term "visible minority" refers to whether a person belongs to one of the visible minority groups defined by the *Employment Equity Act*. The *Employment Equity Act* defines visible minorities as "persons, other than Aboriginal peoples, who are non-Caucasian in race or non-white in colour."

2. Includes First Nations people living off reserve, Métis, and Inuit.

3. Confidence intervals are not reported for provinces or territorial capitals because weights and bootstrap weights were calibrated to their population totals by Statistics Canada.

4. Rated on a scale from 0 (very dissatisfied) to 10 (very satisfied).

5. Responses were rescored from 0 (strongly disagree) to 4 (strongly agree) so that higher scores represented greater perceived constraints and greater personal mastery.

Note: The sample size for each variable may not add up to 18,936 because of missing data.

Sources: Statistics Canada, 2020 and 2021 Survey on COVID-19 and Mental Health.

strategies and less avoidance and disengagement coping strategies²⁷ as well as diminished reactivity to some stressors.²⁸

The current study examined the association between facets of sense of control (i.e., personal mastery and perceived constraints) and three positive mental health outcomes (i.e., high self-rated mental health, strong community belonging, and life satisfaction) during the pandemic among adults in Canada.

These three positive mental health outcomes are monitored in the adult version of the PMHSIF⁷ and included as headline indicators in the Quality of Life Framework for Canada.²⁹ Based on previous research, it was expected that individuals with a higher sense of control (i.e., greater personal mastery and lower perceived constraints) during the pandemic would be more satisfied with their life and be more likely to report high self-

rated mental health and strong community belonging than those with a lower sense of control. This study also explored sociodemographic differences in the facets of sense of control to understand which groups in Canada felt like they had more agency and fewer limitations and which populations were feeling a weaker sense of control during the pandemic. This could help identify where this potential protective factor was lacking and where targeted mental health promotion efforts could be directed within the Canadian adult population.¹³

Methods

Data

Similar to previous research,^{30,31,32} cross-sectional data were pooled³³ from the first two cycles of the Survey on COVID-19 and Mental Health (SCMH). These data were collected by Statistics Canada using computer-assisted telephone interviews and electronic questionnaires from September to December 2020 and from February to May 2021 from adults (18 years and older) living in the 3 territorial capitals and 10 provinces in Canada.^{34,35} Individuals younger than 18 years and those living

on reserves, in the territories outside the capital cities, in collective dwellings, or in institutions were not part of the target population. A two-stage sampling design was used in the SCMH: first, a random sample of dwellings was selected within each province or territorial capital, followed by the selection of one adult respondent per dwelling. The response rates were 53.3% for the 2020 SCMH and 49.3% for the 2021 SCMH. Informed consent was obtained from all participants included in the study. De-identified data were analyzed from 18,936 of the 22,721 respondents who agreed to Statistics Canada sharing their responses with other governmental organizations, such as Health Canada and the Public Health Agency of Canada.

Measures

Sense of control was assessed using the seven-item Sense of Mastery Scale.³⁶ Respondents rated their agreement with each of the following statements: (1) “You have little control over the things that happen to you,” (2) “There is really no way you can solve some of the problems you have,” (3) “There is little you can do to change many of the important things in your life,” (4) “You often feel helpless in dealing with problems of life,” (5) “Sometimes you feel that you are being pushed around in

Table 2
Sociodemographic comparisons on sense of control facets, household population aged 18 years and older, Canada, late 2020 to early 2021

Variable	Perceived constraints			Personal mastery		
	Weighted mean	95% confidence interval		Weighted mean	95% confidence interval	
		from	to		from	to
Gender						
Man	1.46 [†]	1.43	1.49	2.79 [†]	2.76	2.82
Woman	1.58 [‡]	1.55	1.60	2.80 [‡]	2.77	2.82
Age (years)						
18 to 34	1.66 [†]	1.61	1.71	2.80 [†]	2.75	2.84
35 to 49	1.51 [‡]	1.47	1.55	2.82 [‡]	2.78	2.86
50 to 64	1.45 [§]	1.41	1.49	2.80 [†]	2.77	2.84
65 and older	1.45 [§]	1.41	1.49	2.73 [‡]	2.70	2.77
Household income tertile						
Low	1.65 [†]	1.61	1.68	2.70 [†]	2.67	2.74
Middle	1.53 [‡]	1.49	1.57	2.81 [‡]	2.78	2.85
High	1.35 [§]	1.31	1.39	2.87 [§]	2.84	2.91
Population group						
Racialized	1.63 [†]	1.58	1.68	2.72 [†]	2.67	2.76
Indigenous	1.59 ^{†‡}	1.45	1.72	3.00 [‡]	2.87	3.13
Non-racialized, non-Indigenous	1.48 [‡]	1.46	1.50	2.81 [§]	2.79	2.83
Immigrant status						
Yes	1.56 [†]	1.51	1.60	2.70 [†]	2.66	2.74
No	1.51 [†]	1.49	1.53	2.82 [‡]	2.80	2.84
Educational attainment						
High school diploma or less	1.62 [†]	1.58	1.66	2.79 [†]	2.75	2.83
Postsecondary	1.48 [‡]	1.46	1.51	2.79 [†]	2.77	2.82
Place of residence						
Rural area	1.44 [†]	1.40	1.48	2.88 [†]	2.84	2.92
Population centre	1.54 [‡]	1.52	1.57	2.77 [‡]	2.75	2.79

[†] For each sociodemographic factor, groups that do not share the † symbol have weighted means on the facet that are significantly different at $p < 0.05$.

[‡] For each sociodemographic factor, groups that do not share the ‡ symbol have weighted means on the facet that are significantly different at $p < 0.05$.

[§] For each sociodemographic factor, groups that do not share the § symbol have weighted means on the facet that are significantly different at $p < 0.05$.

Notes: The sample sizes for the sociodemographic comparisons were between 16,875 and 18,549 individuals because of varying rates of missing data on the sociodemographic variables and the exclusion of those with any missing data on the Sense of Mastery Scale.

Sources: Statistics Canada, 2020 and 2021 Survey on COVID-19 and Mental Health.

Table 3
Logistic regression analysis with sociodemographic factors and sense of control facets as explanatory variables of high self-rated mental health, household population aged 18 years and older, Canada, late 2020 to early 2021

	Adjusted odds ratio	95% confidence interval	
		from	to
Gender			
Woman	0.77	0.69	0.86
Man ¹	...	...	...
Age (years)			
18 to 34	0.27	0.23	0.32
35 to 49	0.36	0.31	0.43
50 to 64	0.53	0.45	0.62
65 or older ¹	...	...	...
Household income tertile			
Low	0.95	0.82	1.09
Middle	1.00	0.87	1.16
High ¹	...	...	...
Population group			
Racialized	1.50	1.22	1.85
Indigenous	0.64	0.45	0.92
Non-racialized, non-Indigenous ¹	...	...	...
Immigrant status			
Yes	1.13	0.94	1.37
No ¹	...	...	...
Educational attainment			
High school diploma or less	0.86	0.76	0.98
Postsecondary ¹	...	...	...
Place of residence			
Rural area	1.26	1.09	1.45
Population centre ¹	...	...	...
Perceived constraints	0.37	0.35	0.41
Personal mastery	1.21	1.12	1.31

... not applicable

1. This sociodemographic group is the reference category.

Notes: Results are weighted. Respondents with missing data on any of the examined variables were excluded from the regression analysis, leaving a sample size of 16,476 individuals. Odds ratios with confidence intervals that exclude 1.00 are considered statistically significant ($p < 0.05$).

Sources: Statistics Canada, 2020 and 2021 Survey on COVID-19 and Mental Health.

life,” (6) “What happens to you in the future mostly depends on you,” and (7) “You can do just about anything you really set your mind to.” Response options included “Strongly agree,” “Agree,” “Neither agree nor disagree,” “Disagree,” and “Strongly disagree.” While some previous Canadian analyses have used all seven items (after rescoring) as an overall measure of sense of control or mastery,^{7,18,19} results from a confirmatory factor analysis conducted with the current data did not find support for a one-factor model (see Appendix Figure 1 and Appendix Table 1).³⁷ A two-factor model resulted in better model fit, with the first five items loaded onto a factor representing perceived constraints, the last two items loaded onto a factor representing personal mastery, and an association modelled between the two factors (see Appendix Figure 2 and Appendix Table 1).³⁷ The perceived constraints and personal mastery factors were negatively associated with each other. Those items have been used to measure those two facets of sense of control in previous research.^{12,38} Therefore, in the current study, mean scores on each facet were obtained, with higher scores representing greater perceived constraints or greater personal mastery.

To assess self-rated mental health, respondents were asked, “In general, how is your mental health?” Response options were “Excellent,” “Very good,” “Good,” “Fair,” and “Poor.” The Organisation for Economic Co-operation and Development has recommended this single-item question as a population measure of mental health.³⁹ Individuals were considered to have high self-rated mental health if they indicated “Excellent” or “Very good.”^{7,29}

To assess community belonging, respondents were asked, “How would you describe your sense of belonging to your local community?” Response options were “Very strong,” “Somewhat strong,” “Somewhat weak,” and “Very weak.” Strong community belonging was characterized by individuals who answered “Very strong” or “Somewhat strong.”^{7,29} Community belonging captures one aspect (i.e., social integration) of social well-being and can be considered an important part of positive mental health.^{8,39,40,41}

To assess life satisfaction, respondents were asked, “Using a scale of 0 to 10 where 0 means ‘Very dissatisfied’ and 10 means ‘Very satisfied,’ how do you feel about your life as a whole right now?” This variable was treated as continuous in the analyses. Life satisfaction is considered a core part of the hedonic well-

Table 4

Logistic regression analysis with sociodemographic factors and sense of control facets as explanatory variables of strong community belonging, household population aged 18 years and older, Canada, late 2020 to early 2021

	Adjusted odds ratio	95% confidence interval	
		from	to
Gender			
Woman	1.00	0.90	1.11
Man ¹	...	...	...
Age (years)			
18 to 34	0.34	0.29	0.40
35 to 49	0.48	0.41	0.57
50 to 64	0.59	0.50	0.68
65 or older ¹	...	...	...
Household income tertile			
Low	1.02	0.89	1.17
Middle	1.08	0.95	1.24
High ¹	...	...	...
Population group			
Racialized	1.20	0.99	1.46
Indigenous	0.99	0.70	1.40
Non-racialized, non-Indigenous ¹	...	...	...
Immigrant status			
Yes	1.05	0.88	1.24
No ¹	...	...	...
Educational attainment			
High school diploma or less	1.06	0.93	1.21
Postsecondary ¹	...	...	...
Place of residence			
Rural area	1.28	1.12	1.47
Population centre ¹	...	...	...
Perceived constraints	0.58	0.54	0.62
Personal mastery	1.18	1.10	1.27

... not applicable

1. This sociodemographic group is the reference category.

Notes: Results are weighted. Respondents with missing data on any of the examined variables were excluded from the regression analysis, leaving a sample size of 16,452 individuals. Odds ratios with confidence intervals that exclude 1.00 are considered statistically significant ($p < 0.05$).

Sources: Statistics Canada, 2020 and 2021 Survey on COVID-19 and Mental Health.

being component of positive mental health.^{8,42} Self-rated mental health, community belonging, and life satisfaction are positively associated with each other.^{43,44}

Analysis

Analyses were conducted using SAS Enterprise Guide 7.1 (SAS Institute, Cary, North Carolina, United States). To account for the complex survey design, to adjust for nonresponse, and to obtain representative findings, survey sampling weights created by Statistics Canada were applied to generate weighted estimates. Variance estimation was performed using the bootstrap method (1,000 replicates) with weights provided by Statistics Canada. Following the guidelines for combining cycles in the 2020 and 2021 SCMH User Guide, the survey sampling weights and bootstrap weights in each dataset were multiplied by 0.5.

Weighted means with 95% confidence intervals (CIs) for perceived constraints and personal mastery were obtained across various sociodemographic characteristics, including gender (man, woman), age group (18 to 34 years, 35 to 49 years, 50 to 64 years, 65 years and older), household income tertile (low [less than CAN\$55,000], middle [CAN\$55,000 to

CAN\$103,000], high [more than CAN\$103,000]), population group (racialized, Indigenous, non-racialized and non-Indigenous), immigrant status (yes, no), personal educational attainment (high school diploma or less, postsecondary), and place of residence (rural area, population centre). Gender diverse adults were not examined in this study as their sample size in the dataset was too small. The population group was derived from the visible minority flag created by Statistics Canada,⁴⁵ with the exception that those who identified as Indigenous (i.e., First Nations, Métis, or Inuk [Inuit]) were examined separately from those who were non-racialized and non-Indigenous. Immigrants included landed immigrants and non-permanent residents, and non-immigrants included those born in Canada. For place of residence, population centres were continuously built-up areas with population densities of at least 400 people per km² and population concentrations of at least 1,000. Statistically significant differences ($p < 0.05$) in mean estimates between sociodemographic groups were determined using *t*-tests.

Perceived constraints and personal mastery were included as explanatory variables in adjusted (1) logistic regression analyses where high self-rated mental health or high community belonging was the criterion variable and (2) linear regression

analyses where life satisfaction was the criterion variable. Covariates included the aforementioned sociodemographic factors, which have previously shown differences in overall sense of control or positive mental health.^{7,18,19,25} Adjusted odds ratios [aORs] with 95% CIs that excluded 1.00 and linear regression coefficients that excluded 0.00 were interpreted as statistically significant. Respondents with missing data on the Sense of Mastery Scale, any of the sociodemographic factors, or the specific positive mental health variable were excluded from the respective regression analysis, leaving sample sizes of 16,476 for the logistic regression analyses involving high self-rated mental health, 16,452 for the logistic regression analyses involving strong community belonging, and 16,467 for the linear regression analyses involving life satisfaction. Except for household income, no more than 2.0% of the data was missing for each variable (see Table 1 for sample sizes).

Results

Table 1 presents weighted estimates for sociodemographic characteristics, sense of control facets, and positive mental health outcomes. A majority of adults reported high self-rated

mental health (55.7%) and strong community belonging (60.5%). On average, life satisfaction was rated at 7.05 out of 10. The mean perceived constraints score ($M = 1.52$) fell between the “Disagree” (scored 1) and “Neither agree nor disagree” (scored 2) response options, while the mean personal mastery score ($M = 2.79$) was close to the “Agree” (scored 3) response option.

Sociodemographic comparisons on the sense of control facets are reported in Table 2. On average, higher perceived constraints were reported by women (versus men), 18- to 34-year-olds (versus all older age groups), 35- to 49-year-olds (versus the two older age groups), those in low-income households (versus those in middle-income and high-income households) or middle-income households (versus those in high-income households), racialized individuals (versus non-racialized and non-Indigenous individuals), those with a high school education or lower (versus those with a postsecondary education), and those living in population centres (versus those in rural areas). In contrast, higher personal mastery was reported by the three younger age groups (versus those aged 65 years and older), those in high-income households (versus those in middle-income and low-income households) or middle-income

Table 5
Linear regression analysis with sociodemographic factors and sense of control facets as explanatory variables of life satisfaction, household population aged 18 years and older, Canada, late 2020 to early 2021

	Adjusted <i>b</i>	95% confidence interval	
		from	to
Gender			
Woman	-0.10	-0.19	-0.005
Man ¹	...	...	...
Age (years)			
18 to 34	-0.80	-0.94	-0.66
35 to 49	-0.54	-0.67	-0.41
50 to 64	-0.48	-0.61	-0.36
65 and older ¹	...	...	...
Household income tertile			
Low	-0.08	-0.19	0.03
Middle	-0.02	-0.13	0.09
High ¹	...	...	...
Population group			
Racialized	-0.01	-0.17	0.14
Indigenous	-0.03	-0.26	0.20
Non-racialized, non-Indigenous ¹	...	...	...
Immigrant status			
Yes	0.09	-0.05	0.22
No ¹	...	...	...
Educational attainment			
High school diploma or less	0.07	-0.05	0.18
Postsecondary ¹	...	...	...
Place of residence			
Rural area	0.31	0.20	0.41
Population centre ¹	...	...	...
Perceived constraints	-1.09	-1.15	-1.03
Personal mastery	0.23	0.16	0.30

... not applicable

1. This sociodemographic group is the reference category.

Notes: *b* = unstandardized regression coefficient. Results are weighted. Respondents with missing data on any of the examined variables were excluded from the regression analysis, leaving a sample size of 16,467 individuals. Regression coefficients with confidence intervals that exclude 0.00 are considered statistically significant ($p < 0.05$).

Sources: Statistics Canada, 2020 and 2021 Survey on COVID-19 and Mental Health.

households (versus those in low-income households), those who identified as Indigenous (versus racialized individuals and non-racialized and non-Indigenous individuals) or were non-racialized and non-Indigenous (versus racialized individuals), Canadian-born individuals (versus immigrants), and those living in rural areas (versus those in population centres). All other sociodemographic comparisons not mentioned above were not statistically significant.

When statistically controlling for sociodemographic factors and both facets of sense of control in the regression analyses, both facets were significantly associated with the three positive mental health outcomes. Individuals with higher personal mastery were more likely to report high self-rated mental health ($aOR = 1.21$, 95% CI: 1.12 to 1.31), while those with higher perceived constraints were less likely to report high self-rated mental health ($aOR = 0.37$, 95% CI: 0.35 to 0.41; see Table 3). Similarly, strong community belonging was more likely to be reported by individuals with higher personal mastery ($aOR = 1.18$, 95% CI: 1.10 to 1.27) and less likely to be reported by those with higher perceived constraints ($aOR = 0.58$, 95% CI: 0.54 to 0.62; see Table 4). Lastly, life satisfaction ratings were higher for those with higher personal mastery (adjusted $b = 0.23$, 95% CI: 0.16 to 0.30) and lower for those with higher perceived constraints (adjusted $b = -1.09$, 95% CI: -1.15 to -1.03; see Table 5).

Discussion

The current study investigated (1) whether personal mastery and perceived constraints varied by sociodemographic factors and (2) whether these facets of sense of control were associated with positive mental health among adults in Canada during the COVID-19 pandemic.

Lower personal mastery or higher perceived constraints were observed among females, those in lower-income households, those who were racialized, those born outside Canada, and those who were less educated. These results largely replicate sociodemographic differences in sense of control observed in earlier Canadian data from the 2003 and 2008 General Social Survey.^{18,19} Relatively marginalized social positions, unequal access to economic and social resources and opportunities (actual or perceived), and increased exposure to stigma and discrimination may lead to stronger perceptions of constraints or weaker feelings of personal mastery on average among individuals in those groups.^{46,47,48} For similar reasons, a lower sense of control among individuals who identified as Indigenous may have been expected; however, they reported higher personal mastery on average compared with the other population groups that were examined. Whether this finding replicates across specific Indigenous groups (e.g., First Nations, Métis, and Inuit), among those living on reserves, or during other time points is unresolved. In terms of the differences observed for educational attainment and household income, an alternative explanation may be that individuals with a higher

sense of control are more likely to complete further education and obtain more financially rewarding occupations.⁴⁹

A weaker sense of control was also observed among adults in population centres. This finding contrasts with pre-pandemic Canadian research that did not find significant differences in sense of control among older adults living in rural areas, compared with those in urban areas.⁵⁰ Living in more densely populated areas during the pandemic with more opportunities for COVID-19 transmission and greater disruptions to one's daily routine could have partially contributed to the observed difference.^{51,52} More generally, differential risks (actual and perceived) of COVID-19 infection or mortality and indirect pandemic-related impacts may also partially explain some of the other observed sociodemographic differences in sense of control.^{52,53,54}

While older age groups tended to report lower perceived constraints on average, higher personal mastery was reported by younger adults. The latter is more in line with previous studies that tend to find lower overall levels of sense of control among older adults.^{11,18,19} The nuanced pattern of results for personal mastery and perceived constraints for age and other sociodemographic factors emphasizes the importance of considering the different facets of sense of control, which are negatively associated but distinct.

After statistically controlling for sociodemographic factors and each facet, the current study found that individuals with higher personal mastery and lower perceived constraints tended to report better positive mental health across all three outcomes. This is consistent with previous international and Canadian research conducted before the pandemic^{17,18,19} and studies conducted in other countries during the pandemic.^{20,21,22,23} Sense of control has been acknowledged as a psychological resource that can support individuals in coping with stress resulting from negative life events and challenging conditions.^{11,36,55,56,57} Indeed, “unless people believe they can produce desired results and forestall detrimental ones by their actions, they have little incentive to act or to persevere in the face of difficulties.”⁵⁵ The COVID-19 pandemic serves as a prominent example of a potentially challenging environment.

The current findings suggest that a higher sense of control may have played a role in fostering positive perceptions of one's mental health, a stronger sense of community belonging, and greater life satisfaction during the pandemic. Individuals with a higher sense of control may have experienced less helplessness and used more effective coping strategies when facing various stressors during the pandemic.^{13,27} Alternatively, exposure to more stressors during the pandemic could have reduced sense of control and positive mental health. Future research could explore these (and other) potential pathways between sense of control and positive mental health.

Strengths and limitations

This research expands our understanding of sense of control and positive mental health in Canada using a relatively large and representative dataset. Including a multi-item measure of sense of control in the SCMh allowed two of its facets to be examined, while including numerous sociodemographic characteristics provided the opportunity to document inequalities in these facets across different segments of the Canadian population. The results provide consistent evidence that higher personal mastery and lower perceived constraints are associated with three positive mental health outcomes.

Nevertheless, as a cross-sectional survey, causality cannot be determined. Positive mental health may promote a higher sense of control, the associations may be bidirectional, or both could be affected by a confounding variable.¹³ In addition, the degree to which the facets of sense of control and positive mental health outcomes captured state versus trait differences cannot be established with the current data.^{11,13} Potential explanations for the observed sociodemographic differences and associations were considered, but these are just speculations. Moreover, further validation research is needed on the factor structure and measurement invariance of the Sense of Mastery Scale among specific groups examined in this study. As the data were only collected during a specific part of the pandemic in late 2020 and early 2021, the magnitude of associations may have varied during other periods of time. Future studies could explore associations in early 2023 using data from the 2023 SCMh.⁵⁸ Pre-pandemic comparisons were not conducted because of a lack of timely baseline data on the Sense of Mastery Scale immediately preceding the pandemic. Findings may not be generalizable to individuals who were not part of the target population for the SCMh (e.g., youth), to other positive mental health measures or outcomes (e.g., psychological well-being)⁷ that were not assessed in the first two cycles, or to specific domains of perceived control (e.g., work).⁵⁹ Numerous sociodemographic characteristics, which were associated with

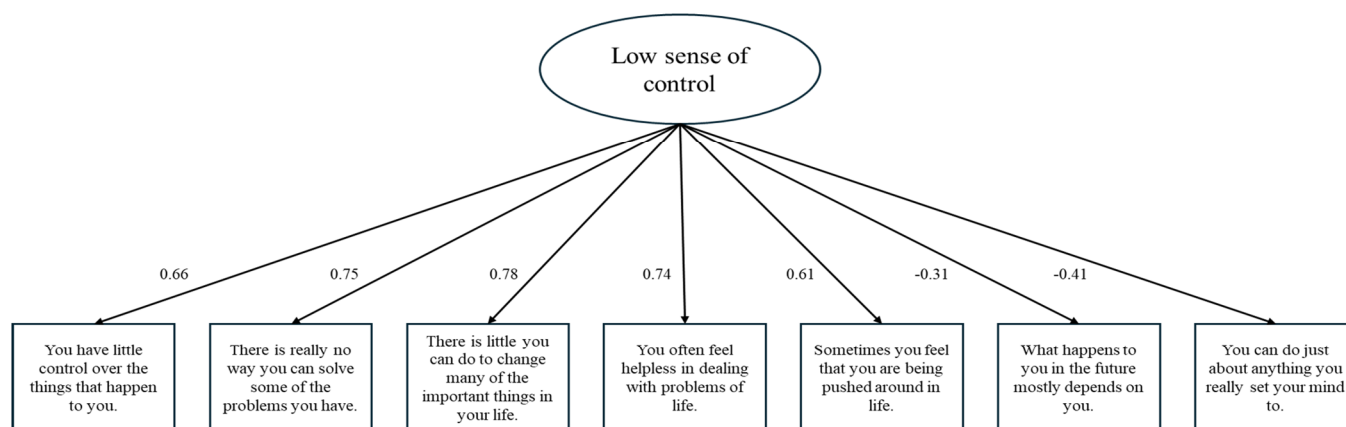
at least one facet of sense of control, were statistically controlled for in the regression analyses, but stratified associations and interaction effects between those characteristics and sense of control were not investigated, nor were analyses involving the facets and distinct pandemic-related impacts (e.g., job or income loss). While results were weighted, nonresponse bias could still be an issue given the response and share rates (especially if the likelihood of responding varied by levels of sense of control or positive mental health), and other potential biases (e.g., socially desirable responding) could be present.⁶⁰ The exclusion of respondents with partially missing data on certain variables (e.g., household income) could also have affected results.

Conclusion

This study contributes to the literature by documenting inequalities in facets of sense of control and their associations with positive mental health outcomes among adults in Canada during the COVID-19 pandemic. These results support the continued inclusion and ongoing monitoring of sense of control as an individual determinant of positive mental health in the PMHSIF,⁷ provide evidence for the importance of sense of control for some key aspects of Canadians' quality of life,²⁹ and highlight sense of control as a potential target for mental health promotion initiatives.¹³ Intersectoral efforts to reduce barriers and empower individuals, along with the promotion of cognitive-behavioural therapy techniques to help people more effectively identify what is in their control and more adaptively cope with events that are out of their control, could be explored as potential routes to boosting sense of control and positive mental health, especially among those who are low on these important psychological factors.^{13,61,62}

Appendix Figure 1

Single-factor confirmatory factor analysis of the Sense of Mastery Scale, household population aged 18 years and older, Canada, late 2020 to early 2021

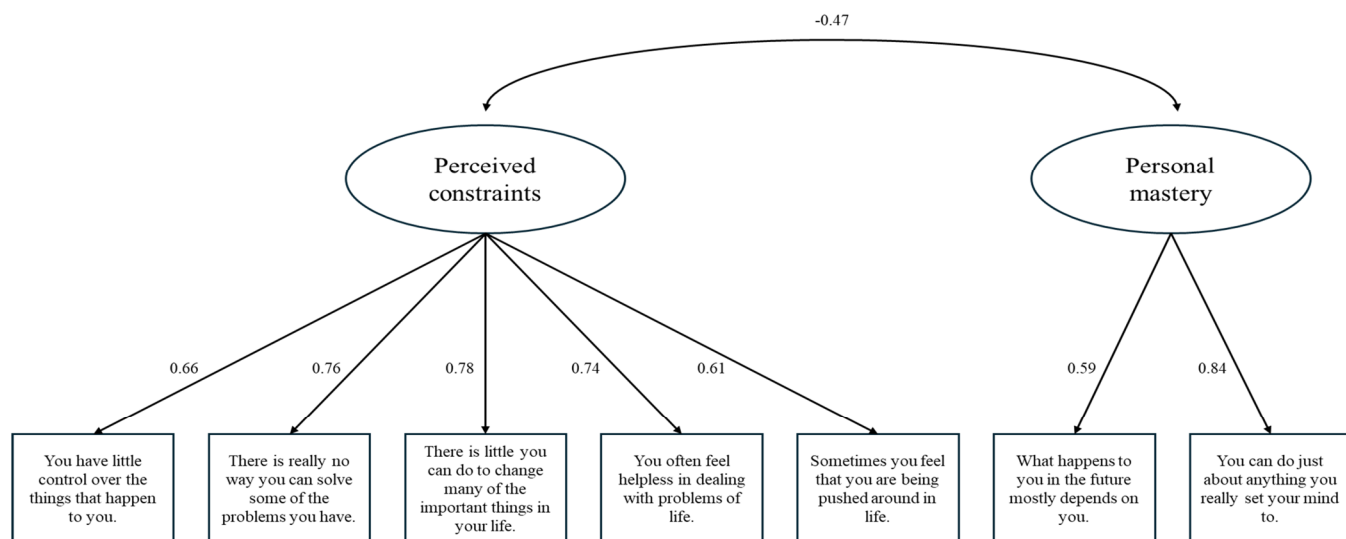


Notes: Standardized factor loadings are represented by single-headed arrows. The factor is represented by an oval. The items of the Sense of Mastery Scale are shown in squares. For ease of interpretation, the intercepts, residuals, and residual variances are not shown. Respondents with missing data on any of the Sense of Mastery Scale items were excluded from the analysis. The sample size was 18,549 individuals. Results are weighted.

Sources: Statistics Canada, 2020 and 2021 Survey on COVID-19 and Mental Health.

Appendix Figure 2

Two-factor confirmatory factor analysis of the Sense of Mastery Scale, household population aged 18 years and older, Canada, late 2020 to early 2021



Notes: Standardized factor loadings are represented by single-headed arrows. Correlations are represented by double-headed arrows. Factors are represented by ovals. The items of the Sense of Mastery Scale are shown in squares. For ease of interpretation, the intercepts, residuals, and residual variances are not shown. Respondents with missing data on any of the seven items from the Sense of Mastery Scale were excluded from the confirmatory factor analyses, leaving a sample size of 18,549 individuals. Results are weighted.

Sources: Statistics Canada, 2020 and 2021 Survey on COVID-19 and Mental Health.

Appendix Table 1

Cut-off criteria for fit indexes and results from one-factor and two-factor models of the Sense of Mastery Scale, household population aged 18 years and older, Canada, late 2020 to early 2021

Hu and Bentler (1999) cut-off criteria	One-factor CFA	Two-factor CFA
CFI $\geq$ 0.95	0.860	0.954
TLI $\geq$ 0.95	0.790	0.925
SRMR $<$ 0.08	0.068	0.027
RMSEA $<$ 0.06	0.075	0.045

Notes: CFA = confirmatory factor analysis. CFI = comparative fit index. RMSEA = root mean square error of approximation. SRMR = standardized root mean square residual. TLI = Tucker–Lewis index. Respondents with missing data on any of the seven items from the Sense of Mastery Scale were excluded from the confirmatory factor analyses, leaving a sample size of 18,549 individuals.

Sources: Statistics Canada, 2020 and 2021 Survey on COVID-19 and Mental Health.

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