

ORIGINAL RESEARCH

Is the cure to male loneliness knowledge about the health benefits of social connection? An exploratory study of the role of social health knowledge in shaping social health behaviour

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Abstract

Background: Despite growing recognition of the profound health risks associated with loneliness, especially among men, limited research has examined how knowledge, beliefs, and behavioral engagement with social connection influence adherence to public health guidelines and wellbeing. We aimed to examine how men's knowledge, perceptions, attitudes, and efforts regarding social connection relate to social and emotional loneliness. **Methods:** Across four exploratory analyses of online survey data, we examined Canadian men's (N = 77, N = 37, N = 122, N = 1681) knowledge about social health (Study 1), their perceived importance of social connection (Study 2), their perceptions about the normativity, utility, and achievability of national public health guidelines for social connection (Study 3), and their self-reported effort to connect with others (Study 4). In each study, we examined the effects of these factors on indicators of social wellbeing (e.g., emotional and social loneliness; guideline adherence). **Results:** Greater knowledge of social wellbeing was associated with lower social loneliness (Study 1). Yet, participants who felt social connection was a relatively important health determinant reported higher overall loneliness (Study 2). Guideline adherence was most strongly predicted by perceived achievability and normative beliefs, rather than perceived health benefits (Study 3). Finally, men who reported greater effort to connect experienced less social loneliness but greater emotional loneliness (Study 4). **Conclusions:** Our findings suggest that striving and recognizing the health importance of social connection does not always meet men's deeper emotional needs. Knowledge, while important and potentially motivating, may not be sufficient to improve social wellbeing. Beyond practical achievability, public health strategies must also enhance normative framing and support men who strive for emotionally meaningful connections to ensure that they not only try to follow public health guidance but are able to do so. Without such support, we may risk worsening experiences of loneliness among men.

Keywords

Loneliness; Social connection; Health literacy; Health promotion; Behaviour change

1. Introduction

Social scientists have long observed that men often avoid seeking help and withdraw into stoic and avoidant forms of "independence" [1, 2]. Conditioned by culture to appear as strong and self-reliant [3–5], they hesitate to label themselves as "lonely". In their view, which is influenced by hegemonic cultural norms, lonely men are weak men, perhaps even feminine [6]. This view of becoming unmanly and burdening others greatly influences their choice not to seek help, even declaratively. A review of studies published before 1985 showed that women consistently reported feeling lonely more often than men. However, the use of validated scales in the same period revealed that men experienced equal or even

greater levels of loneliness [7]. In spite of this systematic reporting bias [2], current data shows a sharp increase in self-reported male loneliness compared to previous reports. In 2024, more US men under 50 said they felt lonely or isolated from those around them compared to women of the same age (16% vs. 15%) [8]. Similarly, 15% of young men reported having no close friends at all in a previous study, a sharp increase compared to past decades [9]. Many Canadian provinces have also seen a spike in self-reported loneliness among men, with about one in eight reporting feeling lonely often or always, nationwide [10]. Nearly one-third of Canadian men experienced "severe" loneliness during the COVID-19 lockdown [11]. Whether these trends reflect a shift in self-

disclosure, a genuine rise in loneliness among men, or both, they point to a growing awareness of what the media has framed as the “male loneliness epidemic” [12].

Studies in culturally diverse settings have shown clear gender differences in the way men and women experience both social life and loneliness. Men, for example, tend to adapt to fit into large groups from a very early age (*i.e.*, they have tribal tendencies) whereas women prioritize close relationships with smaller groups [13–15]. These patterns are in line with hegemonic models of masculinity that frown on intimacy between men, reserving emotional bonds for women to better adhere to masculine norms [4, 16, 17]. Men-to-men socialization typically involves sports, clubs, or other activity-based settings that allow men to start casual talk. These dynamics protect them from social loneliness [4, 18, 19] while preserving masculine norms like competition, risk-taking, stoicism, self-reliance, and emotional restriction [20]. Additionally, there the positive effects of “winning”—a masculine social norm—on men’s well-being are well-documented [20]. However, they are unlikely to help men form deep emotional bonds. Such formative patterns of socialization make women more apt at finding and maintaining meaningful social ties despite a lack of interaction over time, whereas men often require sustained feedback. Eventually, this translates into reduced social networks and supports for men [21, 22]. This vulnerability becomes particularly pronounced in the context of marital dissolution. Separated women are twice as likely to feel lonely compared to married women, but separated men are 13 times more likely to feel lonely compared to married men [3].

Empirical studies indicate that the absence of a close emotional attachment—emotional loneliness—and the absence of a broader social network of group belonging—social loneliness—share only a modest amount of variance (around 20%) [23], meaning a person can experience one without necessarily experiencing the other to the same degree. Differences in the type of loneliness are, too, influenced by gender. Given men’s emotional restriction, it is expected for them to experience emotional rather than social loneliness. These differences, in turn, also affect men’s well-being in unique ways [24]. For example, loneliness has been associated with risky alcohol consumption in men but not women [25]. Likewise, cross-sectional studies have found a stronger correlation between loneliness and suicidal ideation among young men compared to women [26].

While current practices of socialization of men and boys make achieving a fulfilling social life difficult [27], these barriers are amenable to intervention. Past studies have shown that, on average, men respond better than women to practices aimed at restoring social health, suggesting policy efforts “may be more impactful in assisting males to forge a sense of connectedness and belonging” [22], while also carrying positive spillover effects for society in general [27]. Given the challenges posed by loneliness, there is a growing movement to activate public health systems to raise awareness about the importance of social connection [28, 29]. Public health approaches are required not only due to the significant population burden of loneliness, but also because social connection is, by definition, a social act where individual action is necessary but not sufficient [30].

Bandura’s [31, 32] Social Cognitive Theory (SCT) establishes knowledge of health risks and benefits as a “precondition for change” and one of the core determinants of health behavior. Knowledge or health literacy is often associated with changes in health-related lifestyle behaviours and the corresponding outcomes [33–36]. This suggests that educating men about the tangible health hazards of chronic isolation and the benefits of social connection could be a key step in prompting behavior change (*e.g.*, by joining clubs, reaching out to friends, or seeking social support). Based on these and other considerations, several authors have argued for the creation of national public health guidelines for social connection [37, 38]. In 2025, Canada became the first country to produce such guidance (www.socialconnectionguidelines.org). Modelled after guidelines for physical activity and diet, these recommendations were developed to provide evidence-based practices for maintaining healthy social lives. Non-profit organizations in Canada, including GenWell (www.genwell.ca), have sought to raise awareness of these guidelines and the importance of social connection through public health mass media campaigns and health promotion workshops delivered in schools, workplaces, and community centres.

The design of public health interventions must, however, consider potential harmful consequences [39]. Loneliness is, by definition, the subjective perception of a gap between one’s desired and actual levels of social connection [40] and educating about the importance of social connection can act as a double-edged sword: empowering and sensitizing. Potential risks include increasing expectations (*i.e.*, believing that investing effort in friendships or community engagement will “pay off” in terms of feeling better and staying healthier), generating anxiety about the risks of loneliness, increasing an unmet desire for connection, and inducing unhealthy socialization. Hsu & Chao [41], for example, found that increasing certain aspects of loneliness literacy led to greater levels of loneliness during the COVID-19 lockdowns. They concluded that men need to know how to initiate conversations or build supportive relationships (akin to social skills training) apart from being educated of their importance [41]. Similarly, SCT emphasizes the role of self-efficacy (confidence in the ability to execute a behavior) and environmental facilitators in translating knowledge into action. Knowledge without skills and facilitators risks increasing a “knowledge-behavior gap” in social health promotion [42], where men may intellectually recognize that they should “get out and socialize” for health reasons, yet struggle due to poor self-assessment, lack of social skills, or feelings of being inappropriate [17, 43–45].

The challenge for public health practitioners and clinicians is to ensure that raising awareness about loneliness translates into positive action by normalizing help-seeking and social engagement as integral parts of health while concurrently fostering environments where men can confidently build relationships that translate into meaningful intimate ties. Only then can knowledge truly become a pathway toward connection, rather than a source of unmet longings.

The current work presents four independent studies based on distinct independent samples from the Canadian Social Connection Survey (CSCS). Although the cross-sectional samples share a common methodological framework and use compara-

ble core measures, each was asked a subset of unique questions that require separate analyses. Together, they offer a broader view of how knowledge, values, norms, and personal agency intersect to influence men's social health, informing more effective and gender-responsive public health interventions. In these studies, we explored the following research questions:

(1) To what extent does greater knowledge about the health benefits of social connection is associated with reduced loneliness?

(2) How do men perceive the importance of social connection relative to other health determinants, and to what extent this perception is associated with loneliness?

(3) How men's attitudes toward national public health guidelines for social connection—including their perceived benefit, achievability, and normative relevance—relate to adherence behaviors?

(4) To what extent men's self-reported effort to connect with others predicts social and emotional loneliness?

2. Survey design and samples description

CSCS was an online survey in which Canadians aged 16 years and older were recruited in four waves from 2021 to 2024 via English and French advertisements on Facebook, Twitter, Instagram, and Google. Qualtrics was used to collect the data, and the open survey was available on specific dates for each wave, provided in Table 1. In Canada, there is no fixed minimum age of consent for participation in social research. Instead, ability to consent depends on decision-making capacity. Adolescents aged 16 and older are typically presumed to have sufficient capacity to decide about minimal-risk research [46]. Ethics approval was obtained from the Research Ethics Boards of the University of Victoria and Simon Fraser University (Protocol #30000986). Targeted recruitment helped mitigate demographic imbalances based on age, gender, and geography. Participants who completed the survey were eligible for a prize draw of a \$200 cash prize with approximately 1:100 odds of winning. All participants provided informed consent prior to participation.

2.1 Core measures

Loneliness was assessed using the DeJong Gierveld Emotional and Social Loneliness scales [47], comprising two distinct subscales: emotional loneliness (reflecting feelings of emptiness or emotional isolation) and social loneliness (indicating a perceived absence of a supportive social network). This scale has been thoroughly validated in various countries and settings [47]. Participants rated their agreement with six statements reflecting their current feelings, using the response options “Yes”, “More or less”, or “No”. The three emotional loneliness items were: (1) “I miss having people around”, (2) “I often feel rejected”, and (3) “I experience a general sense of emptiness”. Responses indicating emotional loneliness (“Yes” or “More or less”) were scored as 1, while “No” responses were scored as 0. The emotional loneliness subscale score was calculated as the sum of these three items, resulting in a total ranging from 0 to 3, with higher scores reflecting greater emotional

loneliness. The three social loneliness items were reverse-scored and included: (1) “There are plenty of people I can rely on when I have problems”, (2) “There are many people I can trust completely”, and (3) “There are enough people I feel close to”. Responses of “No” or “More or less” indicated social loneliness and were scored as 1; responses of “Yes” were scored as 0. Summing these three items provided the social loneliness subscale score (range: 0–3), with higher scores indicating greater social loneliness.

Social engagement was assessed by asking participants to report the frequency with which they had engaged in 20 distinct social activities during the past three months. Activities included greeting a neighbor or stranger, having an in-person conversation, checking in via text or private message, phone conversations with friends or family, group video chats, walking with someone, meeting for meals or drinks, playing video or board games, visiting friends, visiting family, volunteering in the community, helping neighbors or friends with chores, attending community meetings, participating in online discussion groups, engaging in group exercise, attending religious services, making new friends, hugging someone, kissing someone, and having sex. In Study 1, participants rated each activity using an 8-point numerical scale coded as 0 (Never), 1 (More than three months ago), 2 (Within the past three months), 3 (Within the past month), 4 (Within the past two weeks), 5 (Within the past week), 6 (Within the past few days), and 7 (Today). Studies 2 and 3 added two extra activities: to extend an invitation and been invited. Frequency of engagement, rather than recency, was used in these two studies, ranging from 0 (“Not in the past three months”) to 6 (“Daily or almost daily”).

Social network size was measured by asking participants to estimate the number of individuals with whom they had spent time socializing in the previous three months, categorized into seven relationship types: (1) close friends, (2) casual friends, (3) classmates, (4) coworkers, (5) friends of friends, (6) acquaintances, and (7) other social connections. Participants were instructed to assign each social contact to only one category, selecting the one that best described their primary relationship to that individual. The number of individuals in each category was recorded, and summed to compute the total social network size, representing the breadth of social connections.

Time spent socializing was measured by asking participants to report the total number of hours they spent interacting socially with different groups during the past week. Participants provided numeric estimates of their hours spent with (1) family members, (2) friends, (3) coworkers, (4) classmates, (5) neighbors, (6) acquaintances, and (7) strangers. These data were used to evaluate participants' weekly investment in social activities across diverse social contexts.

Sociodemographic variables included self-reported gender (restricted to men in this analysis), age (later split into decades), ethnicity (categorized as White, East Asian, South Asian, Indigenous, and Other racialized groups), and household income in Canadian dollars (CAD) recoded into numeric values reflecting midpoints of income categories. Apart from those mentioned above, each wave contained unique variables that will be further described under

TABLE 1. Sociodemographic characteristics and loneliness levels of study participants.

	Study 1 (n = 77)	Study 2 (n = 37)	Study 3 (n = 122)	Study 4 (n = 1681)
Data collection period	10 May–28 August 2022	27 June–04 September 2023	19 June–12 August 2024	21 April–09 August 2021
Age, yr (mean (SD))	42.70 (17.64)	49.24 (16.71)	47.49 (17.82)	36.57 (14.35)
Age group, yr (%)				
<25	10 (13.0)	4 (10.8)	13 (10.7)	193 (11.5)
25–34	25 (32.5)	5 (13.5)	25 (20.5)	824 (49.0)
35–44	12 (15.6)	6 (16.2)	21 (17.2)	291 (17.3)
45–54	5 (6.5)	6 (16.2)	11 (9.0)	117 (7.0)
55–64	15 (19.5)	7 (18.9)	27 (22.1)	122 (7.3)
65+	10 (13.0)	9 (24.3)	25 (20.5)	134 (8.0)
Income (thousands, CAD) (mean (SD))	71.23 (56.38)	83.42 (61.58)	78.75 (55.24)	61.03 (45.71)
Ethnicity (%)				
East Asian	4 (5.2)	5 (13.5)	3 (2.5)	80 (4.8)
Indigenous	5 (6.5)	1 (2.7)	17 (13.9)	114 (6.8)
Other Racialized	9 (11.7)	6 (16.2)	12 (9.8)	383 (22.9)
South Asian	4 (5.2)	1 (2.7)	3 (2.5)	27 (1.6)
White	55 (71.4)	24 (64.9)	87 (71.3)	1071 (63.9)
Emotional loneliness score (mean (SD))	1.91 (1.23)	1.92 (1.12)	1.83 (1.16)	2.29 (0.89)
Social loneliness score (mean (SD))	2.04 (1.19)	2.27 (1.07)	2.29 (1.02)	1.77 (1.11)

CAD: Canadian Dollars; SD: Standard Deviation.

“Measures” of each corresponding study.

2.2 Sample description

The demographic characteristics and loneliness levels for the samples are described in Table 1 and briefly summarized within each corresponding section.

3. Study 1

Our first study examined men’s factual knowledge about the health consequences of loneliness and social isolation and assessed whether heightened perceptions were associated with higher or lower levels of emotional and social loneliness.

3.1 Measures

Social wellbeing knowledge was assessed using eight binary items designed to evaluate participants’ awareness of the health impacts associated with social connection, loneliness, and social isolation. Participants responded “Yes, I already knew this” or “No, I did not know this” to each of the following statements: (1) “social connection was important for your physical health”, (2) “social connection was important for your mental health”, (3) “loneliness and social isolation are associated with higher risk for disease, such as heart disease and cancer”, (4) “loneliness and social isolation are associated

with a higher risk for premature death”, (5) “loneliness and social isolation are as bad for your health as air pollution”, (6) “loneliness and social isolation are as bad for your health as being obese”, (7) “loneliness and social isolation are as bad for your health as living a sedentary lifestyle”, and (8) “loneliness and social isolation are as bad for your health as consuming alcohol or tobacco”. Each response was coded as a binary variable (1 = Yes, 0 = No), and responses were summed to form a composite knowledge score ranging from 0 to 8, with higher scores indicating greater overall knowledge regarding the health implications of social well-being.

3.2 Data analysis

Descriptive statistics, including means (M) and standard deviations (SD), were computed for all study variables to characterize the sample and provide context for regression analyses. Statistical analyses involved two regression models with 5000 bootstrap samples to examine associations between social wellbeing knowledge scores (independent variable) and loneliness, controlling for age, ethnicity, and household income. Percentile-based bootstrap confidence interval (CI) were also calculated. Model assumptions, including linearity, normality, homoscedasticity, and multicollinearity, were examined using diagnostic plots and variance inflation factors.

3.3 Results

Participants ($n = 77$ men) had a median age of 37 years (range: 18 to 79). Most identified as White (71.4%) and had an approximate median annual household income of CAD 55,000. Other demographic characteristics can be found in Table 1. Table 2 shows the proportion of participants who “knew” about each specific statement. Overall, men demonstrated moderate social wellbeing knowledge ($M = 5.47$, $SD = 2.30$). Most participants knew social connection was important for physical (87%) and mental health (86%), whereas fewer knew about associations with obesity (53%) or substance use (57%).

Social wellbeing knowledge was negatively associated with social loneliness ($\beta = -0.18$, 95% CI = -0.31 to -0.04) but not emotional loneliness ($\beta = -0.03$, 95% CI = -0.15 to 0.08).

4. Study 2

Study 2 focused on the Perceived Importance of Social Connection rather than Social Health Knowledge Scores and their relation with loneliness. While Study 1 results suggested that greater knowledge about the health impacts of social connection was associated with lower social loneliness, participants may have engaged in favourable reporting because we presented them with factual questions. As such, Study 2 analyzed data which asked participants to rate the Perceived Importance of social health factors to their health in comparison with other common determinants of health.

4.1 Measures

Participants ranked 17 factors according to how impactful they believed each factor was for physical health, daily wellbeing, disease risk, and longevity. Rankings ranged from 1 (“most impactful”) to 17 (“least impactful”). The specific factors participants ranked were: (1) diet (*e.g.*, food intake, fruit and vegetable consumption), (2) supplement usage (*e.g.*, vitamins, minerals), (3) chemical exposures (*e.g.*, microplastics, pesticides), (4) air quality (*e.g.*, particulate matter, pollution), (5) physical activity (*e.g.*, exercise), (6) time spent sitting, (7) sleep, (8) work-related stress, (9) alcohol use, (10) tobacco use, (11) cannabis use, (12) use of other drugs, (13) financial situation (*e.g.*, income, cost of living), (14) quality of romantic and family relationships, (15) amount of social interactions, (16) stress from relationships, and (17) genetic

factors. To quantify Perceived Importance of Social Connection, we combined rankings for items (14) “quality of romantic and family relationships”, and (15) “amount of social interactions”. Specifically, each item’s rank was reverse-coded by subtracting the original rank from the highest possible score so that higher numbers indicate greater perceived importance. These two reverse-coded values were then summed to produce a composite score with possible values ranging from 2 (lowest perceived importance) to 34 (highest perceived importance), with higher scores indicating that participants viewed social connections as more impactful relative to other health factors.

4.2 Data analysis

Like in Study 1, we employed bootstrap regression modelling with 5000 sample repetitions to investigate the associations between the rated importance of the two social health factors and loneliness scores while adjusting for age, ethnicity, and household income.

A Principal Component Analysis (PCA) with varimax rotation was conducted on the social activity items to identify underlying patterns of social engagement. Participants received standardized PCA factor scores for each component, which were subsequently used as dependent variables in regression analyses to explore associations with the perceived importance of social health factors.

4.3 Results

The study sample consisted of 37 men with a median age of 53 years (range: 20 to 73). The majority identified as White (64.9%) and the median household income was CAD 70,000 (see Table 1 for other sociodemographic characteristics). **Supplementary Table 1** provides other sample characteristics regarding network size and shared time with said network. The mean score for the perceived importance of relationship quality and social interactions to physical health was 21.27 ($SD = 7.37$, range = 6–33). The distribution was slightly left-skewed (skewness = -0.35), indicating a modest tendency toward higher scores. The 25th and 75th percentiles were 17 and 27, respectively.

Five distinct social engagement dimensions were identified, explaining 67% of the total variance. These were, community and Organized Group Activities (*e.g.*, volunteering, community meetings, discussion groups, religious services, group

TABLE 2. Number and proportion of participants with knowledge (*i.e.*, Selected “I already knew”) about the health consequences of social connection and loneliness (N = 77).

Statement	n (%)
Social connection is important for your physical health.	67 (87.0%)
Social connection is important for your mental health.	66 (85.7%)
Loneliness and social isolation increase risk for disease (<i>e.g.</i> , heart disease, cancer).	56 (72.7%)
Loneliness and social isolation increase risk for premature death.	52 (67.5%)
Loneliness and social isolation are as harmful as living a sedentary lifestyle.	48 (62.3%)
Loneliness and social isolation are as harmful as air pollution.	47 (61.0%)
Loneliness and social isolation are as harmful as consuming alcohol or tobacco.	44 (57.1%)
Loneliness and social isolation are as harmful as obesity.	41 (53.2%)

exercise); Informal and Socializing Activities (*e.g.*, meeting for coffee, extending or receiving social invitations, going for walks, texting, phone calls); Casual Daily Interactions (*e.g.*, greeting neighbours, casual in-person conversations, chatting informally); Intimate Physical Contact (*e.g.*, sexual activities, kissing, intimate interactions); Family Interactions (*e.g.*, visiting and spending time specifically with family members). All loadings are available in **Supplementary Table 2**.

Across all models (Table 3), the associations between perceived importance of social connection and indicators of social engagement, network size, and time spent socializing were small, with most 95% bootstrap confidence intervals including zero, suggesting considerable uncertainty and no statistically robust evidence of association. A higher perceived importance of social connection was associated with slightly higher emotional loneliness ($\beta = 0.05$), but the 95% CI (-0.02 to 0.13) includes zero. The association with social loneliness was weaker ($\beta = 0.02$; 95% CI: -0.05 to 0.11).

Regarding social activities, the largest estimate was for structured ones ($\beta = 0.05$; 95% CI: -0.01 to 0.09), while the opposite pattern emerged for casual interactions ($\beta = -0.06$; 95% CI: -0.14 to 0.01), suggesting that valuing social connection may be more closely aligned with organized or purposeful social contexts than with spontaneous or informal encounters. Associations with time spent socializing or network size were generally weak and nonsignificant, except for classmates, indicating a very small but possibly real effect in that specific category.

Taken together, the findings suggest a paradoxical role of valuing social connection. While the perceived importance of connection was weakly and inconsistently related to actual social behavior, network size, or time spent socializing, it was not associated to decreases in loneliness levels. If anything, the direction of the effect showed a modest positive association with emotional loneliness. This pattern may reflect a form of motivational tension: men who place a higher value on

TABLE 3. Results from bootstrap regression analyses predicting social engagement, network size, and socializing hours from perceived importance of social connection, adjusted by demographic covariates.

Outcome Variable	Estimate	Bootstrap 95% CI
Loneliness		
Emotional Loneliness	0.05	-0.02 to 0.13
Social Loneliness	0.02	-0.05 to 0.11
Social Engagement (PCA)		
Structured Social Activities (PC1)	0.05	-0.01 to 0.09
Intimate Personal Relationships (PC2)	0.03	-0.07 to 0.09
Casual Social Interactions (PC3)	-0.06	-0.14 to 0.01
Online Social Activities (PC4)	0.03	-0.07 to 0.11
Family-focused Interactions (PC5)	0.03	-0.08 to 0.10
Social Network Size		
Total network size	0.08	-5.76 to 2.31
Close friends	-0.16	-1.74 to 0.20
Casual friends	0.04	-0.49 to 0.70
Classmates	0.03	0.00 to 0.17
Coworkers	-0.01	-0.66 to 0.27
Friends-of-friends	0.05	-1.21 to 0.74
Acquaintances	0.19	-0.09 to 0.61
Other contacts	-0.07	-2.00 to 0.40
Hours Socializing (past week)		
Total socializing hours	-0.01	-1.36 to 0.91
Family	-0.35	-1.34 to 0.40
Friends	0.17	-0.47 to 1.23
Coworkers	0.05	-0.17 to 0.44
Classmates [†]	0.01	0.00 to 0.05
Neighbours	-0.02	-0.12 to 0.06
Acquaintances	0.07	-0.12 to 0.27
Strangers	0.07	-0.05 to 0.21

[†]95% CI for model without adjusting for age is 0.00 to 0.02 . PCA: Principal Component Analysis; PC: Principal Component; CI: Confidence interval.

connection may be more attuned to unmet relational needs, which translates into a search for companion. However, this search does not necessarily translate into meaningful connection. These interpretations remain tentative given the limited strength of the observed effects.

5. Study 3

Building on the finding that men may value social connection but still experience loneliness, Study 3 examined whether such values translate into action—specifically, adherence to national public health guidelines promoting social connection. Rather than focusing on beliefs or knowledge, this study tested whether men’s engagement with guidelines is shaped by practical and social perceptions. In other words, do men follow guidelines because they believe in their benefits, or because the behaviors seem achievable and socially normative (key factors advanced by SCT [31])? By analyzing perceptions of achievability, normativity (*i.e.*, perceiving guidelines as common knowledge), and benefit, we aimed to identify the most influential predictors of whether participants reported already living in line with the proposed Canadian Social Connection Guidelines.

5.1 Measures

Participants evaluated their perceptions of twelve preliminary Canadian Social Connection Guidelines (See **Supplementary Table 3** for text of guidelines and questionnaire items), each designed to foster social wellbeing and connection. Guidelines 1–6 focused on individual behaviors, whereas guidelines 7–12 focused on community-level actions. Each guideline was followed by six items assessing participant agreement regarding its importance, perceived benefit, achievability for a typical person, personal achievability, common knowledge, and personal adherence to the guideline. Responses were captured on a 7-point Likert scale ranging from 1 (“Strongly disagree”) to 7 (“Strongly agree”).

5.2 Data analysis

We computed descriptive statistics and Pearson correlations to explore associations between composite variables. Structural equation modeling (SEM) was employed using lavaan [48] to test relationships among perceptions of guideline importance, benefit, common knowledge, achievability, and reported adherence. Multivariable linear regression analyses further explored whether living in accordance with the guidelines was associated with reductions in emotional and social loneliness.

5.3 Results

Among 122 participants, the median age was 45 years (range: 19 to 85), with a median income of CAD 65,000 and most (61.3%) identified as White (See Table 1 for other sociodemographic characteristics). In general, participants reported high agreement with statements that portrayed the guidelines as beneficial ($M = 5.66$, $SD = 0.83$) and achievable for typical individuals ($M = 5.24$, $SD = 0.89$). They moderately agreed that the guidelines were common knowledge ($M = 4.57$, SD

$= 1.01$). Self-reported adherence was also moderate ($M = 4.28$, $SD = 1.08$). Correlational analyses indicated strong associations between perceived importance and benefits ($r = 0.93$, $p < 0.001$). As shown in Fig. 1, moderate to strong correlations were found between perceptions of achievable typicality and adherence ($r = 0.44$, $p < 0.001$), as well as between common knowledge and adherence ($r = 0.42$, $p < 0.001$).

Fig. 2 and Table 4 show our SEM results. The model demonstrated an excellent fit to the data: $\chi^2(2) = 3.10$, $p = 0.21$; comparative fit index = 0.996; Tucker-Lewis index = 0.986; Root Mean Square Error of Approximation = 0.067; and Standardized Root Mean Square Residual = 0.009. The perceived importance of the guidelines strongly predicted perceived benefit (Standardized $\beta = 0.93$, $p < 0.001$), whereas perceptions that the guidelines were common knowledge was not a significant predictor of benefit ($\beta = -0.01$, $p = 0.82$). However, both perceived achievability for typical individuals/communities ($\beta = 0.26$, $p = 0.018$) and perceptions that the guidelines were common knowledge ($\beta = 0.31$, $p < 0.001$) significantly predicted self-reported guideline adherence. The perceived benefit was not associated with adherence ($\beta = 0.10$, $p = 0.35$).

Greater adherence to the guidelines was significantly associated with lower emotional loneliness ($\beta = -0.21$, $p = 0.002$, $R^2 = 0.34$, Adjusted $R^2 = 0.27$), after adjusting for age, ethnicity, and household income. Living in accordance with the guidelines was also significantly associated with lower social loneliness ($\beta = -0.29$, $p < 0.001$, $R^2 = 0.26$, Adjusted $R^2 = 0.19$) in the fully adjusted model.

Study 3 reveals that men’s adherence to social connection guidelines is driven less by abstract beliefs and internal motivation and more by perceptions of social norms (“common knowledge”) and practical achievability. Encouragingly, those who adhered to the guidelines experienced lower emotional and social loneliness, reinforcing the utility of such behavioral frameworks.

6. Study 4

While Study 3 found an association between adhering to the social health guidelines and reduced levels of loneliness, such adherence may reflect intentional striving, a socially supportive environment, or both. Study 2, for example, showed that men who highly value social connection—possibly internalizing its perceived importance—report greater emotional loneliness, potentially due to an increased awareness of social deficits. In this sense, guideline compliance could be effortless for some and effortful for others—raising the question of whether striving to connect yields the same benefits as thriving through connection. Study 4 examined whether self-reported effort to connect is associated with improvements in social wellbeing. If these two measures are not associated, an effort to connect may reflect a state of emotional striving with limited return.

6.1 Measures

Measures for this study were the same as used in Studies 1 and 2. The primary variable of interest for this study was one’s self-

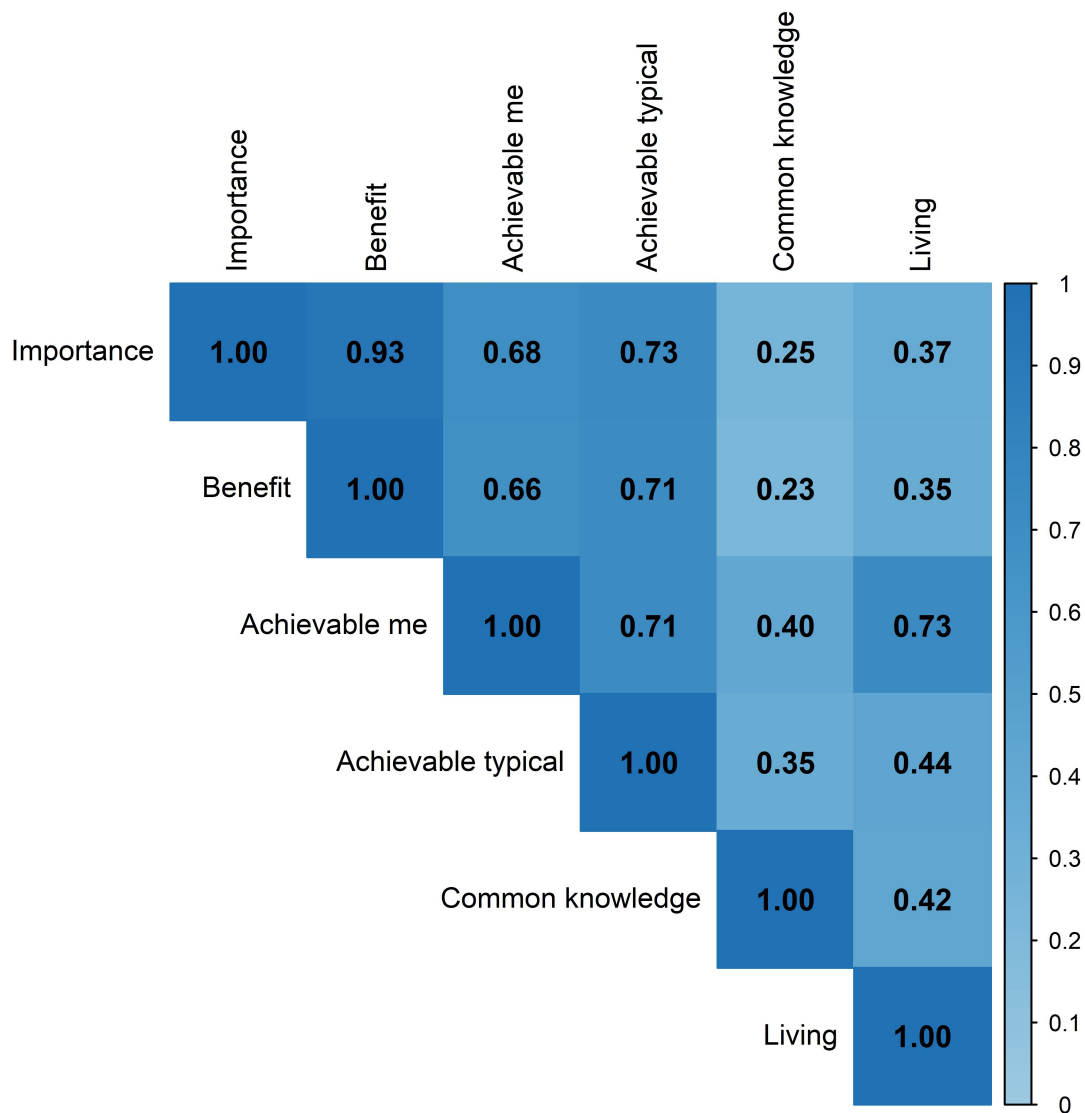


FIGURE 1. Correlations between guideline beliefs and adherence.

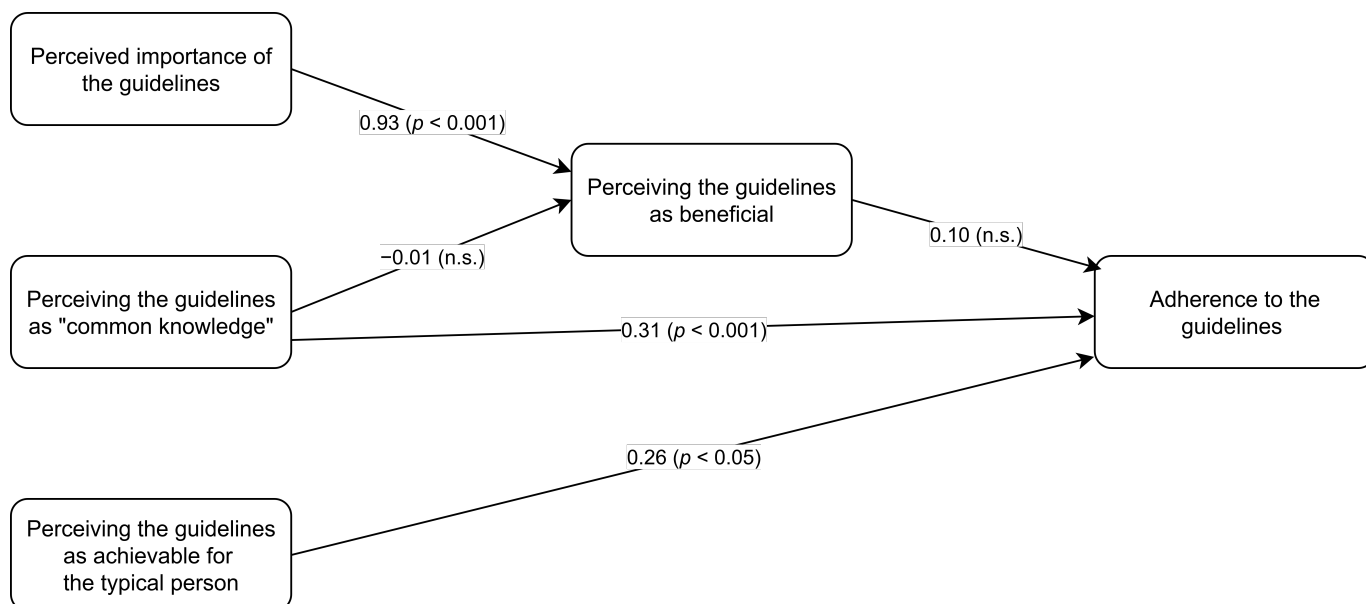


FIGURE 2. SEM path diagram. n.s.: non-significant.

TABLE 4. Path coefficients for Structural Equation Model (SEM) results.

Regression Path	B	SE	z-value	p-value	β (Std.)
Benefit \leftarrow Importance	0.895	0.034	26.550	<0.001	0.929
Benefit \leftarrow Common Knowledge	-0.008	0.035	-0.225	0.822	-0.008
Living \leftarrow Benefit	0.111	0.119	0.928	0.354	0.097
Living \leftarrow Achievable (Typical Person)	0.287	0.121	2.376	0.018	0.258
Living \leftarrow Common Knowledge	0.352	0.093	3.791	<0.001	0.312

SE: Standard error; Std.: Standardized; B: Coefficient.

assessed effort to connect with others, which was measured by asking: “How much effort do you put into intentionally connecting with others?” Responses were ordinally recoded from 1 (“No effort at all”) to 5 (“A great deal of effort”).

6.2 Data analysis

We conducted multivariable linear regressions to examine whether men’s effort to connect was associated with each outcome. All models adjusted for age, ethnicity, and household income. The ggstatsplot package was used to display and describe differences between groups.

6.3 Results

A total of 1681 took part in this study during the third wave of the COVID-19 pandemic. The median age was 32 years (range: 16 to 89), with a median income of CAD 47,500. Most participants identified as White (63.9%). This wave was still marked by lockdowns and an overall imbalance in the dimensions of loneliness compared to the other studies. The sample was also considerably younger (See Table 1 for sociodemographic characteristics).

Fig. 3 shows the number of participants according to their effort (x axis) as well as group differences in social and emotional loneliness (y axis). Significant dose-dependent differences can be observed. These unadjusted results align with the adjusted estimates: greater effort to connect was significantly associated with higher emotional loneliness ($B = 0.053$, $p = 0.024$) and lower social loneliness ($B = -0.171$, $p < 0.001$). These results suggest a dual reality. On one hand, behavioral activation may help men expand their networks and reduce the sense of social scarcity. On the other hand, that same effort may signal emotional longing and unfulfilled relational depth. Men who strive to connect may do so because they feel emotionally disconnected, not necessarily because they are successful in forming meaningful bonds. This finding mirrors the emotional dissonance observed in Study 2, where valuing connection did not guarantee fulfillment.

7. Discussion

Together, these four exploratory studies illuminate the multifaceted relationship between men’s knowledge, values, perceptions, behavioral effort, and lived experiences of emotional and social loneliness. Our findings point to the limitations of approaches that rely solely on awareness-raising and underscore the need for multi-component, whole of society ap-

proaches that emphasize the relative importance of normative and self-efficacy beliefs—in shaping our abilities to comply with public health guidance—and account for the complexity of loneliness as a product of both our social behaviour and emotional responses.

Study 1 found that men with greater knowledge of the health consequences of social connection reported lower levels of social loneliness (and no differences in emotional loneliness). The positive effect on social loneliness is consistent with health behavior theories such as SCT [31, 32] and the Health Belief Model [49], which posits that awareness of health risks can prompt protective behaviors. However, the absence of effects on emotional loneliness suggests a boundary condition: while knowledge may support “activation” across one’s social network, it may not provide the intimacy needed to reduce emotional loneliness. Previous studies have shown that social loneliness is more strongly linked to objective social contact, while emotional loneliness is driven by subjective experiences [23, 45, 47, 50]. Therefore, it is possible that these subjective experiences might inhibit the effect of knowledge [51], aligning with critiques of health literacy frameworks that overemphasize cognitive knowledge while underappreciating emotional, cultural, and relational literacy [52].

Study 2 showed that ranking social connection as an important determinant of health was associated with higher scores for structured activities and lower scores for casual interactions, suggesting a purposeful intent to connect among those who ranked social connection as higher. However, higher rankings did not meaningfully reduce emotional or social loneliness, rather the direction of the effect was the opposite (although there was statistical uncertainty due to wide confidence intervals). Study 4 examined intent directly; it showed that greater effort to connect was associated with reduced social loneliness in line with previous studies about the effects of effort on behavioral engagement and network expansion [53]. However, effort was also positively associated with emotional loneliness, reflecting a potential cost of striving when deeper needs remain unmet [40, 54]. These findings also align with research on social media and loneliness in Canada, which shows that young men search for connection online to escape loneliness. However, the lack of meaningful engagement online lead to increased psychological distress [55].

Advancing these findings in relation to Canada’s emerging social connection guidelines, Study 3 revealed that men’s adherence was not driven by perceived benefits (as predicted by many rational actor models of health behavior). Instead, healthy social behaviour was more easily adopted when men

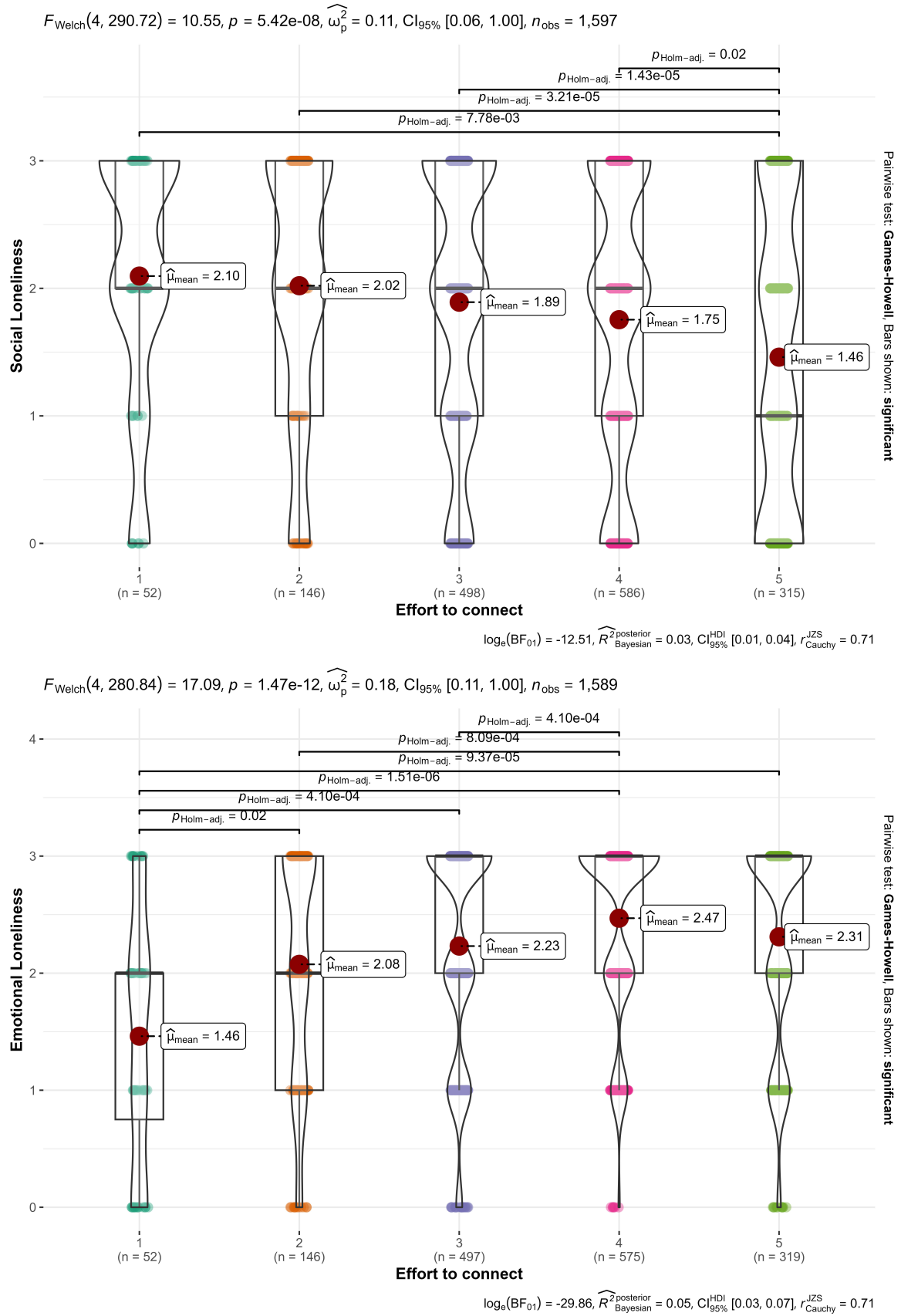


FIGURE 3. Box/Violin plots comparing loneliness levels by connecting efforts. HDI: Highest Density Interval; JZS: Jeffreys-Zellner-Siow; BF: Bayes Factor; CI: Confidence Interval; obs: observations.

perceived the guidelines as achievable and “common sense”, in line with theories of Planned Behavior and Reasoned Action [56]. Interestingly, guideline adherence in this study was associated with both reduced emotional and social loneliness—suggesting that when public health guidance aligns with social norms and perceived feasibility, it can facilitate meaningful behavioral change that improves men’s wellbeing. These results affirm the utility of normative framing in health communication and challenge the assumption that disseminating benefits is enough to shift behavior.

7.1 Recommendations for public health practitioners and policy makers

Public health campaigns should go beyond transmitting knowledge and engaging men in social activities to incorporate strategies to foster deeper emotional connections, particularly men-to-men, as this narrative is contested by unhealthy masculinity models [4]. Messages that emphasize that healthy social behaviors are achievable and align with common sense and existing social norms are more likely to be effective at improving both social and emotional loneliness. Previous research has also found that messages that directly frame men as lonely may trigger avoidance, particularly among older men [6], therefore an adequate balance is required. Additionally, campaigns encouraging men to increase efforts to connect must be aware of the potential emotional costs of unmet social needs, coupling their campaigns with appropriate social training or strategies to help men manage the emotional strain associated with striving to connect [41, 57]. Framing socialization as an activity to help others may give men a sense of responsibility and pride that is compatible with their views of masculinity [6].

While there are positive effects of activity-based interventions, designing interventions that are compatible with the values of hegemonic masculinity risks attending to social, but not emotional loneliness. Educational efforts should be complemented by programs that foster the interpersonal skills, enhance emotional literacy, and prompt the psychological readiness needed to meaningfully engage with others. Separated men in particular may feel the need of gender balance in group activities [6], meaning men would benefit from learning how to approach and sustain friendship with all genders. Finally, policy makers should recognize emotional loneliness in men as a distinct target and offer tailored support that recognizes the unique ways in which men connect [1] through mental health services, relationship counseling, and peer support initiatives that address their deeper emotional needs as an integral part of the overarching strategy against loneliness.

7.2 Recommendations for clinicians, counselors, and social workers

For practitioners, it is essential to assess both social and emotional loneliness in their clients, recognizing that quantity of social interactions alone does not capture the full picture of loneliness. The interventions should focus not only on imparting knowledge but also on enhancing emotional skills, cultural sensitivity, and relational literacy, thus addressing the emotional and subjective aspects of loneliness more effectively. In line with previous research, practitioners should also

adopt strategies that actively build and sustain trust, respect, and understanding from the outset, using clear, goal-focused structures, validating language while being sensitivity to each client’s unique gender socialization, and construction of masculinity [58]. Previous research has shown that appealing to specific archetypes like a “sage” or helping others may help men engaging in tasks related to socialization [6].

7.3 Strengths, limitations, and future research

Several overarching limitations span across the four studies. First, all data were cross-sectional, limiting our ability to infer causal relationships or directional pathways among knowledge, beliefs, behaviors, and loneliness. Longitudinal studies are essential to determine how these domains influence each other over time, especially in response to public health interventions. Second, reliance on self-reported measures—particularly for knowledge, values, perceived norms, and behavioral effort—raises concerns about social desirability and recall bias. While measures were pragmatic and face-valid, some constructs (*e.g.*, effort, knowledge, adherence) were assessed using single-item or composite indices that may oversimplify complex psychological and behavioral processes. Sample sizes varied considerably, with Studies 1 and 2 drawing from small, demographically limited cohorts. We addressed this by using bootstrap methods that provide more robust estimates of standard errors and confidence intervals, allowing for more reliable inference despite the limited sample size. Although Study 4 used a much larger sample, the generalizability of all findings may still be constrained by non-probabilistic sampling and overrepresentation of White, Canadian men, and by the particular normativity around the COVID-19 pandemic. One important limitation related to sample size is that our analysis collapsed distinct life stages (ranging from 16 to 89 years) into a single analytical frame. Loneliness in later life may be shaped by bereavement, retirement, or health decline, whereas for younger men, it may intersect more with identity development, independence, and career transitions [59]. In addition, our analyses did not include explicit measures that would allow us to explicitly evaluate masculine norms neither did we examine women’s experiences as a comparator group, limiting the extent to which gendered patterns of loneliness could be assessed. Future research would benefit from age-targeted sampling or stratified analyses of bigger samples, explicitly attending to these developmental and social distinctions. Across all studies, we were limited in our capacity to assess the emotional texture, context, and quality of social connections—highlighting the need for future mixed-methods or qualitative inquiry. Despite these limitations, each study advances understanding in a meaningful way and builds sequentially on the others, presenting several key findings that contribute to a cohesive theoretical message about the role of social instead of individual and the need of working knowledge to improve social wellbeing. Experimental evidence will be particularly useful in helping us understand how individuals with different baseline levels of social and emotional loneliness respond to information, social training,

therapy, and community-based interventions in the broader context of social connection as an important predictor of wellbeing [31, 32].

8. Conclusions

Our multi-study exploratory investigation suggests that public health systems can effectively respond to “male loneliness”. In particular, we highlight that knowledge alone may activate social networks, but without meeting deeper interpersonal needs, it may even be harmful. Effective strategies must combine public health, policy, and clinical efforts to frame healthy social behaviour as achievable and socially normal while equipping men with emotional literacy, relational skills, and supportive environments, tailored to diverse experiences of masculinity and the distinct dynamics of social and emotional loneliness.

AVAILABILITY OF DATA AND MATERIALS

Researchers interested in collaborating may request access to the data by contacting the Principal Investigator (PI). A public version of the dataset is also available at <https://casch.org/cscs>.

AUTHOR CONTRIBUTIONS

KGC—conceptualized the study design, oversaw all research stages, and drafted the manuscript. JADR—conducted additional analyses and revised the manuscript.

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

All participants provided informed consent prior to participating. The study was reviewed and approved by the research ethics board at Simon Fraser University (Protocol No. 30000986).

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CONFLICT OF INTEREST

The authors declare no conflict of interest.

SUPPLEMENTARY MATERIAL

Supplementary material associated with this article can be found, in the online version, at <https://oss.jomh.org/>

<files/article/2017111209667379200/attachment/Supplementary%20material.docx>.

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