Ethno-cultural disparities in mental health during the COVID-19 pandemic: a cross-sectional study on the impact of exposure to the virus and COVID-19-related discrimination and stigma on mental health across ethno-cultural groups in Quebec (Canada)

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Background
Although social and structural inequalities associated with COVID-19 have been documented since the start of the pandemic, few studies have explored the association between pandemic-specific risk factors and the mental health of minority populations.

Aims
We investigated the association of exposure to the virus, COVID-19-related discrimination and stigma with mental health during the COVID-19 pandemic, in a culturally diverse sample of adults in Quebec (Canada).

Method
A total of 3273 residents of the province of Quebec (49% aged 18–39 years, 57% women, 51% belonging to a minority ethno-cultural group) completed an online survey. We used linear and ordinal logistic regression to identify the relationship between COVID-19 experiences and mental health, and the moderating role of ethno-cultural identity.

Results
Mental health varied significantly based on socioeconomic status and ethno-cultural group, with those with lower incomes and Arab participants reporting higher psychological distress. Exposure to the virus, COVID-19-related discrimination, and stigma were associated with poorer mental health. Associations with mental health varied across ethno-cultural groups, with exposed and discriminated Black participants reporting higher mental distress.

Conclusions
Findings indicate sociocultural inequalities in mental health related to COVID-19 in the Canadian context. COVID-19-related risk factors, including exposure, discrimination and stigma, jeopardise mental health. This burden is most noteworthy for the Black community. There is an urgent need for public health authorities and health professionals to advocate against the discrimination of racialised minorities, and ensure that mental health services are accessible and culturally sensitive during and in the aftermath of the pandemic.

Keywords
Pandemic; mental health; sociocultural factors; discrimination and stigma; exposure to virus.

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The COVID-19 pandemic is affecting social, cultural and economic systems around the world, and mounting evidence suggests profound and concerning negative effects of COVID-19 on mental health, with long-lasting consequences on society.1–3 Preliminary reports from the USA and the UK have denounced how individuals that experience structural and social inequities, such as ethnic and racial minorities,4,5 are disproportionately exposed to the virus and affected by the pandemic. This is because of systemic social and economic disparities,4,8 including poverty, poor housing and inadequate healthcare, and has prompted a call to identify and address sociocultural health disparities in the COVID-19 crisis.

Less is known about how such systemic social and economic inequalities, and associated experiences during the pandemic, affect the mental health of vulnerable communities. Indeed, the pandemic has highlighted social, economic and political fractures and injustices within communities and societies, fuelling fear and xenophobic discourses in the general population. As a result, minorities and marginalised groups, who have already been severely affected by the pandemic, have also increasingly become the target of COVID-19-related racialised and discriminatory actions.5,9–13 Although conspiracy theories and ‘othering’ processes targeting minorities and at-risk groups are common in pandemics,12 empirical evidence on the impact of sociocultural factors and COVID-19-related experiences of exposure, stigma and discrimination on mental health are scarce.

Discrimination, stigma, exposure and mental health during a pandemic
Discrimination and stigma refer to complex and diverse social processes that exist at the individual, interpersonal and structural levels of society, and represent significant public health concerns.14 Stigma refers to the process of unfair treatment of others, and prevents opportunities for equal participation in society for stigmatised groups, fuelling social inequalities.15 In the current study, we focus on ‘individual’ stigma, referring to the internalisation of discriminating beliefs and associated feelings of shame, leading to
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mental health varies across ethno-cultural groups. Based on the
ing prior mental health and discrimination not related to the pan-
when controlling for relevant sociodemographic variables, includ-
discrimination and stigma are associated with mental health,
health; (b) whether exposure to the virus and COVID-19-related
group, immigrant generation, income) are associated with mental
This study investigates the association of sociocultural characteris-
tistical, community and individual level.

The Quebec context
In Canada, the first case of COVID-19 was confirmed at the end of
January 2020. Although representing just 22.57% of the national
population, with >52% of confirmed cases and >64% of deaths,
the province of Quebec became the epicentre of the pandemic in
Canada. More than one-third of confirmed cases in Quebec
were identified in the city of Montreal, with a disproportionately
higher number of individuals diagnosed with COVID-19 residing
in diverse, multicultural areas of the city, suggesting cultural and
social disparities in rates of COVID-19 infections and deaths.
Specific concerns have been expressed over issues of systemic dis-
crimination and unsafe work conditions, given that healthcare
attendants in seniors’ residences and hospitals are mostly racialised
(e.g. Black, Asian, Latino and Arab). Since March 2020, there has
been an increase in reported discrimination and xenophobic inci-
dents directed at members of Asian communities in the province,
including hate speech, vandalism and physical intimidation on
streets and in stores. It is important to note that Quebec society
is demographically and culturally diverse, and 21.9% of its popula-
tion is foreign-born; this highlights the importance of investigat-
ing social and ethnic disparities during the current health
emergency. Information on sociocultural correlates of mental
health during the pandemic is critical to inform public health inter-
ventions and programmes for at-risk populations at the institu-
tional, community and individual level.

The current study
This study investigates the association of sociocultural characteris-
tics and pandemic-specific risk factors (i.e. exposure to the virus,
COVID-19-related discrimination and stigma) with mental health
during the COVID-19 pandemic in a culturally diverse sample of
adults in Quebec (Canada). Specifically, we investigate the follow-
ing: (a) whether sociocultural characteristics (i.e. ethno-cultural
group, immigrant generation, income) are associated with mental
health; (b) whether exposure to the virus and COVID-19-related
discrimination and stigma are associated with mental health,
when controlling for relevant sociodemographic variables, includ-
ing prior mental health and discrimination not related to the pan-
demic; and (c) whether the association between risk factors and
mental health varies across ethno-cultural groups. Based on the
limited evidence on sociocultural vulnerabilities during the
COVID-19 pandemic, we expected participants with lower eco-
nomic resources, an immigrant background and/or those who are
members of a racialised minority to be at higher risk of mental dis-
tress. We expected that exposure to the virus and experiencing
COVID-19-related discrimination and stigma would be negatively
associated with mental health, and that the magnitude of these rela-
tionships would be stronger among those racialised minority groups
most affected by the pandemic.

Method

Participants and procedure
A total of 3273 residents of the province of Quebec, aged ≥18 years,
completed an online survey (see Table 1). Participants were ran-
domly selected from the Leo panel (Léger Opinion), which includes
>400 000 Canadian households. To get to a culturally diverse
sample, respondents who matched the ‘visible minority’ profile
were targeted in the panel based on the ethnic profiling information
available in the Leo panel. The research project was presented as a
study about COVID-19 and social distancing. Participants com-
pleted the survey in either French or English, between 1 June
2020 and 23 June 2020. Participation was voluntary and confiden-
tial. All participants received from 50 cents to $2 in compensation,
depending upon length of time taken to complete the survey
(average completion time of 12 min), and provided electronic
informed consent. A total of 8825 invitation emails were sent. The
response rate was 37%. The authors assert that all procedures con-
tributing to this work comply with the ethical standards of the rele-
vant national and institutional committees on human experimentation and with the Helsinki Declaration of 1975, as
revised in 2008. All procedures involving human participants
were approved by the McGill Faculty of Medicine Institutional
Review Board (Approval no. A05-B25-20A 20-05-005).

Measures
Mental health
Mental health was assessed with the Hopkins Symptom Checklist-
10 (HSCL-10), comprising six items measuring symptoms of
depression and four items measuring symptoms of anxiety.
Participants are asked to rate on a Likert scale from 1 (not at all)
to 4 (extremely), how much they were bothered by the reported
symptoms during the past week. Symptom severity is computed by
averaging responses on the items (range 1–4), with higher
scores indicating higher distress. Cronbach’s α and McDonald’s ω
were both 0.89 in our sample.

Perceived impact of COVID-19 on mental health is a categorical
variable (none, a little bit, a great deal), measured by participant
responses to the question, ‘How much has the COVID-19 epidemic
affected your mental health?’.

Prior exposure to COVID-19 was measured via five questions
(yes/no response format), to investigate whether the participant
had been diagnosed with COVID-19 and if they knew anyone
around them, among their neighbours, friends and/or within their
household/family, who had been diagnosed with COVID-19 in
the past month. Responses were categorised into a binary variable
(yes/no), with participants who replied yes to at least one of the
questions considered as having been exposed to COVID-19.

COVID-19-related discrimination
All participants were asked to report experiences of perceived
discrimination (if any) in the past month as a result of their pre-
sumed COVID-19 status, based on a questionnaire developed by

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| Sociocultural characteristics of participants and descriptive statistics of outcomes across sociocultural variables | Total sample | HSCL-10 | Impact of COVID-19 on mental health |
|---|---|---|---|
| | n | % | Mean (s.d.) | n | 'A great deal' | 'A little bit' | 'None' | P-value |
| **Age** | | | | | | | | |
| 18–39 years | 3273 | 3195 | | 3252 | | | | <0.001 |
| 40–59 years | 1611 | 1555 | 1.85 (0.64) | 1594 | 19.26% | 55.21% | 25.53% |
| ≥60 years | 994 | 977 | 1.64 (0.56) | 991 | 12.41% | 49.65% | 37.94% |
| **Gender** | | | | | | | | <0.001 |
| Male | 1418 | 1386 | 1.61 (0.58) | 1410 | 11.06% | 44.89% | 44.04% |
| Female | 1855 | 1809 | 1.78 (0.60) | 1842 | 17.10% | 54.89% | 28.01% |
| **Race/ethnicity** | | | | | | | | <0.001 |
| White | 1606 | 1583 | 1.63 (0.56) | 1599 | 12.01% | 48.72% | 39.27% |
| East Asian | 249 | 241 | 1.70 (0.59) | 246 | 10.96% | 57.32% | 31.71% |
| South Asian | 96 | 90 | 1.81 (0.64) | 93 | 21.51% | 52.69% | 25.81% |
| Black | 692 | 669 | 1.75 (0.63) | 687 | 8.05% | 47.74% | 34.21% |
| South-East Asian | 119 | 115 | 1.78 (0.67) | 119 | 15.13% | 59.66% | 25.21% |
| Arab | 450 | 434 | 1.86 (0.61) | 447 | 17.67% | 53.02% | 29.31% |
| Other | 61 | 61 | 1.93 (0.72) | 61 | 18.00% | 63.93% | 18.03% |
| **Religion** | | | | | | | | <0.001 |
| Christianity | 3176 | 3106 | | 3156 | | | | .003 |
| Islam | 1626 | 1594 | 1.67 (0.58) | 1616 | 13.37% | 48.89% | 37.75% |
| Judaism | 378 | 362 | 1.83 (0.59) | 372 | 16.40% | 52.69% | 30.91% |
| Atheism | 906 | 890 | 1.73 (0.61) | 904 | 15.15% | 52.77% | 32.08% |
| Other | 131 | 126 | 1.80 (0.70) | 130 | 18.46% | 51.54% | 30.00% |
| **Main language** | | | | | | | | <0.001 |
| English | 3229 | 3163 | | 3156 | | | | |
| French | 2047 | 2014 | 1.67 (0.65) | 2030 | 15.66% | 52.64% | 31.70% |
| **Income** | | | | | | | | 0.101 |
| ≤$20,000 | 1576 | 1534 | 1.74 (0.70) | 1565 | 14.28% | 52.77% | 33.05% |
| ≥$20,000 | 646 | 605 | 1.93 (0.74) | 636 | 18.72% | 53.16% | 27.12% |
| **Employment** | | | | | | | | <0.001 |
| Employed, essential worker | 1046 | 1023 | 1.71 (0.60) | 1043 | 16.20% | 52.64% | 31.16% |
| Employed, non-essential worker | 886 | 873 | 1.71 (0.59) | 884 | 14.14% | 52.38% | 33.48% |
| Unemployed | 1279 | 1258 | 1.70 (0.60) | 1279 | 13.45% | 47.46% | 39.09% |
| **Size of household** | | | | | | | | 0.026 |
| ≤2 persons | 2918 | 2877 | | 2918 | | | | 0.002 |
| 3–4 persons | 923 | 908 | 1.83 (0.65) | 917 | 19.30% | 52.78% | 27.92% |
| 5–6 persons | 710 | 704 | 1.60 (0.55) | 710 | 11.41% | 51.27% | 37.32% |
| **Geographical location** | | | | | | | | <0.001 |
| Greater Montreal region | 2176 | 2126 | 1.73 (0.61) | 2166 | 15.28% | 51.62% | 33.10% |
| Outside Greater Montreal region | 1004 | 989 | 1.64 (0.55) | 1000 | 12.00% | 47.50% | 40.50% |
| **Ethnic identification** | | | | | | | | <0.001 |
| West Asian | 3195 | 3156 | | 3156 | | | | |
| Other | 3273 | 3195 | | 3252 | | | | <0.001 |

The "Other" ethno-cultural cohort grouped participants who self-identified as West Asian (n = 30), Latin American (n = 27) and who responded "other" to the question on their ethno-cultural group (n = 4). The P-value of the univariate effect of each sociocultural variable and predictor on outcomes is reported (n = 3273). HSCL-10, Hopkins Symptom Checklist-10.
COVID-19-related stigma

Participants indicated on a seven-point Likert scale how much they agreed with the following statements: If a member of my family became ill with COVID-19, I would want it to remain secret; If I became ill with COVID-19, I would want it to remain secret. Responses to the two questions were summed, with higher scores indicating greater stigma (range 2–14).

Sociocultural variables

Participants provided information on their age (18–39, 40–59 or ≥60 years), gender (male, female or other), education (high school or less, technical degree or some college/university, university degree and above), household income (<$19,999, $20,000–$39,999, $40,000–$59,999, $60,000–$79,999, $80,000–$99,999 or ≥$100,000), number of people in the household (one, two, three, four or five or more), immigrant generation (first-, second- or third-generation immigrant and above), religion (Christianism, Islam, Judaism, Atheism or other), race/ethnicity (White, East Asian, South Asian, Black, South-East Asian, Arab or other), language (French, English or both), employment (unemployed, employed and designated as an essential worker by the Quebec government, or employed but not designated as an essential worker). Perceived discrimination not related to COVID-19 in the past month was measured as a binary variable (yes/no). Self-reported mental health before the pandemic was assessed with one item, on a three-point Likert scale (poor, average or excellent).

Results

Descriptive statistics of the sample across sociocultural variables at the univariate level are reported in Tables 1 and 2. In terms of urban health, all sociocultural variables except education and employment were significantly associated with HSCL-10 scores. All variables except education were significantly associated with self-reported impact of COVID-19 on mental health at the univariate level (Table 1). Participants aged 18–39 years, first- and second-generation immigrants, essential workers, people living in Montreal and in households of three or more people, and participants who experienced discrimination not related to COVID-19 reported higher prevalence of exposure to the virus and COVID-19-related discrimination, and higher endorsement of COVID-19-related stigma. Black, Arab and South Asian participants had a higher prevalence of exposure, whereas Asian and Black participants reported more COVID-19-related discrimination and stigma. Muslim participants were the religious group most exposed to the virus, followed by Christian participants. Muslim participants and participants who identified with ‘other’ in terms of religion reported higher COVID-19-related discrimination. Anglophone participants were less exposed to the virus, but Francophone participants reported less discrimination because of COVID-19. Participants with an income >$40,000 were more exposed to the virus, whereas participants with an income <$20,000 reported higher stigma and more COVID-19-related discrimination. Participants who self-reported poor mental health before the pandemic also reported higher stigma; participants who were exposed to the virus reported higher stigma and higher prevalence of COVID-19-related discrimination. Participants who reported higher stigma (above median) also reported a higher prevalence of exposure and COVID-19-related discrimination. Neither education nor gender were associated with exposure, stigma or COVID-19-related discrimination (see Table 2).

In multivariate models, women and participants aged between 18 and 39 years reported worse mental health across both outcomes. Arab participants had higher HSCL-10 scores and reported a greater impact of the pandemic on their mental health than other racial/cultural groups. East Asian participants reported lower HSCL-10 scores compared with other ethno-cultural groups. Participants who reported poorer mental health before COVID-19 scored higher on the HSCL-10 scale and reported a stronger impact of the pandemic on mental health. Non-COVID-19-related discrimination was also associated with both mental health outcomes. Individuals with a lower household income (<$100,000), and those living with three people in the same household, had higher HSCL-10 scores, but not more perceived impact of COVID-19 on mental health, than those living alone. Participants living in the Greater Montreal area reported greater impact of the pandemic on their mental health than those living in other parts of Quebec. Employment, education, generation, language and religion were not associated with either mental health outcome at the multivariate level (see Table 3). Differences in the associations of sociocultural variables with mental health outcomes at the univariate and multivariate levels may be partially explained by issues of collinearity among variables (see Supplementary material available at https://doi.org/10.1192/bjo.2020.146).

Prior exposure to the virus was associated with HSCL-10 scores and self-reported impact of COVID-19 on mental health. Both COVID-19-related discrimination and stigma were associated with higher scores on the HSCL-10. Neither COVID-19-related discrimination nor reported stigma were associated with perceived impact of COVID-19 on mental health (Table 4). The magnitude of the relationship between exposure to the virus, experiencing

Williams et al30 and adapted to the present health emergency context. Responses were categorised into a binary variable (yes/no).
| Sociocultural Variable | Exposure to COVID-19 | COVID-19-related stigma | COVID-19-related discrimination |
|-------------------------|----------------------|-------------------------|-------------------------------|
| **Age**                |                      |                         |                               |
| 18–39 years            | 3231                 | 3217                    | 3184                          |
| ≥40 years              | 1589                 | 1576                    | 1551                          |
| ≥60 years              | 978                  | 982                     | 974                           |
| **Gender**             |                      |                         |                               |
| Male                   | 1401                 | 1392                    | 1381                          |
| Female                 | 1830                 | 1825                    | 1803                          |
| **Race/ethnicity**     |                      |                         |                               |
| White                  | 1597                 | 1586                    | 1575                          |
| East Asian             | 247                  | 244                     | 245                           |
| South Asian            | 94                   | 89                      | 93                            |
| Black                  | 674                  | 678                     | 666                           |
| South-East Asian       | 116                  | 118                     | 117                           |
| Arab                   | 444                  | 444                     | 427                           |
| Other                  | 59                   | 58                      | 61                            |
| **Religion**           |                      |                         |                               |
| Christianism           | 1598                 | 1568                    | 1595                          |
| Islam                  | 372                  | 368                     | 353                           |
| Judaism                | 135                  | 132                     | 133                           |
| Atheism                | 902                  | 891                     | 886                           |
| Other                  | 130                  | 128                     | 130                           |
| **Main language**      |                      |                         |                               |
| French                 | 1958                 | 1953                    | 1921                          |
| English                | 527                  | 520                     | 524                           |
| Both                   | 746                  | 744                     | 739                           |
| **Immigrant generation**|           |                         |                               |
| First                  | 1147                 | 1145                    | 1132                          |
| Second                 | 660                  | 661                     | 651                           |
| Third or more          | 1375                 | 1367                    | 1359                          |
| **Education**          |                      |                         |                               |
| High school or less    | 468                  | 469                     | 462                           |
| Technical degree/some college or university | 1201 | 1191 | 1182 |
| University degree or above | 1521 | 1524 | 1507 |
| **Household income**   |                      |                         |                               |
| ≤$19999                | 290                  | 282                     | 278                           |
| $20000–$3999           | 438                  | 440                     | 439                           |
| $40000–$5999           | 594                  | 595                     | 585                           |
| $60000–$7999           | 489                  | 487                     | 482                           |
| $80000–$9999           | 378                  | 380                     | 374                           |
| ≥$100 000              | 706                  | 705                     | 701                           |
| **Employment**         |                      |                         |                               |
| Employed, essential worker | 1031 | 1038 | 1027 |
| Employed, non-essential worker | 878 | 869 | 864 |
| Unemployed             | 1272                 | 1265                    | 1259                          |
| **Household size**     |                      |                         |                               |
| One person             | 596                  | 586                     | 587                           |
| Two people             | 1070                 | 1063                    | 1058                          |
| Three people           | 584                  | 588                     | 582                           |
| Four people            | 563                  | 565                     | 557                           |
| Five or more people    | 341                  | 343                     | 334                           |
| **Geographical location** |                |                         |                               |
| Greater Montreal region | 2150 | 2142 | 2126 |
| Outside Greater Montreal region | 994 | 991 | 976 |
| Non-COVID-19-related discrimination | 3163 | 3155 | 3151 |
| **COVID-19 exposure**  |                      |                         |                               |
| Yes                    | 819                  | 824                     | 816                           |
| No                     | 2344                 | 2331                    | 2335                          |
| **Mental health before COVID-19** | 3207 | 3200 | 3162 |
| Excellent              | 1846                 | 1841                    | 1820                          |
| Average                | 1106                 | 1106                    | 1092                          |
| Poor                   | 255                  | 253                     | 250                           |
| COVID-19-related stigma (median) | 3181 | 3141 | 3141 |
| ≤4                     | 1649                 | 1645                    | 1496                          |
| >4                     | 1532                 | 1532                    | 1532                          |
| COVID-19-related discrimination | 3145 | 3141 | 3141 |
| Yes                    | 536                  | 540                     | 540                           |
| No                     | 2609                 | 2601                    | 2601                           |
| Total                  | 3231                 | 3217                    | 3184                          |

P-value of the univariate effect of each sociocultural variable on predictors is reported (n = 3273).
COVID-19-related discrimination and HSCL-10 scores was strongest among participants who self-identified as Black and White. Although the interaction effect between COVID-19-related stigma and HSCL-10 scores was not statistically significant, higher perceived stigma was associated with worse mental health among South Asian and Black participants. The effect of exposure to the
virus and COVID-19-related discrimination and stigma on the impact of COVID-19 on mental health did not vary across ethno-cultural groups (all $P > 0.05$). However, participants who self-identified as White and Black reported a greater impact of COVID-19 on their mental health when exposed to the virus, compared with those not exposed (see Table 5).

### Discussion

Our study sheds light on sociocultural correlates of mental health during the COVID-19 pandemic and highlights the contribution of exposure to the virus and COVID-19-related discrimination and stigma on mental health in a culturally diverse sample of adults. In addition, the association of the hypothesized risk factors with mental health varied across ethno-cultural groups.

As expected, socioeconomic status (in terms of income and household size) and race/ethnicity were both associated with mental health, beyond the contributions of prior mental health, experiences of discrimination not related to COVID-19 and other sociodemographic variables. Participants living in a household with a greater number of people reported higher mental distress, as did participants who declared a lower income. This suggests that socioeconomic hardship represents a risk factor for one's mental health during the COVID-19 pandemic and highlights the contribution of the immune system as healthcare attendants in seniors' health care.

The association of both exposure to COVID-19 and having experienced COVID-19-related discrimination and stigma contributed to higher mental distress. Of interest, 17.3% of the sample reported having experienced COVID-19-related discrimination, with the highest prevalence reported by East and South Asian participants. This is not surprising in light of the observed anti-Chinese rhetoric online, and the rapid increase in the number of reports of in-person racist acts against Asian participants in North America. In terms of exposure to the virus, Black (38.72%), Arab (33.56%) and South Asian (28.72%) communities were among the most exposed ethno-cultural groups, mirroring the composition of the essential workforce in the province, with Black, Asian, Latino and Arab residents overrepresented in the health sector as healthcare attendants in seniors’ residences and hospitals.

Such results provide preliminary evidence in the Canadian context that aligns with reports from the UK and USA, which indicate that communities of colour are disproportionately affected by COVID-19 because of social and economic disparities, including poverty, poor housing and inadequate healthcare.

The association of both exposure to COVID-19 and having experienced at least one episode of COVID-19-related discrimination with mental health varied across ethno-cultural groups. Of importance, Black participants reported the worst mental health outcomes when exposed to the virus and/or to COVID-19-related discrimination, compared with other sociocultural groups. In other words, one’s mental health depended on experiences of exposure/discrimination: both exposure and discrimination had a differential effect among ethno-cultural groups, putting Black participants at higher risk of mental distress. Such results suggest that sociocultural inequalities during the pandemic are relevant to mental health outcomes, as well as other health disparities. In light of the high rates of COVID-19-related hospital admission and mortality among Black Americans in the USA and despite the absence of Canadian statistics on ethno-racial rates of morbidity and mortality, these results are not surprising, and align with lessons learned from previous pandemics and well-established documentation of the mental health needs of Black Americans.

They clearly indicate that race-conscious and culturally competent interventions, which consider factors such as discrimination and historical and racial trauma, are urgently needed. Obstacles to access public health and social services as well as protective factors, including community- and culture-specific coping strategies, also need to be considered when planning a concerted response in a time of pandemic. The need for multi-stakeholder interventions that use socio-pedagogical approaches to counter discrimination, through development of prosocial behaviours and moral engagement, should also be considered as complementary to those adopted by mental health professionals.
Table 5  Results from moderation (interaction) analyses: associations of exposure to COVID-19 and COVID-19-related discrimination and stigma with total HSCL-10 scores and impact of COVID-19 on mental health, stratified by ethnocultural group (n = 3273)

| Predictor                        | HSCL-10 Exposure to COVID-19 | HSCL-10 COVID-19-related discrimination | HSCL-10 COVID-19-related stigma |
|----------------------------------|-----------------------------|-----------------------------------------|----------------------------------|
| Ethno-cultural group             |                             |                                          |                                  |
| White                            | 0.149***                    | 0.167*                                  | 0.036                            |
| East Asian                       | 0.157                       | -0.520                                  | -0.262 to 0.158                  |
| South Asian                      | -0.171                      | 0.125                                   | -0.221 to 0.471                  |
| Black                            | 0.246***                    | 0.324***                                | 0.182-0.466                      |
| South-East Asian                 | -0.134                      | 0.102                                   | -0.226 to 0.429                  |
| Arab                             | -0.029                      | 0.047                                   | -0.193 to 0.245                  |
| Other                            | -0.143                      | -0.099                                  | -0.356 to 0.358                  |
| P-interaction                    | 0.019                       | 0.050                                   |                                  |

| Impact of COVID-19 on mental health | Predictor                        | Proportional odds ratio | 95% CI | Proportional odds ratio | 95% CI | Proportional odds ratio | 95% CI |
|------------------------------------|----------------------------------|-------------------------|--------|-------------------------|--------|-------------------------|--------|
| Ethno-cultural group               |                                 |                         |        |                         |        |                         |        |
| White                              | 1.328*                          | 1.054-1.673             | 0.860  | -0.599 to 1.233         | 1.045  | 0.932-1.171             |
| East Asian                         | 1.159                           | 0.649-2.070             | 1.120  | 0.661-1.899             | 0.970  | 0.760-1.239             |
| South Asian                        | 1.375                           | 0.567-3.331             | 2.127  | 0.850-5.321             | 1.311  | 0.883-1.945             |
| Black                              | 1.783***                        | 1.303-2.440             | 1.378  | 0.949-1.999             | 1.122  | 0.974-1.293             |
| South-East Asian                   | 0.657                           | 0.303-1.422             | 0.805  | 0.345-1.881             | 1.147  | 0.824-1.596             |
| Arab                               | 1.234                           | 0.833-1.829             | 1.236  | 0.750-2.038             | 1.006  | 0.842-1.202             |
| Other                              | 1.265                           | 0.386-4.146             | 0.682  | 0.220-2.113             | 0.829  | 0.511-1.345             |
| P-interaction                      | 0.317                           | 0.311                   | 0.700  |                         |        |                         |        |

Separate models for each mental health outcome were implemented. Each interaction was tested in separate models. All models presented with HSCL-10 as outcome included age, gender, income, household size, non-COVID-19-related discrimination and prior mental health as covariates. All models presented with impact of COVID-19 on mental health as outcome included age, gender, non-COVID-19-related discrimination, geographical location and prior mental health as covariates. HSCL-10, Hopkins Symptom Checklist-10.

*P < 0.05, **P < 0.01, ***P < 0.001.
practitioners. Sustained multi-sectoral work in the fields of social services, public health and education that magnifies marginalised communities lived experiences of discrimination is essential in creating dialogic platforms that encourage perspective-taking, and build empathy as cogent outcomes of citizen education initiatives. In addition, to sustainably empower marginalised communities and help build resilience against discrimination, specific attention must be paid to the intersections of identities – gender, sexual, racial and otherwise – thereby highlighting the differential effects of prejudicial acts. Exposure to the virus was significantly associated with worse mental health outcomes among White participants at a statistical level ($P < 0.05$). Likewise, COVID-19-related discrimination was associated with higher HSCL-10 scores also among White participants. These findings indicate that White participants’ mental health was significantly affected by COVID-19-related experiences such as exposure and discrimination. This is not surprising: although studies rarely scrutinise it in majority groups, discrimination is a heterogeneous phenomenon stemming from individual and group differences, and is always hurtful. Members of the majority group may take their privileges for granted and, because of that, may be on average more likely to expect protection and justice from their environment, and less prepared to endure discrimination. However, at a methodological level, it is important to consider that these statistically significant effects may be attributable to the large sample size of the White ethno-cultural group in our study. This hypothesis is supported by the fact that regression coefficients of the association between exposure/discrimination and mental health among White participants are very similar to those reported across other smaller ethno-cultural groups (which did not, however, reach the 0.05 statistical threshold used in the present study), with the exception of the estimates for Black participants. Overall, these findings, with a closer look at estimates beyond $P$-values, underline that exposure to COVID-19 and related discrimination are risk factors that should not be underestimated across any ethno-cultural group during the present pandemic, although the Black community seems to be at increased risk of mental distress in the present health emergency. Future studies are warranted to shed more light on these issues.

Some differences emerged in terms of findings for each mental health outcome. This indicates that the self-reported impact of the pandemic on mental health and the HSCL-10 scale measure different constructs that are associated, but not overlapping. Specifically, our findings suggest that subjective single-item measures of the impact of COVID-19 on mental health are more independent to COVID-19-related experiences and socioeconomic aspects compared with validated scales measuring symptoms of depression and anxiety, such as the HSCL-10. This kind of measure of mental health, which may be more sensitive to sociocultural variations, may be more appropriate to evaluate psychological distress during the present situation, as the appraisal of past mental health may be more influenced by personal factors such as memory bias and one’s subjective perceptions.

Limitations and future directions

There are several limitations to this study. First, the cross-sectional design prevents us from drawing any conclusions about causality. Longitudinal studies are needed to shed light on the trajectories of the sociocultural correlates of mental health during the COVID-19 pandemic. Second, our study used a convenience sample with a relatively low response rate (37%), and included a majority of participants with some college or a university degree; therefore, findings cannot be generalised to the larger Quebec population or to less educated populations. Third, differences may exist within the broad ethno-cultural groups used in the present study. Studies including larger samples and collecting more detailed ethno-cultural information are warranted. Fourth, we relied on self-reported items, and thus social desirability and response biases need to be taken into account. In particular, we used a measure of exposure to the virus that did not exclusively measure direct exposure to COVID-19, but rather whether the participant had tested positive or knew someone who tested positive for COVID-19. Future studies should investigate whether different types of exposure are differentially linked to mental health. Finally, our results cannot be generalised to different countries or to other Canadian provinces, and more research on regional and trans-national differences is needed.

In conclusion, despite its limitations, our study provides the first empirical evidence of the impact of sociocultural inequalities on mental health during the COVID-19 pandemic in the Canadian context. Public health authorities should acknowledge that pre-existing social and ethno-racial inequalities are exacerbated by the present pandemic, and actively monitor the evolution of the COVID-19 across sociocultural groups. Policies and messaging should be aimed at promoting inclusiveness at the societal level, to reduce the discrimination of racialised minorities, protect vulnerable groups and be better prepared for the second wave. The implementation and evaluation of multi-sectoral, community-based anti-discrimination programmes is warranted. Efforts should ensure that mental health services are accessible and culturally sensitive to racial minorities during, and in the aftermath of, the pandemic.

Supplementary material

Supplementary material is available online at https://doi.org/10.1192/bjo.2020.146.

Data availability

The data-sets generated and/or analysed during the current study are available from the corresponding author, upon request.

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Author contributions

D.M. contributed to conception and design of the study, data analysis, interpretation of study findings and writing the manuscript. Z.Y.L., R.L.F. and T.S. contributed to data analysis, interpretation of study findings and writing the manuscript. I.M.C., V.V. and C.R. contributed to conception and design of the study, interpretation of study findings and writing the manuscript. The authors listed in the byline have agreed to the byline order and to submission of the manuscript in this form. All authors agreed to act as guarantor of the work.

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Declaration of interests

None.

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