

Peer Positive Social Control and Men's Health-Promoting Behaviors

American Journal of Men's Health
2017, Vol. 11(5) 1569–1579
© The Author(s) 2017
Reprints and permissions:
sagepub.com/journalsPermissions.nav
DOI: 10.1177/1557988317711605
journals.sagepub.com/home/ajmh



Janie Houle, PhD^{1,2}, Sophie Meunier, PhD¹, Simon Coulombe, PhD³,
Coralie Mercerat, PhD candidate¹, Isabelle Gaboury, PhD⁴,
Gilles Tremblay, PhD⁵, Francine de Montigny, PhD⁶, Lyne Cloutier, PhD⁷,
Bernard Roy, PhD⁸, Nathalie Auger, MD⁹, and Brigitte Lavoie, MPs¹⁰

Abstract

Men are generally thought to be less inclined to take care of their health. To date, most studies about men's health have focused on deficits in self-care and difficulties in dealing with this sphere of their life. The present study reframes this perspective, using a salutogenic strengths-based approach and seeking to identify variables that influence men to take care of their health, rather than neglect it. This study focuses on the association between peer positive social control and men's health behaviors, while controlling for other important individual and social determinants (sociodemographic characteristics, health self-efficacy, home neighborhood, spousal positive social control, and the restrictive emotionality norm). In a mixed-method study, 669 men answered a self-reported questionnaire, and interviews were conducted with a maximum variation sample of 31 men. Quantitative results indicated that, even after controlling for sociodemographic variables and other important factors, peer positive social control was significantly associated with the six health behaviors measured in the study (health responsibility, nutrition, physical activity, interpersonal relations, stress management, and spirituality). Interview results revealed that peer positive social control influenced men's health behaviors through three different mechanisms: shared activity, being inspired, and serving as a positive role model for others. In summary, friends and coworkers could play a significant role in promoting various health behaviors among adult men in their daily life. Encouraging men to socialize and discuss health, and capitalizing on healthy men as role models appear to be effective ways to influence health behavior adoption among this specific population.

Keywords

men's studies, exercise nutrition, health promotion and disease prevention, male friendships

Received December 23, 2016; revised April 2, 2017; accepted April 5, 2017

It is well established that men are more likely to put their health at risk than women, for instance, through illegal substance abuse (e.g., Cotto et al., 2010), tobacco use (e.g., Stanton et al., 2016), unsafe sex (e.g., Sicard et al., 2016), or dangerous driving habits (e.g., Gonzalez-Iglesias, Gomez-Franquela, & Sobral, 2015). They are less inclined to adopt health-promoting behaviors (HPBs), such as a healthy diet, stress management activities, and health screening (Callaghan, 2006; Teo, Ng, Booth, & White, 2016). Men are usually considered a hard-to-reach population for the promotion of healthy lifestyles (Deeks, Lombard, Michelmore, & Teede, 2009; Sinclair & Alexander, 2012). This focus on men's deficits and difficulties is widespread in the scientific literature and may explain why personal and environmental factors that help men adopt HPBs are still understudied.

Indeed, men are not a homogeneous population. Many men take care of their health, the dominant stereotype notwithstanding, but they have received much less attention

¹Department of psychology, Université du Québec à Montréal, Montreal, QC, Canada

²CRIUSMM, Montreal, QC, Canada

³Department of psychology, Wilfrid Laurier University, Waterloo, ON, Canada

⁴Family Medicine Department, Université de Sherbrooke, Sherbrooke, Canada

⁵School of Social Work, Université Laval, Quebec City, Canada

⁶Nursing Department, Université du Québec en Outaouais, Gatineau, Canada

⁷Nursing Department, Université du Québec à Trois-Rivières, Trois-Rivières, Canada

⁸Nursing Department, Université Laval, Québec, Canada

⁹Institut national de santé publique du Québec, Montreal, Canada

¹⁰Lavoie Solutions, Montreal, Quebec, Canada

Corresponding Author:

Janie Houle, Department of Psychology, Université du Québec à Montréal, P.O. Box 8888, Station Centre-ville, Montreal, QC H3C 3P8, Canada.

Email: houle.janie@uqam.ca



from scholars than men engaging in risky behaviors. The aim of this mixed-method study is to better understand what helps men take care of their health, using a salutogenic strengths-based approach (Antonovsky, 1987; Eriksson & Lindstrom, 2008; MacDonald, 2005) focusing on “what creates health rather than only what are the causes of disease” (Antonovsky, 1979, p. 12). This study took place in Quebec (Canada), where men's health is considered to be a public health concern and the government is currently working on an action plan to tackle the issue (Duval, 2016). This cross-sectional study among 669 male workers has already produced significant results identifying factors to leverage to promote men's health (Houle et al., 2015; Coulombe et al., 2016; de Montigny et al., 2016). Living in a neighborhood that presents physical and social qualities supporting a healthy lifestyle (e.g., availability of bicycle and pedestrian paths, fresh fruits and vegetables within walking distance, presence of green spaces where it is possible to relax; Coulombe et al., 2016), as well as having a spouse who exerts a positive social influence, and feeling competent in taking care of one's health (i.e., health self-efficacy; de Montigny et al., 2016) were all reported to be positively associated with men's HPBs. However, masculinity ideology, mainly the restrictive emotionality norm, was negatively associated with men's HPBs (Houle et al., 2015). The present article adds to these findings, focusing on the potential influence of peers (friends and coworkers), while controlling for the significant factors highlighted in the study. Few noninterventional studies have examined peer influence on adults' adoption of health behaviors or the specific forms this influence takes.

Peer Social Control

Social control in a health context is defined as “interactions between social network members that entail regulation, influence and constraint” (Lewis & Rook, 1999, p. 63). This control can be either direct, for example, congratulating men who adopt a health behavior or indirect, for example, serving as a positive role model (Craddock, vanDellen, Novak, & Ranby, 2015). Positive reinforcement, modeling, and persuasion are examples of positive social control, while coercion, applying pressure, or expressing disapproval are negative forms of social control (Craddock et al., 2015; Lewis & Rook, 1999). Both positive and negative tactics can be used to exert social control over others' behaviors, but the former is more effective in promoting healthy behaviors. While family members and spouses could influence men's adoption of health behaviors (de Montigny et al., 2016), peers might also play a role. Generally, peers are people who share one or more characteristics (such as gender, age, workplace) with the person in question; in the present study, it refers to male friends and coworkers.

Peer Social Control and Men's Health Behaviors

Little is known about peer social control over men's HPBs, and most evidence comes from intervention studies. Male-only interventions seemed particularly appealing for many men (Gray et al., 2009; Morgan, Warren, Lubans, Collins, & Callister, 2011), and participants have been overtly encouraged to use persuasion (a “tell your mates” strategy) for recruiting purpose (Pringle et al., 2013). Indeed, peer support is considered to be one of the main success factors in gender-sensitive, group-based health promotion programs, although prior studies were focused mainly on weight loss (e.g., Leishman, 2007; Pringle et al., 2013) or smoking cessation (e.g., Oliffe, Bottorff, & Sarbit, 2012). According to qualitative reports from intervention participants, peer support helps men feel less alone and more at ease within the group. Shared commonalities with other participants (overweight football team supporters, for instance), as well as humor and banter, are perceived as helping to build a team atmosphere, increase group cohesiveness, reduce attrition, and obtain better results (Gray et al., 2013). Indeed, group-based weight management programs seem to produce more weight loss than individual programs, even for individuals who have expressed a preference for individual treatment (Robertson et al., 2014).

Information on peer social control over adult men's health behavior in a natural daily context, outside a specific group-based intervention, is scarce. A quantitative study among college students has reported that peers have a strong influence on alcohol consumption, exercise, eating, and seatbelt wearing (Lau, Jacobs Quadrel, & Hartman, 1990). A qualitative study designed to gain a better understanding of motivators and barriers related to physical activity in a university environment identified that having a social network within which to engage in physical activity is perceived to be an important motivator (George, Kolt, Rosenkranz, & Guagliano, 2013). Conversely, negative behaviors of male peers, such as not dieting, have been reported to have an important negative impact on men's motivation to stick with their weight loss objectives (Mallyon, Holmes, Coveney, & Zadoroznyj, 2010). Peer pressure to consume unhealthy food has also been reported in a qualitative study on apprentices in the construction industry, as participants in the study often went along with coworkers to get food and beverages (du Plessis, 2012). Finally, the benefits of connecting with smoke-free peers to help quit smoking has been identified recently in a qualitative study among male smokers (Bortoff, Oliffe, Sarbit, Sharpe, & Kelly, 2016).

Focus groups with the female partners of men participating in a weight loss program suggest that the improvement in men's diet has an impact on their families as well

(including children): less snacking, more fruits and vegetables, and physical exercise (Gray et al., 2009). Impact on peers has not been investigated yet.

Thus, peer social control seems to be a potential asset to men's health worth considering. However, further studies are needed to gain a better understanding of the association between peer social control and men's HPBs in daily life. Most studies to date have focused on nutrition and physical activity. However, the well-established Pender's Model of Health Promotion (Pender, 1996; Pender, Murdaugh, & Parsons, 2002) identifies four more health behaviors that should be examined: health responsibility, stress management, cultivating interpersonal relationships, and spiritual growth.

Salutogenic Strengths-Based Approach

Finally, very few studies have focused on men specifically identified as being good at taking care of their health. Roy, Tremblay, Robertson, and Houle (2015) have taken a salutogenic approach to analyzing how farmers cope with adversity, but this convenience sample was not selected on the basis of those men being particularly effective at coping. A study conducted by Sloan, Gough, and Conner (2010) with a sample of 10 men is an exception in that it focused on men with healthy lifestyles, who exercise regularly, for example, or have a low alcohol intake. The researchers examined these men's motives in taking care of their health. They concluded that they emphasized being in control and presented themselves as rebels resisting unhealthy masculine norms. However, the authors' focus on described motives did not extend to an assessment of the influences that might have helped the participants adopt their healthy lifestyles originally. Further studies are warranted to better understand men who are taking care of their health and to shed light on how their peers (friends and coworkers) influence them in this direction. Contrasting their perspective with that of men who experience more difficulty in taking care of their health could provide insight and help identify key elements that health promotion programs should target.

Objectives

This study has two objectives: (a) to examine whether positive social control from peers adds significantly to the variance in men's HPBs, over and above the variance explained by sociodemographic variables and variables previously highlighted as significant (namely, health self-efficacy, restrictive emotionality norm, home neighborhood, and spousal positive social control); and (b) to qualitatively compare peer influence narratives in men reporting higher or lower than average adoption of HPBs.

Table 1. Characteristics of Participants.

	Quantitative study (<i>n</i> = 669) <i>M</i> (<i>SD</i>)	Qualitative study (<i>n</i> = 31) <i>M</i> (<i>SD</i>)
Continuous variables		
Age, years	46.66 (11.03)	46.71 (10.33)
Years of education	12.25 (1.87)	12.45 (1.77)
Number of comorbidities	1.08 (1.28)	1.62 (1.47)
Categorical variables		
Marital status, <i>n</i> (%)		
Single	156 (23.56)	7 (23.33)
In a relationship	506 (76.44)	23 (76.67)

Method

Participants and Procedure

The study procedure has been described in previous articles (Houle et al., 2015; Coulombe et al., 2016; de Montigny et al., 2016). A random sample of 3,234 men aged 18 years and over was selected from a list of members of partner trade unions active in construction, metallurgy, retail, and police services. The men received a personal letter by mail providing background information on the study and its aim, as well as a self-administered questionnaire, a postage-paid envelope to return the completed questionnaire, and a postage-paid postcard to fill out if they were interested in participating in the qualitative part of the study (face-to-face interviews). To maintain confidentiality, each participant was identified by a numerical code. The project was approved by an accredited research ethics board.

A total of 671 participants answered the self-reported questionnaire (20.8% response rate). Two questionnaires were eliminated due to an excessive amount of missing data. Analyses were therefore performed on data from 669 participants. Participants' ages varied from 19 to 71 years ($M = 46.7$; $SD = 11.0$), with a median age of 49 years. Participants had 12.3 years of education on average ($SD = 1.9$), which in Canada is equivalent to a high school diploma. Three participants out of four (76.4%) were married or in a civil partnership (Table 1).

Participants in the qualitative part of the study were recruited from among the 669 questionnaire respondents. A total of 149 respondents (22%) expressed their interest in taking part in this second part of the study. They were ranked in ascending order based on their average score on the Health-Promoting Lifestyle Profile II (Walker, Sechrist, & Pender, 1987; HPLP II; see the following text for a description). A maximum variation sample was obtained by inviting participants from both extremities of the list (those who had the highest and the lowest scores). Maximum variation sampling aims to ensure that a diversity of conditions related to the phenomenon of interest are represented, thus generating

more insightful results (Rubin & Babbie, 2016). As stated by Patton (1990, p. 172), "By including in the sample individuals the [researcher] determines have had quite different experiences, it is possible to more thoroughly describe the variation in the group and to understand variations in experiences while also investigating core elements and shared outcomes." Out of 45 questionnaire respondents initially solicited, 31 agreed to take part in the interview (participation rate of 69%): Nineteen were in the highest scoring group (average score ranging from 1.6 to 2.3, mean score of 1.88) and 12 in the lowest scoring group (average score ranging from 0.5 to 1.3, mean score of 0.99). This difference in the numbers of participants per group is explained by the fact that there were far fewer volunteers for the interview among the questionnaire respondents with the lowest scores. The two groups' mean scores on the HPLP II ($t(29) = -12.22, p < .01$) differed significantly. Their sociodemographic characteristics were similar to the overall profile of the 669 questionnaire respondents: mean age of 47 years old ($SD = 10$), 12.5 years of education on average ($SD = 1.7$), and 77% married or in civil partnership (Table 1).

The semistructured interviews were conducted after the end of the quantitative data collection, between July 2013 and March 2014, by a female researcher (SM) with a doctorate in psychology and nearly 10 years of experience in conducting interviews in academic research and professional contexts. Participants read and signed an informed consent form before the beginning of the interview and received a financial compensation of CAD\$25. The interview guide was developed by the first author and validated by the other authors of this study, who possess expertise in men's health. It focused on various factors influencing men's health behaviors (e.g., conjugal relationship, parenthood, working conditions, neighborhood), including peer influence. The present article focuses only on the data related to this latter theme. The questions were open-ended ("Which factors facilitate/impede your adoption of health behaviors?"), and prompts were used ("How do your friends influence your health behaviors?") to stimulate further discussion on key themes if required. The first two interviews were used as pretests. Since only minor adjustments were made following the pretests, those two participants were retained in the final sample. The interviews were conducted in French and lasted from 27 to 82 min and mostly took place in participants' homes. Interview data collection lasted until data saturation was reached. By the time the 31 interviews were completed, it was deemed that data saturation for the study had been reached, as the last few participants, both in the "low HPB" and the "high HPB" groups had not added any new information.

Quantitative Measures

Health-Promoting Behaviors. The HPLP II (Walker, Sechrist, & Pender, 1987) was used to assess 52 HPBs distributed along six different dimensions: (a) health responsibility (9 items, e.g., "Read or watch TV programs about improving health"); (b) physical activity (eight items, e.g., "Exercise vigorously for 20 or more minutes at least three times a week"); (c) nutrition (nine items, e.g., "Choose a diet low in fat, saturated fat and cholesterol"); (d) stress management (eight items, e.g., "Practice relaxation or meditation for 15–20 min daily"); (e) interpersonal relations (nine items, e.g., "Maintain meaningful and fulfilling relationships with others"); and (f) spiritual growth (nine items, e.g., "Believe that my life has a purpose"). The questionnaire asks participants to indicate on a 4-point scale how often they engage in different behaviors (0 = *never*; 1 = *sometimes*; 2 = *often*; 3 = *very often*). For the purposes of this study, the questionnaire was reverse-translated following Guillemin, Bombardier, and Beaton's (1993) guidelines for cross-cultural adaptation. Scores were averaged on each subscale, and the internal consistency indices of the six subscales in the present study were satisfactory ($\alpha = .67$ to $.86$).

Socioeconomic Characteristics. Age was calculated using participants' dates of birth. Participants were asked to enter their number of years of education. Health status was measured using an adaptation of the Functional Comorbidity Index (Groll, To, Bombardier, & Wright, 2005), which asks respondents to indicate whether they have ever had one or more of 18 diseases (including cardiovascular diseases, diabetes, cancer, lung diseases). A global score for the number of comorbidities (the number of diseases checked off by the participant) was calculated for the purposes of the analyses.

Restrictive Emotionality. Restrictive emotionality was measured using the three items of this subscale (e.g., "Men should be detached in emotionally charged situations") in the Male Role Norms Inventory-Short Form (Levant, Hall, & Rankin, 2013). The items were reverse-translated (Guillemin et al., 1993), and internal consistency was acceptable ($\alpha = .62$). Responses were given to each item using a 7-point Likert-type scale (1 = *strongly disagree*; 7 = *strongly agree*).

Health Self-Efficacy. Health self-efficacy was assessed using the eight items of the Perceived Health Competence Scale (Smith, Wallston, & Smith 1995). This scale assesses, on a 6-point Likert scale (1 = *strongly disagree*; 6 = *strongly agree*), participants' perceived competence in managing their own health (e.g., "I am able to do things for my health as well as most other people"). Internal consistency for this scale was adequate ($\alpha = .80$).

Home Neighborhood. Perceived quality of the home neighborhood environment was assessed using the Health-Promoting Neighborhood Questionnaire (Coulombe et al., 2016). The eight items of this scale were designed to measure perceptions of the physical and social environmental qualities that support key relevant positive health behaviors (from the list by Walker et al., 1987). Participants had to indicate, on a 4-point Likert scale (1 = *strongly disagree*; 4 = *strongly agree*), the extent to which their home neighborhood (defined as the area within a 10- to 15-min walking distance from home) presents characteristics favorable to physical activity (e.g., “Sports facilities are available”), socialization (e.g., “The people in the neighborhood are friendly”), healthy eating (e.g., “Fresh fruits and vegetables are available within walking distance”), and stress management (e.g., “The neighborhood offers green spaces that promote relaxation or the practice of sports”). One item also measures the neighborhood’s appearance and level of maintenance (e.g., “The neighborhood is well maintained and looks nice”). A mean score was calculated for use in the analysis ($\alpha = .80$).

Spousal Positive Social Control. Four items created specifically for this study were used to measure spousal positive social control (de Montigny et al., 2016). Participants had to indicate, on a 4-point Likert scale, how often in the previous month their spouse had (a) congratulated them for adopting healthy behaviors; (b) done something concrete to help them adopt healthy behaviors; (c) encouraged them to modify unhealthy behaviors; and (d) served as a positive example. A mean score of the four items was calculated ($\alpha = .80$).

Peer Positive Social Control. Peer positive social control was measured using the same items as for spousal positive social control, but reworded to focus respectively on friends (four items) and coworkers (four items). Since correlation between friends’ and coworkers’ positive social control was very high ($r = .76$), a mean score for the eight items was computed ($\alpha = .88$) and used in the analysis.

Quantitative Analysis

Statistical analysis was performed using SPSS statistical software (version 22.0; SPSS Inc., Chicago, IL, USA). To ensure data integrity, data from a random sample of 10% of the questionnaires were double-checked. There were minimal data missing from the questionnaires (between 0% and 6% per variable). However, given the large number of independent variables, the few data missing for each variable added up during multivariate analyses and had the effect of considerably reducing the size of the sample. The missing data were therefore processed in

different ways. First of all, some missing data could be interpolated based on other questionnaire variables. Thus, missing data on education were replaced by the average value for participants in the same income range. Similarly, missing age data were replaced by the average for people with the same level of schooling, while missing data on number of comorbidities were replaced by the mean for people in the same age range. Finally, missing data for the variables of restrictive emotionality, health self-efficacy, spousal positive social control, neighborhood environment, and peer positive social control were replaced by their respective means. There were no missing data for HPBs.

Multiple regression analyses were performed to examine the associations between peer positive social control and the six HPBs. A hierarchical approach was chosen to test whether peer positive social control explained the variance of HPBs beyond the variance already explained by other factors. Sociodemographic variables were entered in a first step. Restrictive emotionality, health self-efficacy, home neighborhood, and spousal positive social control were entered in a second step, followed by peer positive social control in a third step.

Qualitative Analysis

The interviews were transcribed and coded with NVivo v.10 software. Inductive content analysis was performed using the method described by Hsieh and Shannon (2005). In their work, content analysis refers to “a research method for the subjective interpretation of the content of text data through the systematic classification process of coding and identifying themes or patterns” (p. 1278), which is also similar to what others have labeled thematic analysis (Braun & Clarke, 2006). During the coding process, each “unit of meaning”—a group of words or of sentences that form a meaning together—was assigned a theme or a subtheme. Thus, in line with Hsieh and Shannon’s (2005) description of conventional content analysis, the thematic grid was developed over the course of reading, while coding the units of meaning, without imposing a predetermined theoretical framework. The analysis grid was adjusted and revised up until the end of the coding process, with all changes supported by a back-and-forth review of the data collected—between the participants’ statements and the coding grid themes. Two coders participated in the qualitative data analysis. Interrater agreements were reached in coding about 10% of the corpus, achieving satisfactory agreement rates of over 80% (Klenke, 2008). All units of meaning were coded as either themes or subthemes, thus meeting the principle of exhaustiveness (Stemler, 2001). Finally, to conduct what would be called a “qualitative contrasting analysis” from a mixed-method perspective

(Collins, Onwuegbuzie, & Sutton, 2006; Onwuegbuzie & Teddlie, 2003), narratives regarding peer influence were compared between participants with the highest scores on the HPLP II and those with the lowest, to investigate possible explanations for the differences in scores. Interview excerpts presented in this article have been translated from French to English.

Results

Factors Predicting HPB

Age and number of comorbidities were positively associated with health responsibility. Thus, as participants aged and experienced more health problems, they were more inclined to become informed about health issues and consult professionals. However, the number of comorbidities was negatively associated with physical activity, stress management, and spiritual growth. Age was also negatively associated with physical activity and interpersonal relations. Years of education was positively associated with nutrition, physical activity, and spiritual growth.

This multiple hierarchical regression analysis identified that the variables that had been already studied in isolation (Houle et al., 2015; Coulombe et al., 2016; de Montigny et al., 2016) continued to have unique and specific associations with HPBs when investigated in a single model. The results indicated that health self-efficacy and home neighborhood were positively associated with all six HPBs, while spousal positive social control was positively associated with health responsibility, nutrition, interpersonal relations, and spiritual growth. Adherence to the restrictive emotionality norm was negatively associated with health responsibility and interpersonal relations.

Results from hierarchical multiple regression analyses (see Table 2) revealed that peer positive social control explained a significant portion of variance for each of the six HPBs and was significantly and positively associated with it, even when controlling for sociodemographic variables, self-efficacy, restrictive emotionality, home neighborhood, and spousal positive social control.

Men's Narratives About Peer Social Control

Participants in the individual interviews acknowledged the influence of friends and coworkers on their health behaviors. Qualitative analysis revealed three main mechanisms through which this influence operated: (a) shared activity; (b) being inspired; and (c) serving as a positive model for others.

Shared Activity. Peers positively or negatively influenced HPBs through shared activity, for example, by engaging in physical activity together or sharing a meal.

I have a good friend, we train together, we share knowledge. . . . Sometimes, neither of us feel like it, but since he feels like doing it just a bit and I feel like doing it just a bit, together we make it happen anyway. (High HPB)

We go eat somewhere, we pick the restaurant together. We always choose the cheapest, and it's junk food. (Low HPB)

Belonging to a group of friends who are taking care of their health was particularly salient in narratives from the participants with the highest HPB scores. People with high scores seemed to have intentionally chosen to establish and cultivate interpersonal relationships with physically active and healthy people. They reported having opportunities to practice physical activity with their friends, a narrative, which did not emerge among the low HPB score group.

My friends are athletic. They're people who get me to do activities with them. Roadbiking, for example. (High HPB)

I turned to people who wanted to move more as they get older. (High HPB)

Being Inspired. Participants reported that friends and coworkers inspired them by providing significant positive or negative models. While men in the highest HPB group reported having many positive models around them inspiring them to take care of their health, men from the lowest HPB group indicated that many friends and coworkers were models of behaviors to avoid.

I have friends who do great things and that I want to use as models. It influences me. (High HPB).

When you look at others, you say "Whoops!" When you look at others, it makes you feel better. Some people are worse off than you. The more I watch them go at it, the more careful I am, because it doesn't make sense. I don't want to turn out like them. (Low HPB)

Serving as a Positive Model for Others. Some men from the highest HPB group reported having a positive influence on their friends and coworkers, and this responsibility to be a role model motivated them to continue taking good care of their health. This narrative was absent from the answers of the lowest HPB group.

As far as healthy eating goes, they [work colleagues] pay more attention, also there are several of them who come to see me just to get my advice. And, basically, that has a positive influence on me, because I force myself to keep being a model. (High HPB)

Younger people, they see a bit of what I do, what I eat. There are many at work who've changed their eating habits based

Table 2. Regression Model for Determinants of Men's HPBs.

	HPB (global score)			Health responsibility			Physical activity			Nutrition			Interpersonal relations			Stress management			Spiritual growth				
	B	SEB	β	B	SEB	β	B	SEB	β	B	SEB	β	B	SEB	β	B	SEB	β	B	SEB	β		
Step 1																							
Age																							
Years of education	0.03	0.01	.13**	0.00	0.00	.09*	-0.01	0.00	-.13**	0.01	.13**	-0.01	0.00	0.00	-.15**								
Number of comorbidities	-0.03	0.01	-.09*	0.04	0.02	.11*	-0.05	0.02	-.10*	0.03	.04**												
R^2			.04**			.02**			.09**		.04**				.03**								
Step 2																							
Restrictive emotionality	-0.02	0.01	-.08*	-0.04	0.01	-.10*						-0.06	0.01	-.18**									
Health self-efficacy	0.19	0.02	.42**	0.12	0.02	.19**	0.32	0.03	.37**	0.21	0.02	.35**	0.12	0.02	.21**	0.15	0.02	.28**	0.25	0.02	.41**		
Home neighborhood	0.10	0.02	.14**	0.10	0.04	.10*	0.11	0.05	.08*	0.10	0.03	.10**	0.10	0.03	.12**	0.09	0.03	.11**	0.09	0.03	.10**		
Spousal positive social control	0.06	0.01	.15**	0.06	0.02	.13**				0.07	0.02	.14**	0.06	0.02	.13**				0.09	0.02	.17**		
R^2			.30**			.12**			.24**		.22**				.18**								
Step 3																							
Peer positive social control	0.14	0.02	.24**	0.21	0.03	.27**	0.19	0.04	.17**	0.09	0.03	.11**	0.13	0.03	.19**	0.15	0.03	.22**	0.09	0.03	.11**		
R^2			.35**			.19**			.26**		.23**				.21**								

Note. Only significant results are reported. HPB = health-promoting behavior.

* $p < .05$. ** $p < .01$.

on what I was doing or what I was eating. They say they would like to be like me at my age. (High HPB)

Discussion

This mixed-method study is one of the very few noninterventional studies that investigates peer influence on adult men's adoption of HPBs. Overall the quantitative results suggest that peer influence is associated with a range of HPBs, while the qualitative results suggest several ways through which this influence may operate.

Results from statistical analysis indicated that, in daily life, peer positive social control is positively associated with each of the HPBs examined, even after controlling for association with sociodemographic variables, health self-efficacy, restrictive emotionality, home neighborhood, and spousal positive social control. Indeed, peer positive social control adds a unique significant contribution of 5% in the explained variance of HPBs. Standardized beta suggests that it is the second most important predictor of HPB scores ($\beta = .24$), after self-efficacy ($\beta = .42$), and that it has a more significant influence than spousal social control ($\beta = .15$) and home neighborhood ($\beta = .14$). The importance of peer support was already well established as a key ingredient in the efficacy of group-based health promotion programs (Olliffe et al., 2012; Pringle et al., 2013; Leishman, 2007), but this study is the first to quantify the relevance of peer support outside of an intervention context. In more concrete terms, this means that men whose friends and coworkers congratulate them for adopting healthy behaviors and encourage them to adopt healthy behaviors while modifying unhealthy behaviors, as well as men who serve as positive examples for others, are more likely to report having a healthy diet, exercising regularly, managing stress, cultivating their social relationship, and taking responsibility for their health, compared to men who do not have such forms of positive social control around them.

This study is also innovative in its use of a scheme of maximum variation sampling capitalizing on the previous quantitative phase of the study and allowing a narrative comparison between men with high and low reported frequencies of HPB adoption. This original contribution greatly expands knowledge regarding peer influence (George et al., 2013; Gray et al., 2009; Mallyon et al., 2010). Three distinct ways in which men can be influenced by their friends and coworkers were identified: (a) shared activity; (b) being inspired; and (c) inspiring others. Although the aim of the narrative component, given its qualitative nature and the relatively small sample size, was not to provide generalizable results, it enriched the study by exploring potential qualitative processes impacting HPB adoption. These processes represent possible mediator variables that future quantitative research could

examine to understand better how peers influence specific health behaviors.

Having the opportunity to perform health behaviors with peers is a powerful facilitator for those behaviors. Working out with a friend is much easier than doing it alone, but the same is true for eating junk food for lunch or smoking a cigarette during break time (Bottorff et al., 2016; du Plessis, 2012; Larsen, Strong, & Linke, 2014). The influence of "shared activity" can work both negatively and positively.

Men's behavior can also be influenced through modeling: Some men (mostly men from the highest HPB group) had good role models around them who inspired them to adopt healthy behaviors. However, others (mostly men from the lowest HPB group) were surrounded by negative models, examples of what they should avoid doing in order to stay healthy. These counterexamples did not seem to be as efficient as positive examples in enhancing the adoption of HPBs. This converges with the findings from Bottorff et al. (2016), who reported that limited access to smoke-free friendships is perceived as an obstacle for men attempting to quit smoking.

Among the highest HPB group, some men noted that they were positive models for their friends or peers and that this "responsibility" motivated them to maintain good health habits. This is the first time that "being a positive model" for friends and coworkers has been identified as a facilitator of men's health behavior, although this motivation has been identified previously among fathers wanting to be positive examples for their children (Bottorff, Olliffe, Sarbit, Kelly and Cloherty, 2015). On a practical side, the observation that men are models for their peers (and not only for their children) and that modeled health behaviors can be "contagious" (Christakis & Fowler, 2013) could represent a significant mechanism that could be put to use in designing health promotion programs.

The strengths of this study are that it considers individual and social determinants of health and uses a comprehensive and valid measure of HPBs, instead of focusing on only one specific behavior, such as nutrition or physical activity. The final model explains 35% of the variance in HPBs, considerably more than other models published in the literature, which have explained between 4% and 11% (Profis & Simon-Tuval, 2016; Ulla-Diez & Perez-Fortis, 2009; Wei et al., 2012). Although social determinants of health are gaining increasing attention in the literature, few empirical studies have investigated several of them concurrently. The results of the present study suggest that health promotion efforts should not only focus on changing men themselves (increasing their self-efficacy and reducing their adherence to the restrictive emotionality norm) but also aim at modifying their social (friends, coworkers, partner) and physical (neighborhood) environments.

Limitations of the Study

Some limitations need to be taken into consideration when interpreting this study's findings. First, the cross-sectional nature of the design precluded any conclusions about the causal chains between peer positive social control and HPBs. Second, all the measures were self-reported and thus are subject to potential biases. Further studies should consider using more objective measures of HPBs. Also, different procedures were performed to replace missing data from the self-report questionnaire. These procedures could have influenced study results. However, the analysis was performed with and without handling missing data, and the results were similar in both cases, excluding the possibility that missing data had an undue influence on study results. Third, in keeping with a salutogenic approach, only peer *positive* social control was assessed. However, future studies should examine both positive and negative forms of social control. Fourth, this study focused only on trade union workers, mostly from male-dominated domains of work (such as construction, metallurgy and aerospace industry, and police services). Generalization to other male populations should be made with caution. It is possible that restricting the sample to trade union members who are active workers in the field of construction, metallurgy, retail, and police services, where men have a low to moderate educational level and are mostly working in a team, could have overemphasized the influence of peer coworkers. Retired men, as well as men working alone or a higher status occupation could be less influenced by their peer positive social control. This hypothesis deserves consideration in future studies. Finally, the questionnaire participation rate was rather low (20.8%), and it is possible that men who were more concerned by their health or who engaged in HPBs more frequently were overrepresented in the sample.

Conclusion

Friends and coworkers could play a significant role in promoting health behaviors among adult men. Social networks are subcultures that create their own norms. Through encouragement, practical support, and being good role models themselves, men could help their peers take care of their health. The more men adopt healthy lifestyles, the more their healthy behaviors will be considered normal and will propagate themselves through emulation. This study's salutogenic perspective sheds light on men's strengths and resources, instead of on their weaknesses and deficits. By focusing on men who thrive rather than on men with difficulties, it is possible to produce knowledge that can be leveraged to promote health. This study's findings emphasize the importance of

looking beyond individual characteristics to examine the social determinants of health as well. Promoting health among men is not a matter only for health professionals and policy makers; it is everyone's responsibility.

Acknowledgment

We wish to thank Catherine Purenne, the research coordinator, as well as the research assistants: Benoit Martel, Catherine Guillou-Ouellette, Stéphanie Robert, Stephanie Radziszewski, and Jocelyne Gagné. We also thank the unions that collaborated in recruiting participants: CSD and CSD Construction, Metallos, Fédération des policiers municipaux du Québec, and TCA-Québec

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) received financial support for the research, authorship, and/or publication of this article: This research was supported by a grant from the Canadian Institutes of Health Research.

References

- Antonovsky, A. (1979). *Health, stress and coping*. San Francisco, CA: Jossey-Bass.
- Antonovsky, A. (1987). *Unraveling the mystery of health: How people manage stress and stay well* (1st ed.). San Francisco, CA: Jossey-Bass.
- Bottorff, J. L., Oliffe, J. L., Sarbit, G., Kelly, M. T., & Cloherty, A. (2015). Men's responses to online smoking cessation resources for new fathers: The influence of masculinities. *JMIR Research Protocols*, 4(2), e54. doi:10.2196/resprot.4079
- Bottorff, J. L., Oliffe, J. L., Sarbit, G., Sharpe, P., & Kelly, M. T. (2016). Smoke-free men: Competing and connecting to quit smoking. *American Journal of Health Promotion*, 1–8. doi:10.1177/0890117116671257
- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77–101.
- Callaghan, D. (2006). The influence of basic conditioning factors on healthy behaviors, self-efficacy, and self-care in adults. *Journal of Holistic Nursing*, 24(3), 178–185.
- Christakis, N. A., & Fowler, J. H. (2013). Social contagion theory: Examining dynamic social networks and human behavior. *Statistics in Medicine*, 32(4), 556–577.
- Collins, K. M., Onwuegbuzie, A. J., & Sutton, I. L. (2006). A model incorporating the rationale and purpose for conducting mixed methods research in special education and beyond. *Learning Disabilities: A Contemporary Journal*, 4(1), 67–100.
- Cotto, J. H., Davis, E., Dowling, G. J., Elcano, J. C., Staton, A. B., & Weiss, S. R. (2010). Gender effects on drug use, abuse, and dependence: A special analysis of results from the National Survey on Drug Use and Health. *Gender Medicine*, 7(5), 402–413.

- Craddock, E., vanDellen, M. R., Novak, S. A., & Ranby, K. W. (2015). Influence in relationships: A meta-analysis on health-related social control. *Basic and Applied Social Psychology*, 37(2), 118–130. doi:10.1080/01973533.2015.1011271
- Deeks, A., Lombard, C., Michelmore, J., & Teede, H. (2009). The effects of gender and age on health related behaviors. *BMC Public Health*, 9, 213.
- Duval, A. (2016). Québec prépare un plan d'action pour la santé des hommes [Quebec is preparing an action plan to promote men's health]. *Radio-Canada*. Retrieved from <http://ici.radio-canada.ca/nouvelle/1003379/plan-action-sante-bien-etre-hommes-gouvernement-quebec>
- Eriksson, M., & Lindström, B. (2008). A salutogenic interpretation of the Ottawa Charter. *Health Promotion International*, 23(2), 190–199. doi:10.1093/heapro/dan014
- George, E. S., Kolt, G. S., Rosenkranz, R. R., & Guagliano, J. M. (2014). Physical activity and sedentary time: Male perceptions in a university work environment. *American Journal of Men's Health*, 8(2), 148–158. doi:10.1177/1557988313497217
- Gonzalez-Iglesias, B., Gomez-Fraquela, J. A., & Sobral, J. (2015). Potential determinants of drink driving in young adults. *Traffic Injury Prevention*, 16(4), 345–352.
- Gray, C. M., Anderson, A. S., Clarke, A. M., Dalziel, A., Hunt, K., Leishman, J., & Wyke, S. (2009). Addressing male obesity: An evaluation of a group-based weight management intervention for Scottish men. *Journal of Men's Health*, 6, 70–81. doi:10.1016/j.jomh.2008.11.002
- Gray, C. M., Hunt, K., Mutrie, N., Anderson, A. S., Leishman, J., Dalgarno, L., & Wyke, S. (2013). Football fans in training: The development and optimization of an intervention delivered through professional sports clubs to help men lose weight, become more active and adopt healthier eating habits. *BMC Public Health*, 13, 232.
- Groll, D. L., To, T., Bombardier, C., & Wright, J. G. (2005). The development of a comorbidity index with physical function as the outcome. *Journal of Clinical Epidemiology*, 58(6), 595–602. doi:10.1016/j.jclinepi.2004.10.018
- Guillemin, F., Bombardier, C., & Beaton, D. (1993). Cross-cultural adaptation of health-related quality of life measures: Literature review and proposed guidelines. *Journal of Clinical Epidemiology*, 46(12), 1417–1432. doi:10.1016/0895-4356(93)90142-N
- Hsieh, H. F., & Shannon, S. E. (2005). Three approaches to qualitative content analysis. *Qualitative Health Research*, 15(9), 1277–1288. doi:10.1177/1049732305276687
- Klenke, K. (2008). *Qualitative research in the study of leadership*. Bingley, UK: Emerald Group Publishing.
- Larsen, B. A., Strong, D., & Linke, S. E. (2014). The association between family and friend integration and physical activity: Results from the NHIS. *International Journal of Behavioral Medicine*, 21, 529–536.
- Lau, R. R., Jacobs Quadrel, M., & Hartman, K. A. (1990). Development and change of young adults' preventive health beliefs and behavior: Influence from parents and peers. *Journal of Health and Social Behavior*, 31, 240–259.
- Leishman, J. (2007). Working with men in groups—Experience from a weight management programme in Scotland. In A. White & M. Pettifer (Eds.), *Hazardous waist: Tackling male weight problems* (pp. 75–86). Oxford: Radcliffe.
- Levant, R. F., Hall, R. J., & Rankin, T. J. (2013). Male Role Norms Inventory-Short Form (MRNI-SF): Development, confirmatory factor analytic investigation of structure, and measurement invariance across gender. *Journal of Counseling Psychology*, 60(2), 228–238. doi:10.1037/a0031545
- Lewis, M. A., & Rook, K. S. (1999). Social control in personal relationships: Impact on health behaviors and psychological distress. *Health Psychology*, 18, 63–71. doi:10.1037//0278-6133.18.1.63
- Macdonald, J. (2005). *Environments for health: A salutogenic approach*. Sterling, VA: Earthscan.
- Mallyon, A., Holmes, M., Coveney, J., & Zadoroznyj, M. (2010). “I'm not dieting, I'm doing it for science”: Masculinities and the experience of dieting. *Health Sociology Review*, 19, 330–342.
- Morgan, P. J., Warren, J. M., Lubans, D. R., Collins, C. E., & Callister, R. (2011). Engaging men in weight loss: Experiences of men who participated in the male only SHED-IT pilot study. *Obesity Research and Clinical Practice*, 5(3), e239–e248. Retrieved from <http://dx.doi.org/10.1016/j.orcp.2011.03.002>
- Oliffe, J. L., Bottorff, J. L., & Sarbit, G. (2012). Supporting fathers' efforts to be smoke-free: Program principles. *Canadian Journal of Nursing Research*, 44(3), 64–82.
- Onwuegbuzie, A. J., & Teddlie, C. (2003). A framework for analyzing data in mixed methods research. In A. Tashakkori & C. Teddlie (Eds.), *Handbook of mixed methods in social and behavioral research* (pp. 351–384). Thousand Oaks, CA: Sage.
- Patton, M. Q. (1990). *Qualitative evaluation and research methods*. Beverly Hills, CA: Sage.
- Pender, N. J. (1996). *Health promotion in nursing practice* (3rd ed.). Stamford, CT: Appleton and Lange.
- Pender, N. J., Murdaugh, C. L., & Parsons, M. A. (2002). *Health promotion in nursing practice* (4th ed.). Upper Saddle River, NJ: Prentice Hall.
- Pringle, A., Zwolinsky, S., McKenna, J., Daly-Smith, A., Robertson, S., & White, A. (2013). Delivering men's health interventions in English Premier League football clubs: Key design characteristics. *Public Health*, 127(8), 716–726.
- Profis, M., & Simon-Tuval, T. (2016). The influence of health-care workers' occupation on health promoting lifestyle profile. *Industrial Health*, 54(5), 439–447.
- Robertson, C., Archibald, D., Avenell, A., Douglas, F., Hoddinott, P., van Teijlingen, E., . . . Fowler, C. (2014). Systematic reviews of and integrated report on the quantitative, qualitative and economic evidence base for the management of obesity in men. *Health Technology Assessment*, 18(35), 195–217.
- Roy, P., Tremblay, G., Robertson, S., & Houle, J. (2015). “Do it all by myself”: A salutogenic approach of masculine health practice among farming men coping with stress. *American Journal of Men's Health*, 1–11. doi:10.1177/1557988315619677
- Rubin, A., & Babbie, E. (2016). *Essential research methods for social work*. Boston: Cengage Learning.

- Sicard, S., Mayet, A., Duron, S., Richard, J. B., Beck, F., Meynard, J. B., Deparis, X., & Marimoutou, C. (2016). Factors associated with risky sexual behaviors among the French general population. *Journal of Public Health*, doi:10.1093/pubmed/fdw049
- Sinclair, A., & Alexander, H. (2012). Using outreach to involve the hard-to-reach in a health check: What differences does it make? *Public Health*, *126*(2), 87–95.
- Sloan, C., Gough, B., & Conner, M. (2010). Healthy masculinities? How ostensibly healthy men talk about lifestyle, health and gender. *Psychology and Health*, *25*(7), 783–803. doi:10.1080/08870440902883204
- Smith, M. S., Wallston, K. A., & Smith, C. A. (1995). The development and validation of the Perceived Health Competence Scale. *Health Education Research*, *10*(1), 51–64. doi:10.1093/her/10.1.51
- Stanton, C. A., Keith, D. R., Gaalema, D. E., Bunn, J. Y., Doogan, N. J., Redner, R., . . . Higgins, S. T. (2016). Trends in tobacco use among US adults with chronic health conditions: National Survey on Drug Use and Health 2005–2013. *Preventive Medicine*, *92*, 160–168.
- Stemler, S. (2001). An overview of content analysis. *Practical Assessment, Research & Evaluation*, *7*(17), 137–146.
- Teo, C. H., Ng, C. J., Booth, A., & White, A. (2016). Barriers and facilitators to health screening in men: A systematic review. *Social Science and Medicine*, *165*, 168–176. doi:0.1016/j.socscimed.2016.07.023
- Ulla-Diez, S. M., & Perez-Fortis, A. (2009). Socio-demographic predictors of health behaviors in Mexican college students. *Health Promotion International*, *25*(1), 85–93.
- Walker, S. N., Sechrist, K. R., & Pender, N. J. (1987). The health-promoting lifestyle profile: Development and psychometric characteristics. *Nursing Research*, *36*(2), 76–81.
- Wei, C. N., Harada, K., Ueda, K., Fukumoto, K., Minamoto, K., & Ueda, A. (2012). Assessment of health-promoting lifestyle profile in Japanese university students. *Environmental Health and Preventive Medicine*, *17*(3), 222–227.