



Trends in population characteristics associated with mental health service use among youth and emerging adults in Canada from 2011 to 2016

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Received: 30 July 2022 / Accepted: 14 December 2022 / Published online: 27 January 2023
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Abstract

Objectives Despite the high prevalence of mental disorders among youth (age 12 to 17) and emerging adults (age 18 to 24), few receive mental health (MH) services. Using a cross-sectional study design, we examined population characteristics associated with MH service use in this age group from 2011 to 2016.

Methods Data were from six cycles of the Canadian Community Health Survey (2011–2016). Population characteristics associated with service use were analyzed using logistic regression models for each year. Changes in odds ratios over time were used to examine trends.

Results Presence of a mood or anxiety disorder had the largest magnitude of association on MH service use in every year. Trends suggested an increased association size between self-rated MH status and service use; lower self-rated MH was associated with a 62% increase in odds of service use in 2011 and an 83% increase in 2016. Being female was associated with increased odds of MH service use (range: 59–107%). Compared with white respondents, individuals who were East and Southeast Asian or South Asian had decreased odds of MH service use. While the association size varied for South Asians, there was a trend toward decreasing likelihood of accessing care (55% decreased odds in 2011, 74% in 2016) for East and Southeast Asians.

Conclusion Trends suggest changes in population characteristics associated with access to MH care (e.g., self-rated MH status) as well as persistent inequity in MH service use in Canada for males and individuals from Asian ethnic groups.

Résumé

Objectifs Les jeunes (12 à 17 ans) et les adultes émergents (18 à 24 ans) sont peu nombreux à recevoir des services de santé mentale (SSM) malgré la prévalence élevée des troubles mentaux dans ces deux groupes d'âge. À l'aide d'une étude transversale, nous avons examiné les caractéristiques démographiques associées à l'utilisation des SSM dans ces groupes d'âge entre 2011 et 2016.

Méthode Les données provenaient des six cycles de l'Enquête sur la santé dans les collectivités canadiennes (2011–2016). Les caractéristiques démographiques associées à l'utilisation des services ont été analysées à l'aide de modèles de régression logistique pour chaque année étudiée. Les changements dans les rapports de cotes au fil du temps ont servi à analyser les tendances.

Résultats Pour chaque année, c'était la présence d'un trouble de l'humeur ou d'un trouble anxieux qui était la plus largement associée à l'utilisation des SSM. Les tendances ont indiqué une association accrue entre l'état de santé mentale autoévalué et l'utilisation des services; une moins bonne santé mentale autoévaluée était associée à une hausse de 62 % de la probabilité

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d'utilisation des services en 2011 et à une hausse de 83 % en 2016. Le sexe féminin était associé à une probabilité accrue d'utilisation des SSM (intervalle : 59–107 %). Comparativement aux répondants blancs, les personnes originaires de l'Asie de l'Est, du Sud-Est ou du Sud présentaient une probabilité réduite d'utilisation des SSM. Malgré la variabilité de l'ampleur de l'association chez les Asiatiques du Sud, nous avons observé une tendance à la baisse dans la probabilité d'avoir accédé aux soins (probabilité réduite de 55 % en 2011 et de 74 % en 2016) chez les Asiatiques de l'Est et du Sud-Est.

Conclusion Ces tendances indiquent des changements dans les caractéristiques démographiques associées à l'accès aux SSM (p. ex. l'état de santé mentale autoévalué), ainsi qu'une iniquité persistante dans l'utilisation des SSM au Canada chez les hommes et les personnes appartenant aux groupes ethniques asiatiques.

Keywords Mental health service use · Mental health · Help-seeking · Youth · Emerging adults · Trends · Canada

Mots-clés Utilisation des services de santé mentale · santé mentale · recherche d'aide · jeunes · adultes émergents · tendances · Canada

Introduction

Mental disorders are common among youth (age 12 to 17; Georgiades et al., 2019) and emerging adults (age 18 to 24; Findlay & Sunderland, 2014) in Canada. In 2014, the prevalence rate for any mental disorder (i.e., anxiety, depression, attention-deficit, conduct) among youth in Ontario was 18.2–21.8%, depending on the informant (Georgiades et al., 2019). From 2011 to 2018, there was a 5.7% increase in fair or poor self-rated mental health (MH) among youth and emerging adults in Canada (Wiens et al., 2020). Unfortunately, few individuals with MH problems access MH services. In 2012, among young adults aged 15–24 years in Canada, only 49.7% of those with a MH condition and 12% of all young adults reported speaking to a health provider about MH concerns (Findlay & Sunderland, 2014).

Multiple factors likely influence low MH service utilization in this population. The Behavioral Model of Health Service Use (Andersen, 1995) identifies three population characteristics that influence service use: (1) predisposing characteristics, (2) enabling resources, and (3) need for care factors (Fig. 1). (1) *Predisposing characteristics* include demographic factors, social structure, and health beliefs that can indirectly contribute to an individual's ability to seek health services. For instance, ethnicity may indirectly influence service use through associated factors such as experiences of racism in healthcare settings. (2) *Enabling resources*, at family and community levels, consist of the availability of community health services as well as the means (e.g., income, insurance) and access (i.e., system capacity) to such services. (3) *Need for care* includes both perceived (i.e., self-assessment) and evaluated need (i.e., professional assessment) for services (Andersen, 1995). Past studies have examined sociodemographic correlates of MH service use in a given year (e.g., Fleury et al., 2014) or age- and sex-related differences in MH service use across time (e.g., Wiens et al., 2020). It is unclear whether there is sociodemographic variation among individuals using MH services over time. Investigating trends in population characteristics

associated with MH service use may identify areas for additional investment of resources, such as an underserved group or growing need for services relating to a specific MH problem.

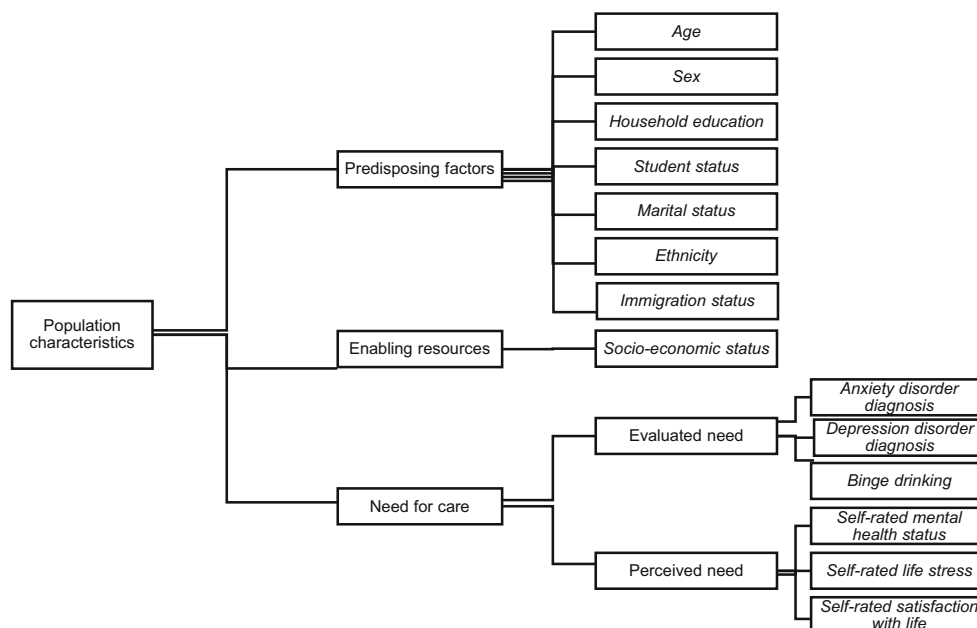
We conducted a repeated-measures cross-sectional study examining trends in population characteristics associated with MH service use during 2011 to 2016, among youth and emerging adults age 12 to 24 years in Canada. We used population-level data collected from the Canadian Community Health Survey (CCHS) and chose a time period marked by considerable efforts to improve access to care in Canada. For example, the Opening Minds 10-year anti-stigma campaign, launched in 2009 by the Mental Health Commission of Canada (MHCC, 2013), aimed to help individuals in need of MH services to feel comfortable seeking help. In 2010, the British Columbia government released a 10-year strategic plan, *Healthy Minds Healthy People*, to improve their MH response including access to quality services (Government of British Columbia, 2010). In 2011, a Canadian telecommunications company launched an annual social media campaign, *Bell Let's Talk*, to promote MH awareness (Booth et al., 2018). These various initiatives may have resulted in changes in population characteristics indicative of a more equitable MH system. We hypothesized that need for care variables would be the strongest correlates of MH service use across time and association sizes for predisposing factors and enabling resources would decrease over time.

Methods

Data source and study population

The Statistics Canada User Guide provides full details on the CCHS methodology (Statistics Canada, 2011, 2012, 2013, 2014, 2015, 2016). Briefly, the CCHS is a cross-sectional survey that gathers health-related information at regional and

Fig. 1 Population characteristics from Andersen’s Behavioral Model of Health Service Use (1995). Variables included in the study are in italics



provincial levels of the Canadian population. A representative sample of people age 12 years or older in private dwellings is selected using a multi-stage stratified cluster sampling approach. Individuals living in Indigenous communities, health institutions, remote regions, or on Crown lands, and those in the Canadian Forces were excluded from the survey. Basic demographic information and household-level information is provided by the “person most knowledgeable” household member. Then, one household member, 12 years or older, is selected for an in-depth health content interview. Response rates ranged from 59.5% to 68.4% over the cycles selected in this study. Statistics Canada does not provide demographic characteristics of non-respondents.

This study used data from CCHS cycles conducted annually from 2011 to 2016. We selected cycles and provinces with (a) large sample sizes and (b) the optional Contacts with Health Providers module that included the outcome variable: past-year MH service use. To produce the most accurate results using a representative sample of the Canadian population and limit the ability of any one province with a large sample size to skew findings, we analyzed data from the same set of provinces each year: British Columbia, Manitoba, Ontario, Quebec, and Newfoundland (see Table A1, Supplementary Materials). Eligible participants were respondents age 12 to 24 years with a valid response (i.e., yes or no) to the “Mental health service use” item.

Study variables

A complete list of study variables with the original response options (Table A2) and recoded responses (Table B1) are presented in the supplementary materials.

Outcome variable

Mental health service use was assessed by the item: “In the past 12 months, have you seen or talked to a health professional about your emotional or mental health?”, with yes or no as response options. The term “health professionals” appeared early in the interview and referred to a range of professionals including physicians, psychologists, and nurses.

Population characteristics

Variables are organized using Andersen’s (1995) Behavioral Model of Health Service Use.

Need for care (1) Perceived MH needs were assessed using three items: (A) self-rated mental health status (1 = *Excellent* to 5 = *Poor*), (B) self-rated life stress (1 = *Not at all stressful* to 5 = *Extremely stressful*), (C) self-rated satisfaction with life (SWL; 0 = *very dissatisfied* to 10 = *very satisfied*).

(2) Evaluated need represents professional judgement and objective measurement about a patient’s health status (Andersen, 1995) and was assessed using three variables: (A) anxiety disorder diagnosis from a health professional, (B) mood disorder diagnosis from a health professional, and (C) binge drinking: frequency of drinking 5+ alcoholic drinks on one occasion (NIAAA, 2021).

Enabling resources At the family level, a key enabling factor is socio-economic status (SES). The approach to measuring SES varies across studies, limited to either household-level factors (e.g., income level; Steele et al., 2007) or neighbourhood-level factors (e.g., average neighbourhood income; Missiuna et al.,

2021) which may contribute to inconsistent findings (e.g., Fleury et al., 2014; Steele et al., 2007). A measure of income distribution calculated in the Statistics Canada (2011, 2012, 2013, 2014, 2015, 2016) CCHS master files was used to measure SES, and incorporates household-level factors (i.e., household size, household income) and neighbourhood size. Income distribution is computed using the adjusted ratio between total household income and the low-income cut-off (LICO, based on household and neighbourhood size). The final household income distribution assigned to households ranged from 1 (“households in the lowest income distribution”) to 10 (“highest income distribution”). Appendix A in Supplementary Materials includes a detailed description of the income distribution calculation. In a Toronto, ON sample, Leung et al. (2007) found SES using the LICO and the Hollingshead index were significantly correlated ($r = 0.60$).

Predisposing characteristics Variables included age, sex, marital status, ethnicity, immigrant status, highest household education, and current student status (see Table B1, Supplementary Materials).

Data analysis

Statistical analyses were performed using Stata version 15 and weighted using Statistics Canada’s sample weights. Balance repeated replication was used with 500 bootstrap weights provided by Statistics Canada to estimate 95% confidence intervals (CIs) and ensure valid variance estimation despite clustering in the multi-stage sampling procedures.

Descriptive statistics of population characteristic variables were analyzed within each year. Missing values for most variables were less than 1.5%. Variables with missing values greater than 1.5% were ethnicity (6.5%), student status (9.5%), and highest household education (8.1%). Cross-tabulations of student status and age indicated that most missing values (82%) were from respondents under the age of 18, who were likely to be in school. Therefore, missing values for student status were imputed with mode response “yes”. For highest household education, missing data were imputed based on mode response for highest household education within income groups for each year (see Tables B1 and B2 in Supplementary Materials for more information on missing data).

Logistic regression models were used to examine population characteristics associated with MH service use, measured dichotomously (yes/no). A total of six regression models were conducted, one for each CCHS cycle. Statistical significance of population characteristics was assessed using $p < 0.05$. If a variable emerged as statistically significant in *any* of the

models, odds ratios (ORs) were used as a measure of association to examine trends (Chu et al., 2021).

Results

Sample characteristics

Table 1 reports descriptive statistics for all variables analyzed. Across the 6 years analyzed, sample size ranged from $N = 5531$ (2015) to $N = 7474$ (2011). Mean age was 18 years; about half (50.3–52.1%) were male. Most respondents identified as white (67.7–75.0%; Table 1).

Trends

Trends in ORs of population characteristics are reported using ranges. Table 2 presents the ORs and standard errors of significant population characteristics associated with MH service use within each year of 2011 through 2016 (see Table B3 in Supplementary Material for ORs and standard errors of all population characteristics).

Need for care Self-reported MH status, mood disorder, and anxiety disorder were significantly associated with MH service use within each year (2011 to 2016). Presence of a mood (OR range: 8.21 in 2012; 3.34 in 2014) or anxiety disorder (OR range: 6.80 in 2011; 3.54 in 2014) increased odds of using MH services. The ORs for presence of a mood disorder decreased from an eightfold increase in odds of service use in 2011–2012 to a three to sixfold increase in odds within each year between 2013 and 2016. The ORs for presence of an anxiety disorder seemed to fluctuate between years with no clear pattern. Overall, the presence of a mood or anxiety disorder had the largest magnitude of association on service use each year among the population characteristics analyzed. The ORs of self-rated MH status increased over time, such that lower self-rated MH status ranged between a 62–64% increase in odds of service use each year between 2011 and 2012 and a 72–110% increase in odds each year between 2013 and 2016. Self-rated stress was significant in four of the six cycles: 2012, 2013, 2015, and 2016. A one-unit increase in stress ratings (i.e., higher stress) was associated with a 15–37% increase in odds of using MH services in each year between 2011 and 2016, though no clear trends emerged. Binge drinking was not statistically significant in any model.

Enabling resources Income distribution was not significantly associated with MH service use in any model.

Table 1 Descriptive statistics of study population by year

	2011 <i>M</i> or % [95% CI]	2012 <i>M</i> or % [95% CI]	2013 <i>M</i> or % [95% CI]	2014 <i>M</i> or % [95% CI]	2015 <i>M</i> or % [95% CI]	2016 <i>M</i> or % [95% CI]
<i>N</i>	7474	7125	7071	6771	5531	5670
Weighted <i>N</i>	4,315,788	4,393,070	4,256,655	4,327,992	4,253,525	4,087,689
Predisposing characteristics						
Age	18.2 [18.1, 18.3]	18.4 [18.3, 18.5]	18.3 [18.2, 18.4]	18.4 [18.3, 18.5]	18.4 [18.3, 18.6]	18.3 [18.2, 18.4]
Male	50.3% [49.4, 51.3]	51.0% [50.0, 52.1]	51.3% [50.4, 52.2]	51.5% [50.5, 52.5]	52.1% [50.7, 53.5]	51.2% [49.8, 52.5]
Ethnicity						
White	75.0% [73.4, 76.5]	71.7% [69.7, 73.7]	71.4% [69.9, 72.9]	70.4% [68.4, 72.4]	68.4% [66.4, 70.3]	67.7% [65.7, 69.7]
Black	2.9% [2.3, 3.7]	3.7% [3.0, 4.6]	3.5% [2.8, 4.3]	3.8% [3.1, 4.6]	4.2% [3.3, 5.3]	3.7% [2.9, 4.7]
East and Southeast Asian	8.2% [7.1, 9.4]	9.9% [8.4, 11.5]	9.0% [7.9, 10.1]	11.1% [9.8, 12.6]	10.3% [8.9, 11.8]	11.5% [10.0, 13.2]
South Asian	5.1% [4.3, 6.0]	6.3% [5.4, 7.5]	6.4% [5.5, 7.5]	6.6% [5.5, 7.9]	6.6% [5.4, 8.2]	6.1% [5.1, 7.2]
Arab and West Asian	2.7% [2.1, 3.4]	2.2% [1.7, 2.9]	2.4% [1.8, 3.1]	2.1% [1.7, 2.8]	2.8% [2.1, 3.8]	3.1% [2.5, 3.8]
Latin American and other	2.5% [1.9, 3.3]	3.3% [2.6, 4.2]	3.0% [2.5, 3.7]	2.6% [2.0, 3.3]	3.5% [2.7, 4.4]	4.7% [3.7, 5.8]
Multiple ethnic groups	3.7% [2.9, 4.6]	2.9% [2.2, 3.9]	4.4% [3.7, 5.2]	3.4% [2.7, 4.2]	4.2% [3.4, 5.2]	3.3% [2.6, 4.1]
Marital status						
Single	93.6% [92.8, 94.3]	93.6% [92.7, 94.5]	94.0% [93.1, 94.8]	93.3% [92.1, 94.4]	94.6% [93.7, 95.4]	94.6% [93.7, 95.3]
Married/common law	6.4% [5.7, 7.2]	6.4% [5.5, 7.4]	6.0% [5.2, 6.9]	6.7% [5.7, 7.9]	5.4% [4.6, 6.3]	5.5% [4.7, 6.3]
Immigrant status	15.1% [13.8, 16.4]	15.9% [14.2, 17.7]	16.5% [15.0, 18.1]	15.3% [13.8, 16.9]	17.4% [15.6, 19.4]	18.4% [16.8, 20.2]
Student status	73.5% [72.1, 75.0]	71.3% [69.5, 73.1]	71.2% [69.7, 72.7]	70.3% [68.6, 72.0]	71.2% [69.2, 73.1]	71.7% [69.9, 73.3]
Highest household education						
High school or less	16.8% [15.5, 18.1]	16.1% [14.6, 17.8]	20.1% [18.7, 21.7]	17.2% [15.9, 18.7]	15.2% [13.9, 16.5]	15.3% [13.9, 16.8]
Trade certificate	7.3% [6.5, 8.2]	7.6% [6.7, 8.7]	7.4% [6.6, 8.4]	7.4% [6.5, 8.4]	6.3% [5.5, 7.3]	6.9% [6.1, 7.9]
College	36.0% [34.3, 37.8]	32.9% [31.1, 34.8]	31.4% [29.9, 33.0]	34.3% [32.4, 36.2]	33.6% [31.8, 35.6]	29.5% [27.7, 31.3]
Bachelor's degree	27.7% [26.1, 29.4]	32.5% [30.7, 34.3]	29.3% [27.7, 31.0]	29.2% [27.5, 30.9]	32.9% [30.9, 35.0]	34.3% [32.2, 36.5]
University degree greater than bachelor's	12.2% [10.9, 13.6]	10.9% [9.7, 12.2]	11.7% [10.7, 12.8]	12.0% [10.9, 13.1]	12.0% [10.5, 13.6]	14.0% [12.5, 15.6]
Enabling resources						
Income distribution	4.82 [4.72, 4.91]	4.93 [4.81, 5.05]	4.84 [4.73, 4.95]	4.85 [4.74, 4.96]	4.76 [4.63, 4.89]	4.89 [4.77, 5.01]
Need for care						
Disorder diagnoses						
No diagnosis	92.6% [91.7, 93.5]	91.7% [90.6, 92.7]	91.5% [90.5, 92.4]	90.2% [89.0, 91.2]	87.9% [86.2, 89.3]	87.7% [86.2, 89.0]
Mood disorder only	2.0% [1.6, 2.5]	2.4% [1.9, 3.1]	2.3% [1.9, 2.8]	2.0% [1.6, 2.6]	2.9% [2.2, 3.8]	2.3% [1.8, 2.9]
Anxiety disorder only	3.7% [3.0, 4.4]	3.5% [2.8, 4.2]	3.8% [3.2, 4.5]	4.6% [3.8, 5.5]	5.8% [4.8, 7.1]	5.4% [4.5, 6.4]
Both mood and anxiety disorder	1.7% [1.4, 2.1]	2.5% [1.9, 3.2]	2.4% [2.0, 3.0]	3.3% [2.7, 4.0]	3.4% [2.8, 4.3]	4.7% [3.9, 5.7]
Binge drink						
Never	56.0% [54.3, 57.6]	53.9% [52.2, 55.6]	54.8% [53.1, 56.5]	56.7% [54.9, 58.6]	56.3% [54.4, 58.3]	56.2% [54.2, 58.3]
Once a month or less	27.7% [26.2, 29.3]	31.1% [29.4, 32.8]	29.6% [28.0, 31.2]	29.6% [27.9, 31.4]	28.8% [27.0, 30.6]	31.3% [29.3, 33.4]
2+ times a month	16.4% [15.1, 17.7]	15.0% [13.8, 16.4]	15.6% [14.3, 17.0]	13.7% [12.4, 15.0]	14.9% [13.3, 16.7]	12.4% [11.0, 13.9]
Mental health status	1.89 [1.86, 1.93]	1.94 [1.91, 1.98]	1.95 [1.92, 1.98]	2.01 [1.97, 2.04]	1.95 [1.91, 1.99]	2.03 [1.99, 2.08]
Satisfaction with life	8.17 [8.12, 8.23]	8.18 [8.13, 8.23]	8.19 [8.14, 8.24]	8.15 [8.10, 8.20]	8.37 [8.31, 8.42]	8.33 [8.27, 8.38]
Stress	2.69 [2.66, 2.72]	2.67 [2.64, 2.70]	2.68 [2.65, 2.71]	2.74 [2.71, 2.78]	2.67 [2.63, 2.71]	2.65 [2.61, 2.68]

Note. *M*, mean; %, percentage reported; 95% CI, 95% confidence intervals. Immigrant status = % of immigrants. Student status = % of students. Income distribution = decile 1 (lowest income distribution) to 10 (highest income distribution). Mental health status = 1 “excellent” to 5 “poor.” Satisfaction with life = 0 “very dissatisfied” to 10 “very satisfied.” Stress = 1 “not at all stressful” to 5 “extremely stressful.”

Table 2 Significant population characteristics associated with mental health service use between 2011 and 2016

Significant population characteristics ^a	Cycle year					
	2011 OR (SE)	2012 OR (SE)	2013 OR (SE)	2014 OR (SE)	2015 OR (SE)	2016 OR (SE)
Need for care						
Mood disorder	7.86 (2.11)***	8.21 (2.34)***	5.04 (1.08)***	3.34 (0.86)***	4.40 (1.15)***	5.85 (1.69)***
Anxiety disorder	6.80 (1.61)***	3.74 (0.86)***	6.19 (1.18)***	3.54 (0.81)***	4.66 (1.05)***	5.20 (1.13)***
Mental health status	1.62 (0.13)***	1.64 (0.16)***	2.10 (0.17)***	1.72 (0.16)***	1.72 (0.18)***	1.83 (0.16)***
Stress	1.15 (0.09)	1.31 (0.12)**	1.30 (0.11)**	1.15 (0.12)	1.26 (0.12)*	1.37 (0.11)***
Satisfaction with life	0.92 (0.05)	0.94 (0.05)	0.90 (0.05)	0.89 (0.05)*	0.91 (0.06)	0.86 (0.05)*
Predisposing characteristics						
Female	2.07 (0.27)***	1.86 (0.24)***	1.65 (0.23)***	1.59 (0.25)**	1.71 (0.27)**	1.74 (0.25)***
Student	1.53 (0.31)*	1.50 (0.29)*	1.29 (0.23)	1.23 (0.27)	1.10 (0.23)	1.68 (0.34)*
Ethnicity						
Black	0.92 (0.42)	0.45 (0.19)	0.37 (0.22)	1.05 (0.41)	0.70 (0.40)	0.38 (0.28)
East and Southeast Asian	0.45 (0.15)*	0.46 (0.19)	0.32 (0.12)**	0.59 (0.20)	0.14 (0.07)***	0.26 (0.09)***
South Asian	0.45 (0.18)*	0.37 (0.18)*	0.81 (0.39)	0.29 (0.14)*	0.19 (0.11)**	0.45 (0.24)
Arab and West Asian	1.34 (0.81)	0.91 (0.56)	0.59 (0.32)	0.52 (0.31)	2.24 (1.43)	0.36 (0.19)
Latin American and other	0.30 (0.16)*	0.38 (0.21)	0.94 (0.40)	0.95 (0.49)	0.21 (0.11)**	0.66 (0.27)
Multiple ethnic groups	1.13 (0.44)	0.69 (0.37)	0.56 (0.20)	0.95 (0.37)	0.65 (0.24)	1.89 (0.79)
Constant	0.01 (0.01)***	0.01 (0.00)***	0.01 (0.01)***	0.02 (0.02)***	0.01 (0.01)***	0.01 (0.01)***

Note. OR (SE), odd ratios (standard errors)

^a Variables that were controlled for in each model include age, marital status, immigrant status, highest household education, income distribution, and binge drinking (see Table B3 in Supplementary Materials for the odds ratios of all variables included in each model)

Variables included in the table above were found to be significantly associated with MH service use in at least one logistic regression model

Comparison groups: presence of mood disorder compared to no mood disorder; presence of anxiety disorder compared to no anxiety disorder; mental health status treated numerically (1 = “excellent” and 5 = “poor”); stress treated numerically (1 = “not at all stressful” and 5 = “extremely stressful”); satisfaction with life treated numerically (0 = “very dissatisfied” and 10 = “very satisfied”); females compared to males; student compared to not a student; Ethnicity = all response options compared to white respondents

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

Predisposing characteristics Sex and ethnicity emerged as significant predisposing characteristics in every year analyzed. Females had an increased odds of service use in each year, with fluctuating ORs over time. In 2011 and 2012, females had a range of 86–107% increased odds of service use; in 2013–2014, this association reduced to a 59–65% increase in odds, and then trended upwards in 2015–2016 to a 71–74% increase in odds. Student status was significantly associated with service use in three cycles: 2011, 2012, and 2016. Students, compared to non-students, had a 50–53% increased odds of service use in 2011–2012. This association decreased within each year between 2013 and 2015 to a 10–29% increase in odds, and then increased in 2016 to a 68% increase in odds of service use.

To examine the relative influence of ethnicity on MH service use, white respondents were assigned as the reference group. Two groups emerged as having significantly different rates of MH service use within each year for four of the six years: East and Southeast Asians and South Asians. Within each year from 2011 to 2014, East and

Southeast Asians had a 41–68% decrease in odds of service use compared to white respondents; in 2015–2016, this gap increased to a 74–86% decrease in odds. South Asians also had decreased odds of service use compared to white respondents. Within each year between 2011 and 2013, South Asians had a 19–55% decrease in odds of service use; in 2014–2015, this association increased to 71–81% lower odds of accessing care, and then decreased to a 55% decrease in odds of service use in 2016. All other ethnic groups had smaller sample sizes (< 5%) limiting interpretability of results. Age, marital status, immigrant status, and highest household education were not statistically significant in any model.

Discussion

This study extends on the current literature by examining trends in population characteristics associated with MH

service use in Canada using repeated-measures cross-sectional data. To our knowledge, we are the first to do so.

1) Need for care Our hypothesis that need for care factors will have the largest magnitude of association on MH service use was partially supported. Presence of a mood or anxiety disorder had the largest association size within each model analyzed. However, the impact of a disorder diagnosis on MH service use may be influenced by two additional factors: (1) previous contact with a health provider and (2) psychopathology symptoms. The CCHS asked about a mood or anxiety disorder diagnosis made by a health professional, though not necessarily in the past year. Thus, individuals who endorsed this item would have received MH services from a health provider in their past, which may influence future visits (Schraeder et al., 2021). Alternatively, depression and anxiety disorders tend to follow an episodic, chronic course (Scholten et al., 2016) and recurrence may have also contributed to service use. Future studies should investigate psychopathology symptoms (e.g., a depression inventory) separately from having a disorder; the CCHS does not consistently include measures of psychopathology (e.g., PHQ-9) across cycles. Interestingly, the association size between self-rated MH status and MH service use increased over time; individuals who rated themselves as having poorer MH had increasingly greater odds of seeking services in more recent years. Another Ontario-based study found that among youth age 12 to 16 years, perceived need for MH services increased from 6% in 1983 to 15% in 2014 (Comeau et al., 2019). MH awareness and psychoeducation initiatives such as Opening Minds anti-stigma campaign and Bell Let's Talk may have led to more individuals recognizing a MH problem and deciding to seek help.

Binge drinking was not significantly associated with MH service use despite the high prevalence of binge drinking at least 2+ times a month in the current study (16.4% in 2011 to 12.4% in 2016). Binge drinking may be normalized within this age group and not seen as a “need” to seek help.

Life stress was associated with MH service use in four cycles. Stress is broadly defined as a state of mental or emotional strain resulting from situational pressures (Schneiderman et al., 2005). Self-ratings of stress may be a proxy for impairment, and impairment is often a driving factor in seeking help. Prolonged stress may also increase the risk of MH problems, while effective coping strategies can reduce stress (e.g., Schneiderman et al., 2005). MH promotion and mental illness prevention through upstream efforts that target stress reduction in everyday settings (e.g., schools, workplaces) may be a cost-effective strategy to improve MH of the population.

2) Enabling resources Our hypothesis that the association size between enabling resources and MH service use would decrease over time was not supported. There was no significant

relationship between income and MH service use in any year. The Canadian mental healthcare system includes public and private MH services (Steele et al., 2007). It is possible that people from lower SES groups may use publicly funded MH services while those from higher SES groups may use private services. Bartram (2019) examined access to MH providers in Canada across income distributions after standardizing for MH need and found equitable access to family physicians, psychiatrists, nurses, and social workers but *not* for psychologists, most of whom work privately. Future studies should examine access to MH services based on provider type.

3) Predisposing characteristics Our hypothesis that the association size for predisposing characteristics would decrease over time was not supported. Consistent with past studies (Fleury et al., 2014; Wiens et al., 2020), females had increased odds of using MH services compared to males in each year examined. MH problems are prevalent in both sexes despite differences in the manifestation and type of MH problems. For instance, males have higher rates of substance abuse and externalizing difficulties while rates of internalizing problems are higher among females (Georgiades et al., 2019; Wiens et al., 2020). Slaunwhite (2015) reported that males are more likely to report “acceptability” barriers related to perception of MH issues (e.g., thought nothing of the MH problem) and usefulness of healthcare services (e.g., preferred to self-manage). Differing health beliefs may be contributing to discrepancies in MH service use between males and females and this has not changed over the years examined in this study. Unfortunately, we could not include gender in our analysis, as this was not an item included in the CCHS.

People who identified as white had significantly higher odds of using MH services than East and Southeast Asians as well as South Asians. For other ethnic groups, we found variable significance over the years (i.e., Latin American and other group) or nonsignificant differences (i.e., Black, Arab and West Asian, multiple ethnic groups); small sample sizes and lack of power may contribute to this finding. Chiu et al. (2018) presented pooled prevalence estimates of ethnic differences in MH status and MH service use in Ontario using CCHS data from 2001 to 2014. Among Canadian-born individuals, there were no significant differences in prevalence of fair and poor self-rated MH across white, South Asian, Chinese, and Black ethnic groups. Among immigrants, Chinese immigrants had significantly greater prevalence of fair and poor MH compared to white respondents (8.2% compared to 4.9%; Chiu et al., 2018). Yet, among those with fair or poor self-rated MH, white respondents were significantly more likely to have a past-year MH visit compared to all other ethnic minorities (Chiu et al., 2018). Thus, ethnicity is substantially related to service use independent of MH

need. Rastogi et al. (2014) explored clinician perceptions of MH symptoms and barriers to treatment in South Asians living in the United States and identified stigma, denial of mental illness, and a lack of acceptance of MH treatments as major barriers to treatment. In the current study, we found that the discrepancy in odds of service use has not improved over time for South Asians compared to white respondents and has worsened for East and Southeast Asians even when adjusting for need for care factors.

Current MH awareness and psychoeducation campaigns may be less effective for specific demographic groups known to have higher rates of MH stigma. For instance, the Opening Minds anti-stigma initiative identified four generalized target groups including children and youth, healthcare providers, the workforce, and the media (MHCC, 2013); they did not address stigma within specific ethnic groups. Our findings indicate that males and individuals from Asian ethnic groups were consistently less likely to use MH services each year from 2011 to 2016, during the height of the Opening Minds 10-year campaign. In 2017, the federal government committed to providing \$5 billion dollars in funding over 10 years to provincial and territorial governments to improve access to evidence-based, culturally appropriate mental healthcare (Government of Canada, 2018). Results of this initiative are not yet known, but our findings emphasize the need for targeted outreach programs for equitable MH services. Further, the sample size for marginalized groups limited our study findings. Research emphasizing equity, diversity, and inclusion (EDI) has become an important mandate in Canada. Population-level survey designs should increase sample sizes for ethnic groups and include representative gender categories to allow for meaningful EDI-related research.

Students had increased odds of using MH services in some cycles (2011, 2012, 2016). Students usually have access to MH services through schools, post-secondary institutions, or insurance coverage included in their student fees. Future research should investigate trends in students' MH service use compared to post-secondary student insurance and school-based MH services to inform policies on MH service provision for students.

Limitations

Selection of the CCHS cycles for this study was limited by the inclusion of the optional Contacts with Health Providers module which included information on past-year MH service use. Consequently, the most recent survey data analyzed was from 2016 and may not reflect current trends. The self-report measure of past-year MH service use may also be subject to recall and social desirability bias. We used a self-report measure of MH service use as it includes non-physician-based MH

services (i.e., psychologists, social workers, and counsellors), which is not usually reported in provincial administrative data in Canada. Additionally, our ability to examine a range of variables was limited by CCHS questionnaire content. The CCHS did not ask about gender identity and psychopathology modules (e.g., depression) were often optional and not included in every CCHS cycle nor by all provinces included in the study.

Contributions to knowledge

What does this study add to existing knowledge?

- Self-rated MH status is becoming an important factor associated with MH service use. Individuals who rated themselves as having poorer MH had increased odds of seeking services in more recent years.
- Perception of stress is an important factor associated with MH service use even when accounting for MH status and presence of a mood or anxiety disorder.
- There is inequity in access to MH services within each year from 2011 through 2016 based on demographic characteristics. Males and individuals who identified as East, Southeast, and South Asian were consistently less likely to receive MH services compared to white respondents.

What are the key implications for public health interventions, practice, or policy?

- Current MH awareness and psychoeducation initiatives may be effective in reducing the gap between individuals recognizing a MH problem (i.e., self-rated MH) and deciding to seek help.
- MH promotion and illness prevention in everyday settings remains an important strategy to target stress at a population level and reduce the overall number of MH visits to health providers.
- Current policies and investments toward increasing access to MH services may not be sufficient for males and individuals from Asian ethnic groups. Targeted outreach programs and healthcare policies to reduce disparities in MH service use for these demographic groups are warranted.

Supplementary Information The online version contains supplementary material available at <https://doi.org/10.17269/s41997-022-00734-5>.

Acknowledgements We thank everyone who worked on the creation and data collection of the Canadian Community Health Survey, which was supported by Statistics Canada. The analysis was conducted at the University of Western Ontario Research Data Centre which is part of the Canadian Research Data Centre Network. The statements expressed in this study are those of the authors and not necessarily those of Statistics Canada. Parts of this manuscript were included in a thesis in partial fulfillment of the requirements for the degree in Master of Science.

Author contributions All authors contributed to the study conception and design. Material preparation and data analysis were performed by TS. The first draft of the manuscript was written by TS. GJR provided feedback and helped shape the analysis and manuscript. Both authors read and approved the final manuscript.

Code availability Not applicable.

Declarations

Ethics approval and data access Ethics approval from a research ethics board was not necessary for this study. Data from this study are held securely at the Canadian Research Data Centre Network (CRDCN). Permission was received from the CRDCN to access these data at The University of Western Ontario Research Data Centre.

Consent to participate Not applicable.

Consent for publication Not applicable.

Conflict of interest The authors declare no potential conflicts of interest concerning the research, authorship, and/or publication of this article. This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors. Dr. Reid is supported by the Children's Health Research Institute, London, ON.

References

- Andersen, R. M. (1995). Revisiting the behavioral model and access to medical care: Does it matter? *Journal of Health and Social Behavior*, 36(1), 1–10.
- Bartram, M. (2019). Income-based inequities in access to mental health services in Canada. *Canadian Journal of Public Health*, 110(4), 395–403.
- Booth, R. G., Allen, B. N., Jenkyn, K. M. B., Li, L., & Shariff, S. Z. (2018). Youth mental health services utilization rates after a large-scale social media campaign: Population-based interrupted time-series analysis. *JMIR Mental Health*, 5(2), e8808.
- Chiu, M., Amartey, A., Wang, X., & Kurdyak, P. (2018). Ethnic differences in mental health status and service utilization: A population-based study in Ontario, Canada. *The Canadian Journal of Psychiatry*, 63(7), 481–491.
- Chu, B., Liu, M., Leas, E. C., Althouse, B. M., & Ayers, J. W. (2021). Effect size reporting among prominent health journals: A case study of odds ratios. *BMJ Evidence-Based Medicine*, 26(4), 184–189.
- Comeau, J., Georgiades, K., Duncan, L., Wang, L., Boyle, M. H., & 2014 Ontario Child Health Study Team. (2019). Changes in the prevalence of child and youth mental disorders and perceived need for professional help between 1983 and 2014: Evidence from the Ontario Child Health Study. *The Canadian Journal of Psychiatry*, 64(4), 256–264.
- Findlay, L. C., & Sunderland, A. (2014). Professional and informal mental health support reported by Canadians aged 15 to 24. *Health Reports*, 25(12), 3–11.
- Fleury, M. J., Ngui, A. N., Bamvita, J. M., Grenier, G., & Caron, J. (2014). Predictors of healthcare service utilization for mental health reasons. *International Journal of Environmental Research and Public Health*, 11(10), 10559–10586.
- Georgiades, K., Duncan, L., Wang, L., Comeau, J., Boyle, M. H., & 2014 Ontario Child Health Study Team. (2019). Six-month prevalence of mental disorders and service contacts among children and youth in Ontario: Evidence from the 2014 Ontario Child Health Study. *The Canadian Journal of Psychiatry*, 64(4), 246–255.
- Government of British Columbia. (2010). *Healthy minds, healthy people*. https://www.health.gov.bc.ca/library/publications/year/2010/healthy_minds_healthy_people.pdf
- Government of Canada. (2018). *A common statement of principles on shared health priorities*. <https://www.canada.ca/en/health-canada/corporate/transparency/health-agreements/principles-shared-health-priorities.html>
- Leung, R., Hawkes, M., & Campisi, P. (2007). Severity of juvenile onset recurrent respiratory papillomatosis is not associated with socioeconomic status in a setting of universal health care. *International Journal of Pediatric Otorhinolaryngology*, 71(6), 965–972.
- Mental Health Commission of Canada. (2013). *Opening Minds programs*. Mental Health Commission of Canada.
- Missiuna, S., Plante, C., Pahwa, P., Muhajarine, N., & Neudorf, C. (2021). Trends in mental health inequalities in urban Canada. *Canadian Journal of Public Health*, 112(4), 629–637.
- National Institute on Alcohol Abuse and Alcoholism. (2021). *Drinking levels defined*. Retrieved November 20, 2021, from <https://www.niaaa.nih.gov/alcohol-health/overview-alcohol-consumption/moderate-binge-drinking>
- Rastogi, P., Khushalani, S., Dhawan, S., Goga, J., Hemanth, N., Kosi, R., et al. (2014). Understanding clinician perception of common presentations in South Asians seeking mental health treatment and determining barriers and facilitators to treatment. *Asian Journal of Psychiatry*, 7, 15–21.
- Schneiderman, N., Ironson, G., & Siegel, S. D. (2005). Stress and health: Psychological, behavioral, and biological determinants. *Annual Review of Clinical Psychology*, 1, 607–628.
- Scholten, W. D., Batelaan, N. M., Penninx, B. W. J. H., Balkom, A. J. L. M. V., Smit, J. H., Schoevers, R. A., & Oppen, P. V. (2016). Diagnostic instability of recurrence and the impact on recurrence rates in depressive and anxiety disorders. *Journal of Affective Disorders*, 195, 185–190.
- Schraeder, K. E., Barwick, M., Cairney, J., Carter, J., Kurdyak, P., Neufeld, R. W. J., Stewart, S. L., St Pierre, J., Tobon, J., Vingilis, E., Zaric, G., & Reid, G. J. (2021). Re-accessing mental health care after age 18: A longitudinal cohort study of youth involved with community-based child and youth mental health agencies in Ontario. *Journal of the Canadian Academy of Child and Adolescent Psychiatry*, 30(1), 12–24.
- Slaunwhite, A. K. (2015). The role of gender and income in predicting barriers to mental health care in Canada. *Community Mental Health Journal*, 51(5), 621–627.
- Statistics Canada. (2011). *Canadian Community Health Survey (CCHS) (Master file)*. Statistics Canada (producer). Using University of Western Ontario Research Data Centre (distributor). Accompanying documentation: electronic data dictionary and user guide.
- Statistics Canada. (2012). *Canadian Community Health Survey (CCHS) (Master file)*. Statistics Canada (producer). Using University of Western Ontario Research Data Centre (distributor). Accompanying documentation: electronic data dictionary and user guide.
- Statistics Canada. (2013). *Canadian Community Health Survey (CCHS) (Master file)*. Statistics Canada (producer). Using University of Western Ontario Research Data Centre (distributor). Accompanying documentation: electronic data dictionary and user guide.
- Statistics Canada. (2014). *Canadian Community Health Survey (CCHS) (Master file)*. Statistics Canada (producer). Using University of Western Ontario Research Data Centre (distributor).

- Accompanying documentation: electronic data dictionary and user guide.
- Statistics Canada. (2015). *Canadian Community Health Survey (CCHS) (Master file)*. Statistics Canada (producer). Using University of Western Ontario Research Data Centre (distributor). Accompanying documentation: electronic data dictionary and user guide.
- Statistics Canada. (2016). *Canadian Community Health Survey (CCHS) (Master file)*. Statistics Canada (producer). Using University of Western Ontario Research Data Centre (distributor). Accompanying documentation: electronic data dictionary and user guide.
- Steele, L. S., Dewa, C. S., Lin, E., & Lee, K. L. (2007). Education level, income level and mental health services use in Canada: Associations and policy implications. *Healthcare Policy*, 3(1), 96–106.
- Wiens, K., Bhattarai, A., Pedram, P., Dores, A., Williams, J., Bulloch, A., & Patten, S. (2020). A growing need for youth mental health services in Canada: Examining trends in youth mental health from 2011 to 2018. *Epidemiology and Psychiatric Sciences*, 29(e115), 1–9.

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