Depression

Marie P. Beaudet*

Abstract

According to the 1994-95 National Population Health Survey, close to 6% of Canadians aged 18 and over had experienced a major depressive episode in the previous 12 months.

Univariate analysis shows that the prevalence of depression was higher among women than among men, but tended to decline at older ages for both sexes. The prevalence of depression was also related to a number of socioeconomic characteristics such as marital status, education, and household income, and to several measures of stress, psychological resources and social support. However, multivariate analysis shows that not all of these variables were significantly associated with the odds of experiencing depression. In some instances, factors that increased the risk differed for men and women.

For both sexes, chronic strain, recent negative events, lack of closeness, and low self-esteem increased the odds of depression. Traumatic events in childhood or young adulthood and a low sense of mastery were associated with a higher risk of depression for women, but not men. For men, being single and having moderate self-esteem heightened the risk of depression.

A substantial proportion of both men and women who had suffered depression reported using drugs. As well, a notable share of people who had been depressed sought professional health care for emotional or mental problems.

Keywords: *depression, major depressive episode, stress, psychological and social resources, sense of coherence, 12-month prevalence, sex, National Population Health Survey*

Introduction

At one time or another everyone feels down. Most people snap out of it and resume their regular routines. But for some, this feeling intensifies and turns into a major depressive episode—a period characterized by a depressed mood or a lack of interest in most activities, accompanied by symptoms such as appetite loss or sleep disturbance, decreased energy, difficulty concentrating, feelings of worthlessness, or suicidal thoughts (see *Major depressive episode*).

Depression is a relatively common mental disorder. It causes substantial suffering and disruption in the lives of those affected and of those around them, but is amenable to treatment. Thus, knowledge of the prevalence of depression and some of its risk factors is important. The 1994-95 National Population Health Survey (NPHS) asked respondents if they had experienced the symptoms of depression for a period of two weeks or more during the previous year (see page 9 for a description of the survey).

Estimates from the survey indicated that about one in twenty Canadian adults had suffered a major depressive episode in the past year. But not everyone was equally likely to have been depressed. Depression was more prevalent among women than men, and among young people than older individuals. Factors associated with increased odds of depression include being unmarried, ill or on disability leave, experiencing considerable stress, and having diminished psychological resources.

* *Marie P. Beaudet (613-951-7320) is with the Health Statistics Division at Statistics Canada, Ottawa K1A 0T6.*

However, the socioeconomic, social and psychological factors that can increase the risk of depression are intertwined. Logistic regression can identify the relative effect of each factor while all others are held constant (see *Logistic regression*). In this article, percentages refer to unadjusted prevalence figures (*Appendix*), while adjusted odds ratios refer to significant estimates derived from the logistic regression model, which controls for other variables entered in the analysis (Table 1). This article is based on data from 16,291 NPHS respondents aged 18 and over.

Depression twice as common among women

According to the 1994-95 NPHS, an estimated 5.6% of Canadians aged 18 and over—1.1 million—had recently experienced depression. Depression was almost twice as common among women as men: 7.3% versus 3.7% (Chart 1).

Major depressive episode

The NPHS measures a major depressive episode (MDE) with a subset of questions from the Composite International Diagnostic Interview.[1] These questions cover a cluster of symptoms for a depressive disorder, which are listed in the Diagnostic and Statistical Manual of Mental Disorders (DSM-III-R).[2]

The question numbers refer to those used in the NPHS questionnaire. There are three possible paths through these questions: “yes” to 2, then 3 to 13; “no” to 2, “yes” to 16, then 17 to 26; and “no” to 2 and “no” to 16.

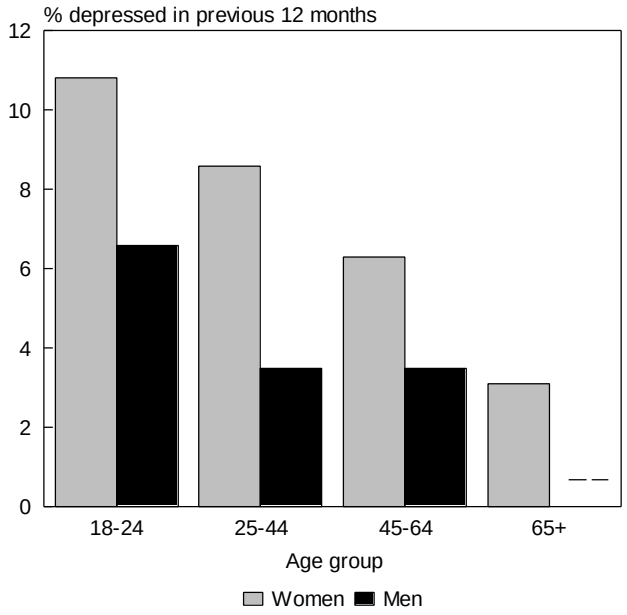
2. During the past 12 months, was there ever a time when you felt sad, blue, or depressed for two weeks or more in a row? (Yes - go to 3; No - go to 16)

16. During the past 12 months, was there ever a time lasting two weeks or more when you lost interest in most things like hobbies, work, or activities that usually give you pleasure? (Yes - go to 17; No - end)

3./17. For the next few questions, please think of the two-week period during the past 12 months when 3. these feelings were worst / 17. you had the most complete loss of interest in things. During that time how long did these feelings usually last? (All day long; Most of the day; About half of the day; Less than half the day)

Chart 1

Unadjusted prevalence of depression, by sex and age groups, Canada, 1994-95



Source: *National Population Health Survey, 1994-95*

The higher prevalence of depression among women is consistent with studies in Canada,[3,4] the United States,[5] and other western countries.[6] A number of explanations (some contradictory) for this difference have been suggested. For example, one theory holds that women more than men have to balance multiple roles, and consequently, experience added stress, which increases their vulnerability to depression; other theories suggest that depression is likely to be more common among women who have few roles. Some research emphasizes differences in socially acceptable ways for men and women to cope, with women being more willing to self-disclose (that is, talk about their feelings). A gender bias in how depression is defined and measured has also been suggested.[7-9]

Logistic regression

Depression is related to a complex set of factors that range from demographic and socioeconomic characteristics to social and psychological resources. To assess the effect of any one of these factors on the prevalence of depression, a logistic regression model was specified. Because of the difference in the prevalence of and the factors associated with depression among men and women, separate models were fitted for each sex.

The independent variables that were significant risk factors for depression are shown in Table 1. The "dropped" variables included in the original model were: living arrangements; lone parenthood; household income; the variables measuring main activity except recovering from illness or on disability; and the variables measuring social resources, except lack of closeness.

The backward solution of the logistic regression was used. The results are based on a sample size of 6,402 men (87%) and 8,115 women (91%). The sample weights were adjusted so that they average to 1.0. This approach permits a less biased estimate of the standard errors. Respondents with information missing for one or more variables were omitted from the analysis.

To ensure that the results were based on the highest possible number of respondents, the regressions were recalculated after the following variables were deleted from the model: scope of network, frequency of contacts, social involvement, and social support. Removal of these variables and the subsequent increase in sample size did not modify the variables that contributed to the model, although the actual magnitudes of the odds ratios were slightly altered.

An estimated odds ratio tends to have a skewed distribution, because the distribution is bound away from zero. The skewness of the distributions is reflected in the upper bound of the confidence intervals, especially when cell sizes are relatively small.

Logistic regression results also provide global statistics that permit evaluation of the adequacy of the model.[10] A residual chi-square which is non-significant indicates that the model adequately fits the data. The residual chi-square for the female model was 23.1 with 23 degrees of freedom and an associated significance level of .45. The residual chi-square for the male model was 26.6, with 26 degrees of freedom and an associated significance level of .43. These statistics indicate that both models adequately fit the data.

Another way to evaluate the model is to compare the actual number of respondents with and without depression to the classification generated by the logistic regression. Both the male and female models detected the majority of respondents with depression. This is the *sensitivity* of the model: 74% of men and 86% of women who experienced depression were correctly identified. The *specificity* of the model is more problematic in that a substantial number of respondents classified as fitting the profile of those with depression did not, in fact, meet the criteria for having had a major depressive episode. The specificity was 74% for the male model and 56% for the female model. Thus, for men, in about three out of four cases, knowledge of the variables included in the model will lead to a correct determination of whether a person has experienced an episode of depression in the last year. However, the model correctly classifies slightly over half of women. Consequently, the model could not be used as a screening device. Although it does not miss many people with depression, it would also identify a large number, particularly women, who, upon closer scrutiny, were not depressed.

Table 1

Significant adjusted odds ratios associated with 0.90 probability of diagnosis of depression, by sex, Canada, 1994-95

	Women		Men	
	Odds ratio	95% confidence interval	Odds ratio	95% confidence interval
Personal characteristics				
Age				
18-24	1.75	1.26-2.43	1.81	1.17-2.79
25-44	1.69	1.34-2.14	n.s.	--
45-64	n.s.	--	n.s.	--
65+†	1.00	...	1.00	...
Marital status				
Never married	n.s.	--	2.03	1.42-2.91
Previously married‡	1.36	1.08-1.71	3.53	2.35-5.29
Married†§	1.00	...	1.00	...
Education				
Less than secondary graduation	n.s.	--	0.66	0.47-0.94
Secondary graduation	n.s.	--	n.s.	--
Some postsecondary	n.s.	--	n.s.	--
Postsecondary graduation†	1.00	...	1.00	...
On disability or recovering from illness				
Yes	2.27	1.67-3.10	n.s.	--
No†	1.00	...	1.00	...
Interactions				
Inadequate income and some postsecondary	n.s.	--	1.87	1.15-3.02
Age 18-24 and less than secondary	0.55	0.31-1.00	n.s.	--
Age 18-24 and some postsecondary	n.s.	--	0.28	0.15-0.55
Age 25-44 and secondary graduation	0.63	0.45-0.89	n.s.	--
Age 45-64 and some postsecondary	1.86	1.26-2.75	n.s.	--
Psychological resources				
Low sense of coherence				
Yes	3.08	2.36-4.02	4.43	2.81-6.99
No†	1.00	...	1.00	...
Self-esteem				
Very low	2.71	2.17-3.37	3.27	2.08-5.12
Low	1.35	1.06-1.72	1.82	1.16-2.86
Moderate	n.s.	--	1.70	1.11-2.63
High†	1.00	...	1.00	...
Low sense of mastery				
Yes	1.32	1.06-1.65	n.s.	--
No†	1.00	...	1.00	...
Stress				
Number of chronic strains				
Low†	1.00	...	1.00	...
Moderate	1.48	1.14-1.93	n.s.	--
High	1.91	1.45-2.50	2.19	1.63-2.95
Recent life events				
Yes	1.96	1.61-2.37	1.68	1.25-2.25
No†	1.00	...	1.00	...
Traumatic events				
Yes	1.69	1.38-2.08	n.s.	--
No†	1.00	...	1.00	...
Social resources				
Lack of closeness				
Yes	1.27	1.04-1.54	1.53	1.13-2.06
No†	1.00	...	1.00	...

Source: *National Population Health Survey, 1994-95*
Note: *Based on adjusted weights that average to 1.0; 6,402 (87%) men and 8,115 (91%) women.*
n.s. Indicates not significant at the .05 level.
† *Indicates reference category for which the odds ratio is always 1.00.*
‡ *Includes widowed, divorced and separated.*
§ *Includes common-law and living with a partner.*

Young adults at heightened risk

After controlling for other variables, the odds of being depressed for 18- to 24-year-olds compared with those for people aged 65 and over were 1.75 to 1.00 for women, and 1.81 to 1.00 for men (Table 1). Women aged 25 to 44 had higher odds of being depressed than did women 65 and over. However, for men aged 25 to 44, the odds of being depressed were not significantly different from those of men 65 and over.

Married people less likely to be depressed

Marriage seems to provide some insulation against depression, particularly for men (see *Socioeconomic characteristics)* (Chart 2). After all other variables entered in the analysis were controlled, being single (never married) significantly increased men's odds of experiencing depression. Single men were twice as likely as married men to have been depressed (2.03 to 1.00). By contrast, when all other factors were controlled, being single did not place women at increased risk.

Formerly married men (widowed, divorced and separated) were three and a half times more likely than married men to have been depressed. To a much lesser degree, the odds of depression were also increased for previously married women, compared with their married counterparts (1.36 to 1.00). Other studies have consistently shown married people to be less at risk for mental illness, but it is not clear if marriage provides a protective edge, or if people less prone to mental illness are more likely to find a partner, or if both contribute.[11]

Socioeconomic characteristics

Marital status is divided into three categories: single (never married), married (including living with partner and common-law union), and previously married (widowed, divorced, separated).

A lone-parent family consists of a parent with at least one never-married child aged 18 or younger.

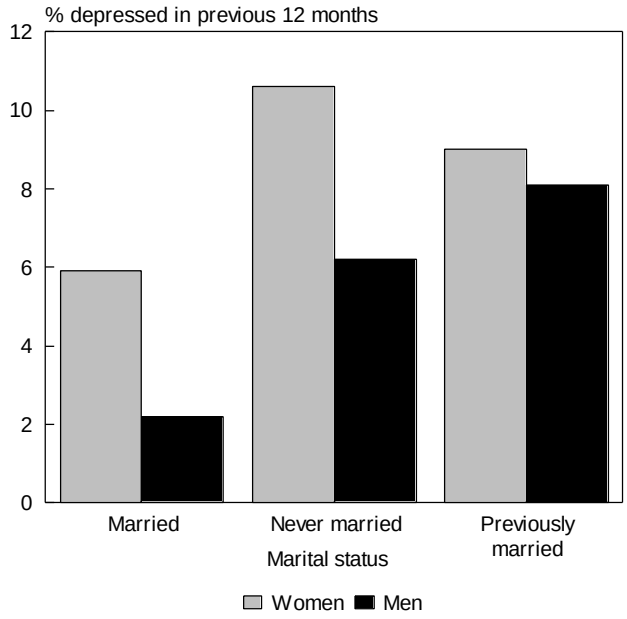
Income adequacy is based on household income in relation to household size. Household income is classified as *inadequate* according to the following criteria:

Household income	Household size
Less than $15,000	1 or 2 persons
Less than $20,000	3 or 4 persons
Less than $30,000	5 or more persons

Main activity includes: working, caring for someone, attending school, unemployed, retired, and on disability/ recovering from an illness. Respondents were classified as working if they spent 30 hours or more a week at a job in the 12 months before the interview; they were classified as retired if they had been retired for the entire 12 months.

Chart 2

Unadjusted prevalence of depression, by sex and marital status, Canada, 1994-95



Source: *National Population Health Survey, 1994-95*

Living arrangements and lone parenthood

Among men, 7% of those living alone experienced depression, more than double the rate for those living with others (3%) (*Appendix*). For women, lone parenthood was associated with a high prevalence of depression: 15% of female lone parents had experienced a major depressive episode in the previous 12 months, compared with 7% of all other women.[a] However, neither living arrangements nor lone parenthood was itself a significant factor for depression when all others were controlled. Instead, other variables strongly associated with these situations such as marital status, sex, or stress contributed to the odds of being depressed.

[a] *No estimate is available for men because of the small number who are lone parents.*

Depression and illness

The prevalence of depression among women varied substantially with their main activity. Women with caring responsibilities and those who were employed had the same prevalence of depression (7%). Prevalences were relatively high among women in school and among those who were unemployed: 11% and 9%, respectively. But by far, the highest prevalence of depression was among women recovering from an illness or on disability (23%), while the lowest was among women who were retired (4%). However, when all other factors were controlled, women who were recovering from an illness or on disability were the only ones who had a significantly increased risk of being depressed.

Estimates of the prevalence of depression among men are available only for those whose main activity was working: 3% versus 4% for all other men. Because small proportions of male NPHS respondents reported caring responsibilities, school attendance, unemployment, retirement, or recovering from illness or being on disability as their main activity, reliable estimates of the prevalence of depression among these groups could not be calculated.

Unanticipated life courses

Both men and women in households classified as having inadequate income had prevalences of depression well above those in adequate-income households. Nevertheless, when all other factors were controlled, income alone was not a significant predictor of depression.

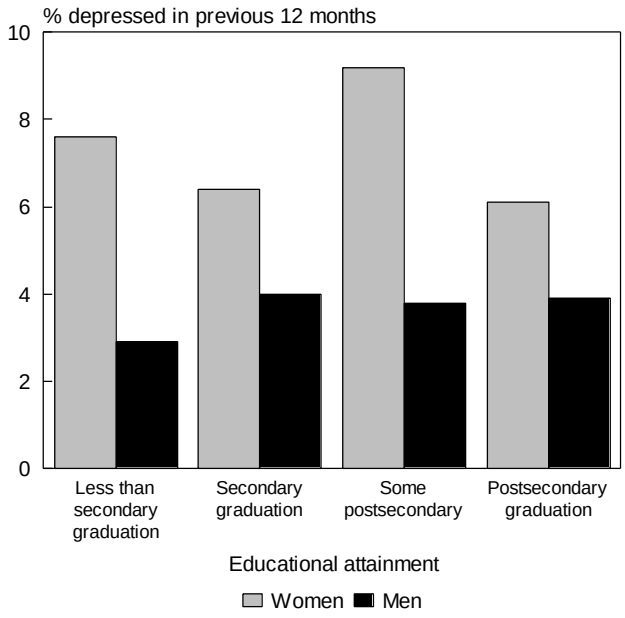
The relationship between depression and education was even less clear (Chart 3). Men's prevalence of depression varied little by level of education. In fact, when all other variables were controlled, men with less than secondary graduation had *lower* odds of depression than did those who had a postsecondary diploma or degree.

Among women, those who had some education beyond high school, but had not completed a diploma or degree, had the highest prevalence of depression; the second highest prevalence was among women who had not completed high school.

The combination of specific levels of educational attainment with age or income tended to increase the likelihood of depression among both sexes. For instance, men with some (but not completed) postsecondary education who lived in households classified as having inadequate income had increased odds of having suffered depression. For women, the combination that increased the odds was some postsecondary education and being in the 45 to 64 age range.

Chart 3

Unadjusted prevalence of depression, by sex and educational attainment, Canada, 1994-95



Source: *National Population Health Survey, 1994-95*

These associations suggest that vulnerability to depression may be associated with a discrepancy between anticipated and actual life course. Unanticipated outcomes may increase vulnerability to depression by compromising psychological resources such as self-esteem. For example, it could be argued that in the anticipated course of events, men with education beyond high school would not be in households classified as having inadequate income. For the cohort of women aged 45 to 64, education beyond high school was atypical.[12] Those women who did attend a post-secondary institution may have been more determined than their male counterparts. Consequently, not completing a postsecondary program would have been comparatively more unexpected for these women.

Depression and psychological resources

Not surprisingly, the prevalence of depression was related to psychological resources, three measures of which were included in the NPHS: sense of coherence, self-esteem, and sense of mastery (see *Psychological resources*) (Chart 4).

Psychological resources

Self-esteem measures the "positiveness" with which individuals regard themselves.[13] On a five-point scale from "strongly disagree" (score 0) to "strongly agree" (score 4), respondents to the NPHS replied to the following statements:

1. You feel that you have a number of good qualities.
2. You feel that you're a person of worth at least equal to others.
3. You are able to do things as well as most other people.
4. You take a positive attitude toward yourself.
5. On the whole, you are satisfied with yourself.
6. All in all, you're inclined to feel you're a failure (scoring reversed).

Respondents who scored 1 to 17 (12%) were considered to have very low self-esteem; 18 (23%), low self-esteem; 19 through 22 (33%), moderate self-esteem; and 23 or 24 (32%), high self-esteem. The internal consistency of the scale, measured by Cronbach's alpha, was 0.85—an adequate level for research.[14]

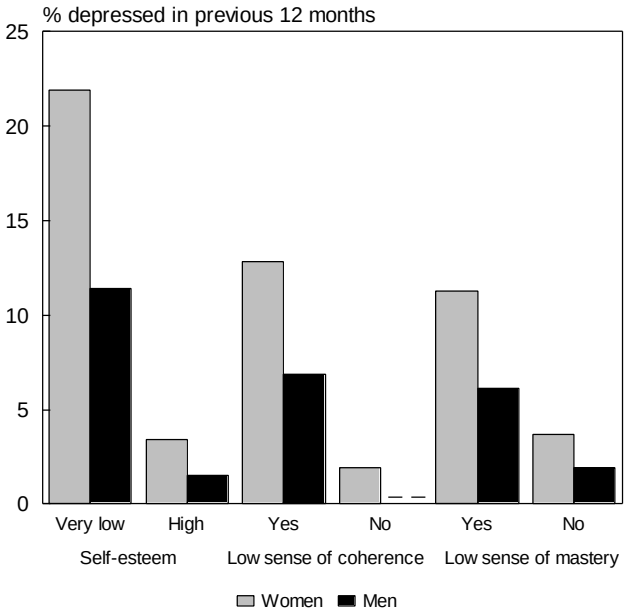
Sense of mastery measures the extent to which people believe that their life chances are under their control.[15] On a five-point scale from "strongly agree" (score 0) to "strongly disagree" (score 4), respondents replied to the following statements:

1. You have little control over the things that happen to you.
2. There is really no way you can solve the problems you have.
3. There is little you can do to change many of the important things in your life.
4. You often feel helpless in dealing with the problems of life.
5. Sometimes you feel that you are being pushed around in life.
6. What happens to you in the future mostly depends on you (scoring reversed).
7. You can do just about anything you really set your mind to (scoring reversed).

Respondents scoring 19 or less (46%) were classified as having a low sense of mastery. The scale's internal consistency estimate is adequate at 0.76.

Chart 4

Unadjusted prevalence of depression, by sex and psychological resources, Canada, 1994-95



Source: *National Population Health Survey, 1994-95*

Sense of coherence is the feeling that life is meaningful, manageable, and comprehensible (see **A Healthy Outlook** on page 25).[16] When all other factors were accounted for, the odds of reporting depression were higher for people with a low sense of coherence. (Respondents scoring 61 or less on a scale from 0 to 78—52% of all respondents—were classified as having a low sense of coherence.) Men with a low sense of coherence were almost four and half times more likely than those with a high sense of coherence to have reported depression. For women, the odds were approximately three to one.

The link between self-esteem and depression was also strong for men. Men with *very low* self-esteem were over three times more likely to have been depressed than those whose self-esteem was high. For men with *low* self-esteem, the odds were around two to one, and even those with *moderate* self-esteem had increased odds of depression (1.70 to 1.00). Very low and low self-esteem were also associated with depression among women, but less strongly, and there was no significant difference between those with moderate and high self-esteem.

By contrast, a low sense of mastery placed women at risk of being depressed, whereas for men, there was no increased risk when all other factors entered in the analysis were controlled. The odds of being depressed for women with a low sense of mastery, compared with those whose sense of mastery was higher, were 1.32 to 1.00.

The lack of psychological resources that characterized both women and men who had suffered a major depressive episode was not unexpected, as symptoms of depression are often accompanied by low self-esteem and feelings of being overwhelmed and out of control. It is, therefore, difficult to determine the direction of causality. Did lack of psychological resources contribute to depression, or did the episode of depression deplete the individual's psychological resources?

High stress—high rate of depression

Depression was associated with three measures of exposure to stress: chronic strain, recent life events, and traumatic events in childhood or early adulthood (see *Stress*) (Chart 5).

Of the three, chronic strain was most strongly related to the prevalence of depression. After all other variables entered in the analysis were controlled, men and women with a high number of chronic strains were almost twice as likely as those with few chronic strains to report a depressive episode. However, even a moderate level of chronic strain placed women at increased risk of depression, whereas this was not true for men.

The prevalence of depression was high among people if they, or someone close to them, had experienced one or more negative life events in the 12 months before the survey. After all other factors were controlled, the odds of depression for those who reported at least one recent life event, compared with those who did not, were 1.96 to 1.00 for women, and 1.68 to 1.00 for men. People who recently had such experiences may be suffering situational depression, a common reaction to an event with strong negative consequences.

Stress

To measure **chronic strain**, the NPHS asked respondents whether 11 statements were true or false.[17] A score of 1 was assigned to each "true" response. Low chronic strain was defined as a total score of 0 or 1 (44% of respondents); moderate chronic strain, 2 or 3 (34%); and high chronic strain, 4 to 11 (22%).

1. You are trying to take on too many things at once.
2. There is too much pressure on you to be like other people.
3. Too much is expected of you by others.
4. You don't have enough money to buy the things you need.
5. Your work around the home is not appreciated.
6. Your friends are a bad influence.
7. You would like to move but you cannot.
8. Your neighborhood or community is too noisy or too polluted.
9. You have a parent, a child or partner who is in very bad health and may die.
10. Someone in your family has an alcohol or drug problem.
11. People are too critical of you or what you do.

To measure **recent life events,** the NPHS asked respondents eight "yes/no" questions about events that happened to them or to someone close to them, such as a spouse or partner, child, other relative, or close friend.[18-20] Those who had experienced one or more such events in the previous 12 months (34%) were considered to have endured this kind of stress.

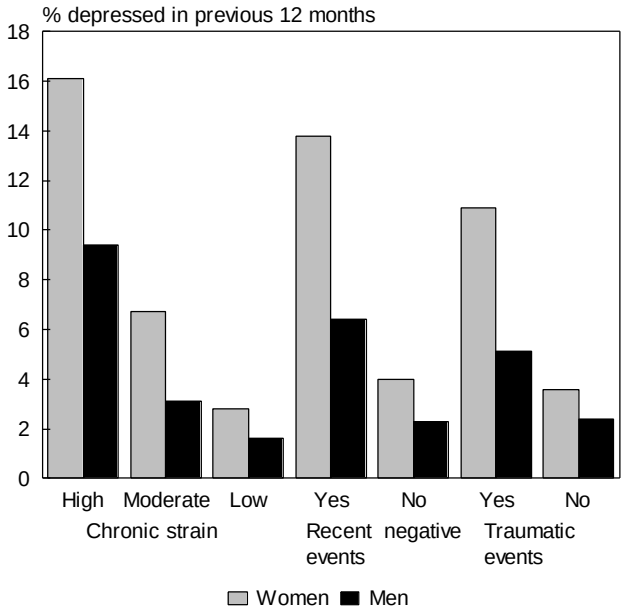
1. Was anyone of you beaten up or physically attacked?
2. Did you or someone in your family have an unwanted pregnancy?
3. Did you or someone in your family have an abortion or miscarriage?
4. Did you or someone in your family have a major financial crisis?
5. Did you or someone in your family fail school or a training program?
6. Did you (or your partner) experience a change of job for a worse one?
7. Were you (or your partner) demoted at work or did you/either of you take a cut in pay?
8. Now, just you personally, in the past 12 months, did you go on welfare?

To measure **traumatic events** during childhood or young adulthood (before leaving home), the NPHS asked seven "yes/no" questions.[21,22] Respondents with one or more "yes" replies (49%) were considered to have experienced this kind of stress.

1. Did you spend two weeks or more in the hospital?
2. Did your parents get a divorce?
3. Did your father or mother not have a job for a long time when they wanted to be working?
4. Did something happen that scared you so much you thought about it for years after?
5. Were you sent away from home because you did something wrong?
6. Did either of you parents drink or use drugs so often that it caused problems for the family?
7. Were you ever physically abused by someone close to you?

Chart 5

Unadjusted prevalence of depression, by sex and exposure to stress, Canada, 1994-95



Source: *National Population Health Survey, 1994-95*

Traumatic events in childhood or young adulthood were related to a high prevalence of depression. The odds of depression were heightened for women who reported one or more traumatic events (1.69 to 1.00). But when all other factors in the analysis were controlled, having experienced traumatic events did not significantly increase the odds of depression for men.

Lack of closeness related to depression

Social resources, that is, support from others, can buffer the effects of stress and thereby lessen the risk of depression. Social resources were assessed with five measures: scope of network, frequency of contacts, social involvement, social support, and lack of closeness (see *Social resources*) (Chart 6).

It does not take many people to render the social support that may make the difference between being depressed or not. In fact, the prevalence of depression among those with a comparatively small network of family, friends, and neighbours was virtually the same as among those with a more

Social resources

Scope of network indicates whether respondents have a link with family members who are not part of their household, with friends, and with neighbors. Anyone with at least a yearly contact in person, by phone, or by mail scored 1 for that link. Respondents with fewer than six links (42%) were classified as having a small network.

Frequency of contacts measures the average number of contacts with members of the respondent's network in the past 12 months. Possible responses were: "every day," "at least once a week," "two or three times a month," "once a month," "a few times a year," "once a year," and "never." These responses were scored from "never" and "don't have any" (score 0) to "every day" (score 6). The average was obtained by dividing the sum of these scores by the scope of network score. Respondents with an average frequency of contact of "once a month or less" (25%) were classified as having a low average frequency of contact; "two or three times a month" (40%), moderate frequency of contact; and "once or more per week" (35%), high frequency of contact.

Social involvement measures frequency of participation in associations or voluntary organizations and frequency of attendance at religious services in the last year. Respondents were asked:

1. Are you a member of any voluntary organizations or associations such as school groups, church social groups, community centres, ethnic associations or social, civic or fraternal clubs? (Yes; No - go to 3)

If " yes," respondents answered the following question on a five-point scale ("at least once a week," "at least once a month," "at least three or four times a year," "at least once a year," "not at all"):

2. How often did you participate in meetings or activities sponsored by these groups in the past 12 months? If you belong to many, just think of the ones in which you are most active.

They were also asked:

3. Other than on special occasions (such as weddings, funerals or baptisms), how often did you attend religious services or religious meetings in the past 12 months?

Questions 2 and 3 were scored from 0 ("not at all") to 4 ("at least once a week"). Respondents who scored 0 (33%) had low social involvement; from 1 to 3 (31%), moderate social involvement; and 4 or more (36%), high social involvement.

Four "yes/no" questions measured **social support**. Those who answered "no" to one or more questions (17%) were classified as lacking social support.

1. Do you have someone you can confide in, or talk to about your private feelings or concerns?
2. Do you have someone you can really count on to help you out in a crisis situation?
3. Do you have someone you can really count on to give you advice when you are making important personal decisions?
4. Do you have someone who makes you feel loved and cared for?

Lack of closeness was assessed with two "true/false" questions: one for people who were married, living with a partner or in a common-law union, and one for people who were single, widowed, divorced or separated.[23] Respondents who answered "yes" (20%) were classified as lacking closeness.

1. Your partner doesn't understand you.
2. You find it is very difficult to find someone compatible with you.

extensive network. More important was the frequency of contact with the people in a social network—depression was more prevalent among those reporting a low average number of contacts in the 12 months before their interview than among those with a high number of contacts. The pattern was similar for social involvement, which refers to participation in associations and voluntary organizations, and attendance at religious services.

Social support is having someone to confide in, count on in a crisis, consult for advice, and who makes one feel loved and cared for. Women and men with low social support were more likely than

depression and set in motion a downward spiral of deteriorating personal, psychological, and social resources. Future cycles of the NPHS will help clarify the dynamics of some of these relationships.

The logistic regression model cannot be used as a screening device. Although the model would not miss many people with depression, it would also identify a large number, particularly women, who upon closer scrutiny would not meet the criteria. For men, in about three out of four cases, knowledge of the variables included in the model would lead to a correct determination of whether a person had experienced an episode of depression. However, the model would correctly classify slightly over half of women—the rest would be misclassified, and the error would be in the direction of predicting a major depressive episode when none occurred. Therefore, other variables are needed to improve the fit of the model for women.

Nonetheless, the logistic regression indicates that when all other variables in the model are controlled, each of the following increased the risk of depression for both men and women: being young (aged 18 to 24), being previously married, a high number of chronic strains, recent negative life events, a low sense of coherence, low self-esteem, and a lack of closeness. However, the extent of the effect of a particular variable on the odds of depression differed for men and women. For instance, while high chronic strain increased the risk for both sexes, a moderate level also did so for women, but not men. Self-esteem was more important for men. Whereas having very low or low self-esteem heightened the odds of depression for both sexes, a moderate level also increased the odds for men but not for women.

Finally, some variables were associated with depression for one sex, but not the other. For example, traumatic events in childhood or young adulthood and a low sense of mastery were significant risk factors for women but not men. By contrast, being single was a significant risk factor for depression among men but not women.

Acknowledgement

The author thanks Gary Catlin for his support and insightful comments.

References

1. Kessler RC, McGonagle KA, Zhao S, Nelson CB et al. Lifetime and 12-month prevalence of DSM-III-R psychiatric disorders in the United States: Results from the National Comorbidity Survey. *Archives of General Psychiatry* 1994; 51: 8-19.

2. American Psychiatric Association. *Diagnostic and Statistical Manual of Mental Disorders*, Revised, 3rd edition. Washington: D.C.: 1987.

3. Bland RC, Newman SC, Orn H. Period prevalence of psychiatric disorders in Edmonton. *Acta Psychiatrica Scandinavica* 1988*;* 77 (suppl. 338): 33-42.

4. Kovess V, Murphy HBM, Tousignant M. Urban-rural comparisons of depressive disorder in French Canada. *Journal of Nervous and Mental Disease* 1987; 175: 457-66.

5. Weissman MM, Leaf PJ, Tischler GL, Blazer DG et al. Affective disorders in five United States communities. *Psychological Medicine* 1988; 18: 141-83.

6. Weissman MM, Kierman GL. Sex differences and the epidemiology of depression. *Archives of General Psychiatry* 1987; 34: 98-110.

7. Kessler RC, McRae JA. Trends in sex and psychological distress. *American Sociological Review* 1981; 46: 443-52.

8. Canadian Mental Health Association. *Depression: An overview of the literature*. Ottawa: 1995.

9. Stoppard JM. *Interdisciplinary perspectives on sex-related differences in depression: Implications for theory, research, and policy*. Ottawa: National Health Research and Development Program, 1990.

10. Hosmer DW, Lemeshow S. *Applied logistic regression*. New York: John Wiley & Sons, 1989.

11. Eaton WW. Life events, social supports, and psychiatric symptoms: A reanalysis of the New Haven data. *Journal of Health and Social Behavior* 1978; 19: 230-4.

12. Statistics Canada. *Educational attainment and school attendance* (Catalogue 93-328) Ottawa: Minister of Industry, Science and Technology, 1993.

13. Rosenberg M. *Society and the adolescent self-image*. Princeton: Princeton University Press, 1965.

14. Nunnally JC. *Psychometric theory*, 2nd edition. New York: McGraw-Hill Book Company, 1978.

15. Pearlin LI, Lieberman M, Menaghan E, Mullan J. The stress process. *Journal of Health and Social Behavior* 1981; 22: 337-56.

16. Antonovsky A. The structure and properties of the sense of coherence scale*. Social Science and Medicine* 1993; 36(6): 725-33.

17. Wheaton B. Chronic stress: Models and measurement. Paper presented at the Society for Social Problems meetings in Cincinnati, Ohio, 1991.

18. Turner RJ, Avison WR. Innovations in the measurement of life stress: Crisis theory and the significance of event resolution. *Journal of Health and Social Behavior* 1992; 33: 36-51.

19. Avison WR, Turner RJ. Stressful life events and depressive symptoms: Desegregating the effects of chronic stress and eventful stressors. *Journal of Health and Social Behavior* 1988; 29: 253-64.

20. Dohrenwend BS, Krasnoff L, Askenasy AR, Dohrenwend BP. Exemplication of a method for scaling life events. The PERI Life Events Scale. *Journal of Health and Social Behavior* 1978; 19: 205-29.

21. Wheaton B. Sampling the stress universe. In Avison WR, Gotlib IH (eds.), *Stress and mental health: Contemporary issues and prospects for the future*. New York: Plenum Publishing, 1994.

22. Turner RJ, Wheaton B, Lloyd D. The epidemiology of social stress. *American Sociological Review* 1995; 60: 104-25.

23. House JS, Kahn RL. Measures and concepts of social support. In Cohen S, Syme LS (eds.), *Social support and health*. Orlando, Florida: Academic Press Inc., 1995.

24. Avison WR, Gotlib IH. *Parental mental health and its consequences for children: A review of protective and risk factors*. Ottawa: Health and Welfare, Canada, 1990.

Appendix

Prevalence estimates associated with 0.90 probability of diagnosis of depression and unadjusted odds ratios, by sex, Canada, 1994-95

	Women			Men		
	% with depression[†]	Unadjusted odds ratio	95% confidence interval[‡]	% with depression[†]	Unadjusted odds ratio	95% confidence interval[‡]
Personal characteristics						
Age						
18-24	10.8	3.8	2.7-5.5	6.6 Q	3.8	2.2-6.8
25-44	8.6	3.0	2.2-4.1	3.5	2.0	1.2-3.3
45-64	6.3	2.1	1.5-3.0	3.5	2.0	1.1-3.4
65+[§]	3.1 Q	...	...	--	...	...
Marital status						
Never married	10.6	1.9	1.5-2.3	6.2	2.9	2.2-3.8
Previously married	9.0	1.6	1.3-1.9	8.1 Q	3.9	2.7-5.5
Married[§]	5.9	...	...	2.2	...	...
Education						
Less than secondary graduation	7.6	1.3	1.0-1.6	2.9 Q	0.7	0.5-1.0
Secondary graduation	6.4	1.0	0.8-1.4	4.0	1.0	0.7-1.5
Some postsecondary	9.2	1.6	1.3-1.9	3.8	1.0	0.7-1.4
Postsecondary graduation[§]	6.1	...	...	3.9	...	...
Household income						
Inadequate	10.1	1.6	1.3-1.9	6.4 Q	2.0	1.5-2.7
Adequate[§]	6.7	...	...	3.3	...	...
Main activity						
Employed						
Yes[§]	6.9	...	...	3.2	...	...
No	7.9	1.2	1.0-1.4	4.4	1.4	1.1-1.8
Caring responsibilities						
Yes	6.9	0.9	0.7-1.2	--	--	--
No[§]	7.4	...	...	3.6	...	...
In school						
Yes	10.7 Q	1.5	1.0-2.3	--	--	--
No[§]	7.2	...	...	3.6	...	...
Unemployed						
Yes	9.1 Q	1.3	0.8-1.9	--	--	--
No[§]	7.3	...	...	3.4	...	...
Retired						
Yes	3.8 Q	0.5	0.3-0.6	--	--	--
No[§]	8.0	...	...	3.9	...	...
Recovering from illness or on disability	23.4	4.3	3.3-5.6	--	--	--
Yes	6.6	...	...	3.4	...	...
No[§]						
Living arrangements						
Alone	7.7	1.1	0.9-1.3	6.9 Q	2.2	1.6-3.0
With others[§]	7.3	...	...	3.2	...	...
Lone parent						
Yes	14.7	2.3	1.8-3.0	--	--	--
No[§]	6.9	...	...	3.6	...	...

	Women			Men		
	% with depression[†]	Unadjusted odds ratio	95% confidence interval[‡]	% with depression[†]	Unadjusted odds ratio	95% confidence interval[‡]
Psychological resources						
Low sense of coherence						
No[§]	1.9	...	...	--	...	...
Yes	12.8	7.5	5.9-9.4	6.9	10.8	7.0-16.5
Self-esteem						
Very low	21.9	7.9	6.1-10.1	11.4	8.6	5.7-13.0
Low	6.2	1.8	1.4-2.4	3.8 Q	2.7	1.7-4.1
Moderate	5.8	1.7	1.3-2.3	3.4	2.3	1.5-3.5
High[§]	3.4	...	...	1.5 Q	...	...
Low sense of mastery						
No[§]	3.7	...	...	1.9	...	...
Yes	11.3	3.3	2.7-3.9	6.1	3.3	2.5-4.3
Stress						
Chronic strain						
Low[§]	2.8	...	...	1.6 Q	...	...
Moderate	6.7	2.7	2.1-3.4	3.1	2.0	1.4-2.9
High	16.1	6.8	5.4-8.5	9.4	6.5	4.6-9.0
Recent life events						
No[§]	4.0	...	...	2.3	...	...
Yes	13.8	3.9	3.3-4.6	6.4	2.9	2.3-3.8
Traumatic events						
No[§]	3.6	...	...	2.4	...	...
Yes	10.9	3.3	2.7-3.9	5.1	2.2	1.7-2.9
Social resources						
Small scope of network						
No[§]	7.4	...	...	3.5	...	...
Yes	7.3	1.0	0.9-1.2	3.9	1.1	.09-1.4
Frequency of contacts						
Low	10.4	1.9	1.6-2.4	4.9	1.7	1.2-2.3
Moderate	7.2	1.3	1.1-1.6	3.3	1.1	0.8-1.5
High[§]	5.7	...	...	3.0 Q	...	...
Social involvement						
Low	9.7	2.0	1.6-2.5	4.5	1.7	1.2-2.3
Moderate	7.8	1.6	1.3-2.0	3.8	1.4	1.0-2.0
High[§]	5.1	...	...	2.7 Q	...	...
Low social support						
No[§]	6.4	...	...	2.8	...	...
Yes	12.6	2.1	1.7-2.5	6.9	2.6	2.0-3.3
Lack of closeness						
No[§]	5.4	...	...	2.5	...	...
Yes	14.5	3.0	2.5-3.5	8.5	3.6	2.8-4.7

Source: *National Population Health Survey, 1994-95*

Q Estimates subject to high sampling variability.

[†] *Based on sample weights.*

[‡] *Based on adjusted weights which average to 1.0.*

[§] *Indicates reference category.*