Looking for capacities rather than vulnerabilities: The moderating effect of health assets on the associations between adverse social position and health

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Word count of the abstract: 248/250

Word count of the main text: 349/3500

Number of pages: 29

Number of tables: 4

Conflict of interest: The authors declare no conflicts of interest

Abstract

To increase capacities and control over health, it is necessary to foster assets (*i.e.* factors enhancing abilities of individuals or communities). Acting as a buffer, assets build foundations for overcoming adverse conditions and improving health. However, little is known about the distribution of assets and their associations with social position and health. In this study, we documented the distribution of health assets and examined whether these assets moderate associations between adverse social position and self-reported health.

A representative population-based cross-sectional survey of adults in the Eastern Townships, Quebec, Canada (*n* = 8737) was conducted in 2014. Measures included assets (*i.e.* resilience, sense of community belonging, positive mental health, social participation), self-reported health (*i.e.* perceived health, psychological distress), and indicators of social position. Distribution of assets was studied in relation to gender and social position. Logistic regressions examined whether each asset moderated associations between adverse social position and self-reported health.

Different distributions of assets were observed with different social positions. Women were more likely to participate in social activities while men were more resilient. Resilience and social participation were moderators of associations between adverse social position (*i.e.* living alone, lower household income) and self-reported health.

Having assets contributes to better health by increasing capacities. Interventions that foster assets and complement current public health services are needed, especially for people in unfavorable situations. Health and social services decision-makers and practitioners could use these findings to increase capacities and resources rather than focusing primarily on preventing diseases and reducing risk factors.

Introduction

In 1986, the World Health Organization (WHO) defined health promotion as the process by which individuals and communities increase control over their health.[1] Thirty years later, despite huge steps forward in public health, health promotion practices are often still directed at diseases and risk factors. This pathogenic perspective must be complemented by a salutogenic approach focusing on factors that create health.[2-3] Health promotion is not about preventing disease but about improving health. One way to promote health is to foster assets that help individuals and communities increase control over their lives. As many have said[2-6] it is time to create a balance between assets and deficits in public health as this field has traditionally focused more on vulnerabilities. Initiated by different public health entities and the Ottawa Charter for Health Promotion,[1] this shift toward building capacities in public health is relatively recent. Actions and models are beginning to move away from diseases and toward health determinants and capacities. Current health promotion should bring together such actions and models under a unifying theory and translate it into concrete practices.[7]

Even though the concept of health as a set of capacities is quite recent in public health, it is well established elsewhere. Over recent decades, many positive health concepts emerged in the social sciences. For example, Bandura talked about self-efficacy[8] and Cyrulnik about resilience[9] while Antonovsky introduced the concept of sense of coherence.[10] From Antonovsky's salutogenic theory that views health along the ease-disease continuum,[10] a salutogenic orientation emerged.[11] This orientation encompasses a sense of coherence and other positive health concepts with a view to uniting approaches that focus on capacities rather than vulnerabilities. This orientation provides a unifying theory for moving forward with health promotion. To translate this theory into practice, on behalf of the WHO Morgan and Ziglio

developed the health assets model[5] in which assets are factors enhancing abilities of individuals, communities, systems or institutions.[11] Such assets operate as capacities and act as buffers against stresses.[5] Like others, Morgan and Ziglio argued that public health focuses too much on deficits. Even though knowledge of deficits is essential to identify problems, focusing on deficits may increase dependence on limited services. To restore a balance, more knowledge about assets must be produced and transferred to decision-makers to foster asset-based actions.[5]

There is increasing evidence that having more assets has a positive influence on health.[3,5,12] Studies point to two main ways in which assets help to increase capacities and promote health. First, many studies identify direct associations between assets and better health. For example, a systematic review of the literature which included 458 scientific publications and 13 doctoral theses showed that a stronger sense of coherence (SOC) is associated with better health (especially mental health) among individuals and populations regardless of age, gender, ethnicity, and study design.[13] Other studies[14-15] (including a 15-year prospective cohort study[15]) highlighted direct associations between a stronger SOC and less likelihood of self-harming behaviors[15] and reduced alcohol, drug, and cigarette intake.[14] Another recent systematic review of the literature focusing on assets among seniors concluded that asset-based actions uncover the skills, knowledge, and potentials of older adults and help to empower them.[16] Assets in this review were diverse and included being religious, social participation, control over one's life, self-achievement, life satisfaction, social ties, and others.[16] Besides such direct associations between a larger number of assets and positive health, studies also identified indirect associations. In these studies, assets moderated effects between unhealthy states or behaviors and undesirable outcomes. For example, a moderating effect of the SOC concept and resilience was observed on stress and mental health.[17-19] In other words, having more assets was linked to better

mental health, for equal levels of stress. Some studies on resilience indicated fewer depressive symptoms among resilient adults who were exposed to trauma or abuse in their childhood.[20] Social capital was also identified as a moderator of individual characteristics (*i.e.* income, education) and health-related behaviors.[21-23] Literature on indirect associations of assets between adverse social conditions and health thus exists but is scarce in the public health arena. In fact, there are few large high-quality surveys including assets and health outcomes anywhere in the world.

To address this limitation, the regional public health authority in the Eastern Townships, Quebec, Canada included assets in a survey of a large representative sample of adults to update their monitoring data and tailor local actions. Using this survey, the objectives of this study were to 1) document the distribution of health assets, and 2) examine whether these assets moderate associations between adverse social position and self-reported health. The hypotheses were that 1) assets are available at a population level, and 2) the positive association between indicators of adverse social position and poorer self-reported health would be weaker among people with more assets.

Methods

The Eastern Townships Population Health Survey

The 2014 Eastern Townships Population Health Survey (ETPHS) is a cross-sectional study representative of adults in the Eastern Townships, Quebec, Canada. This region includes a mix of urban, semi-urban, and rural areas. Its population is around 300,000 and 93.4% is French-speaking.[24] About half of this population lives in Sherbrooke (Quebec's 6th largest city[25]).

Study Sample and Missing Data for Analyses

The ETPHS involved 8737 adults aged 18 to 106 years (mean=54.9; SD=15.3). Based on a random digit dialing procedure including cellular phones, respondents were randomly selected according to age and gender. Respondents were selected in three steps: 1) random selection of households, 2) confirmation of household eligibility (in Eastern Townships, with someone ≥18 years of age), and 3) random selection of a household member aged ≥18. The randomly selected respondent in the household could not be substituted. If the respondent was not available, reminders were sent to complete the interview at another time. To gather local estimates with accuracy, around 800 participants living in residential units or private homes were surveyed in each area of the Townships and boroughs of Sherbrooke. Businesses, people living in second or nursing homes, and people without a private phone line were excluded. Respondents answered a phone or online questionnaire. An independent firm trained to administer questionnaire surveys collected the data. The Ethics Committee of the Eastern Townships Integrated University Health and Social Services Center approved this study.

Missing data for analyses ranged from 0 to 144 among men (3.5%) and 0 to 272 among women (5.9%). With the exception of women who were more likely not to report their household income, the profile of adults with missing data did not differ from that of those with complete data.

Measures

Health assets. Four health assets were surveyed in the ETPHS (*i.e.* resilience, positive mental health, social participation, sense of community belonging). All four assets were used to test the research hypotheses.

Resilience. Resilience is the individual's or community's capacity to adapt positively when faced with stressful or traumatic events.[26] This asset was captured using the 10-item Connor-Davidson Resilience Scale,[27] which is designed to measure the ability to cope with

adversity based on 10 questions assessing the extent to which, over the previous month, respondents felt able to deal with problems that arose.[28] This measure gives a composite score ranging from 0 to 40 (sum of 10 items scored between 0 and 4), with higher scores indicating greater resilience.[28] This measure has good construct validity and internal consistency (Cronbach α=0.88) and has been used in large studies.[29-30] Because of non-normal distribution and as other authors did,[31-33] total scores were categorized (0-10, 11-20, 21-30, 31-40) to look for non-linear associations.

Positive mental health. Positive mental health was captured with the 14-item Mental Health Continuum-Short Form questionnaire (MHC-SF) which provides a mental health assessment based on hedonic (3 items) and eudemonic (11 items) approaches to well-being.[34-35] This measure acknowledges that mental health is more than the absence of mental disorders as people with such disorders are able to experience well-being and quality of life while people without such disorders can experience low levels of mental health.[36] Because it captures an asset rather than negative health or vulnerabilities, this positive view of mental health differs from outcomes used in this study, namely perceived health and psychological distress. Participants indicated how often in the last month they experienced each item (*e.g.* happy, interested in life) using a six-point Likert scale (*i.e. never, rarely, a few times, often, most of the time, always*). The MHC-SF proposes three mental health levels: flourishing, moderate, and languishing. Flourishing mental health is defined as answering "Always" or "Most of the time" to one of the three hedonic dimension items and six of the 11 eudemonic dimension items. Languishing mental health is defined as answering "Never" or "Rarely" to the same number of items in the same dimensions. People whose mental health is neither flourishing nor languishing are categorized as having moderate mental health. The MHC-SF has good reliability and was

validated with many languages[37-38] including Canadian French.[39] In this study, moderate and

languishing mental health levels were merged because the proportion of the latter was too small.

Social participation. Taken from Statistics Canada's Participation and Activity

Limitation Survey,[40] this measure is an eight-item scale assessing the frequency of involvement

in social activities (*e.g.* friends outside the home, church or religion, sports or physical).

Response options were converted into days per month.[41] A composite score of social activities

per month between 0 and 160 was calculated by summing the scores on each item. Higher scores

indicate greater social participation. The internal consistency of this scale is adequate (Cronbach

α=0.72).[42] Because of non-normal distribution, total scores were categorized in quartiles to look

for non-linear associations. While this measure can be used with people of various ages (*i.e.* ≥45

years old in the Statistics Canada survey[40]), the ETPHS used it with adults ≥60 years.

Sense of community belonging. Taken from the Statistics Canada General Social Survey-

Social Identity[43] the sense of belonging to one's local community was assessed on a four-point

Likert scale (*i.e.* very weak, quite weak, quite strong, very strong). This question presents good

face and content validity[43] and was dichotomized in this study (weak vs. strong).

Indicators of social position. Social position was captured with eight indicators: age (18-

49, ≥ 50), highest completed education level (high school or less, college, university), annual

household income (<$30,000, ≥$30,000), living alone (yes, no), housing status (owner, renter),

working status (full- or part-time, other), marital status (single, in a relationship, other), and

geographic location (rural, urban). Urban areas were defined as municipalities with a population

of ≥1,000 and density of ≥400 inhabitants per square kilometre.

Self-reported health. Two measures of self-reported health were assessed. One

measured global health (*i.e.* perceived health) and another captured possible mental health

problems (*i.e.* psychological distress). Perceived health was assessed with the question: "*In general, would you say your health is excellent, very good, good, fair, or poor?*" and categorized as fair or poor versus excellent, very good or good. Psychological distress was assessed with the six-item Kessler Scale and the question: "*In the past six months, how often did you feel (nervous, hopeless, restless, so depressed that nothing could cheer you up, that everything was an effort, worthless)?*" Answers were *no time (0), a little time (1), sometimes, (2) most of the time (3),* and *all the time (4)*. A composite score was created and a score of seven or more was used to define psychological distress.[44] These measures have both been used in large surveys and present good content and face validity.[42-43]

Statistical Analysis

The proportion of each asset was examined, and its distribution according to each indicator of social position was investigated. Chi-square analyses were used to look for significant differences in the proportions of each asset as a function of gender and social position. To examine the moderating effect of each asset on the associations between adverse social position and self-reported health, logistic regression analyses were used with a two-step modelling procedure. The main effect of each indicator of adverse social position on both measures of self-reported health was tested as the first step of the modelling procedure. In the second modelling step, interaction models were tested to examine the moderating effect of each asset (only if the main effect of social position on self-reported health was significant in the first step). To avoid multiple testing problems resulting from the use of seven indicators of adverse social position to predict two self-reported health outcomes, a Spearman rank-order analysis was used to select two specific indicators of adverse social position, one capturing economic deprivation and the other social deprivation. P values of <0.05 were considered significant.

Analyses were carried out in 2015-2016 and were conducted separately for men and women using SPSS Statistics V24.

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Results

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Participants Characteristics

With respect to social position and self-reported health, men were more likely to hold university degrees, have higher household incomes, be homeowners, and work full- or part-time. Women were more likely to live alone, be single, and show psychological distress (Table 1).

Frequency of Assets

A large amount of assets was frequent at the population level (Table 1). With the exception of social participation, which was categorized in quartiles, the proportion of each asset was above 50%. Women were more likely to report higher levels of social participation while men were more likely to have higher resilience scores (Table 1).

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[Table 1]

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Distribution of Assets According to Social Position

Higher resilience scores were observed among homeowners, holders of university degrees, people with higher incomes, and older women (Table 2). Different distributions of social participation were observed with different indicators of social position. While living alone was linked to greater social participation for both genders, lower income, being a renter, and not working full- or part-time (*e.g.* being unemployed) were linked to greater social participation among women only. More education and being in a relationship were associated with greater social participation among men, as were less education and being single for women (Table 2). A strong sense of community belonging was observed among older and educated adults as well as among men with higher incomes, homeowners, and in a relationship. A strong sense of

community was observed among women in urban areas. Post-hoc analyses revealed that assets were geographically distributed, with fewer assets in more deprived boroughs of Sherbrooke and areas of the Eastern Townships.

[Table 2]

Main Effects of Social Position on Self-reported Health

With the exception of geographic location, all indicators of social position were associated with both measures of self-reported health (Table 3). Older age was associated with increased likelihood of fair or poor perceived health (for both genders) and protected against psychological distress among men. These measures were also associated with less education, lower income, living alone, being a renter, not working full- or part-time, and being single, for both genders.

[Table 3]

Moderating Effect of Assets on Associations Between Social Position and Self-reported Health

From the seven indicators of social position with a significant main effect on self-reported health measures, two were retained for the interaction models, one capturing social deprivation (*i.e.* living alone) and the other economic deprivation (*i.e.* household income). Living alone, marital status, and age were highly correlated ($0.68 <$ Spearman's rho < 0.84), as were household income, working status, education, and homeownership ($0.13 <$ Spearman's rho < 0.42). Interaction models were then run to examine whether each asset moderated the associations between these two indicators of adverse social position and both measures of self-reported health.

Moderating effects were observed for two of the four assets, namely social participation and resilience (Table 4). These assets were found to influence the relationship between social position and health. As expected, weaker associations were found between adverse social position and self-reported health among people with more assets. The associations between adverse social position (*i.e.* living alone, lower household income) and measures of self-reported health (*i.e.* fair or poor perceived health, psychological distress) were all mitigated among resilient adults of both genders. For example, compared to women with higher incomes, women with lower incomes were almost four times more likely to report fair or poor health if they also had a low resilience score (OR=3.91; 95%CI:2.01-7.60). Furthermore, the adverse influence of living alone was not present in adults of either gender with greater social participation. No moderating effects of positive mental health and sense of community belonging were observed.

[Table 4]

Discussion

This study documents the distribution of health assets at a population level and examines whether assets moderate associations between adverse social position and self-reported health. While some indicators of social position such as living alone and older age were linked to greater social participation for both genders, others were gender-specific, namely lower income, less education, being a renter, not working, or being single for women, and more education or being in a relationship for men. Although results suggesting that older women are more likely to participate in social activities corroborate previous findings,[41,45-47] gender-specific results warrant further investigation. Greater participation in social activities of single, less educated, not working, and lower-income women might reflect their obligations, such as being a caregiver.[48] Also, men with more education and in a relationship might participate more in social activities as

they might be more aware of the benefits of social participation and have been positively influenced by the involvement of their significant others. Higher resilience scores (*i.e.* 31-40) were frequent at the population level (men=60.1%, women=52.4%) but these results were similar to those observed in samples examining the same asset in adults from different countries.[29-30,49-51] These studies also pointed to greater resilience among men and people with higher social positions (*i.e.* homeowners, holders of university degrees, higher income earners). About half of the adults reported flourishing mental health. This high proportion at the population level is similar to that in American studies with large samples of youth[52] and adults.[53] A strong sense of community belonging was noted among older educated adults, men (with higher incomes, homeowners, in a relationship), and urban women. These findings of high proportion of assets at the population level suggest that resources to create health are available where people live, love and work.

With respect to the moderating effect of assets, larger numbers of assets were linked to weaker associations between adverse social position and self-reported health. Greater social participation and greater resilience both decreased the adverse effect of social (living alone) and material (lower household income) deprivation on perceived health and psychological distress. Similar results were found in the field of psychology, where resilience is a moderator between exposure to trauma[53-55] or disaster[56-57] and post-traumatic stress disorder. Assets such as acceptance of change and spirituality have also been associated with lower rates of suicide ideation, alcohol intake, and depression among U.S. veterans.[58-60] These results with respect to the buffering effect of assets on associations between adverse social position and self-reported health should be considered when planning health promotion interventions.

According to these results, fostering assets is a complementary strategy to traditional public health measures that could be employed by authorities to reduce inequalities for people living in unfavorable situations. It is more feasible to develop an approach that fosters assets in subpopulations than to create wealth in deprived areas. Because poverty cannot be completely eliminated, practitioners can equip people living in unfavorable conditions with the capacity to cope with adversity and improve control over their health while continuing existing efforts to fight poverty.

Strengths and Limitations

The major strength of this study was the large representative sample. It included assets that allowed for exploration of under-examined hypotheses in the field of public health. This study, however, had some limitations. It was based on self-reported measures, which are subject to misclassification. These measures increased the likelihood of social desirability and recall biases. Because the ETPHS was cross-sectional, it was not possible to infer causality or determine the direction of results (*i.e.* relationships between social participation and health may be two-way). Some assets, such as social participation, were only measured on a subsample of adults (*i.e.* ≥60 years). Finally, because this survey did not include people without a private phone line, vulnerable people may have been excluded and the strength of the results may have been reduced.

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Conclusions

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This study suggests that larger numbers of assets could act as a buffer and help increase capacities that may, in turn, be associated with better health. The study informs practitioners and decision-makers in the field of public health that assets are available at the population level and that mobilizing such assets moderates associations between adverse social position and poorer

self-reported health. As a complement to current public health services, efforts should be

directed at fostering assets in individuals and communities in unfavorable situations. Future

studies should replicate these findings with longitudinal samples and co-construct or evaluate

upstream interventions with local communities or high-risk groups based on the use of assets.

Health authorities could use these findings to restore the balance between the current pathogenic

paradigm in the field of public health and a more salutogenic approach aimed at fostering assets

that create health.

Acknowledgements

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Table 1.

Participants' characteristics and proportions of assets in the Eastern Townships Population Health Survey (Quebec, Canada, 2014).

	Men (*n*=4121)	Women (*n*=4616)
	%	**%**
Indicators of social position		
Age		
18-49	35.2	33.7
≥ 50	64.8	66.3
Education		
High school or less	36.9	38.5
College	29.3	31.5
University	**33.8 *****	30.0
Household income		
<$30,000	21.4	33.2
≥$30,000	**78.6 *****	66.8
Living alone		
Yes (vs. no)	19.8	**30.0 *****
Housing status		
Homeowner (vs. renter)	**81.8 *****	75.4
Working status		
Full-time or part-time (vs. other)	**58.3 *****	49.1
Marital status		
In a relationship	69.0	56.9
Single	22.5	**34.5 *****
Other	8.6	8.6
Geographic location		
Urban (vs. rural)	34.2	33.3
Measures of self-reported health		
Perceived health		
Excellent, very good or good (vs. fair or poor)	86.0	84.8
Psychological distress		
Yes (vs. no)	21.8	**25.5 *****
Health assets		
Resilience		
0-10	0.3	0.4
11-20	3.3	4.1
21-30	36.4	43.2
31-40	**60.1 *****	**52.4**
Positive mental health		
Flourishing	49.9	49.2
Not flourishing	50.1	51.8
Social participation $_a$		
Quartile 1 (≤ 8)	28.3	25.7
Quartile 2 (9-15)	24.3	23.3
Quartile 3 (16-25)	26.1	23.5
Quartile 4 (≥ 26)	21.4	**27.5 *****
Sense of community belonging		
Weak	40.7	43.4
Strong	59.3	56.6

*** = *p* χ^2 ≤ 0.001

$_a$ Social participation was measured among adults aged 60 years and over only (*n*=2896; men = 1348, women = 1548)

Table 2.

Proportions of assets according to social position indicators among adults in the Eastern Townships Population Health Survey (Quebec, Canada, 2014).

Indicator of social position	Men (*n*=4121)				Women (*n*=4616)			
	Resilience (Score of 31-40)	Positive mental health (Flourishing)	Social participation (Q4)	Sense of community belonging (Strong)	Resilience (Score of 31-40)	Positive mental health (Flourishing)	Social participation (Q4)	Sense of community belonging (Strong)
Age								
18-49	36.2	35.8	0.0	32.4	34.9	33.9	0.0	31.4
≥ 50	63.8	64.2	**100.0 *****	**67.6 *****	**64.6 ***	66.1	**100.0 *****	**68.6 *****
Education								
High school or less	32.8	36.3	32.9	35.7	34.5	38.0	**45.1 *****	37.8
College	31.1	29.1	23.3	28.6	30.5	32.5	25.0	29.9
University	**36.1 *****	34.6	**43.8 *****	**35.6 ****	**34.9 *****	29.6	29.8	**32.2 *****
Household income								
<$30,000	19.1	20.8	22.7	20.2	29.3	34.0	**45.7 ***	31.9
≥$30,000	**80.8 *****	79.2	76.3	**79.9 *****	**70.7 *****	66.0	54.3	68.1
Living alone								
Yes (vs. no)	18.9	19.2	**27.0 *****	19.1	29.9	30.3	**51.1 *****	30.9
Housing status								
Homeowner (vs. renter)	**83.1 *****	81.3	83.9	**82.4 ***	**78.0 *****	49.5	**70.3 *****	76.1
Working status								
Full-time or part-time (vs. other)	59.4	59.1	82.0	57.6	50.1	50.4	**11.0 *****	48.2
Marital status								
In a relationship	70.2	68.9	**68.6 *****	**70.8 *****	57.5	56.4	41.7	56.5
Single	21.8	21.9	27.0	20.9	34.2	35.0	**52.2 *****	34.7
Other	8.0	9.2	4.4	8.3	4.4	8.6	6.1	8.7
Geographic location								
Urban (vs. rural)	65.9	66.6	69.5	66.2	67.6	65.8	63.5	**68.3 ***

*** = p χ2 ≤ 0.001, ** = p χ2 ≤ 0.01, * = p χ2 ≤ 0.05

a Social participation was measured among adults aged 60 years and over only (n=2896; men = 1348, women = 1548)

Table 3.

Associations between social position indicators and self-reported health in the Eastern Townships Population Health Survey (Quebec, Canada, 2014).

Indicator of social position	Perceived health (Fair or poor vs. excellent, very good or good) OR (95%CI)		Psychological distress (Yes vs. no) OR (95%CI)	
	Men (*n*=4121)	Women (*n*=4616)	Men (*n*=4121)	Women (*n*=4616)
Age				
18-49	1.00	1.00	1.00	1.00
≥ 50	2.60 (2.08-3.25)	2.59 (2.11-3.18)	0.82 (0.70-0.95)	1.05 (0.91-1.21)
Education				
High school or less	2.70 (2.16-3.38)	4.46 (3.53-5.63)	1.83 (1.53-2.20)	1.72 (1.46-2.04)
College	1.29 (1.01-1.68)	1.54 (1.18-2.01)	1.42 (1.17-1.73)	1.48 (1.24-1.76)
University	1.00	1.00	1.00	1.00
Household income				
<$30,000	3.85 (3.19-4.65)	4.51 (3.79-5.37)	1.93 (1.63-2.28)	2.06 (1.79-2.37)
≥$30,000	1.00	1.00	1.00	1.00
Living alone				
Yes (vs. no)	2.53 (2.09-3.06)	2.16 (1.83-2.54)	1.49 (1.25-1.77)	1.49 (1.29-1.71)
Housing status				
Renter (vs. homeowner)	2.04 (1.67-2.49)	2.86 (2.42-3.38)	1.62 (1.35-1.94)	1.76 (1.52-2.04)
Working status				
Other (vs. full- or part-time)	3.18 (2.64-3.83)	4.02 (3.33-4.86)	1.02 (0.88-1.19)	1.24 (1.08-1.42)
Marital status				
In a relationship	1.00	1.00	1.00	1.00
Other	1.28 (0.93-1.77)	1.57 (1.18-2.11)	1.54 (1.20-1.99)	1.29 (1.01-1.64)
Single	2.38 (1.96-2.88)	2.16 (1.82-2.57)	1.63 (1.37-1.93)	1.59 (1.39-1.84)
Geographic location				
Urban (vs. rural)	1.16 (0.96-1.41)	0.85 (0.72-1.01)	0.95 (0.80-1.11)	0.94 (0.82-1.09)

Table 4.

Moderating effect of social participation and resilence on the associations between adverse social position indicators (i.e. living alone, household income) and self-reported health (i.e. perceived health, psychological distress) among adults in the Eastern Townships Population Health Survey (Quebec, Canada, 2014).

Indicator of social position	Perceived health (Fair or poor vs. excellent, very good or good) OR (95%CI)		Psychological distress (Yes vs. no) OR (95%CI)	
	Men (*n*=4121)	Women (*n*=4616)	Men (*n*=4121)	Women (*n*=4616)
Living alone (yes vs. no)				
Social participation (Quartile 1)	2.29 (1.20-4.39)	1.77 (1.08-2.92)	1.35 (0.86-2.13)	1.67 (1.09-2.54)
Social participation (Quartile 2)	1.84 (1.01-3.34)	1.71 (1.07-2.74)	1.98 (0.97-2.99)	1.56 (1.00-2.44)
Social participation (Quartile 3)	1.51 (0.86-2.66)	1.05 (0.66-1.66)	1.54 (0.92-2.60)	1.49 (0.99-2.23)
Social participation (Quartile 4)	1.51 (0.98-2.29)	1.35 (0.93-1.97)	1.13 (0.60-2.12)	1.22 (0.83-1.79)
Resilience score between 0-20	3.25 (1.69-6.25)	2.19 (1.84-2.61)	2.03 (1.04-3.95)	4.13 (3.47-5.00)
Resilience score between 21-30	2.62 (1.99-3.46)	2.04 (1.70-2.80)	1.43 (1.10-1.87)	1.62 (0.89-2.77)
Resilience score between 31-40	2.33 (1.90-2.86)	1.32 (0.77-2.24)	1.24 (0.93-1.64)	1.30 (0.81-2.44)
Household income (<$30,000 vs. ≥$30,000)				
Social participation (Quartile 1)	2.25 (1.49-3.40)	3.51 (2.04-6.04)	1.12 (1.01-1.76)	1.93 (1.25-2.97)
Social participation (Quartile 2)	2.25 (1.44-4.53)	3.85 (2.83-8.33)	1.19 (0.65-2.19)	1.57 (0.93-2.35)
Social participation (Quartile 3)	2.21 (1.82-5.31)	2.82 (1.72-4.64)	1.22 (0.63-2.38)	1.71 (1.12-2.60)
Social participation (Quartile 4)	2.27 (1.15-4.46)	2.90 (1.89-4.46)	1.23 (0.63-2.40)	1.82 (1.20-2.77)
Resilience score between 0-20	3.70 (3.03-4.51)	3.91 (2.01-7.60)	1.72 (1.43-2.06)	1.90 (1.55-2.32)
Resilience score between 21-30	3.50 (2.62-4.74)	3.71 (2.89-4.85)	1.65 (1.26-2.17)	1.85 (1.47-2.34)
Resilience score between 31-40	2.35 (1.20-4.60)	1.43 (1.23-1.66)	1.38 (0.74-2.60)	0.83 (0.45-1.54)