Table of Contents

Drivers of Sexual Health Knowledge for Two-Spirit, Gay, Bi and/or Indigenous Men Who Have Sex with Men (gbMSM)

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ABSTRACT

Purpose: Centering Two-Spirit (2S) and Indigenous experiences and ways is critical for more respectful, reciprocal, relevant, and responsible sexual health research with gay, bisexual, and other men who have sex with men (gbMSM). The Two-Spirit Dry Lab, a collaborative initiative of Indigenous and settler researchers, conducted a study to explore drivers of sexual health knowledge with 2S and other Indigenous gbMSM community(ies). **Methods**: We used data from the 2015 Canadian Sex Now online survey. Our models balanced Indigenous ways of knowing with western epidemiology: we applied mitakuye oyasin (i.e., everything is related)—a Sioux teaching—alongside linear regression (i.e., certain relationships enable certain outcomes), to examine drivers of sexual health knowledge (a 6-point scale), comparing 2S and other Indigenous gbMSM. We also examined differences between those living in urban settings versus those living in non-urban ones. **Results**: Income and education were correlated, as were having a gay peer network, living in an urban setting, social support, and education. Income, education, gay peer network, and social support were associated with greater sexual health knowledge, as was younger age. In stratified analyses, living in an urban setting had a large and statistically significant association with sexual health knowledge for 2S men but not for other Indigenous men. **Conclusions**: Our study emphasizes the need to work with 2S and other Indigenous gbMSM to improve sexual health knowledge, focusing in particular on those with lower levels of income or educational attainment—who are less connected to gay peer networks—and older men.

Keywords:
Two-Spirit, Sexual Health, Indigenous, and Gay, Bisexual and Men-who-have-Sex-with-Men.

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INTRODUCTION

Rarely are Two-Spirit and/or Indigenous[1] gay, bi, or men who have sex with men (2S/gbMSM) participants included in research projects that center their experiences and ways. Often Indigenous sexual minority health research focused on HIV and AIDS gestures toward "Two-Spirit" identities yet collapses them into sexual orientation categories, or Indigenous person(s) who are either lesbian, gay, bisexual and/or transgender (Ecker, 2019; Fantus, 1997; Ferlatte et al., 2019; Smith, 2018) thereby erasing important distinctions tied to living openly and proudly as Two-Spirit. While many Two-Spirit people also identify as Indigenous, lesbian, gay, bisexual, transgender, queer, and/or additional identities (LGBTQ+), the term "Two-Spirit" [2] has vibrant and diverse local and regional meanings tied to a plurality of possible gender and sexual expressions within different Indigenous communities (Robinson, 2020). Further, the distinguished place of Two-Spirit-identified individuals within Indigenous communities (Cannon, 1998) pre-dates western and colonial medical identities and the formation of transgressive urban sexual communities (D'Emilio, 1983 [1998]; Foucault, 1978 [1990]; Maynard, 1994). Its use merely as a marker of sexual identity in quantitative research therefore becomes a colonializing practice of misrecognition (Coulthard, 2007; Fanon, 1967).

"On August 4th, 1990, Two-Spirit was adopted at the 3rd Annual Gathering of Native American Gays and Lesbians that was held near Beausejour, Manitoba" (Pruden, 2020). "Two-Spirit" is an organizing strategy or tool, and not an identity. In other words, it is a way to identify those individuals who embody diverse sexualities, genders, gender-identities and/or gender expressions *and* who are Indigenous to Turtle Island[3] *and* is Nation specific (Pruden, 2019). Additionally, Two-Spirit does not make sense unless it is contextualized within Indigenous frameworks/communities and, in a traditional (pre-contact) setting; it was tied to gendered labor roles within communities and not seen as an enduring "sexual orientation" (Cannon, 1998; Pruden, 2019). Today, most people associate the term with LGBTQ+ Indigenous peoples; however, the work of the Two-Spirit elders, leaders, community members, and organizations is often more akin with these pre-contact/'traditional' understandings and the relevancy and applicability of these ways within a contemporary setting (Pruden, 2019). The present study therefore offers a significant departure for the current usage of the term Two-Spirit by non-Indigenous researchers.

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[1] The terms 'Indigenous' and 'Indigenous peoples' will be used to represent all First Nations, Inuit and Métis inclusively. Terms like 'Native', "Native peoples', 'Indian', 'Aboriginal' and 'Aboriginal peoples' are used when reflected in the literature under discussion. Wherever possible, Nation/culturally specific names are used.

[2] "According to Harlan Pruden …"'Two-Spirit' is a community organizing strategy or tool. Although it is often positioned as an identity (when it is listed alongside other identities; hence the slash), it is neither an end-point nor an identity. . . . [I]t is used as a way to identify those individuals who embody diverse (or non- normative) sexualities, genders, gender roles, and/or gender expressions . . . while evoking the time before the harshness of colonization where many, not all, First Peoples had traditions and ways that were non-binary, where some Nations had 3, 4, 5, 6, or even 7 different genders, and these genders were not only accepted and honored but also had distinct roles within their respective Nations. Today, we would generally refer to these individuals as Two-Spirit." (cf. Stillwagon and Ghaziani, 2019).

[3] Turtle Island harkens to some of the First Peoples creation stories: Anishnaabe; Lenepe; to list a few and is used to name the land that has come to be referred to as the Americas. Turtle Island is used to reference this land mass while not affirming or recognizing the various nation states that now overlay the First Peoples traditional territories and lands.

The centering of Two-Spirit communities and people when it comes to sexual health is important and has potential to yield respectful, reciprocal, relevant, and responsible results. Specifically, we suggest that using this approach conveys ways in which sexual health knowledge is complex and dynamic and requires greater attention to genders beyond the binary and to the interconnectedness of Indigenous people and families. We believe that these relationships and networks are important to our study in order to make meaningful contributions that support the wellness of Two-Spirit communities. We aim to respond to previous research in which Two-Spirit is misrecognized in quantitative analyses.

The Two-Spirit Dry Lab (2SDL) is a working example of allyship in action. The 2SDL is a collaborative initiative of Indigenous and settler researchers and community leaders engaged in research at the intersections of Indigeneity, gender, sexual orientation, and geography. The collaboration works to promote best practices in sex and gender science and to grow new knowledge(s) that can be applied to improve health outcomes. Additionally, 2SDL has a capacity-building function to promote understanding and best practices for Indigenous and Two-Spirit research as well as a discovery function through our analyses and continuous learning and engagement with and for the Two-Spirit community. The vision of 2SDL is a robust, gender-inclusive, active, and thriving network of Two-Spirit health researchers, leaders, and knowledge users in 'good-relations' with an integrated network of settler-allies. The 2SDL is based at the British Columbia Centre for Disease Control, a provincial public health and research centre located on the traditional, ancestral and unceded territories of Musqueam, Squamish, and Tsleil-Waututh Nations.

The goal of this study is to understand how Two-Spirit facilitates access to health information and well-being for Indigenous sexual and gender minority people and communities. This study explores the drivers of sexual health knowledge with the 2S/gbMSM community(ies) based on Indigenous respondents in the 2014/15 Sex Now data set. It also examines differences within 2S/gbMSM community(ies), e.g., between those who use the term Two-Spirit and those who identify as Indigenous gay, bi or MSM men, and between those living in urban settings and non-urban (suburban, small city/town, rural or remote) settings. Findings from this study can help identify existing gaps and inform public health initiatives that better address the unique context of these groups.

FRAMING THE STUDY: MITAKUYE OYASIN

"Syndemic theory," was coined by medical anthropologist Merrill Singer (1994) while studying how HIV/AIDS and social positions are "intertwined and mutually enhancing health and social problems facing the urban poor," (p. 933). This theory has become a popular framework for understanding the co-occurring health-related *and* social struggles among sexual minorities that worsen their sexual health outcomes—in particular among gay and bisexual men (Stall et al., 2003; Ferlatte, 2015; Parson et al., 2015). Contrasting the traditional epidemiological approach that focuses on reducing individual 'risk[4]' factors in relation to disease transmission (Farmer,

[4] Intentionally re-using the 'risk' word and framing recognizing that it would be better to use the phrase "Increased (or decreased) likelihood, chance," as this framing, positionality, helps reduce the passivity applied to populations in

1996), a syndemic approach predicts that population-specific issues like discrimination and marginalization based on structural conditions like socioeconomic status, race, gender, dis/ability, ethnicity, nationality, and sexual orientation co-occurs and combines with health struggles to produce multiple and overlapping epidemics among specific populations (Adeboye et al., 2017; Kuhns et al., 2016; Singer et al., 2017). Notable to a syndemic approach is "its predictions about how interactions between epidemics amplify disease burden and about how public health planners can (or cannot) effectively intervene to mitigate this burden," (Tsai et al., 2017: 978). A syndemic approach, in other words, is useful because it calls attention to how multiple, overlapping epidemics unduly burden specific communities over others. It also provides insight for policy makers and public health officials to craft targeted and localized community-based interventions or to restructure policy funds to new and emerging programs that reduce the compounding effects of multiple epidemics such as poverty, unsupported mental health struggles, and physical health ailments.

Indigenous teachings—many of which notably precede western epidemiological models like syndemics—similarly suggest that matters of health, well-being, and social position are interdependent. Mitakuye oyasin[5] is a well-known, and often used Sioux expression and worldview meaning "*all are related*," or "*all my relations*", a prayer of oneness and harmony with all forms of life: other people, animals, birds, insects, trees and plants, and even rocks, rivers, mountains and valleys (Maroukis, 2005, p.160). Similarly, in another land-based language, nēhiyawewin (Cree y-dialect) "kakeeyo, niwakoomakuntik"[6] has a very close translation to mitakuye oyasin. For this study, the more familiar mitakuye oyasin will be used as our theoretical framework while recognizing different expressions of this concept across many languages.

Indigenous teachings embodied in mitakuye oyasin (and/or kakeeyo, niwakoomakuntik) remind us that the factors determining the health and well-being of Indigenous peoples must be looked at in relation to one another; they also suggest that analyses of Indigenous data should work in support of harmony and healing for Indigenous people. To do this, Indigenous research participants must be centered in analyses. While many syndemic research studies have included Indigenous status as a covariate in analyses (Ecker, 2019; Fantus, 1997; Ferlatte et al., 2019; Smith, 2018), mitakuye oyasin-informed analyses focus attention on the strengths and well-being of Indigenous people themselves being in 'good relation' with the world around them (Wilson, 2008).

The underlying tenet of this study is "Two-Eyed Seeing," an approach introduced by Mi'kmaq Elders Albert and Murdena Marshall from Unama'ki, Nova Scotia (Wright et al., 2019). Through Two-Eyed Seeing, we aim to see from one eye with the strengths of Indigenous knowledges and

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an effort to lessen the perceived stigmatizing framing that 'risk' carries or connotes. (British Columbia Centre for Disease Control, 2020, p. 11)

[5] We do not italicize Sioux or Nehiyô (Cree) words, we italicize the translations. Italicization is often used to represent foreign elements in a text. This work is grounded in and informed by Nehiyô (Cree) (and/or Indigenous) ways of knowing. Siouan, Nehiyawewin (Cree language speaking) is not a foreign element or language and therefore shall not be italicized or follow this western convention. Scholars such as Alice Te Punga Somerville (Maori) and Tracy Lee Bear (Nehiyô) use similar strategies to demonstrate agency as Indigenous scholars writing in the English language.

[6] Word and translation provided by Edward Lavalle, a Two-Spirit elder, primary Cree language speaker and keeper.

ways of knowing and from the other eye with the strengths of western knowledges and ways of knowing while learning to use both eyes together for more robust and comprehensive discussion(s) and conversation(s). We now move into a discussion on how we operationalize Indigenous and western knowledges—both eyes—in service of sexual health results that center Two-Spirit and Indigenous gbMSM participants.

This study also stands for our commitment to the Truth and Reconciliation's 94 Calls to Action (Truth and Reconciliation Commission of Canada, 2015, pp. 2-3). This study meets the following calls:

> 18. We call upon the federal, provincial, territorial, and Aboriginal governments to acknowledge that the current state of Aboriginal health in Canada is a direct result of previous Canadian government policies, including residential schools, and to **recognize and implement the health-care rights of Aboriginal people** as identified in international law, constitutional law, and under the Treaties.
>
> 19. We call upon the federal government, in consultation with Aboriginal peoples, to establish **measurable goals to identify and close the gaps** in health outcomes between Aboriginal and non-Aboriginal communities, and to publish annual progress reports and assess long term trends…
>
> 20. In order to address the jurisdictional disputes concerning Aboriginal people who do not reside on reserves, we call upon the federal government to recognize, respect, and address the **distinct health needs of the Métis, Inuit, and off-reserve Aboriginal peoples.**

METHODS

Participants

The Sex Now survey is an anonymous survey of gay and bisexual men in Canada administered by the Community-Based Research Centre and has been implemented at regular intervals since 2002. The current study examined measures from the 2014/15 Sex Now survey where participants were recruited between October 2014 and April 2015, from across Canada through dating and sex-seeking mobile applications, websites, and social media, a database of previous survey participants, and word-of-mouth. Eligible participants identified as a man who has sex with other men. The survey was administered entirely online and offered in English and French. Responses were anonymous, and no honorarium was provided. Informed consent was obtained from all individual participants included in the study. Participation was restricted by IP address to avoid duplication. The study protocol was approved by the independent ethics board of the Community-Based Research Centre. From the 2014/15 Sex Now national data set, this analysis included all participants who self-identified as Aboriginal (i.e., First Nations, Métis, and Inuit). Two-Spirit participants were identified among those who self-identified as Aboriginal and reported "Two-Spirit" as their gender and/or sexual identity.

Measures

From this survey, data relating to Two-Spirit identity[7], living environment (urban versus non-urban settings), income, free time spent with other gbM2M men, age, social support network, education, and sexual health knowledge were chosen for this study (see Appendix for survey questions), based on existing theory and empirical research (Beyrer et al., 2012; Sullivan et al., 2012). All nominal-measured explanatory variables were recoded into binary variables (i.e., having a Two-Spirit identity and living in urban environment were all coded as 1).

Income, education, free time spent with other gay and bisexual men ("gay peer network') and social support network were recoded into binary variables using the median responses. The median bracket for income was $30,000-$39,000. Those reporting incomes equal to or greater than $40,000 were coded as 1. The median bracket for education was "some college/university". Those who reported completing some post-secondary education or additional levels of education (i.e., started or completed college, university or graduate school) were coded as 1. The median bracket for amount of free time spent with other gay and bisexual men was "a little." Those who reported spending 25% or more of their time with other gay and bisexual men were recoded as 1. The median amount of people reported in one's social support network was 4-6 people. Participants who reported 4-6 people or more in their social support network were coded as 1. Age was included as a covariate in all models.

Sexual Health Knowledge

Participants reported their awareness of six true statements related to sexual health knowledge and HIV/STI prevention, which were developed in consultation with community members and public health clinicians who specialize in HIV. Items were chosen from the SexNow survey through discussion among 2SDL.

- "Condoms remain a reliable way to prevent STI and HIV transmission between anal sex partners."
- "Antiretroviral medications, taken daily, significantly reduce the chance that HIV positive persons can transmit HIV to their sexual partners by suppressing their viral load."
- "An HIV positive person can be charged with sexual assault for not disclosing his positive status and/or having sex without a condom."
- "PEP – Post-exposure prophylaxis: Within three days after a sexual risk event (such as fucking without a condom) there are medications you can take for a month that can prevent an HIV infection from establishing."
- "TasP – Treatment as prevention (TasP) is a current tactic in HIV prevention that seeks to increase the frequency of HIV testing among gay and bisexual men and the uptake of viral suppressing treatment among those who test positive."

[7] Although Two-Spirit is not an identity but a community organizing tool or strategy, we use the phrase "Two-Spirit identity" in sections of this paper due to the framing of questions from the 2014/15 Sex Now survey of: Q1 What is your gender identity? and/or Q2 How do you usually describe your sexual identity? where "Two-Spirit" was offered as an option.

- "PrEP – Pre-exposure prophylaxis is a daily antiretroviral medication now available for HIV negative men that can prevent sexual transmission of HIV (not yet approved in Canada [at time of survey])."

Each item that the participants reported awareness of was coded as 1, and these items were summed, for a minimum score of 0 and maximum score of 6.

In our study, we examined associations between sexual health knowledge (outcome) and the following explanatory variables: Two-Spirit identity, living in urban settings, income, education and peer networks. Analyses were conducted in three steps. First, we examined the correlations between explanatory variables (e.g., mitakuye oyasin) using unadjusted odds ratios and 95% confidence intervals. Second, we used univariate and multivariable linear regression to estimate associations between each of the explanatory variables and the sexual health knowledge outcome. Third, we repeated regression analyses stratifying by Indigenous respondents who self-described as Two-Spirit and those who did not, as well as by urban/non-urban area of residence.

Correlation and regression analyses were conducted using the 'epiR' package in R version 3.4.1 (R Foundation for Statistical Computing, Vienna, Austria).

RESULTS

There were 365 survey respondents who identified as Aboriginal (First Nations, Inuit, and/or Métis), which comprised 4.5% of total respondents in the 2014/15 Sex Now dataset. This proportion roughly reflects the national proportion of Indigenous people in Canada (2011=4.3% and 2016=4.9%) reported by Statistics Canada during the same time period.

Participants were able to choose multiple gender identities (see Table 1 for gender identity breakdowns). The vast majority chose a single gender identity (n=319, 87.4%) and of those with a single gender identity, most identified as a man (n=301, 94.4%) followed by Two-Spirit (n=12, 3.8%). Of those who reported two or more gender identities, participants chose to identify as a man and one or more of the other gender identities (n=45, 97.8%). One individual identified as a woman and Two-Spirit (2.2%).

Table 1. Proportion of gender and sexual identities reported by Indigenous participants

Gender Identity		**n**	**%**
Single identity (n=319)	Man	301	94.4%
	Two-Spirit	12	3.8%
	Woman	2	0.6%
	Transgender	2	0.6%
	Queer	1	0.3%
	Other	1	0.3%
Two or more identities (n=46)	Man/Other gender identities	45	97.8%
	Woman/Two-Spirit	1	2.2%
Sexual Identity		n	%
Single identity (n=298)	Gay	205	68.8%

	Bisexual	61	20.5%
	Queer	11	3.7%
	Two-Spirit	9	3.0%
	Straight	7	2.3%
	Other	5	1.7%
Two or more identities (n=67)	Gay/Other sexual identities	49	73.1%
	Bisexual/Other sexual identities (not Gay)	16	23.9%
	Queer/Two-Spirit	1	1.5%
	Straight/Other	1	1.5%

In addition, participants were able to report multiple sexual identities (see Table 1 for breakdowns). Most identified as a single sexual identity (n=298, 81.6%). Of those who identified a single sexual identity, most identified as gay (n=205, 68.8%) or bisexual (n=61, 20.5%). Of the participants who identified two or more sexual identities, the majority identified as gay and one or more sexual identities (n=49, 73.1%) followed by those who identified as bisexual and one or more other sexual identities but not as gay (n=16, 23.9%). One person identified as queer and Two-Spirit (1.5%) and another as straight and other (1.5%). A total of 60 (16.4%) Indigenous participants selected Two-Spirit as either their gender or sexual identity.

The median age of participants was 35 years (Interquartile Range (IQR): 25, 49 years) with a median income bracket of $30,000-$39,999 (IQR: $10,000-$19,999, $60,000-$69,999). The majority of participants lived in British Columbia (n=118, 32.3%) and Ontario (n=85, 23.3%).

To examine the relationships among our predictor, variables odds ratios (ORs) were computed (see Table 2). Income was associated with identifying as Two-Spirit (OR: 0.50; 95% CI: 0.27, 0.91) and level of education (OR: 2.68; 95% CI: 1.52, 4.73). Those who identified as Two-Spirit tended to have below median income and those making more than the median income tended to have some post-secondary education. Free time spent with other gay and bisexual men was associated with living in urban settings (OR: 2.15; 95% CI: 1.41, 3.28). Those who spent 25% or more free time with other gay and bisexual men tended to live in urban settings.

Table 2. Odds ratios (95% Confidence Intervals) among Two-Spirit identity, living in urban environments, income, education, gay peer network and social support network (N=365).

	Urban environment (n=172, 47.1%)	**Income** (n=152, 41.6%)	**Post-Secondary Education** (n= 287, 78.6%)	**Gay Peer Network** (n= 170, 46.6%)	**Social Support Network** (n=195, 53.4%)
Two-Spirit Identity (n=60, 16.4%)	1.24 (0.71, 2.16)	**0.50 (0.27, 0.91)**	1.43 (0.69, 2.98)	1.38 (0.79, 2.41)	1.50 (0.85, 2.64)
Urban Environment	-	1.46 (0.96, 2.22)	1.37 (0.82, 2.27)	**2.15 (1.41, 3.28)**	1.05 (0.70, 1.59)

Income	-	-	**2.68 (1.52, 4.73)**	0.80 (0.53, 1.22)	1.19 (0.78, 1.80)
Post-Secondary Education	-	-	-	1.02 (0.62, 1.69)	**1.77 (1.07, 2.93)**
Gay Peer Network	-	-	-	-	**3.15 (2.05, 4.86)**

A regression model was run with sexual health knowledge scale as the outcome and Two-Spirit identity, urban living environment, income, education, gay peer network, social support and age as predictors (F (7, 357)=6.41, p<.001) (Table 3). Income, education, gay peer network and age were significantly associated with more sexual health knowledge. Higher than median incomes, some post-secondary education and spending 25% or more of one's free time with other gay and bisexual men predicted more awareness of sexual health information.

Table 3. Adjusted betas of independent variables predicting sexual health knowledge (N=365)

	Beta	**Std. Error**	**p-value**
Two-Spirit Identity	0.13	0.21	0.52
Urban Environment	-0.02	0.16	0.91
Income	0.41	0.17	0.02*
Post-secondary Education	0.82	0.19	0.00***
Gay Peer Network	0.54	0.16	0.00**
Social Support	0.10	0.16	0.55
Age	-0.02	0.01	0.02*
		R^2(adj.)	.09

*<.05; ** <.01; ***<.001

To further explore factors that may be relevant for predicting sexual health knowledge for those who selected Two-Spirit, follow-up regression models were performed on people who selected Two-Spirit and Indigenous people who did not (Table 4). In the unadjusted models (data not shown), only the variable of living in urban environments significantly predicted levels of sexual health knowledge among Two-Spirit people (F(1,58)=6.01, p<.02). The overall model of urban living environment, income, post-secondary education, gay peer network and social support did not significantly predict level of sexual health knowledge for Two-Spirit people. Among people who did not identify as Two-Spirit, the overall model was significant (F(6,298)=8.47, p<.001) and was very similar to the model with all respondents included. Higher than median incomes, some post-secondary education, spending 25% or more of one's free time with other gay and bisexual men and having 4 or more people in their social support network predicted higher sexual health knowledge. Interestingly, the slightly higher adjusted R^2 suggests that the model fits better for people who did not identify as Two-Spirit than for those who identified as Two-Spirit.

Because gay peer networks predicted higher sexual health knowledge, we further examined factors relevant to predicting sexual health knowledge for those who live in urban environments and those in non-urban environments because of the strong relationship of gay peer networks and living in urban areas (Table 5). The overall model of Two-Spirit identity, income, post-secondary education, gay peer network, age, and social support significantly predicted sexual health knowledge among those living in urban environments ($F(6, 165)=5.82$, $p<.001$). Among those in urban areas, those who identified as Two-Spirit, those who had four or more people in their social support network and those with some post-secondary education tended to have higher sexual health knowledge.

The overall model for those who live in non-urban environments also significantly predicted sexual health knowledge ($F(6,186)=3.42$, $p<.01$) although the significant variables differed. Those who spent 25% or more time with other gay or bisexual men and those with some post-secondary education tended to have higher sexual health knowledge in non-urban areas (see Table 5). The lower R2 for this model suggests that it is a poorer fit of the data compared to the model for those living in urban areas.

Table 4. Adjusted betas of independent variables predicting level of sexual health knowledge among Indigenous respondents who identified as Two-Spirit and Indigenous respondents who did not identify as Two-Spirit.

	Two-Spirit Respondents (n=60)			**Non-Two-Spirit Respondents (n=305)**		
	Beta	**Std. Error**	**p-value**	**Beta**	**Std. Error**	**p-value**
Urban Environment	0.94	0.40	0.02*	-0.20	0.17	0.25
Income	0.43	0.45	0.34	0.40	0.18	0.03*
Post-secondary Education	-0.28	0.56	0.61	1.01	0.20	0.00***
Gay Peer Network	0.01	0.39	0.99	0.68	0.18	0.00**
Social Support	0.45	0.41	0.28	0.07	0.18	0.70
Age	-0.01	0.02	0.62	-0.01	0.01	0.052
		R^2(adj.)	0.03		R^2(adj.)	.13

*<.05; ** <.01; ***<.001

Table 5. Adjusted betas of independent variables predicting sexual health knowledge among Indigenous respondents living in urban and non-urban areas.

	Urban Respondents (n=172)			**Non-Urban Respondents (n=193)**		
	Beta	**Std. Error**	**p-value**	**Beta**	**Std. Error**	**p-value**
Two-Spirit	0.59	0.29	0.04*	-0.25	0.30	0.41
Income	0.44	0.24	0.07	0.32	0.24	0.19

Post-secondary Education	0.73	0.29	0.01*	0.94	0.26	0.00***
Gay Peer Network	0.46	0.24	0.06	0.51	0.23	0.03*
Social Support	0.54	0.24	0.02*	-0.22	0.22	0.31
Age	-0.01	0.01	0.22	-0.02	0.01	0.07
		R^2(adj.)	.14		R^2(adj.)	.07

*<.05; ** <.01; ***<.00

DISCUSSION

Our Two-Eyed Seeing approach to sexual health knowledge of Indigenous men of Turtle Island responds to the Calls to Action of the Truth and Reconciliation Commission by offering measurable goals and Indigenous approaches to data analysis and interpretation(s). The findings from this study emphasize the need to work with Two-Spirit and other Indigenous gbMSM to improve sexual health knowledge, focusing in particular on those with lower levels of income or educational attainment, those who are less connected to gay peer networks, and older men. Moreover, the finding that urban respondents had higher levels of sexual health knowledge among Two-Spirit (but not other Indigenous) men points to a need to better understand how Two-Spirit approaches to reconnecting Indigenous gbMSM to pre-colonial traditions that supported or even venerated diverse genders and sexualities may in turn improve sexual health knowledge. We hypothesize that this may happen by both improving a sense of self-esteem and belonging for Two-Spirit individuals and by creating social connections that allow Two-Spirit people to learn about new sexual health interventions (such as PEP and PrEP).

Fifty-eight percent of the Indigenous men surveyed in Sex Now 2014/15 were aware of HIV PrEP. HIV PrEP was approved for use in Canada in February 2016 (Hull & Tan 2017) and was immediately available as an insured benefit to First Nations and Inuit people through the Non-Insured Health Benefits Program (Tan, et al 2017). Unfortunately, little work happened in the subsequent period to ensure that First Nations and Inuit people were aware of this intervention or their eligibility to receive publicly funded HIV PrEP (Gancena, Stillwagon, Pruden, 2019), causing the Community-Based Research Centre (CBRC) to issue a public apology for this gap December 2019 (Watson, *CBC* 2019). Given the demonstrated effectiveness of HIV PrEP (Anderson et al., 2012) and the expanding efforts in Canada (Hull & Tan, 2017), and elsewhere globally, to ensure that gbMSM have access to PrEP as a means to address the ongoing HIV epidemic, our results call for focused and tailored interventions to first, ensure equitable access to prescribing providers, and second, raise awareness of PrEP in Indigenous 2S/gbMSM communities. Given the multiple barriers Indigenous people and sexual minority people face in accessing affirming and culturally-specific healthcare (cf. Dehlin, Stillwagon et al., 2019), such efforts must be conducted in close collaboration with Two-Spirit communities and the allies and healthcare providers serving them. In the 2018-19 cycle of the Sex Now survey, we enhanced recruitment activities to increase the number of Indigenous respondents and plan to repeat

analyses presented here to assess the degree to which levels of sexual health knowledge have changed in the intervening three years and the sub-groups of Indigenous men who may have benefited most from any increases.

These findings may also be used for future sexual health opportunities and interventions including long-acting HIV PrEP injectables or syphilis PrEP ensuring that Indigenous people are a priority and included in knowledge translation and dissemination and implementation efforts of these and other interventions.

Beyond these empirical inferences, our study offers significant advances to methodological approaches that incorporate Two-Eyed Seeing and Two-Spirit ways of knowing. We parallel the methods of 'syndemic' research—acknowledging the intercorrelation and imbrication of socially meaningful variables e.g., geography, place, socioeconomic position, race, nationality, dis/ability, gender expression, sexual orientation, and social networks—while reframing this approach as an extension of the Sioux teaching mitakuye oyasin. While both western (syndemic) and Indigenous (mitakuye oyasin) approaches call for attention to how these variables interact, mitakuye oyasin reminds us that Indigenous research, interpretation, and intervention must start and end with Indigenous people themselves. In this vein, we have worked with Indigenous researchers and community members to ensure that variable selection, future iterations of the variable design, and interpretation are grounded in the lives and ways of Indigenous people. Hence, Two-Spirit and urban/non-urban geography are focal variables of interest. Other social variables—such as age and economic status—are also included, as is typical of syndemic analyses, and in accordance with the 'western eye' of Two-Eyed Seeing. Western statistical methods were also used. Thus, we borrow from the strengths of each eye.

LIMITATIONS

Notwithstanding the promise of Two-Eyed Seeing methodologies, the survey itself is limited in its application to our research questions. Firstly, although we have worked with the Sex Now survey team to expand Indigenous-focused survey items for the 2018-19 survey (i.e., measuring whether Indigenous respondents live on- or off-reserve; measuring access to Indigenous healing such as elders, sweat lodges, etc.), Indigenous input to the 2014/15 instrument was minimal. This means we did not measure several variables, like the ones referenced above, that likely would help to explain the distribution of sexual health knowledge in our sample. Secondly, although there is no enumerated sampling frame of Two-Spirit and other Indigenous gbMSM—and thus no way to determine the representativeness of our sample—in exploratory analyses, we noticed that Indigenous men from eastern Canada represented less than half of our sample, suggesting that our sample is heavily biased toward men living in western Canada. Relatedly, we observed that 79% of the sample have completed post-secondary education, suggesting that we may have under-represented Indigenous men with lower levels of educational attainment—a group which notably experienced lower levels of sexual health knowledge. This may be attributed to the survey being only online and requiring resources for access to hardware (computer, laptop, smartphone) and to the internet. The eligibility criteria for the 2014/15 Sex Now survey was to identify as a man who has sex with other men and does. The survey did not address issues for

Two-Spirit women, transgender women, and/or non-binary[8] people. Finally, as a quantitative study, this analysis cannot explain the 'why' behind the associations we observed (why Two-Spirit men in urban settings experience higher levels of sexual health knowledge, for example). To address these questions, qualitative approaches are needed.

Furthermore, the question about gay peer support network ("How much of your free time do you usually spend hanging out with other gay or bisexual men?) not only privileges European sexual orientation identities, it also presumes that sexual orientation is the most significant community attachment for respondents, thereby erasing the importance of attachment to Indigenous communities.

CONCLUSIONS

We conclude by offering three recommendations to researchers and practitioners—perhaps especially those who are non-Indigenous and who also have an important role to play in response to the Truth & Reconciliation Commission Calls to Action. First, there is an urgent need to expand research by, for, and with Two-Spirit people, and this research should, in turn, be used to monitor and evaluate measurable and significant health indicators—including knowledge of and access to PrEP and other HIV-related interventions—in accordance with TRC Call to Action #19.

We note that Two-Spirit is not a proxy for gay *plus* Indigenous, which is how it is too often applied in the gbMSM literature (Ecker, 2019; Fantus, 1997; Ferlatte, 2019; Smith, 2018). Rather, Two-Spirit implies an approach that starts with and centers the knowledge and experience of Indigenous people, reconnecting Indigenous people to Nation-specific traditions, many of which may have been obscured during the colonial period (Cannon 1998). Second, public health leaders and practitioners must invest in policy and program development that accounts for contextual influences of geography (urban/rural) on the lives of Two-Spirit and other Indigenous people, while improving sexual health knowledge in this population. These interventions may be strengthened by including fundamental rights to land and economic means of control—programs that will benefit rural and low-socioeconomically positioned Indigenous 2S/gbMSM included in our study as well all Indigenous people, who systemically experience economic disadvantage in colonial societies (Hunt, 2016; Reading & Wien, 2009). Public health program and policy should also account for the intersections of sexuality, gender, and Indigeneity that critically influence the lives of Two-Spirit and other Indigenous sexual and gender minority people. For example, while laudable in its efforts to improve the lives of the overall sexual and gender minority population, the recently released Canadian Parliament's report on "The Health of LGBTQIA2 Communities in Canada" does not include recommendations that specifically address within-population health disparities that affect Indigenous sexual and gender minority people (Government of Canada, House of Commons Standing Committee on Health, 2019). Third, we call for targeted and focused efforts to expand

[8] A person who identifies between or outside of the gender binary by experiencing their gender as neither exclusively man nor woman. (British Columbia Centre for Disease Control, 2020, p. 20)

sexual health knowledge for Indigenous 2S/gbMSM. This work will take time to ensure that it is meaningfully inclusive of Indigenous people; however, this work can begin now.
In conclusion, these empirical results of mitakuye oyasin demonstrate and provide a model of allyship in action with Indigenous and settler researchers and community leaders as they engage at the intersections of Indigeneity, gender, sexual orientation, and geography. By working together to be in good-relations and the seamless integration of respectful, reciprocal, relevant, and responsible relations will benefit all parties.

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Appendix

Questions used in this study from the Sex Now 2014/15 survey instrument

1. What is your gender identity (check all that apply)

- Man
- Woman
- Transgender
- Genderqueer
- Two-spirit
- Other

2. How do you usually describe your sexual identity? (check all that apply)

- Gay (homosexual)
- Bi (bisexual)
- Straight (heterosexual)
- Queer
- Two-Spirit
- Other

SEXUAL HEALTH KNOWLEDGE: The following statements are TRUE. Were you previously aware of them before taking this survey? (select Yes or No)

31. Condoms remain a reliable way to prevent STI and HIV transmission between anal sex partners.

32. Antiretroviral medications, taken daily, significantly reduce the chance that HIV positive persons can transmit HIV to their sexual partners by suppressing their viral load.

33. An HIV positive person can be charged with sexual assault for not disclosing his positive status and/or having sex without a condom.

34. PEP-Post Exposure Prophylaxis: Within three days after a sexual risk event (such as fucking without a condom) there are medications you can take for a month that can prevent an HIV infection from establishing.

35. TasP - Treatment as Prevention (TasP) is a current tactic in HIV prevention that seeks to increase the frequency of HIV testing among gay and bisexual men and the uptake of viral suppressing treatment among those who test positive.

36. PrEP - Pre Exposure Prophylaxis is a daily antiretroviral medication now available for HIV negative men that can prevent sexual transmission of HIV (not yet approved in Canada).

60. Your Age

65. What best describes the environment you live in?

- Urban
- Suburban
- Small city/town
- Rural
- Remote
- Other

69. What is the highest level of education that you have completed?

- Some high school
- High school
- Some college/university
- College
- University degree: BA, BSc etc.
- Graduate degree: MA, MBA etc
- Doctorate: PhD, MD etc.

70. What best describes your ethnic/cultural origins? (Check all that apply)

- Aboriginal (First Nations, Inuit, Metis)
- African
- East Asian
- South Asian
- South-east Asian
- Caribbean
- Latino/Hispanic
- Middle Eastern
- Pacific Islands
- White/Caucasian (British, European)
- Other

71. What was your income in the last year?

- Under $10,000
- $10,000 - $19,999
- $20,000 - $29,999
- $30,000 - $39,999
- $40,000 - $49,999
- $50,000 - $59,999
- $60,000 - $69,999
- $70,000 - $79,999
- $80,000 - $89,999
- $90,000 - $99,999

- $100,000 +

78. How much of your free time do you usually spend hanging-out with other gay or bisexual men?

- little
- 25%
- 50%
- 75%
- most

79. How many people can you count on for support if you need help or if something goes wrong?

- No one
- 1-3
- 4-6
- 7-9
- 10+