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Sexual orientation and complete mental health

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Abstract

Background: Previous research indicates that lesbian, gay and bisexual individuals have poorer mental health than their heterosexual counterparts. The concept of complete mental health, which combines the presence of positive mental health and the absence of mental disorder, has not been thoroughly examined in this population.

Data and methods: Data from the 2015 Canadian Community Health Survey (CCHS) were used to estimate the number and percentage of men and women aged 15 and older who self-identify as lesbian, gay, bisexual, or heterosexual. Complete mental health was defined as the presence of flourishing mental health together with the absence of any self-reported mood disorder, anxiety disorder or suicide ideation in the previous 12 months. Multivariate logistic regression models stratified by sex were used to identify differences in complete mental health among gay, lesbian, bisexual, and heterosexual individuals.

Results: In 2015, an estimated 252,000 (1.9%) Canadian men identified as gay and 145,000 (1.1%) as bisexual, while 153,000 Canadian women (1.1%) identified as lesbian and 299,000 (2.2%) as bisexual. Gay men had significantly lower unadjusted odds of complete mental health, but this association was no longer significant when controlling for sociodemographic and health factors. The likelihood of complete mental health was not significantly different for lesbians than for heterosexual women. Both bisexual men and bisexual women had significantly lower odds of complete mental health in the fully adjusted models.

Interpretation: Awareness of poorer mental health outcomes, particularly for bisexual individuals, can help guide specific interventions aimed at improving the mental health and well-being of sexual minority populations.

Keywords: cross-sectional study, health survey, mood disorders, anxiety disorders, quality of life, suicidal ideation, flourishing, positive mental health.
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Lesbian, gay and bisexual individuals are more likely to experience depression, anxiety, suicidality and substance abuse than their heterosexual counterparts.[1-12] Social stresses experienced in sexual minority populations, such as stigma, prejudice and discrimination, in addition to internalized feelings of negativity and expectations of rejection, are thought to be part of the explanation for these differences in risk for mental disorders.[1]

Much of the research to date has focussed on mental illness or distress. Less is known about positive mental health and well-being in sexual minority populations.[8,9,12,13] Keyes' two continua model[14] conceptualizes mental illness and mental health as separate but related constructs. Those with a combination of high positive emotions and high psychological and social function, as measured by the Mental Health Continuum Short Form (MHC-SF),[14] are considered to be in flourishing mental health. However, the absence of mental illness does not imply the presence of mental health, or vice versa.[14,15] Complete mental health means both flourishing mental health and being free of mental illness. States other than complete mental health have been associated with limitations in activities of daily living, missed days of work, physical conditions, and greater use of acute health care services and prescription medication.[14,16-19]

Previous studies have not included the concept of complete mental health,[8,9] or have examined only one mental illness at a time in conjunction with flourishing mental health,[12] did not include youth[8,9,12,13] or bisexual individuals[13] in the study population, have been based on a non-probability sample,[13] or have not included multivariate analysis.[12] Using data for the population aged 15 and older from the 2015 Canadian Community Health Survey (CCHS), complete mental health is defined as being in flourishing mental health in combination with the absence of a mood or anxiety disorder diagnosis and absence of suicide ideation in the previous 12 months. Prevalence estimates of sexual minority populations and disparities in complete mental health between gay, lesbian and bisexual individuals, and their heterosexual counterparts are presented. Adjusted odds ratios (AOR) of complete mental health were examined in relation to sexual orientation while controlling for sociodemographic and health correlates. Analyses are stratified by sex.

Methods

Data source

The cross-sectional CCHS collects information related to health status, health care utilization, and health determinants for the Canadian population 12 years of age and older. Excluded from the survey's coverage are the following: persons living on reserves and other Aboriginal settlements in the provinces; full-time members of the Canadian Armed Forces; youth aged 12 to 17 living in foster homes; the institutionalized population; and persons living in the Quebec health regions of *Région du Nunavik* and *Région des Terres-Cries-de-la-Baie-James*. These exclusions represent less than 3% of the target population. CCHS data were collected from January 2015 through December 2015. The overall response rate was 57.5% for a final sample of 51,545 respondents. Prevalence of sexual orientation was based on a sample of 46,055 individuals (21,063 men; 24,992 women). Adjusted logistic regressions were based on samples

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of 20,528 men and 24,440 women. Sex was assessed by asking whether the respondent was male or female; these were the only two response categories.

Definitions

Sexual orientation

Sexual orientation in research has been assessed on the basis of sexual behaviour, sexual attraction, or self-identity—each of these three concepts yielding slightly different prevalence estimates.[20-23] Identity refers to individuals' social identity, such as whether they consider themselves to be heterosexual, homosexual or bisexual. Sexual behaviour denotes whether a person's sexual partners are of the same or opposite sex. Sexual attraction refers to feelings independent of behaviours. In this study, the concept of identity was used. Sexual orientation was assessed by asking respondents aged 15 and older whether they considered themselves to be heterosexual (sexual relations with people of the opposite sex), homosexual, that is, lesbian or gay (sexual relations with people of your own sex), or bisexual (sexual relations with people of both sexes). Respondents were classified as lesbian (n=245), gay (n=334), bisexual women (n=477), bisexual men (n=224), heterosexual women (n=24,270), and heterosexual men (n=20,505). All analyses were stratified by sex, and those who responded "don't know" (n=529) or "not stated" (n=2,325), or who refused (n=58), were excluded.

Complete mental health

In accordance with the complete mental health model,[14] mental health was assessed as a combination of flourishing mental health, absence of self-reported diagnosis of mood or anxiety disorders, and absence of suicide ideation in the previous 12 months.

Flourishing mental health was assessed by means of the MHC-SF (Appendix A). The three-factor structure of mental well-being found in other populations[15,24-29] was replicated in this Canadian population sample. The internal consistency (Cronbach's alpha) for the three subscales was as follows: 0.80 for emotional well-being, 0.76 for social well-being, and 0.81 for psychological well-being. Reliability for the total scale was 0.88.

Respondents were asked about conditions that had been diagnosed by a health professional and that had lasted, or were expected to last, six months. Mood and anxiety disorders were the only mental disorders covered in the survey. Mood disorders were assessed with the question "Do you have a mood disorder such as depression, bipolar disorder, mania or dysthymia?" and anxiety disorders with the question "Do you have an anxiety disorder such as a phobia, obsessive-compulsive disorder or a panic disorder?"

Respondents were asked whether they had ever seriously contemplated suicide. Those who replied "yes" were asked whether this had happened in the previous 12 months.

Covariates

Covariates known to be associated with both sexual orientation identity and positive mental health were included in the analysis.

Four age groups were defined: 15 to 24; 25 to 44; 45 to 64; and 65 years and older. Age was used continuously in multivariate analysis.

Income was represented as the adjusted ratio of household income to the low-income cut-off corresponding to household and community size, and divided into quintiles. Income was reported in 71% of the analytical sample and is imputed in 29%—there were no missing values for income.

The categories for marital status were married or living common-law; widowed, separated or divorced; or never married.

Cultural / racial background was identified as White or non-White for prevalence, and as White, South Asian, Chinese, Black, or Other for logistic regression.

Those born in Canada, the United States or Greenland who indicated that they were First Nations, Métis, or Inuit were categorized as Indigenous.

Physical conditions diagnosed by a health professional which had lasted, or were expected to last, six months or more were summed and grouped into 0, 1, 2, or 3 or more chronic conditions. The diagnosed conditions were the following: asthma, arthritis, fibromyalgia, back problems excluding fibromyalgia and arthritis, migraine, chronic obstructive pulmonary disease, diabetes, sleep apnea, osteoporosis, heart disease, cancer, effects of stroke, Alzheimer's disease or other dementia, chronic fatigue syndrome, multiple chemical sensitivities, and high blood pressure.

Analytical techniques

Weighted frequencies and cross-tabulations were calculated to examine estimates of sexual orientation, flourishing mental health, mood and anxiety disorders, suicide ideation, and complete mental health. Multivariate logistic regression was used to determine factors independently associated with complete mental health. Bootstrap weights were applied in SAS-Callable SUDAAN 11.0 to account for underestimation of standard errors resulting from the complex survey design.[30]

Results

In 2015, an estimated 1.9% (252,000) of men identified as gay and 1.1% (145,000) as bisexual (Table 1), and 1.1% (153,000) of women identified as lesbian and 2.2% (299,000) as bisexual.

In younger age groups, women were significantly more likely than men to identify as bisexual. In the 25-to-44 and 65-and-older age groups, men were more likely than women to identify as homosexual.

Bisexual men and women tended to be younger and in lower-income groups than heterosexuals (Table 2). A higher proportion of heterosexual men and women than gay, lesbian and bisexual individuals were married or in common-law relationships. Bisexual women were more likely to have self-identified as Indigenous than their heterosexual counterparts, but the small sample did not allow for exam-

Table 1
Sexual orientation by sex and age group, household population aged 15 and older, Canada 2015

	Heterosexual				Gay or Lesbian				Bisexual			
			95% confidence interval				95% confidence interval				95% confidence interval	
Characteristic	'000s	%	from	to	'000s	%	from	to	'000s	%	from	to
Men	**12,788.3**	**97.0**	**96.5**	**97.4**	**252.1**	**1.9***	**1.6**	**2.3**	**145.2**	**1.1***	**0.9**	**1.3**
Age group (years)												
15 to 24	2,045.4	96.4*	95.0	97.4	35.1[E]	1.7	0.9	2.9	40.8[E]	1.9[E]*	1.3	2.8
25 to 44	4,282.6	96.6	95.6	97.4	102.0[E]	2.3[E]*	1.6	3.2	48.0[E]	1.1[E]*	0.8	1.6
45 to 64	4,413.3	97.4	96.5	98.0	89.8[E]	2.0[E]	1.4	2.8	29.6[E]	0.7[E]	0.4	1.0
65 and older	2,047.1	97.5*	96.5	98.2	25.2[E]	1.2[E]*	0.8	1.8	26.8[E]	1.3*	0.7	2.2
Women†	**13,164.7**	**96.7**	**96.3**	**97.1**	**152.6**	**1.1**	**0.9**	**1.4**	**298.5**	**2.2**	**1.9**	**2.5**
Age group (years)												
15 to 24	1,744.8	92.0	90.2	93.5	33.9[E]	1.8[E]	1.2	2.7	117.6	6.2	4.9	7.8
25 to 44	4,340.0	96.0	95.1	96.7	51.5[E]	1.1[E]	0.8	1.6	130.9	2.9	2.3	3.7
45 to 64	4,582.1	98.0	97.4	98.5	54.4[E]	1.2[E]	0.8	1.7	38.2[E]	0.8[E]	0.6	1.2
65 and older	2,497.8	99.0	98.7	99.3	12.8[E]	0.5[E]	0.3	0.8	11.8[E]	0.5[E]	0.3	0.7

[E] use with caution
* significantly different from reference category (p<0.05)
† reference category
Source: Statistics Canada, Canadian Community Health Survey, 2015.

Table 2
Selected characteristics by sexual orientation and sex, household population aged 15 and older, Canada excluding the territories, 2015

	Men									Women								
	Heterosexual†			Gay			Bisexual			Heterosexual†			Lesbian			Bisexual		
		95% confidence interval			95% confidence interval			95% confidence interval			95% confidence interval			95% confidence interval			95% confidence interval	
Characteristic	%	from	to	%	from	to	%	from	to	%	from	to	%	from	to	%	from	to
Age group (years)																		
15 to 24	16.0	15.2	16.8	13.9	8.2	22.6	28.1[E]*	19.8	38.3	13.3	12.6	13.9	22.2[E]*	15.2	31.3	39.4*	32.1	47.2
25 to 44	33.5	32.6	34.4	40.4	31.0	50.7	33.0[E]	23.8	43.8	33.0	32.1	33.8	33.7[E]	24.5	44.3	43.9*	36.3	51.8
45 to 64	34.5	33.9	35.1	35.6	26.8	45.5	20.4[E]*	13.7	29.3	34.8	34.2	35.5	35.7	26.3	46.2	12.8[E]*	9.0	17.8
65 and older	16.0	15.7	16.3	10.0[E]*	6.5	15.1	18.5[E]	11.2	29.0	19.0	18.7	19.3	8.4[E]*	5.3	13.0	4.0[E]*	2.6	6.0
Household income quintile																		
Lowest	15.6	14.8	16.5	11.6[E]	7.6	17.4	22.4[E]	14.8	32.5	20.3	19.4	21.2	16.0[E]	10.7	23.3	29.8*	24.3	35.9
Low–middle	17.6	16.8	18.5	17.1	10.1	27.4	29.0[E]*	19.7	40.4	20.7	19.8	21.5	18.8[E]	11.7	28.7	28.5	21.1	37.3
Middle	20.3	19.4	21.2	18.2[E]	12.5	25.7	18.5[E]	12.2	27.0	21.3	20.4	22.2	18.1[E]	12.4	25.8	15.1[E]*	10.7	20.9
High–middle	21.7	20.8	22.6	24.3[E]	16.6	34.0	16.8[E]	10.6	25.5	19.3	18.5	20.2	20.7[E]	13.0	31.2	16.4[E]	11.4	22.9
Highest	24.7	23.8	25.7	28.9[E]	20.0	39.7	13.4[E]*	8.3	20.7	18.4	17.6	19.3	26.4[E]	18.2	36.7	10.2[E]*	6.7	15.3
Marital status																		
Married or living common-law	62.9	61.9	63.9	38.7*	29.3	49.0	27.3[E]*	19.5	36.8	58.8	57.7	59.8	46.1*	36.3	56.3	29.3*	23.0	36.5
Widowed/separated/divorced	7.8	7.3	8.4	7.0	4.1	11.7	6.8	4.0	11.4	17.0	16.3	17.8	8.6*	5.1	14.1	11.7[E]*	8.1	16.6
Never married	29.3	28.4	30.1	54.3*	44.0	64.3	65.9*	56.2	74.4	24.2	23.4	25.0	45.3*	36.0	54.8	59.0*	51.5	66.1
Cultural / racial background																		
White	76.0	74.9	77.1	82.2	74.0	88.3	83.5	73.3	90.4	75.6	74.6	76.6	76.9	65.5	85.4	75.9	68.2	82.1
Non-White	20.2	19.2	21.3	15.5[E]	9.7	23.9	13.1	7.1	23.2	20.6	19.6	21.6	17.6	10.2	28.6	15.1[E]	9.4	23.2
Indigenous identity																		
Indigenous	3.7	3.3	4.2	F	F	F	F	F	F	3.8	3.5	4.2	F	F	F	9.1[E]*	6.4	12.8
Non-Indigenous	96.3	95.8	96.7	x	x	x	x	x	x	96.2	95.8	96.5	x	x	x	90.9*	87.2	93.6
Number of chronic conditions																		
None	50.8	49.6	51.9	50.1	39.9	60.3	51.7	41.1	62.1	43.9	42.8	44.9	44.6	34.1	55.6	44.3	36.6	52.3
One	24.6	23.6	25.5	29.3[E]	20.5	40.0	26.7[E]	18.6	36.7	24.7	23.8	25.6	23.0[E]	15.1	33.3	27.0	20.9	34.1
Two	12.3	11.6	13.0	9.9	6.0	15.9	13.4	8.0	21.5	14.6	13.9	15.4	15.1[E]	9.2	23.9	12.5[E]	9.1	16.9
Three or more	12.4	11.8	13.0	10.7[E]	6.7	16.6	8.3[E]	5.1	13.4	16.8	16.1	17.5	17.3[E]	11.1	26.0	16.3	12.1	21.6

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† reference category
Source: Statistics Canada, Canadian Community Health Survey, 2015.

ining differences in Indigenous identity between gay and bisexual men and lesbians, and heterosexuals. There were no significant differences in cultural / racial background or number of chronic conditions between gay, lesbian or bisexual individuals, and heterosexuals.

When both sexes were combined, it was found that heterosexuals were less likely to have been diagnosed with a mood or anxiety disorder or to have experienced suicide ideation in the previous 12 months than bisexual, gay or lesbian individuals (Table 3). Bisexual individuals were also less likely to be in flourishing mental health than heterosexuals. As a result, heterosexuals were more likely to be categorized as having complete mental health than were gay or lesbian and bisexual individuals. When examined separately by sex, it was found that lesbians did not differ significantly from heterosexual women on mental health indicators. However, bisexual women fared poorer than lesbians. Differences between bisexual men and gay men did not reach statistical significance.

Gay men had significantly lower unadjusted odds of complete mental health than heterosexuals, but this association was no longer significant when controlling for potential confounders. The likelihood of complete mental health was not significantly different for lesbians than for heterosexual women. Bisexual men and women had significantly lower odds of complete mental health than their heterosexual counterparts in both the unadjusted and fully adjusted models.

For both men and women, increasing age and higher income were associated with higher odds of complete mental health. Those who were widowed, separated, divorced or never married had lower odds of complete mental health than those who were married or in a common-law relationship.

Men and women of South Asian cultural or racial background had significantly higher odds of complete mental health than White people, as did Black men, and women from other cultural or racial backgrounds. Indigenous identity was significantly associated with lower odds of complete mental health in unadjusted models, but this did not persist in fully adjusted models.

An increasing number of chronic conditions was associated with lower odds of complete mental health.

Discussion

According to the 2015 CCHS, the proportion of Canadians identifying as gay, lesbian or bisexual is similar to that found in population-based surveys conducted in other developed countries.[8,31,32]

Some sociodemographic differences between gay, lesbian and bisexual individuals, and heterosexuals, could be contributing factors to mental health and well-being.[33] Bisexual individuals tended to be younger and of lower socioeconomic status, and were more often women. These results are similar to those obtained in other population-based studies.[11,34] Gay, lesbian and bisexual people were also less likely to be married or in a common-law relationship.

This study found that poor mental health outcomes were more prevalent among gay and lesbian individuals than among heterosexuals. This is consistent with previous studies.[7,10,11] Sexual minority groups were more likely to have experienced mood or anxiety disorders or suicidality, and less likely to be in flourishing or complete mental health.

In multivariate analysis, gay or lesbian identity was not independently associated with lower odds of complete mental health. It may be that small sample size

Table 3
Components of complete mental health by sexual orientation and sex, household population aged 15 and older, Canada 2015

	Heterosexual			Gay or lesbian			Bisexual		
		95% confidence interval			95% confidence interval			95% confidence interval	
Characteristic	%	from	to	%	from	to	%	from	to
Both sexes									
Complete mental health	74.1	73.4	74.9	65.3*	58.3	71.7	43.9*†	38.1	50.0
Flourishing mental health	81.4	80.7	82.1	75.8	69.6	81.1	62.2*†	55.7	68.2
Mood or anxiety disorder	11.4	11.0	11.9	19.2*	14.4	25.1	40.4*†	34.1	47.0
Suicide ideation (past 12 months)	2.3	2.1	2.5	5.4E*	3.4	8.3	12.9E*†	9.2	17.8
Men									
Complete mental health	76.8	75.7	77.8	67.0*	57.1	75.5	56.8*	46.3	66.8
Flourishing mental health	81.8	80.9	82.7	75.9	67.4	82.7	68.9*	57.9	78.0
Mood or anxiety disorder	8.2	7.6	8.8	17.4E*	11.4	25.7	23.9E*	16.1	34.0
Suicide ideation (past 12 months)	1.9	1.6	2.2	x	x	x	x	x	x
Women									
Complete mental health	71.5	70.6	72.5	62.7	52.6	71.7	37.6*†	30.8	45.0
Flourishing mental health	81.0	80.2	81.9	75.7	66.1	83.2	58.9*†	50.8	66.6
Mood or anxiety disorder	14.6	13.9	15.3	22.2E	15.2	31.3	48.4*†	40.4	56.4
Suicide ideation (past 12 months)	2.7	2.4	3.1	x	x	x	16.9E*	11.7	23.9

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E use with caution
* significantly different from heterosexual category ($p<0.05$)
† significantly different from the gay or lesbian category ($p<0.05$)
Source: Statistics Canada, Canadian Community Health Survey, 2015.

Table 4
Unadjusted and adjusted odds ratios relating selected characteristics to complete mental health, by sex, household population aged 15 and older, Canada, 2015

	Men						Women					
		95% confidence interval			95% confidence interval			95% confidence interval			95% confidence interval	
Characteristic	OR	from	to	AOR	from	to	OR	from	to	AOR	from	to
Sexual identity												
Heterosexual†	1.0	...	...	1.0	...	...	1.0	...	...	1.0	...	...
Gay or lesbian	0.6*	0.4	0.9	0.6	0.4	1.0	0.7	0.4	1.0	0.7	0.5	1.1
Bisexual	0.4*	0.3	0.6	0.5*	0.3	0.8	0.2*	0.2	0.3	0.3*	0.2	0.5
Age group (years)												
15 to 24†	1.0	...	...	...	...	...	1.0	...	...	...	...	...
25 to 44	1.0	0.9	1.2	...	...	...	1.2*	1.1	1.4	...	...	...
45 to 64	1.0	0.8	1.1	...	...	...	1.3*	1.1	1.5	...	...	...
65 and older	0.9	0.8	1.1	...	...	...	1.2*	1.0	1.4	...	...	...
Age (continuous)	...	...	...	1.00*	1.00	1.01	...	...	...	1.02*	1.01	1.02
Household income quintile												
Lowest†	1.0	...	...	1.0	...	...	1.0	...	...	1.0	...	...
Low–middle	1.3*	1.1	1.6	1.2*	1.0	1.5	1.3*	1.1	1.5	1.2*	1.0	1.4
Middle	1.6*	1.4	1.9	1.5*	1.2	1.8	1.5*	1.3	1.7	1.3*	1.1	1.5
High–middle	2.2*	1.9	2.6	1.9*	1.6	2.3	1.8*	1.6	2.1	1.6*	1.4	1.9
Highest	2.3*	1.9	2.7	1.9*	1.6	2.3	2.3*	2.0	2.6	1.9*	1.6	2.3
Marital status												
Married or living common-law†	1.0	...	...	1.0	...	...	1.0	...	...	1.0	...	...
Widowed/separated/divorced	0.6*	0.5	0.7	0.7*	0.6	0.9	0.6*	0.6	0.7	0.8*	0.7	0.9
Never married	0.6*	0.6	0.7	0.7*	0.6	0.8	0.6*	0.6	0.7	0.7*	0.7	0.8
Cultural / racial background												
White†	1.0	...	...	1.0	...	...	1.0	...	...	1.0	...	...
South Asian	1.4*	1.0	2.0	1.5*	1.1	2.2	1.5*	1.0	2.1	1.7*	1.1	2.4
Chinese	0.7	0.6	1.0	0.8	0.5	1.1	0.8	0.6	1.0	0.7	0.5	1.0
Black	2.2*	1.3	3.7	3.0*	1.7	5.4	1.0	0.7	1.5	1.3	0.9	2.0
Other	1.0	0.8	1.3	1.2	1.0	1.5	1.6*	1.3	2.0	1.9*	1.5	2.4
Indigenous identity												
Indigenous	0.7*	0.6	0.9	0.8	0.3	2.4	0.6*	0.5	0.8	0.5	0.2	1.5
Non-Indigenous†	1.0	...	...	1.0	...	...	1.0	...	...	1.0	...	...
Number of chronic conditions												
None†	1.0	...	...	1.0	...	...	1.0	...	...	1.0	...	...
One	0.8*	0.7	0.9	0.7*	0.6	0.8	0.6*	0.6	0.7	0.6*	0.5	0.7
Two	0.6*	0.5	0.7	0.5*	0.5	0.7	0.6*	0.5	0.7	0.5*	0.4	0.6
Three or more	0.4*	0.3	0.4	0.3*	0.3	0.4	0.3*	0.3	0.4	0.3*	0.2	0.3

... not applicable
* significantly different from reference category ($p<0.05$)
† reference category
Source: Statistics Canada, Canadian Community Health Survey, 2015.

contributed to lack of statistical power, or that other factors in the model accounted for the relationship. In particular, the lower odds of complete mental health for gay men than for heterosexual men persisted when the model was adjusted for sociodemographic characteristics and physical health (data not shown), but was no longer significant with the addition of marital status. This is consistent with previous evidence suggesting that relationship formalization is a protective factor for mental health among gay and lesbian individuals.[35]

Bisexual identity was independently associated with lower odds of complete mental health even after possible confounding factors are accounted for. This is consistent with previous studies that have found bisexual individuals have poorer mental health outcomes than both heterosexual and gay or lesbian individuals.[1,7,9,11,12] Evidence also suggests that bisexual women may have comparatively worse mental health outcomes than their homosexual and heterosexual counterparts than is the case for bisexual men.[11] Prevalence of mental disorders, flourishing mental health, and odds ratios for complete mental health in this study also support the notion that outcomes are worse for bisexual women than bisexual men. Additionally, a separate multivariate model restricted to bisexual individuals showed that bisexual women had significantly lower odds of complete mental health than bisexual men (AOR 0.5, 95% confidence interval 0.3 to 0.8). Therefore, sex may be an important moderator of the relationship between bisexuality and mental health.[11]

The predominant explanation for these disparities is minority stress theory,[1] whereby aspects such as chronic stress,

stigma and discrimination experienced by sexual minorities because of their socially stigmatized identities contribute to their increased risk of mental disorder. On the one hand, discrimination toward bisexual individuals from monosexual (heterosexual, gay, lesbian) individuals, as well as the invisibility of bisexuality in society and the lack of a community that provides bisexual-affirmative support have been theorized to be additional contributing factors related to poorer mental health outcomes for this group.[1,11,36]

On the other hand, lesbian, gay or bisexual identity may provide opportunities for group affiliation, social support and coping resources that could counteract the effect of stress resulting from sexual minority identity and foster positive mental health.[1,37] Consequently, the relationship between sexual minority identity and positive mental health may be moderated by positive aspects of group identity. The results of this study suggest that, at least for bisexual individuals, the effect of stressors outweighed that of positive aspects of sexual minority identity in relation to complete mental health.

Further examination of the complex relationship between sexual minority identity and mental health, as well as differences between and within sexual minority groups, is warranted. Studies that delve into factors associated with developing and maintaining resiliency and positive mental health in sexual minority individuals would be of particular policy and clinical relevance.

Strengths and limitations

A strength of this study is the large, population-based sample. However, the relatively small number of lesbian, gay and bisexual respondents limits the ability to assess variability of complete mental health within sexual minority groups. It is likely that the experience of sexual minority people is not homogenous and that the examination of subgroups, such as racial minorities or socioeconomic groups, would highlight important differences.

This study includes individuals aged 15 and older with no upper age limit, whereas previous versions of the CCHS have been restricted to those aged 18 to 59 years or aged 18 and older.

Self-reported data may be subject to recall and social desirability biases. In particular, an unwillingness to disclose sexual orientation on a survey may result in misclassification bias.[38] Additionally, sexual orientation identities beyond heterosexual, homosexual and bisexual were not ascertained, and "other" was not a response category. Some respondents may refuse to be categorized into one of the groups listed in the question, or may self-identify as an identity not included in the list (e.g., queer, pansexual, two-spirit).[21] These two factors may have contributed to the size of the "not stated/refusal/don't know" response categories (6.3%) for the sexual identity question on this survey. An analysis of the "not stated/refusal/don't know" group showed that they were significantly more likely to be 65 and older, widowed, separated or divorced, in the lowest-income quintile, have 3 or more chronic conditions, and to be of South Asian or other cultural / racial background (data not shown).

The CCHS sexual identity question has shown high, but imperfect, agreement (0.89) with the SMART Guide sexual identity item.[23] This suggests that the current study may underestimate the prevalence of sexual minority groups and, consequently, the association with complete mental health.

Self-identification as a sexual minority may be an indication of self-acceptance. CCHS respondents who self-identify may be more likely to have good mental health. This may result in an underestimation of the association between sexual minority status and complete mental health.[6]

Chronic conditions, including mood and anxiety disorders, were self-reported and not verified by another source.

Conclusion

The results of this study highlight the poorer mental health of sexual minority groups, in particular the lower likelihood of complete mental health among bisexual individuals than among heterosexuals. These findings support the growing body of literature that has identified such disparities. Awareness of poorer mental health outcomes, particularly for bisexual individuals, can help guide interventions aimed at improving the mental health and well-being of sexual minority populations. ■

Appendix

Table A
Questions in Mental Health Continuum Short Form (MHC-SF)

Emotional well-being

How often† in the past month did you feel . . .

1. happy?
2. interested in life?
3. satisfied with your life?

Positive functioning

How often† during the past month did you feel . . .

4. that you had something important to contribute to society? (social contribution)
5. that you belonged to a community (like a social group, your neighbourhood, your city, your school)? (social integration)
6. that our society is becoming a better place for people like you? (social growth)
7. that people are basically good? (social acceptance)
8. that the way our society works makes sense to you? (social coherence)
9. that you liked most parts of your personality? (self-acceptance)
10. good at managing the responsibilities of your daily life? (environmental mastery)
11. that you had warm and trusting relationships with others? (positive relationship with others)
12. that you had experiences that challenged you to grow and become a better person? (personal growth)
13. confident to think or express your own ideas and opinions? (autonomy)
14. that your life has a sense of direction or meaning to it? (purpose in life)

Flourishing requires a response of "almost every day" or "every day" to 1 or more of the 3 emotional well-being questions, and to 6 or more of the 11 positive functioning questions.

† every day, almost every day, about two or three times a week, about once a week, once or twice, or never
Source: Keyes CLM. Brief description of the Mental Health Continuum Short Form (MHC-SF)[39]

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