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[Table of Contents]

Mental Health of the Canadian Population: A Comprehensive Analysis

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Abstract

This study examines eight measures of mental health and looks for associations with nine potential demographic and psychosocial determinants. Data from the National Population Health Survey (NPHS), analyzed by logistic regression, reveal consistently strong, graded, independent associations of current stress, social support, life events, education and childhood traumas with both positive and negative indicators of mental health status. Sex differences exist for four of eight measures. For most indicators, mental health is relatively poor among youth and improves with age. Physical and mental health problems are associated. There is no independent relation between mental health and income adequacy or province of residence. Two measures used in several previous Canadian surveys are recommended for inclusion in the NPHS to better monitor population mental health.

Key words: Canada; cognitive impairment; depression; distress; mastery; mental health; population; self-esteem; sense of coherence

Introduction

Recent reports on the mental health of the Canadian population have focused on specific measures and traits, notably depression,[1-3] a general measure of psychological well-being called "sense of coherence,"[4,5] cognitive status[6] and work stress.[7] To date, there have been no comprehensive studies covering a range of positive and negative indicators of mental health, nor has there been a systematic examination of factors associated with positive and negative mental health. However, Statistics Canada's National Population Health Survey allows this type of examination.

Such an analysis is the purpose of this article. We seek to answer two interrelated questions: "What is the current state of mental health in the Canadian population?" and "Which psychosocial and physical health factors are most closely associated with mental health status?" Answers to these questions will have obvious implications for planning mental health services and mental health promotion.

Our approach to the description of population mental health and the analysis of its determinants has both conceptual and practical rationales.

Conceptually, mental health is treated here as a set of affective/relational and cognitive attributes that permit the individual to carry out valued functions with *reserve capacity* or *resilience* and thus to cope effectively with challenges to both mental and physical functioning. Happiness and work satisfaction are examples of such desirable states, as are self-esteem, mastery and a sense of coherence. Although some consider these latter attributes as *determinants* of mental health, they are considered here as (positive) indicators of mental health status since they contribute to reserve capacity and coping ability.

The population health framework identifies a wide range of conditions or determinants that influence health status.[8] Many of these determinants—health services, the physical environment, personal health practices— initially gained prominence on the policy scene with the publication of *A New Perspective on the Health of Canadians*.[9] The social and economic environment is the most notable addition from the population health framework, and it is the focus of the determinants examined here for their contribution to mental health status.

From a practical point of view, this analysis is limited by the data available to describe the mental health of the Canadian population. Fortunately, the initial cycle of the ongoing National Population Health Survey in 1994/95 included a wide range of mental health indicators as well as a full complement of plausible determinants. These are described further under Methods.

Methods

Source of Data

This study involved secondary analysis of the public use data file of the 1994/95 National Population Health Survey (NPHS).[10,11] As a result of its sample design and the high response rate, the NPHS provides an authoritative picture of the Canadian population living in the 10 provinces. Data were collected by computer- assisted personal interview with both a household representative and selected individuals. For all of the indicators reported here on mental health status and determinants, except for physical health and some of the demographic information, data were obtained directly from the selected household member; proxy responses were not accepted. The maximum sample available for analysis was 17,626 persons aged 12 and older; the actual sample for most analyses was usually closer to 14,500 as a result of missing cases on any given variable.

Because stress was a major topic for the initial NPHS, the survey included a variety of indicators relevant to mental health, which was unprecedented for a major national study. Although two of these—depression and distress—have since been promoted to "core" survey content and were thus repeated in 1996/97, we have chosen to focus exclusively on the 1994/95 data in order to compare associations across a large number of indicators of status, most of which were *not* repeated in the second cycle of the NPHS. Most of the social determinants in this analysis were not repeated either.

In 1994/95, the NPHS covered several self-reported indicators of mental health on the positive dimension, including sense of coherence, self-esteem, mastery and happiness/interest in life, and on the negative side, depression, level of distress, impact of distress and cognitive impairment. Thus mental health status is measured here with four positive and four negative indicators, which are only modestly interrelated.[a] This provides an unusual opportunity to compare associations with determinants across many indicators.

Indicators of Mental Health and of Determinants

Sense of coherence (SOC), or psychological well-being, refers to an outlook or enduring attitude whereby life is seen as comprehensible, manageable and meaningful. It has been shown in a number of international studies to predict longevity and to relate to physical health,[12] a conclusion that appears to hold for the Canadian population as well.[4] The NPHS was the second population survey in the world, after Finland's,[13] to measure SOC at the national level. SOC was measured by means of 13 questions that were summarized into a scale with potential scores ranging from 0 to 78. On the basis of the distribution, a high SOC was arbitrarily defined as a score of 67 or greater. This measure was completed only by persons aged 18 and older.

Self-esteem refers to a positive sense of self and was assessed by six questions taken from the classic Rosenberg scale used to measure this attribute.[14] No previous national survey in Canada has assessed self-esteem. Since there is no accepted definition of *adequate* self-esteem, the 25-point scale was arbitrarily divided according to the distribution of scores. High self-esteem refers to a score of 20 or greater.

Sense of mastery is the extent to which individuals believe their life chances are under their control. It was measured by means of seven questions,[15] yielding scores ranging from 0 to 28. A high sense of mastery was arbitrarily defined as a score of 23 or greater, based on the distribution.

Happiness and interest in life is a single item from the multi-item Health Utility Index.[16] Respondents were asked "Would you describe yourself as usually ... happy and interested in life," through "somewhat happy" and ending with "... so unhappy that life is not worthwhile." This variable was dichotomized as happy/other.

Depression is a mood disorder characterized by pervasive feelings of sadness, sometimes accompanied by a sense of helplessness, hopelessness, irritability and physical symptoms such as fatigue. It was measured in the 1994/95 NPHS by a set of 27 questions about such symptoms, taken from the Composite International Diagnostic Interview.[17] The total score was an estimate of the probability that the individual had a major depressive episode in the previous 12 months, stated in six levels with 90% as the definition of "probable" depression. For the purposes of analyzing the relation with the determinants, but not for descriptive analysis, the small and ambiguous category of "possible depression" (>0% and <90% probability of a depressive episode) was omitted.

Distress, as measured in the 1994/95 NPHS, is a state characterized by symptoms of anxiety and depression. *Amount of distress* was assessed by a six-item symptom checklist yielding a score of 0-24. On the basis of the distribution, high distress was arbitrarily defined as a score of 5 or greater. The *impact* of distress on life and activities was measured with a single question: "How much do these experiences usually interfere with your life or activities?" and a response of either "a lot" or "some" was used to define a life affected by distress.

Cognitive impairment was measured by two questions, one each about difficulties with thinking and remembering, which were part of the Health Utility Index.[16] Impairment was defined as "unable to remember anything at all," "unable to think or solve problems" or "some difficulty thinking."

The NPHS gathered information on a wide range of demographic attributes, and on psychosocial and physical health factors that are plausibly related to

mental health. The demographic factors analyzed here were age, sex, province of residence, education, income adequacy and household type. The psychosocial factors and their method of measurement were childhood traumas (number checked on a list of 7); life events (number checked on a list of 10); current stressors, involving time pressures, others' expectations and quality of social relationships (number checked on a list of 18); a social involvement index (based on three questions about regularity of participation in voluntary groups and church attendance); a frequency of social involvement index (based on reported frequency of contact with persons considered part of the respondent's social network); and a social support index (number of informal social resources checked as available in the event of need). The physical health questions were broad, and were analyzed to ensure that they were limited to physical health: chronic physical conditions (number checked on a list of 18) and activity restriction (long-term limitation attributed to a physical cause). Further details on these measures have been published by Statistics Canada.[10]

Analysis Methods

For the descriptive analysis of mental health status reported in Table 1, population estimates were produced from the weighted frequencies, in the usual manner. These were reviewed for reliability using Statistics Canada's suggested criteria.[10]

For the analysis of associations among determinants, multiple logistic regression was employed, using weighted data for which the weights had been adjusted to an average value of 1. For this purpose, all mental health status variables (the dependent measures) were dichotomized so that the target conditions became high sense of coherence, high self-esteem, high sense of mastery, happy and interested in life, depressed, high level of distress, life affected by distress and cognitively impaired. Independent variables were maintained as ordinal wherever applicable, although some collapsing of categories was necessary for reasons of sample size.

The independent variables (psychosocial factors and physical health) described earlier were selected for the multivariate analysis on the basis of consistently strong bivariate associations. Variables of potential interest omitted from the present analysis because of their generally weak relation to mental health were leisure-time physical activity and regular heavy drinking.[18]

Initial analyses included all of the eight independent variables reported later, plus four others—province of residence, income adequacy, social involvement and frequency of social contacts. When these four variables were dropped from the analyses because of their weak associations with the indicators of mental health, it had little impact on the associations between mental health and the remaining independent variables or "determinants."

One final control was effected in the analyses. In addition to controlling for the eight determinants in all logistic regressions, level of distress was controlled for in the analyses of impact of distress. This answers the question of whether, regardless of the amount of distress, some persons are more affected by distress than others.

Results

Table 1 summarizes the results on eight measures of mental health status, by sex, age, education and province of residence. As already noted, four of these

indicators were measured with continuous scales that had been categorized for the present analysis according to their respective distributions. As a result, these total scores are not absolutely meaningful; however, intergroup comparisons are valid. By these arbitrarily defined indicators, almost one third (31%) of Canadian adults had a high SOC, slightly more than half (52%) had high self-esteem, close to one quarter (23%) had a high sense of mastery and more than one quarter (29%) reported some distress.

TABLE 1
Indicators of population mental health status, by sex, age, education completed and province, Canada, ages 12+, 1994/95

		Positive mental health			
	Population estimate (thousands)	High sense of coherence (%)	High self-esteem (%)	High mastery (%)	Happy, interested in life (%)
TOTAL	23,949	31[a]	52	23	74
Males	11,780	32[a]	53	25	74
Females	12,168	30[a]	51	21	74
Ages 12–19	3,372	12[a]	44	18	72
Ages 20–29	3,879	21	51	25	72
Ages 30–39	5,210	27	54	24	76
Ages 40–49	4,235	30	56	26	72
Ages 50–59	2,825	35	57	21	77
Ages 60–69	2,282	43	51	19	76
Ages 70+	2,145	47	48	18	73
Less than high school	7,986	33	45	16	70
High school	9,007	28	53	23	74
College	3,806	30	55	25	76
University	3,109	34	63	34	81
Newfoundland	483	39	37	14	76
Prince Edward Island	110	35*	42	19	82
Nova Scotia	764	30	39	21	73
New Brunswick	626	29	44	15	75
Quebec	6,030	27	66	24	72
Ontario	9,050	32	51	24	74
Manitoba	891	34	36	14	74
Saskatchewan	792	37	36	17	75
Alberta	2,166	30	47	24	78
British Columbia	3,037	30	49	23	73

[a] Limited to ages 18+, thus the population estimates for the first four rows are, in thousands:
Total — 19,818 , Males — 9,477, Females — 10,341, Ages 18–19 — 754. The provincial populations are also lower by approximately 17% than the figures reported.
* Moderate sampling variability — to be interpreted with caution
# High sampling variability — not sufficiently reliable for publication

TABLE 1 (continued)
Indicators of population mental health status, by sex, age, education completed and province, Canada, ages 12+, 1994/95

		Mental health problems			
	Population estimate (thousands)	Depressed (%)	High distress level (%)	Distress affects life (%)	Some cognitive impairment (%)
TOTAL	23,949	6	29	16	9

Males	11,780	4	26	14	9
Females	12,168	7	32	18	9
Ages 12–19	3,372	7	40	17	13
Ages 20–29	3,879	7	38	17	9
Ages 30–39	5,210	6	29	15	7
Ages 40–49	4,235	6	25	16	9
Ages 50–59	2,825	5	23	14	6
Ages 60–69	2,282	2	21	15	8
Ages 70+	2,145	3	22	17	14
Less than high school	7,986	6	33	17	13
High school	9,007	6	30	16	8
College	3,806	5	26	14	7
University	3,109	5	23	14	5
Newfoundland	483	#	25	14*	11
Prince Edward Island	110	#	23*	#	6
Nova Scotia	764	8*	27	19	11
New Brunswick	626	4*	28	17	11
Quebec	6,030	5	35	13	6
Ontario	9,050	6	28	17	10
Manitoba	891	8*	30	15	11
Saskatchewan	792	5*	23	14	10
Alberta	2,166	5	26	15	9
British Columbia	3,037	6	26	18	11

[a] Limited to ages 18+, thus the population estimates for the first four rows are, in thousands:
Total — 19,818 , Males — 9,477, Females — 10,341, Ages 18–19 — 754. The provincial populations are also lower by approximately 17% than the figures reported.
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The non-arbitrary measures paint a moderately positive picture overall: three quarters (74%) of Canadians described themselves as happy and interested in life, 6% were depressed, one in six (16%) reported that stress affects their lives and 9% had some cognitive impairment.

Although the results in Table 1 are unadjusted for relations to other variables, it is instructive to note some consistencies across mental health indicators. For example, there were similar sex differences on six of eight indicators, suggesting modestly better mental health for males than females. There were also consistent associations between these self-reported measures of mental health and age: on most indicators, youth aged 12-19 or 12-29 had the lowest prevalence of positive mental health and the highest prevalence of mental health problems.

Among the few consistent provincial differences was the good mental health in Newfoundland and Prince Edward Island, where respondents reported among the highest SOC, most happiness and least amount of depression and distress. No province consistently ranked low in mental health, but Quebec was noteworthy for the number of measures on which it was at the extreme of the distribution. Quebeckers reported among the highest levels of self-esteem and mastery but the least happiness, lowest sense of coherence and most distress.

Although these descriptive data may be useful for identifying population groups at risk, they raise questions about the underlying reasons. To begin to answer this question, we conducted a series of multiple logistic regressions. The essence of this statistical technique is that it reveals the unique contribution of a potential determinant of health status while simultaneously controlling for the influence of all other determinants. Results are expressed as odds ratios.

Table 2 shows the relations of three demographic variables (age, sex, education), four psychosocial variables (childhood traumas, current stress, life events and social support) and two physical health variables (chronic problems and activity restriction) to the four measures of positive mental health. Table 3 provides similar information for the four measures of mental health problems. Province has been omitted from the analyses because the associations with mental health were consistent across provinces once all the other factors had been taken into account. Similarly, income adequacy, social involvement and frequency of social contacts are not reported here, as they did not have any independent association with mental health in other models that were examined.

With eight dependent variables and nine independent variables, what can be concluded from these results? Are there demographic, psychosocial or physical health indicators that have consistent relations with these indicators of mental health? Is the relation with mental health problems simply the inverse of any relation with positive mental health?

Table 4 provides an overview of the findings to answer these questions. Because of the large and complex sample of the NPHS and the number of relations used for the analysis, a strict standard for statistical significance was adopted ($p < 0.001$) for this overview. Further, the order of the categories for each variable in Tables 2 and 3 was taken into account in Table 4 (but not tested for trends).

The significant and graded relations between these determinants and the measures of mental health status may be summarized as follows.

Independent of all other variables, age was clearly related to psychological well-being (SOC), which increased impressively with age. The odds of seniors reporting a high sense of psychological well-being were as much as five times those of teens. Level of distress also tended to decline with age, but not as regularly as psychological well-being increased. Interestingly, cognitive impairment among teens was second only to the level among seniors aged 70 and older. Compared with the data in Table 1, the associations between age and mental health were fewer but led to the same conclusion—that poorer mental health is more common among youth than older age groups, at least on these indicators.

Education was strongly related to six measures of mental health and had a consistent, graded association with four. Self-esteem, mastery and happiness/interest in life all increased with amount of formal education. The odds of a high sense of mastery among university graduates were 2.2 times the odds among high-school dropouts, even after other factors had been accounted for. Interestingly, with more education the impact of distress became increasingly *more* likely to affect one's life.

Number of childhood traumas was strongly associated with SOC, depression and distress, and, to a lesser extent, with mastery and happiness. Such traumas appear not to be related to self-esteem, however.

Amount of current stress was one of the strongest correlates of mental health status, being strongly and consistently related to all positive and negative measures. The odds ratios were quite high. For example, compared with persons reporting low stress, the odds of those with a lot of stress being depressed were about three times as high, and of being distressed, four times as high.

Number of life events was also important for its apparent impact on mental

health: it was negatively associated with three measures of positive health and positively with three indicators of problems. Persons reporting two or more significant life events in the previous year had more than twice the odds of being depressed as those reporting no events.

TABLE 2

Adjusted odds ratios[a] (OR) and standard errors (SE) for four measures of positive mental health, by demographic, psychosocial and physical health determinants, Canada, ages 12+, 1994/95

Determinant	Sense of coherence (high vs lower) OR SE (n = 14,477[b])	Self-esteem (high vs lower) OR SE (n = 14,665[b])	Mastery (high vs lower) OR SE (n = 14,590[b])	Happiness (high vs lower) OR SE (n = 14,703[b])
Age	*<0.001*[c]	*<0.001*[c]	*<0.001*[c]	*<0.001*[c]
12–19	1.000 –	1.000 –	1.000 –	1.000 –
20–29	1.987* 0.144	1.224 0.096	1.052 0.115	1.356 0.106
30–39	2.850* 0.141	1.360 0.094	0.953 0.113	1.642* 0.104
40–49	3.503* 0.142	1.527* 0.096	1.123 0.115	1.396 0.106
50–59	4.121* 0.144	1.694* 0.099	0.894 0.120	1.895* 0.112
60–69	5.143* 0.146	1.368 0.103	0.812 0.126	1.577* 0.116
70+	5.335* 0.149	1.258 0.106	0.764 0.131	1.356 0.120
Sex	*0.031*	*0.035*	*<0.001*	*0.154*
Male	1.000 –	1.000 –	1.000 –	1.000 –
Female	0.918 0.040	0.931 0.034	0.849* 0.041	1.060 0.041
Education	*0.710*	*<0.001*	*<0.001*	*<0.001*
Less than high school	1.000 –	1.000 –	1.000 –	1.000 –
High school	1.012 0.052	1.363* 0.044	1.498* 0.057	1.286* 0.051
College	1.040 0.063	1.429* 0.054	1.598* 0.067	1.399* 0.064
University	0.963 0.065	1.854* 0.058	2.218* 0.068	1.421* 0.071
Childhood traumas (number)	<0.001	*0.140*	*<0.001*	*<0.001*
0	1.000 –	1.000 –	1.000 –	1.000 –
1	0.670* 0.047	0.942 0.041	0.929 0.049	0.753* 0.048
2	0.737* 0.067	1.050 0.055	1.368* 0.063	0.756* 0.062
3	0.592* 0.104	1.040 0.076	0.910 0.099	0.702* 0.084
4–7	0.467* 0.158	0.866 0.094	0.769 0.136	0.544* 0.099
Current stress	*<0.001*	*<0.001*	*<0.001*	*<0.001*
Low	1.000 –	1.000 –	1.000 –	1.000 –
Moderate	0.534* 0.043	0.952 0.040	0.728* 0.046	0.590* 0.052
High	0.207* 0.065	0.747* 0.049	0.441* 0.062	0.337* 0.057
Life events (number)	*<0.001*	*0.170*	*<0.001*	*<0.001*
0	1.000 –	1.000 –	1.000 –	1.000 –
1	0.762* 0.050	1.007 0.042	0.859 0.051	0.889 0.050
2+	0.527* 0.076	0.911 0.053	0.768* 0.069	0.660* 0.058
Social support	*<0.001*	*<0.001*	*<0.001*	*<0.001*
Little	1.000 –	1.000 –	1.000 –	1.000 –
Low	0.984 0.190	1.398 0.134	1.365 0.215	1.765* 0.137
Moderate	1.218 0.162	1.644* 0.116	1.878 0.186	2.065* 0.118
High	1.878* 0.151	1.841* 0.106	2.320* 0.176	3.219* 0.107
Physical health problems (number)	*<0.001*	*0.076*	*0.005*	*0.087*
0	1.000 –	1.000 –	1.000 –	1.000 –
1	0.879 0.048	0.916 0.041	0.967 0.049	1.010 0.050
2	0.733* 0.066	1.004 0.055	0.909 0.067	0.877 0.064
3+	0.806 0.071	0.900 0.059	0.762* 0.077	0.902 0.068

Restricted activity	*0.002*	*0.005*	*0.009*	*<0.001*
No	1.000 –	1.000 –	1.000 –	1.000 –
Yes	0.831 0.060	0.872 0.049	0.846 0.064	0.735* 0.055

[a] Adjusted for all other independent variables shown

[b] Ns are weighted to reflect the sample design (numbers vary because of missing values).

[c] Italicized *p* values describe the overall association of the variables.

* $p < 0.001$ for individual coefficient

TABLE 3

Adjusted odds ratios[a] (OR) and standard errors (SE) for four measures of mental health problems, by demographic, psychosocial and physical health determinants, Canada, ages 12+, 1994/95

Determinant	Depression (probable vs none) OR SE (n = 14,288[b])	Distress level (high vs lower) OR SE (n = 14,674[b])	Distress affects life[d] (some vs none) OR SE (n = 11,156[b])	Cognitive Impairment (some vs none) OR SE (n = 14,708[b])
Age	*<0.001*[c]	*<0.001*[c]	*0.347*[c]	*<0.001*[c]
12–19	1.000 –	1.000 –	1.000 –	1.000 –
20–29	0.443* 0.168	0.820 0.106	0.975 0.146	0.788 0.149
30–39	0.430* 0.164	0.535* 0.104	0.967 0.145	0.570* 0.149
40–49	0.437* 0.169	0.423* 0.107	1.096 0.149	0.731 0.150
50–59	0.337* 0.185	0.368* 0.113	0.974 0.159	0.414* 0.167
60–69	0.186* 0.230	0.375* 0.119	1.027 0.170	0.658 0.167
70+	0.231* 0.239	0.408* 0.124	1.277 0.176	1.215 0.164
Sex	*<0.001*	*<0.001*	*<0.001*	*0.126*
Male	1.000 –	1.000 –	1.000 –	1.000 –
Female	2.039* 0.084	1.299* 0.041	1.256* 0.060	0.909 0.062
Education	*0.130*	*<0.001*	*<0.020*	*<0.001*
Less than high school	1.000 –	1.000 –	1.000 –	1.000 –
High school	1.066 0.100	0.821* 0.053	1.154 0.076	0.716* 0.074
College	0.960 0.125	0.727* 0.065	1.069 0.095	0.604* 0.098
University	1.317 0.138	0.859 0.071	1.356 0.102	0.551* 0.116
Childhood traumas (number)	*<0.001*	*<0.001*	*<0.001*	*<0.001*
0	1.000 –	1.000 –	1.000 –	1.000 –
1	1.325 0.104	1.251* 0.049	0.865 0.073	1.017 0.077
2	1.731* 0.115	1.254* 0.063	1.083 0.088	1.401* 0.091
3	2.095* 0.135	1.359* 0.085	1.214 0.110	1.379 0.120
4–7	2.618* 0.143	1.917* 0.102	1.543* 0.120	1.426 0.135
Current stress	*<0.001*	*<0.001*	*<0.001*	*<0.001*
Low	1.000 –	1.000 –	1.000 –	1.000 –
Moderate	1.506 0.124	1.973* 0.053	1.224 0.085	1.503* 0.083
High	2.894* 0.124	4.388* 0.058	1.864* 0.089	2.099* 0.090
Life events (number)	*<0.001*	*<0.001*	*0.007*	*<0.001*
0	1.000 –	1.000 –	1.000 –	1.000 –
1	1.499* 0.099	1.294* 0.049	1.042 0.072	1.321* 0.077
2+	2.527* 0.100	1.738* 0.058	1.272 0.078	1.646* 0.086
Social support	*<0.001*	*<0.001*	*<0.001*	*0.001*
Little	1.000 –	1.000 –	1.000 –	1.000 –
Low	0.440* 0.215	0.988 0.143	0.599 0.176	0.710 0.186
Moderate	0.429* 0.175	0.677 0.123	0.530* 0.152	0.691 0.157
High	0.307* 0.150	0.491* 0.112	0.518* 0.134	0.596* 0.138
Physical health problems (number)	*<0.001*	*<0.001*	*0.013*	*<0.001*
	1.000 –	1.000 –	1.000 –	1.000 –

0	1.193	0.099	1.100	0.050	1.105	0.074	1.103	0.080
1	1.334	0.122	1.219	0.066	1.244	0.092	1.425*	0.096
2	1.693*	0.119	1.722*	0.068	1.320	0.092	1.673*	0.096
3+								
Restricted activity	*0.001*		*<0.001*		*<0.001*		*<0.001*	
No	1.000	–	1.000	–	1.000	–	1.000	–
Yes	1.654*	0.096	1.589*	0.056	1.599*	0.073	1.489*	0.076

[a] Adjusted for all other independent variables shown

[b] Ns are weighted to reflect the sample design (numbers vary because of missing values).

[c] Italicized *p* values describe the overall association of the variables.

[d] Model also includes level of distress (dichotomized).

* $p < 0.001$ for individual coefficient

Social support was second only to current stress in its importance for mental health: it was strongly and positively associated with SOC, self-esteem, mastery and happiness, and negatively related to depression, level of distress and impact of distress. Persons with high levels of social support had only half the odds of being affected by distress, even when the amount of distress was held constant.

In contrast to most of these demographic and psychosocial determinants, the association between physical and mental health was limited to only some of the indicators in this study. The number of chronic physical health problems was closely associated with depression and cognitive impairment, and physical restriction was associated with all four mental health problems but none of the indicators of positive mental health.

After all the other variables had been controlled for, sex differences remained on four of the eight indicators of mental health: the odds were twice as high that women were depressed, and they were somewhat more prone to and affected by distress, whereas the odds of men reporting high mastery were higher.

Discussion

These results from the NPHS provide an unusually comprehensive look at the mental health of a population and the factors that may influence it. They provide evidence of consistently strong, graded, independent relations linking current stress, social support, life events, education and childhood traumas to several indicators of both positive mental health and mental health problems. They also provide evidence of differences related to sex, age and physical health status, although these are concentrated among the indicators of mental health problems, and there are few differences in positive mental health associated with sex and physical health. Relations between age and mental health are the most complex but can be summarized by noting that it is usually youth who are most likely to have mental health problems and least likely to report positive mental health.

It is important to note that terms such as "influence" and "determinants" are not strictly correct in this context, since these results are based on cross-sectional data. Only childhood traumas and life events imply a temporal order that is logically necessary for inferring causation, and even then longitudinal analysis would be needed to confirm this. Indeed, in other analyses of NPHS data, SOC has been described as a determinant of physical health[4] rather than an outcome of it, and depression has been described as affecting social life[19]

rather than being affected by it, as is implied here. In reality, there is probably a negative and self-reinforcing spiral between mental health and many of the factors reported here. For example, longitudinal analysis of US population data reveals that distress leads to negative assessment of self-reported health status, which in turn elevates subsequent distress.[20] Similarly, Icelandic data show that chronic physical conditions affect depression, in part by undermining personal resources such as mastery and self-esteem.[21]

Leaving aside the question of direction of the associations, many of the relations reported here echo findings from other population studies, which have typically been limited to a single outcome variable.

Many of these psychosocial factors have previously been reported as important for depression and other outcomes. For example, stressors and life events affect both sexes in the Canadian population, whereas childhood traumas are additionally important for women.[1] A British cohort study links parental divorce in childhood (an item on the childhood trauma scale) with psychological distress at ages 23 and 33,[22] and Norwegian data reveal how economic hardship and family dissension (other scale items) in childhood lead to poorer mental health in adulthood.[23] Longitudinal data from the Whitehall II study in Britain show that emotional support predicts good mental health in men and negative social support predicts poor mental health in both sexes.[24] Among Canadian workers, psychological distress is greater for women when support from co-workers is low, and for men, when job-related stressors are high.[25]

The distribution of mental health problems among demographic groups reported here is consistent with other recent studies. The higher prevalence of depression among Canadian women replicates the results of a study across 10 countries, including Canada, using a different measure.[26] Sex differences in depression have been reported to start as early as 15 years of age in Canada.[3] However, it is noteworthy that, although this study considered eight distinct measures of mental health, sex differences were found for only four of them. Previous studies limited to one or two measures of mental health problems may have left the impression that sex differences are more widespread than they appear to be here.

TABLE 4
Summary of relations among eight measures of mental health status and nine demographic, psychosocial and physical health determinants, Canada, ages 12+, 1994/95

Determinant	Sense of coherence	Self-esteem	Mastery	Happy	Depressed	Distress level	Distress affects life	Some cognitive impairment
Age	*++	*	*	*	*	*		*
Education		*++	*++	*++		*	*+	*– –
Childhood traumas	*–		*–	*–	*++	*++	*++	*+
Current stress	*– –	*– –	*– –	*– –	*++	*++	*++	*++
Life events	*– –		*– –	*– –	*++	*++		*++
Social support	*+	*++	*++	*++	*– –	*– –	*– –	
Physical health problems (number)	*–				*++	*++		*++

Sex	*		*	*	*	
Restricted activity		*	*	*	*	*

Key

* $p < 0.001$ for the association of the variable with the measure of mental health status
In addition to $p < 0.001$ for the association,
++ a consistent, ordered positive association of all levels of the determinant
+ a consistent, ordered positive association of all but one level
– – a consistent, ordered negative association of all levels of the determinant
– a consistent, ordered negative association of all but one level

The association we found between age and mental health is important because it runs counter to both intuition and much previous evidence. On several indicators, mental health is shown to improve with age at least until the middle years and, on SOC, well into the senior years. With respect to depression and distress in Canada, this has been reported before, based on NPHS data, and the contrast with the *inverse* association between age and depression in the United States has been hypothesized to result from the different racial make-up of the two populations.[2] However, there may be another explanation: in 1978/79, distress and age were inversely related in Canada as well, according to the Canada Health Survey.[26] Since that time, however, the social and economic lot of seniors has improved markedly in Canada while that of youth has declined, relatively speaking.[27] The strong link between socio-economic status and mental health is well established, as illustrated by the results in this report and population studies in Britain and the United States.[28,29]

The *lack* of an independent relationship between income adequacy and mental health status in the NPHS data is especially interesting in this light, but consistent with the view that education improves psychological well-being because it provides access to non-alienating work[29] and that, independent of income, a sense of mastery is related to greater life satisfaction and less depression.[30]

Conclusions

This study has implications for the strategy of mental health promotion, further analysis of the NPHS and other data, and future monitoring of mental health in Canada.

A unique feature of this study is the mix of positive and negative outcome measures, an approach made possible by the number and variety of relevant indicators in the first cycle of the NPHS. Our analysis of associations of demographic and psychosocial factors with all of these outcome measures leads to an important conclusion: the psychosocial and demographic factors associated with mental health problems were also found to be (inversely) associated with the indicators of positive mental health. *This implies that strategies that promote resilience and other psychological resources will also contribute to problem reduction or even prevention.* More generally, health promotion and disease prevention can be seen as two sides of the same coin and entirely compatible, even mutually reinforcing.

Mental health promotion consists of establishing those conditions that will foster resilience and support, and lead to positive states such as satisfaction and happiness.[31] It is clear from this analysis that such conditions include,

broadly stated, a reduction in current stressors and childhood traumas and a fostering of social support. More detailed analysis of longitudinal data from the NPHS and other sources is required to be more specific about the desired conditions, although some of this analysis has been started with respect to job factors[7] and types of social support.[24]

Notwithstanding the comparative richness of the measures in the NPHS and the fact that the measures of depression and distress will be repeated in every cycle, improvements are possible. In particular, it would be highly desirable to repeat the mental health status measures of the 1978/79 Canada Health Survey, including the Affect Balance Scale [32] and the Health Opinion Survey.[33] This would permit more systematic comparisons with earlier times. The Affect Balance Scale was also used in the 1981 and 1988 Canada Fitness Surveys and the General Social Surveys of 1985 and 1990; it remains in use internationally[34] and is conceptually compatible with the NPHS. The Health Opinion Survey is a long-standing measure of anxiety and depression that is conceptually similar to the current NPHS distress scale. The possibility of direct and unambiguous comparisons of mental health status in the Canadian population over approximately 25 years argues strongly for its inclusion in the NPHS or comparable national surveys of population health.

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[a] Phi coefficients for paired measures, as dichotomized for the later analyses, ranged from 0.07 to 0.37 (data not shown).

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[Previous][Table of Contents] [Next]
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