

Depression: An undertreated disorder?

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Abstract

In 1994, an estimated 6% of Canadians aged 18 and over—1.1 million adults—experienced a Major Depressive Episode (MDE). Although depression is amenable to treatment, fewer than half (43%) the people who met the criteria of having experienced an MDE in the past year (approximately 487,000) reported talking to a health professional about their emotional or mental health. Furthermore, only 26% of those who had an MDE reported four or more such consultations.

As expected, depression that was not chronic was more likely to be untreated. In addition, MDE sufferers whose physical health was good and those who had not recently experienced a negative life event were less likely to be treated. However, after controlling for these factors, a multivariate model suggests that lower educational attainment and inadequate income acted as barriers to treatment. Relatively few contacts with a general practitioner substantially reduced the odds of being treated. Also, men and married people who were depressed were less likely to receive treatment.

With data from Statistics Canada's 1994-95 National Population Health Survey (NPHS), this article examines the characteristics of people who met the criteria for having had an MDE, but who discontinued or did not receive treatment. The selection of explanatory variables was informed by an established theoretical framework of individual determinants of health service utilization, proposed by Andersen and Newman. Logistic regression was used to predict the probability of not being treated among people who experienced an MDE.

Key words: depressive disorder, treatment, mental health services, help-seeking

Depression touches the lives of many Canadians. According to Statistics Canada's 1994-95 National Population Health Survey (NPHS), approximately 6% of people aged 18 and over—1.1 million adults—had experienced a major depressive episode (MDE) in the 12 months before the survey (see *Major depressive episode*).

Although depression is one of the mental disorders most amenable to treatment,¹ just 43% of people identified by the NPHS as having experienced an MDE (about 487,000 adults) reported talking to a health professional about emotional or mental health in the same period. Furthermore, only 26% of people who experienced an MDE reported more than three consultations, a level of contact defined here as "receiving treatment" (see *Methods and Limitations*).

An MDE is characterized by a depressed mood and/or lack of interest in most activities lasting at least two weeks. The symptoms include appetite or sleep disturbance, decreased energy, difficulty concentrating, feelings of worthlessness, and/or suicidal thoughts.

Major depressive episode

Using the methodology of Kessler et al.,² the NPHS identifies a major depressive episode (MDE) with a subset of questions from the Composite International Diagnostic Interview (see *Appendix A*). These questions cover a cluster of symptoms for depressive disorder, which are listed in the Diagnostic and Statistical Manual of Mental Disorders.³ Responses to these questions were scored on a scale and transformed into a probability estimate of a diagnosis of MDE. If this estimate was 0.9, that is, 90% certainty of a positive diagnosis, then the respondent was considered to have experienced an MDE in the previous 12 months.

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Methods

Data source

The data are from the 1994-95 National Population Health Survey (NPHS), a longitudinal survey that measures the health status of the Canadian population. The NPHS will interview the same panel of respondents every two years for up to two decades. Data collection for the first wave began in June 1994 and finished in the summer of 1995.

The target population is household residents in all provinces and territories, except persons living on Indian reserves, on Canadian Forces bases, or in some remote areas. The final sample size was 27,263 households after including provincial buy-ins and households eligible to be rejected. The final response rate (the proportion of selected households agreeing to participate, including households later rejected for sampling reasons) was 89%. An institutional component of the NPHS covers long-term residents of hospitals and residential care facilities. Data from the institutional component are not included in this analysis. As well, data from the Northwest Territories and the Yukon were not available at the time of analysis.

The household survey collects most of the information from an adult household member knowledgeable about the health of all members of the household. In-depth health information is also collected from a randomly selected household member. For the core sample, these randomly selected individuals become members of the longitudinal panel and will be re-interviewed every two years. Among randomly selected respondents, the response rate was 96%. Further information about NPHS content and sample design are described elsewhere.^{4,5}

NPHS respondents were asked, "In the past 12 months, have you seen or talked on the telephone to a health professional about your emotional or mental health?", followed by "How many times (in the past 12 months)?"

Analytical techniques

Treatment for depression can be sought through psychotherapy (counselling) or pharmacotherapy (medication). Pharmacotherapy in conjunction with psychotherapy has traditionally been used for moderate to severe depression, while psychotherapy has been used in less severe cases. A combination of both methods is becoming increasingly common, even for less severe episodes of depression.⁶ Experts recognize three treatment phases: acute, continuation, and maintenance.^{7,8} The acute treatment phase lasts six to 12 weeks, typically involving at least four visits: diagnosis, initiation of treatment, monitoring, and response assessment.^{7,8} When anti-depressants are prescribed, regular monitoring is also advised.⁶

In accordance with these criteria, in this article, treatment for depression is defined as *at least four* consultations with a health professional about emotional or mental health in the previous year. Three-quarters of MDE sufferers were below this threshold. Depression sufferers with fewer than four contacts include people who "sought" as opposed to "received" treatment, those who discontinued treatment, and people who reported no contact. Together, they make up the untreated group.

To identify the characteristics of people who experienced an MDE but did not receive treatment, a number of demographic and socioeconomic variables, health care utilization indicators, health status indicators, and psychological factors were considered.^{9,10} The selection of these explanatory variables was guided by an established theoretical framework of individual determinants of health service use, proposed by Andersen and Newman.¹¹ This framework assumes that choosing health care services is associated with a need for treatment, the ability to negotiate the health care system, and a predisposition to use the services (see *Appendix B*).

The first component of the framework, a need for treatment, what Andersen and Newman call "signalling characteristics," stems from the severity of an illness, the probability of its recurrence, and the ability to cope with its symptoms without treatment. A need for treatment may be recognized by the individual affected, those who know the individual, or by a health care provider. In the case of depression, some people may be able to cope without treatment. For those who are less able, unless the symptoms recur or are long-lasting, a need for treatment may not be easily discernible. Thus, the people who tend to not receive treatment are likely to be those whose circumstances, behaviour, and demeanour suggest that they have no need for it. The variables selected to measure the importance of need were chronic depression (yes, no), chronic strain (high, moderate, low), recent negative life events (yes, no), employment status (working, not working), self-rated health (poor or fair, good or very good, excellent), and level of recreational physical activity (inactive, moderate, active).

The second component of the framework, factors associated with the ability to secure health care services (Andersen and Newman's "enabling conditions"), measures access to, awareness of, and a willingness to seek treatment. Depression sufferers with few enabling factors may have more difficulty accessing the health care system, and consequently, may not receive treatment. The variables selected to measure the role of enabling conditions were educational attainment (high school diploma or less, more than high school education), household income (adequate, inadequate), social isolation (yes, no), and number of visits and/or telephone consultations with a general practitioner in the past year (0-2, 3-5, 6+).

The third component of the framework consists of inherent traits that existed before the onset of a specific illness. Andersen and Newman call these "predisposing characteristics" in that they may indicate a propensity toward, but are not directly responsible for, the use of health services. The predisposing characteristics selected for this analysis were age, sex, and marital status.

Analysis was performed using a logistic regression model predicting the probability of not receiving treatment for depression based on these variables measuring signalling characteristics, enabling conditions, and predisposing characteristics.

As a result of experimentation with different combinations of the explanatory variables, with different size categories for age and health care utilization, and with various interaction terms, several variables were dropped from the original model because of high levels of non-response, or because of their overlap with selected variables. These variables were urban/rural residence, living arrangements (alone or with others), overnight hospital stays, and use of alternative health care. To investigate possible inter-province differences in treatment, province of residence was considered as an independent variable; results were non-significant, and this was also dropped. Interaction terms between sex and age, sex and marital status, and income and education did not contribute significantly to the model.

A total of 972 respondents aged 18 and over had suffered an MDE in the 12 months before they were interviewed. The analysis was based on the 919 respondents about whom information on all the selected variables was available. Of this group, 234 (26%) had received treatment, and 685 (74%) had not.

Responses were weighted using the survey weights. Because of the complex multi-cluster sample design of the NPHS, the standard errors are underestimated. The jackknife approach to the estimation of the variance was used to calculate the confidence intervals for the odds ratios of the logistic regression.¹²⁻¹⁵ The residual chi-square (a measure of how well the model fits the data), after backward elimination and using weights that were normalized, was 6.4 with 7 degrees of freedom ($p=0.49$).

A recent analysis of NPHS data revealed that women were twice as likely as men to have been depressed, and that young people were more likely than older people to have been depressed.¹⁶ This study also found that being previously married, being exposed to considerable stress, and having few psychological resources increased the odds of experiencing an MDE. However, the characteristics associated with experiencing an MDE are not necessarily the same as those that are related to seeking professional help with emotional or mental disorders.

Typically, studies of the use of health care services for an emotional or mental disorder focus on patients who receive treatment. By relying mainly on hospital and other administrative data, these studies have been able to determine the characteristics of people who are treated. However, little information is available about those who are not treated. This is particularly true for depression, since many people who suffer from it do not receive treatment.¹⁷

Some MDE sufferers who do not receive treatment likely do not need it. They may have had non-recurring symptoms, a relatively short depressive episode, or are better able to cope. Others, however, would likely benefit from treatment.

This article uses data from the first wave of the NPHS to determine factors associated with not being treated for depression. It compares untreated MDE sufferers with those who received treatment.

The burden of suffering and the economic, social, and personal costs of depression are staggeringly high.¹ Depression tends to reduce immune status¹⁸ and quality of life, and often interferes with work productivity and relationships. Identifying the characteristics of those who do not receive treatment provides information that may be helpful in reaching this group.

Non-chronic depression

People who suffered a major depressive episode, but whose depression was not chronic, had odds of being untreated nearly double those of people whose

depression was chronic (odds ratio 1.9) (Table 1). For this analysis, chronic depression was defined as more than four weeks of symptoms in the past year, as opposed to the two weeks necessary to qualify as an MDE.

It is not surprising that people who had an MDE, but were not chronically depressed, were more likely to be untreated. As is the case with most health problems, those that persist or recur are most likely to be treated. Moreover, symptoms of depression are not always evident, particularly if they are relatively short-lived.

No recent negative life events

Depressed individuals in circumstances that increase their vulnerability—for instance, a major financial crisis, a demotion at work—are less likely to be untreated than are depression sufferers who do not report a recent negative life event. In fact, people who suffered an MDE but did not report a negative life event in the last year had higher odds of being untreated than did those reporting such an event (odds ratio 1.7).

The absence of such a signalling characteristic may be a deterrent to seeking and remaining in treatment. Negative life events are seen as legitimate reasons for being depressed, so the stigma often associated with receiving care for emotional problems may be reduced. The fact that these events are readily identifiable as a source of depression may also legitimize the seeking of care.

Otherwise healthy

People in poor health are at a relatively high risk of becoming depressed.^{18,19} For someone whose health is failing, depression may arise out of helplessness or despair, especially if the condition is chronic or terminal. Thus, illness, like recent negative life events, can signal an increased risk of depression. General practitioners and other health care providers are aware of this, and since they are likely to be in frequent contact with people whose physical health has been compromised, they can identify and refer patients with MDE symptoms. By contrast, depressed people who are in

Limitations

This analysis has several important limitations. The item identifying respondents who had at least four contacts with a health professional about mental or emotional problems in the 12 months before the survey, does not necessarily refer to contacts triggered by a depressive episode. Therefore, it is possible that the treatment received was not in response to the identified MDE. Nonetheless, it is likely that the majority of people who experienced an MDE in that period, and who had four or more contacts with health care professionals about mental or emotional health, were receiving treatment for depression.

The broadness of the question used to measure contact with a health professional required a judgment about what constituted treatment. At this time, there are no published clinical practice guidelines in Canada for the treatment of depression, although experts recommend close monitoring of patients through regular contacts, whether medication is prescribed or not.⁶⁻⁸ The selection of four visits to a health professional regarding emotional or mental health as the threshold for receiving treatment was to ensure that the group deemed to be receiving treatment was actually doing so. Respondents who had an MDE but fewer than four contacts during the year, were likely to be "untreated," and were, therefore, classified as such.

To determine whether three or fewer contacts with a health professional about emotional or mental health was a reasonable cut-off for non-treatment, the analysis was also performed using zero, one or no, two or fewer, and four or fewer contacts as the threshold. The profiles of depression sufferers who did not receive treatment were somewhat different if no contacts or one or fewer contacts during the year was used as the threshold for non-treatment, rather than two or fewer, three or fewer, or four or fewer. At the one or no contact cut-off, three variables—age, employment status, and social isolation—were significant, although this was not the case at higher contact thresholds (data available from the authors).

Another limitation is the difficulty of assessing the degree of bias introduced by inaccurate recall and self-reporting. Respondents may have over- or underestimated the significance of events or feelings from their past. They may have recalled inaccurately when contact with a health professional was made or the precise number of encounters. Investigations of reporting error in recalling such past events have been inconclusive.^{20,21} In addition, some respondents may not have reported contacts with health care providers such as social workers and marriage counsellors, while others reported them.

The fact that the MDE could have occurred any time in the previous 12 months means that by the date of the NPHS interview, the behaviour, characteristics, and life circumstances of some people who had suffered a depressive episode several months earlier had changed. For instance, respondents who were no longer depressed and who described their health as good when they were interviewed might have had a less favourable self-assessment during or shortly after their MDE.

Survey and item non-response also constitute potential problems. Non-response in the NPHS was caused primarily by refusals or by interviewers' inability to contact selected respondents. This is of particular interest in the case of depression. It is possible that some non-respondents were depressed, but were unwilling to complete the survey because of the personal and probing nature of some questions. Consequently, non-response may not be random.

good physical health, and thus have the outward appearance of functioning well, are less likely to receive treatment.

Successively better health states were associated with declining odds of receiving treatment for depression. People who had experienced an MDE and who rated their health as good or very good had odds of being untreated double those of people in poor or fair health (odds ratio 2.2). This finding holds as self-rated health status improves. Only a small number of people with excellent physical health had experienced an MDE. Nonetheless, their odds of not receiving treatment were five times those of MDE sufferers in poor or fair health. People who rate their physical health highly may fail to recognize, or may be unwilling to acknowledge, that their emotional health is poor. On the other hand, they may also be better equipped to cope with a depressive episode.

Exercise

In this analysis, the relationship between recreational physical activity and receiving treatment for depression is not clear-cut. Other studies, among them a report from the U.S. Surgeon General, have found exercise to be associated with improvements in mental health.²²⁻²⁴ Given this evidence, exercise might be expected to reduce and/or control depressive symptoms, and consequently, decrease the need for treatment. However, data from the NPHS indicate that people who experienced an MDE and who described themselves as active had odds of being untreated that were not significantly different from those who reported themselves as inactive. By contrast, MDE sufferers who were moderately physically active were untreated at a rate that was half that of inactive people (odds ratio 0.5). In other words, moderately physically active people who were depressed were more likely to have received treatment.

This somewhat unexpected result may be attributable to the measure of physical activity used here. It is not a comprehensive measure, in that it pertains only to recreational activity and excludes physical activities at work or in travelling to and from work.

Lower educational attainment and low household income

When other factors were controlled, relatively low educational attainment was associated with the likelihood of not receiving treatment for depression. MDE sufferers whose education had not extended beyond high school had odds of not receiving treatment twice those of people with higher attainment (odds ratio 2.0). People with less education may have limited information on depression, its symptoms, and the effectiveness of treatment. As well, social differences between themselves and “better-educated” health professionals may deter them from seeking treatment.²⁵

Inadequate household income was also related to being untreated for depression. People from households with inadequate income had odds more than double those of people living in households with adequate income of not receiving treatment (odds ratio 2.1).

Income, like education, may be a barrier to treatment. The choices for people with inadequate incomes are restricted to services covered by provincial health care plans. In all provinces, individuals who seek care for mental or emotional problems will receive treatment if it is medically necessary.²⁶ But for those without additional insurance coverage, restrictions in the type of health care providers and the costs of prescriptions can be additional deterrents to initiating or continuing treatment.

Relatively few contacts with general practitioners

Not surprisingly, MDE sufferers who frequently consult general practitioners were more likely to receive treatment for depression.^a Conversely, those with

^a The definition of receiving treatment for depression used in this analysis—four or more contacts with a health professional about emotional or mental health—could include general practitioners, since family doctors and internists are often called upon to diagnose and treat depression.²⁷ While the extent of overlap between contacts with a general practitioner and contacts with a health professional about emotional or mental health cannot be determined, the correlation suggests that it is not large ($r=0.23$, calculated using continuous measures of these two variables). If the extent of overlap was large, the correlation coefficient would be 0.7 or greater, explaining at least half the variance.

Table 1

Odds ratios for MDE sufferers being untreated for depression, Canada, 1994-95

Variable	% untreated	Odds ratio	95% confidence interval
Signalling characteristics			
Chronic depression			
Yes [†]	68.3	1.0	...
No	83.7	1.9*	(1.1, 3.4)
Chronic strain			
Low	76.6	1.1	(0.5, 2.5)
Moderate	77.5	1.2	(0.7, 2.1)
High [†]	71.3	1.0	...
Recent negative life event(s)			
Yes [†]	71.0	1.0	...
No	80.7	1.7*	(1.0, 3.2)
Employment status			
Not working	70.3	0.7	(0.4, 1.3)
Working [†]	77.0	1.0	...
Self-rated health			
Poor or fair [†]	61.3	1.0	...
Good or very good	77.2	2.2*	(1.2, 3.9)
Excellent	88.7	5.4*	(2.0, 15.1)
Recreational physical activity			
Inactive [†]	74.7	1.0	...
Moderate	67.9	0.5*	(0.3, 0.9)
Active	80.1	0.9	(0.5, 1.7)
Enabling conditions			
Educational attainment			
Some postsecondary or more [†]	70.1	1.0	...
High school diploma or less	80.3	2.0*	(1.3, 3.3)
Household income			
Adequate [†]	73.7	1.0	...
Inadequate	75.9	2.1*	(1.2, 3.6)
Social isolation			
No [†]	72.5	1.0	...
Yes	78.4	1.5	(0.9, 2.7)
Number of visits to general practitioner			
0-2	82.8	2.3*	(1.2, 4.3)
3-5	80.8	2.6*	(1.5, 4.3)
6+ [†]	61.2	1.0	...
Predisposing characteristics			
Age			
18-29	79.3	1.0	(0.3, 3.5)
30-44	71.6	0.6	(0.2, 2.0)
45-59	69.7	0.7	(0.2, 2.1)
60+ [†]	79.5	1.0	...
Sex			
Female [†]	70.2	1.0	...
Male	83.0	1.8*	(1.1, 3.1)
Marital status			
Married/With partner	76.0	2.1*	(1.2, 3.6)
Never married	78.4	1.4	(0.7, 2.8)
Previously married [†]	64.5	1.0	...

Source: National Population Health Survey, 1994-95

Note: Sample size= 919. Analysis excludes 53 depressed respondents (5.4%) for whom information was missing on one or more of the variables included in the analysis.

[†] Identifies the reference category, for which the odds ratio is always 1.00.

... Figures not appropriate or not applicable.

* $p \leq 0.05$.

relatively few contacts were less likely to receive such treatment. After controlling for other factors, including health status, the odds that depressed persons with fewer than six visits to a general practitioner in the previous year would not receive treatment for depression were more than twice those of people reporting six or more visits.

The finding that less frequent users of the health care system are less likely to receive treatment appears obvious but hides a number of underlying factors. Some of these people may have been able to overcome their depressive episode without treatment. Others who rarely use the health care system may not see it as offering a solution to their emotional problems. They may not recognize that they are ill, or may not know that their illness is treatable. And for some, the system may be intimidating. Thus, less frequent use reduces the likelihood of being recognized, diagnosed, and treated or referred for treatment by the general practitioner. And in turn, relatively few contacts with health care providers may amplify a lack of familiarity, further reducing the likelihood of treatment for depression.

Men and married people less likely to be treated

Men were only about half as likely as women to have suffered an MDE.^{1,16} And when they were depressed, men were less likely to be treated. When other factors were controlled, men had higher odds of not receiving treatment than did women (odds ratio 1.8) .

As well, married people who suffered an episode of depression were less likely to be treated than were previously married people (odds ratio 2.1). Perhaps the support of a partner is substituted for formal treatment by a health care professional. Alternatively, a partner may discourage entering and continuing treatment.

Non-significant factors

A number of variables that might reasonably have been expected to be associated with not receiving treatment for depression were not significant. These factors are age, employment status, chronic strains, and social isolation.

While the prevalence of depression varied substantially with age, the odds of being untreated did not.¹⁶ Young adults who experienced an MDE were no more likely than people in middle life or the elderly to be untreated.

The association between treatment for depression and employment status might be anticipated to be similar to that for health status and negative life events. That is, depression sufferers who are employed might regard themselves, and be regarded by others, as functioning well, so their need for treatment would be less likely to be identified. Additionally, members of the paid workforce tend to have less time to devote to treatment, which can be lengthy. And for some people, prescribed medications may interfere with job performance. Yet despite these considerations, the odds that an employed person who suffered an MDE would not receive treatment were no greater than those for people who were not employed. It may be that the availability of private insurance and employee assistance programs to people who are employed offsets these potential deterrents to treatment. The finding of non-significance may also be due to the positive correlation between the two dichotomous variables, employment and income ($r = .36$).

Like recent negative life events, chronic strain increases vulnerability to depression, and may also be seen as a legitimate reason for treatment. Consequently, people who had an MDE but were found to have little chronic strain might be expected to have higher odds of being untreated than those confronting a high level of strain. But unexpectedly, the degree of chronic strain bore little relationship to the odds of not receiving treatment.

A weak support network of family and friends might also be thought of as a barrier to treatment for depression. Without family and friends to offer encouragement and support, a person suffering from depression might not seek or remain in treatment. By contrast, a weak support network may increase the need for treatment. These conflicting effects may cancel each other out, because when other factors were controlled, depression sufferers who were socially

isolated were no more or less likely to be untreated than were those with a stronger network of family and friends.

Implications

Some of the results of this analysis were anticipated. For instance, people who had an MDE but for whom depression was not chronic, or who did not experience a negative life event in the past year, were less likely to receive treatment than those whose depression was chronic or who had experienced a recent negative life event. Similarly, depression sufferers whose assessment of their own health ranged from good to excellent were more likely than those in poor health to be untreated. In other words, people who did not "signal" a need for treatment were more likely to remain untreated.

Other results of the analysis are important in the context of the Canadian health care system, whose mandate is to provide equal access to medically necessary treatment.²⁸ People who experienced an MDE and had relatively little formal education were more likely to be untreated. Inadequate income, too, may be a barrier to treatment in that the choice of providers may be restricted to those whose services are covered by provincial health care plans. As well, inadequate incomes may preclude the purchase of medications. MDE sufferers who had comparatively few contacts with general practitioners were more likely to be untreated, possibly because they are unaccustomed to seeking help from health professionals. Fewer contacts with general practitioners may also lessen the chances of being diagnosed with depression, and further limit access to mental health care providers.

Finally, some results of the analysis were surprising. For example, the amount of chronic strain an individual reported was not associated with receiving treatment. Nor was being employed, a potential source of private insurance or help via an employee assistance program. As noted earlier, this may have been the result of the association of income and employment status. As well, the age of people who were depressed had little to do with whether they would be treated.

The model used here should be viewed as a preliminary exploration of relationships. Future work should focus on identifying measures that will make the model more complete, such as the availability and use of employee assistance programs and private insurance for the treatment of mental disorders. A clearer and more comprehensive measure of treatment should also be developed. Finally, it is possible to assess the reliability and validity of self-reported contact measures used in the NPHS by linking them to administrative data including fee-for-service and reimbursed contacts with health care professionals.

Despite the limitations of the data, especially the broadness of the dependent variable, this study is the only current analysis based on a national Canadian sample of the characteristics of people who experienced an MDE but who did not receive treatment. While it serves to identify depression sufferers who did not receive treatment, it cannot identify those in need of treatment, although this analysis suggests that there may be many. It is appropriate, then, to say only that depression is undertreated in Canada, but not by how much.

Acknowledgments

The authors thank Gary Catlin, Cécile Dumas, and Doug Norris for their helpful suggestions.

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Appendix A

Questions used to identify a Major Depressive Episode (MDE)

The following National Population Health Survey (NPHS) questions are a subset from the Composite International Diagnostic Interview. These questions cover a cluster of symptoms for a depressive disorder, which are listed in the *Diagnostic and Statistical Manual of Mental Disorders (DSMIII-R)*.³ The question numbers refer to those used in the NPHS questionnaire. There are three possible paths through the questions:

- (1) "yes" to Q2, then Q3 to Q13
 - (2) "no" to Q2, "yes" to Q16, then Q17 to Q26
 - (3) "no" to Q2 and "no" to Q16
- Q2. 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 Q3; No - go to Q16]
- Q16. 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 Q17; No - end]
- Q3 or Q17. For the next few questions, please think of the two-week period during the past 12 months/ (Q3) when these feelings were worst/ (Q17) when 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 of the day]
- Q4 or Q18. How often did you feel this way during those two weeks? [Every day; Almost every day; Less often]
- Q5. During those two weeks did you lose interest in most things? [Yes; No]
- Q6 or Q19. Did you feel tired out or low on energy all of the time? [Yes; No]
- Q7 or Q20. Did you gain weight, lose weight or stay about the same? [Gained weight; Lost weight; Stayed about the same; Was on a diet]
- Q8 or Q21. About how much did you (gain/lose)?
- Q9 or Q22. Did you have more trouble falling asleep than you usually do? [Yes; No]
- Q10 or Q23. How often did that happen? [Every night; Nearly every night; Less often]
- Q11 or Q24. Did you have a lot more trouble concentrating than usual? [Yes; No]
- Q12 or Q25. At these times, people sometimes feel down on themselves, no good, or worthless. Did you feel this way? [Yes; No]
- Q13 or Q26. Did you think a lot about death - either your own, someone else's, or death in general? [Yes; No]

Appendix B

Independent variables^b

Signalling characteristics

Chronic depression: an MDE in the past year that lasted more than four weeks.

Chronic strain was measured by asking respondents whether 11 statements were true or false.²⁹ 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 all randomly selected respondents); moderate chronic strain, 2 or 3 (34%); and high chronic strain, 4 to 11 (22%). The statements were:

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 neighbourhood 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.

Recent negative life events were measured in the NPHS by asking respondents eight "yes/no" questions about events that happened to them or to someone close to them, such as a spouse or partner, child, relative or close friend.³⁰⁻³² Experiencing one or more such events meant that respondents would be considered to have endured this kind of stress.

1. In the past 12 months, were you or was anyone you know 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 either of you take a cut in pay?
8. Now, just you personally, in the past 12 months, did you go on welfare?

Employment status was divided into two categories: working, and not working. The not working category includes both the unemployed and those not in the labour force.

^b Self-evident categories are not listed here.

Recreational physical activity was subdivided into three groups based on average daily energy expenditure (EE). Respondents with an estimated EE below 1.5 kcal/kg/day are considered physically inactive. A value between 1.5 and 2.9 kcal/kg/day, equivalent to taking a daily 45-minute walk, indicates moderate physical activity. Respondents with an estimated EE of 3.0 or more kcal/kg/day are considered physically active. Details of the calculations to obtain average daily EE can be found in the *National Population Health Survey Overview 1994-95*.⁴

Enabling conditions

Income adequacy is based on household income in relation to household size. Household income was classified as inadequate if any of the following three criteria were met:

Household income and household size

- Less than \$15,000 and 1 or 2 persons
- Less than \$20,000 and 3 or 4 persons
- Less than \$30,000 and 5 or more persons

Social isolation was measured by four "yes/no" questions. Those who answered "no" to one or more questions were classified in the socially isolated group.

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?

Contact with a general practitioner was measured at the beginning of the interview by asking respondents how many times in the past 12 months they had seen or talked on the telephone with a general practitioner or family physician about their physical, emotional or mental health. A different question, asked in the mental health section of the interview, was used to determine contact with health professionals about only emotional or mental health.

Predisposing characteristics

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