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Positive Social Support and Mental Health Among Two-Spirit and Heterosexual Aboriginal People Living with HIV/AIDS in Ontario

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ABSTRACT

Social support is an important predictor of health in people living with HIV, but little research has specifically investigated its role within cultural and demographic groups such as Aboriginal and two-spirit people. Our objective was to examine the role social support plays in predicting health outcomes of Aboriginal people living with HIV/AIDS (APHAs) in Ontario with a specific focus on the potential differences in access to and effect of social support among two-spirit APHAs. In 2006, 79 Aboriginal participants completed the *Positive Spaces, Healthy Places* baseline questionnaire. We analyzed the association between social support and mental and physical health outcomes using the Medical Outcome Survey for HIV patients. Better mental health in APHAs was associated with being older, being male, and having higher levels of emotional / informational and affectionate support. Physical health was not significantly associated with social support. There was no difference in the level of social support or health

reported between two-spirit and non-two-spirit participants. Among APHAs in Ontario, social support is an important component of well being, as it was the only variable we examined that could be addressed and improved through increased access to culturally relevant programs and services. These findings stress the importance of these programs for women and youth. Further community-based consultation and research is needed to determine how best to increase and maintain social support for all Aboriginal people living with HIV.

INTRODUCTION

Aboriginal groups (people of First Nations, Métis, or Inuit ethnicity) have lower life expectancies than non-Aboriginal people (Stephens, Nettleton, Porter, Willis, & Clark, 2005), and are grossly overrepresented in the Canadian HIV epidemic. In 2006, national public health estimates indicated that Aboriginal people comprised 3.8% of the total Canadian population, but represented 8.9% of all prevalent HIV infections, and 12.2% of incident diagnoses in 2011 (Public Health Agency of Canada, 2011). The prevalence of Aboriginal people diagnosed with HIV in Canada rose by 17.3% from 2008 to 2011 (Public Health Agency of Canada, 2011), which indicates the need, now more than ever, for an evidence-based, culturally relevant public health response. Moreover, within Aboriginal communities in Canada, groups such as women, people who inject drugs, and men who have sex with men (MSM) are at an elevated risk of HIV exposure. Between the years 1998 and 2008, Aboriginal women in Canada accounted for 48.8% of incident HIV diagnoses among Aboriginal people, as compared with 20.6% of cases in women of other ethnicities (Public Health Agency of Canada, 2011), and compared with non-Aboriginal MSM in Canada, Aboriginal MSM are at a greater risk of HIV infection (O'Connell et al., 2004). However, there is a lack of research about the HIV/AIDS epidemic in two-spirit groups in Canada, and this gap in understanding needs to be addressed in order to contextualize the experiences and needs of two-spirit people within the broader populations of people living with HIV/AIDS (PHA) and Aboriginal people living with HIV/AIDS (APHA).

SOCIAL SUPPORT AND HIV

Social support is an important determinant of health for PHAs (Borgoyne & Renwick, 2004; Richmond, Ross, & Egeland, 2007). To the best of our knowledge, there has been no research that has specifically compared levels of social support between two-spirit Aboriginal people and non-two-spirit Aboriginal people in Ontario. Greater levels of social support have been shown to increase the number of visits a patient makes to a doctor's office (Tamers, Beresford, Thompson, Zheng, & Cheadie, 2011), decrease stress, and increase physical (Moak & Agrawal, 2010) and mental health outcomes (Richmond et al., 2007; Bekele et al., 2013). Indeed, the availability of social support in PHAs is an integral part of achieving and maintaining optimal quality of life (Broadhead et al., 1983). Importantly, however, a study by Monette and colleagues (2011) stated that among PHAs in Ontario, there were differences in the demographic characteristics of APHAs as compared to non-Aboriginal PHAs. These differences, in conjunction with other studies showing that sexual minority groups have lower levels of social support than do

heterosexual people (Ueno, 2005; Williams, Connolly, Peplet, & Craig, 2005), demonstrate the need for a specific, focused analysis of two-spirit and heterosexual APHAs to examine whether these differences change the availability and / or effectiveness of social support in affecting health outcomes in order to provide the most effective care, treatment, and support possible. Only a few published studies (Ristock, Zoccole, & Passant, 2010; Bauer, Travers, Sconlon, & Coleman, 2012) specifically address HIV/AIDS among two-spirit Aboriginal people in Canada, who may experience social support and its association with health differently than non-two-spirit Aboriginal people.

RESEARCH OBJECTIVES

Our research objective was to determine whether there is an association between social support and positive health outcomes among APHAs in Ontario, with a specific focus on potential differences among two-spirit people. We hypothesized that better social support would be associated with better physical and mental health among Aboriginal people living with HIV/AIDS in Ontario.

METHODS

The Positive Spaces, Health Places (PSHP) study

The PSHP survey is a collaborative, community-based longitudinal study of HIV-positive people living in Ontario (see Positive Spaces, Healthy Places 2013 for more information). The PSHP survey was developed in order to study the housing support and homelessness, social support, and health outcomes of PHAs in Ontario. In 2006, 602 HIV-positive study participants completed the PSHP survey. Recruitment was achieved using partnerships with community-based organizations (CBOs), local Ontario AIDS service organizations (ASOs), and through word of mouth by local community connections of Peer Research Assistants (PRAs). Eligibility criteria of the PSHP survey specified that participants live in Ontario, be HIV-positive, and be able to provide informed consent. HIV-positive peer research assistants (PRAs) who were trained by Aboriginal organizations on culturally appropriate research practices administered all consent forms and survey questionnaires. The baseline survey itself was administered in a face-to-face format, and took 60 to 90 minutes to complete.

Ethics Approval & OCAP Principles

This project was a secondary data analysis of the PSHP study, which is strongly committed to community-based research as well as GIPA, MIPA and OCAP principles (see Monette et al., 2009 for further explanation). This specific paper is a result of a research collaboration between the 2-Spirited People of the 1st Nations organization based in Toronto and researchers at the University of Guelph. The 2-Spirited People of the 1st Nations, a community-based organization serving the needs of two-spirit Aboriginal people living with or affected by HIV/AIDS,

articulated the desire for this work. The final author of this project completed a placement with this organization during his Universities Without Walls fellowship. To demonstrate our commitment to OCAP, one of the authors is an Aboriginal person who has worked in the HIV/AIDS movement for many decades. Applying principles of OCAP, our community-academic partnership requested the data collected from APHAs in the PSHP study. The Research Ethics Board at the University of Guelph granted approval in May 2012 for secondary analyses of the PSHP survey data predicated on the partnership with the 2-Spirited People of the 1st Nations organization. Our community partner initiated the inquiry and research on these data and assisted in interpreting and contextualizing these results, while the academic partners conducted the analyses and were primarily responsible for the drafting of this manuscript. All authors were involved in revising and finalizing this manuscript.

MEASURES

MOS-HIV

The Medical Outcome Study HIV Health Survey (MOS-HIV) (Wu, 1997) was developed as a comprehensive, easily accessible assessment of quality of life in people living with HIV/AIDS (Revicki, Sorensen, & Wu, 1998; Wu, 1997). The 35-question MOS-HIV survey was developed using the MOS short-form general health survey, with subscales being added to better reflect outcomes specific to HIV-positive participants such as cognitive function, energy / fatigue, and health distress (Wu, 1997). These data were used as a measure for each participant's physical and mental health. After standardization, the score ranges from 0 (lowest possible score) to 100 (best possible score). Scores equaling or falling below 25 were defined as "very low", scores between 26 and 50 as "low", scores from 51 to 75 as "moderate" and scores above 76 as "high".

Mental Health Outcomes

The mental health summary (MHS) scores (Wu, 1997), which include questions relating to anxiety, depression, loss of behavioural / emotional control, and psychological well-being were developed by asking participants to rank how much of the time in the past 4 weeks they: have felt happy, calm and peaceful, very nervous, downhearted and blue, and so down in the dumps that nothing could cheer them up.

Physical Health Outcomes

The physical health summary (PHS) scores (Wu, 1997) were obtained by combining and standardizing responses relating to physical functioning, pain, and role functioning. Questions included, but were not limited to the following: how would you rate your physical health now compared to 4 weeks ago; does your health limit your ability to walk one block; does your health keep you from working; and how much bodily pain have you generally had during the past 4 weeks?

Social Support

Social support was the main predictor variable of interest in this study. It was calculated as an overall summary measure (see Sherbourne & Stewart, 1991 on MOS-HIV Social Support Subscale (MOS-HIV-SSS)), and then as four sub-scales, specifically: emotional / informational support, affectionate support, tangible support, and positive social interaction. The range of possible standardized values for this variable fall between 0 and 100, with scores equaling or falling below 25 defined as “very low social support”, scores between 26 and 50 as “low support”, scores from 51 to 75 as “moderate social support” and scores above 76 as “high social support” (Sherbourne & Stewart, 1991; Rand Organization, 2013). A measure for each subscale of social support was also calculated separately. The values for each subscale were computed by taking the means of the relevant responses in order to accommodate easy comparability across subscales.

Questions on Social Support

The MOS-HIV-SSS contains questions relating to emotional / informational social support ranked from 1 (none of the time) to 5 (all of the time). Each question asked participants to specify how often the following types of support were available to them: someone you can count on, someone to give you information to help you understand a situation, someone to give you good advice about a crisis, someone to confide in, someone whose advice you really want, someone to share your most private worries and fears with, someone to turn to for suggestions about how to deal with a personal problem, and someone who understands your problems. Similarly, the tangible support subscale was obtained by taking the mean of the responses (a scale from 1 to 5) to four statements: someone to help you if you were confined in bed, someone to take you to the doctor if you need it, someone to prepare your meals if you were unable to do it yourself, someone to help with daily chores if you were sick. The affectionate support subscale comprised the three following statements: someone who shows you love and affection, someone to love you and make you feel wanted, someone who hugs you. Finally, positive social interaction subscale included four items: someone to have a good time with, someone to get together with for relaxation, someone to do something enjoyable with, someone to do things with to help you get your mind off things.

Two-spirit participants

There was no question included in the PSHP survey that explicitly asked participants whether they identified as two-spirit, nor was it an option included in gender or sexual orientation questions. For the purpose of this study, and as agreed between all authors, two-spirit Aboriginal people were defined as those who identified as being gay, lesbian, bisexual, or some other sexual orientation that was not heterosexual. The comparison group was participants who identified as heterosexual.

Other measures

Participants also provided demographic information: age (measured in years), gender identification (male versus other [female, transgender female-to-male, or transgender male-to-female]), Aboriginal ethnicity (First Nations versus Métis or Inuit), and level of education (did not complete high school versus completed high school, a technical degree, college, or university). With respect to gender identification, due to the risk of residual disclosure it was necessary to combine female and transgender participants; the authors acknowledge the problematic nature of this diverse grouping and the subsequent limitations for interpretation. Additional independent clinical health variables (hereafter referred to HIV marker variables) were also included: years living with HIV, the highest CD4 cell count in the last 6 months, the lowest ever CD4 cell count, ever having had an AIDS diagnosis, and whether the participant was currently taking HIV treatment medication (i.e., antiretroviral drugs).

Statistical Analysis

All statistical analysis was performed on the data using SPSS version 20.0 (IBM Corp, 2011). The first stage of statistical analysis involved preparing descriptive statistics. Count and frequency measures were determined for the dichotomized variables. Mean, standard deviation, median, and range were determined for all continuous variables. Given the particular interest in two-spirit people, the results specific to two-spirit and heterosexual participants were calculated. Differences between groups were assessed using either a chi-square test of independence or t-test, as appropriate. We conducted multivariable linear regression to determine the factors associated with the main outcome of interest (health). Factors associated with the outcome at the univariate level ($p < 0.20$) were retained for the multivariate analysis where all final variables were significant at $p < 0.05$. Confounding was assessed at each stage of analysis.

RESULTS

Of the 602 individuals who participated in the 2006 PSHP baseline survey, 79 people identified as an Aboriginal person. Of this APHA subsample, 43 (54.5%) identified as two-spirit and the remaining 36 (45.5%) identified as heterosexual. Descriptive statistics of demographic information, HIV markers, social support and health outcomes stratified by sexual orientation (i.e. two-spirit or heterosexual) are presented in **Table 1**.

Table 1. Descriptive statistics of demographic information, HIV-related markers, social support and health outcomes among Aboriginal people living with HIV/AIDS in Ontario who participated the Positive Spaces, Healthy Places study (2006).

	Two-spirit participants (n=43)		Heterosexual participants (n=36)		Total sample (n=79)	
	n or mean	% or (SD)	n or mean	% or (SD)	n or mean	% or (SD)
Age	41.7	(7.4)	41.7	(8.4)	41.7	(7.8)
Gender identification						
Male	40	93.0	12	33.3	52	65.8
Female and/or Transgender	3	7.0	24	66.7	27	34.2
Aboriginal ethnicity						
First Nations	27	67.5	23	65.7	50	66.7
Inuit / Métis	13	32.5	12	34.3	25	33.3
Education level						
Did not complete high school	9	20.9	22	61.1	31	39.2
Completed high school or higher	34	79.1	14	38.9	48	60.8
Ever had an AIDS defining condition						
Yes	22	51.2	16	50.0	38	50.7
No	21	48.8	16	50.0	37	49.3
Currently taking HIV treatment medication						
Yes	29	67.4	22	61.1	51	64.6
No	14	32.6	14	38.9	28	35.4
HIV Marker						
Years living with HIV	11.4	(6.2)	9.7	(6.0)	10.6	(6.1)
Highest CD4 Count in L6M ^a	477.0	(337.1)	726.4	(528.7)	567.7	(428.5)
Lowest CD4 Count in L6M ^b	195.4	(208.5)	240.8	(204.9)	212.7	(206.2)
Social Support						
Overall Social Support	64.9	(20.2)	63.8	(19.2)	64.4	(19.6)
Emotional / Informational	3.9	(0.9)	3.1	(1.3)	3.4	(1.0)
Tangible Support	3.7	(1.1)	2.9	(1.5)	3.0	(1.4)
Affectionate Support	3.8	(1.3)	3.2	(1.4)	3.6	(1.4)
Positive Social Interaction	3.9	(1.2)	3.1	(1.4)	3.6	(1.2)
Health Outcomes						
Physical Health Summary	44.6	(10.2)	42.4	(9.9)	43.6	(10.1)
Mental Health Summary	46.7	(12.0)	42.5	(11.1)	44.8	(11.7)

L6M = in the last six months prior to survey; ^a35 missing responses; ^b29 missing responses

NB: Missing data excluded from table

The mean age of participants was 41.7 years. Compared with heterosexual APHAs, two-spirit participants were more likely to report a male gender (93.0% vs. 33.3%, $p<0.001$). Aboriginal ethnicity did not differ based on sexual orientation ($p=0.68$), with 66.7% of the sample reporting a First Nations ethnicity. Two-spirit participants were more likely to report having completed high school or a greater level of education when compared with heterosexual participants (79.1% vs. 38.9%, $p<0.001$).

With regards to HIV clinical information among all APHAs, half (50.7%) reported having had an AIDS-defining condition in their lifetime, and nearly two-thirds (64.6%) were taking HIV treatment medication at the time of survey administration. There were no differences observed between the two-spirit and heterosexual groups for either of these variables. Additionally, there was no difference in the number of years living with HIV, nor highest or lowest CD4 counts between two-spirit and heterosexual participants. On average, participants had been living with HIV for an average of 10.6 years. The highest and lowest CD4 counts reported in the six months prior to completing the survey were 567.7 and 212.7 respectively.

The overall social support score based on the MOS-HIV-SSS was 64.4 for the entire APHA sample, which indicates moderate social support. The average subscale scores were as follows: emotional / informational = 3.4, tangible = 3.0, affectionate = 3.6, and positive social interaction = 3.6 (see **Table 1**). No differences were observed in any of the of social support subscales in the groups that differed by ethnicity, gender identification, or level of education. However, while the overall social support variable score did not differ between two-spirit and heterosexual participants, greater levels of emotional / informational support ($p=0.03$), tangible support ($p=0.05$), and positive social interaction ($p=0.02$) were reported by two-spirit participants compared with heterosexual participants.

The average mental health summary score for all APHA participants was 44.8 and the average physical health summary score was 43.6 (out of a possible 100). There was no difference between two-spirit and heterosexual participants' mental health or physical health summary scores. However, participants who completed high school or a higher level of education had better physical health than those who did not complete high school. Mental health summary scores were higher for males, for APHAs who had a higher level of education, and among participants who were taking HIV treatment medication at the time of survey administration. Given a lack of significant associations between the demographic, HIV marker, and social support subscales with physical health, we only conducted multivariable linear on mental health summary scores as the main outcome of interest.

At the univariate level ($p<0.20$), mental health was associated with five demographic variables (sexual orientation, gender identification, Aboriginal ethnicity, level of education, age), two HIV marker variables (number of years living with HIV, whether the participant was currently taking HIV treatment medication), and four social support variables (emotional / information social support, affectionate social support, tangible social support, and positive social interaction) (see

Table 2).

Table 2. Univariate associations between demographic, HIV marker and social support variables with mental health among Aboriginal people living with HIV/AIDS in the Positive Spaces, Healthy Places study (2006) (n=79).

	β	Standard Error	p-value	95% Confidence Interval	
				Lower	Upper
Age (in years)	0.267	0.165	0.020	0.065	0.723
Two-spirit sexual orientation (ref: heterosexual)	0.178	2.620	0.118	-1.069	9.363
Male gender (ref: female or transgender)	0.337	2.632	0.002	3.026	12.506
Inuit or Métis Aboriginal ethnicity (ref: First Nations)	-0.163	2.867	0.162	-9.760	1.666
Completed high school or higher education (ref: did not complete high school)	0.229	2.590	0.007	1.976	12.292
Years living with HIV	0.162	0.215	0.154	-0.119	0.739
Currently taking HIV treatment medications (referent: not currently taking treatment)	0.241	2.690	0.033	0.494	11.208
Overall Social Support	0.189	0.064	0.005	0.060	0.317
Emotional / Informational Support	3.675	1.232	0.004	1.222	6.128
Affectionate Support	0.739	0.390	0.062	-0.037	1.515
Tangible Support	2.129	0.255	0.023	0.297	3.961
Positive Social Interaction	2.205	1.092	0.047	0.031	4.379

ref: = referent category

At the multivariate level, increased mental health scores were associated with the following factors: age measured in years ($\beta = 0.370$, $p = 0.025$), male versus other gender ($\beta = 7.361$, $p = 0.005$), emotional/informational support ($\beta = 3.183$, $p = 0.008$), and affectionate support ($\beta = 0.887$, $p = 0.015$). Aboriginal ethnicity was retained in the model as it confounded the relationship between affectionate support and mental health ($\beta = -1.435$, $p = 0.581$). Two-spirit sexual orientation was no longer significantly associated with the mental health outcome in the multivariate analysis.

DISCUSSION

Higher levels of social support being associated with better mental health has been well

established in the literature (Viswesvaran , Sanchez, & Fisher, 1999; Broadhead et al., 1983). This relationship has been shown to hold true for people living with HIV/AIDS (Turner-Cobb et al., 2002) and for Aboriginal people in Canada (Richmond et al., 2007). A study by Monette and colleagues (2011) using the entire PSHP survey established that there were clear differences in the demographic characteristics of APHAs of the PSHP survey as compared with Caucasian participants. Our findings demonstrate the positive link between social support and mental health for Aboriginal people living with HIV/AIDS.

Several hypotheses have been used to explain why social support is an effective predictor of mental health, as seen in our sample. One opinion, known as the ‘direct effect’ hypothesis, suggests that social support improves mental health directly, independent of stress or negative life events (Williams, 1981). More popular is the theory proposed by Cohen and Willis (1985) known as the ‘Buffering Model’. This model states that social support is protective against the negative mental health associated with stressful life events by increasing the individual’s ability to cope with stressful situations, which was validated by Richmond and colleagues (2007). Regardless, both theories contribute to improving quality of life (Taylor, 2011), although some attribute higher importance to the buffering model (Carpenter, Fowler, Maxwell, & Andersen, 2010, Patrick, Chamot, & Perneger, 2004). Although our work focused primarily on the role social support plays in predicting mental health, there may be a further two-way consideration: poorer mental health may be a cause as much as it is a result of lower levels of social support. Regardless, it is clear that social support is associated with mental health among APHAs of Ontario.

Our mental health prediction model indicated that emotional / informational and affectionate support were the two most important social support subscale predictors of mental health. In the original buffering theory of social support, it was reasoned that functional measures of social support (i.e. types of support that increase a person’s ability to personally cope with a situation) would be most important in decreasing their stress. Our findings are consistent with this theory: emotional / informational support (providing trust, acceptance, empathy, and concern) (Sherbourne & Stewart, 1991) and affectionate support (expressions of love, acceptance) (Sherbourne & Stewart, 1991) seem effective at decreasing stress. Indeed, other research in non-Aboriginal populations investigating the effect of social support subscales have found affectionate (Charyton, Elliot, Lu, & Moore, 2009) and emotional / informational support (Himle, Jayaratne, & Thyness, 2008) to be key determinants of mental health in the context of the buffering hypothesis. Our research demonstrates the particular need for increased social support programming and services for APHAs in Ontario.

The relationship between social support and physical health has been markedly more modest (Mezuk, Roux, & Seeman, 2010). Nonetheless, previous studies of HIV-positive populations have shown social support to be a significant predictor of physical health (Bastardo & Kimberlin, 2000; Borgoyne et al., 2004). This trend was previously in a study published by Bekele et al. (2013) using the PSHP survey, which found social support positively predicted better physical

health in all of the HIV-positive participants. We expect that the lack of association between social support and physical health among our Aboriginal subsample was likely a result of lower statistical power (n=79 in our study as compared with n=602 in the Bekele et al. paper).

One important finding of our research is that social support did not differ by sexual orientation among these APHAs, contrary to some previous studies (Ueno, 2005; Williams et al., 2005) that found less social support availability among young populations of sexual minority groups (among all ethnicities). However, the studies by Ueno and Williams et al. focused on sexual minority youths, whereas our sample consisted entirely of HIV-positive adults (the youngest participant in our sample was 26 years old). Our findings could be explained by a larger trend that mental health improves with age of PHAs (Stewart, Clanfrini, & Walker, 2005; Bastardo et al., 2000; Brennan, Emler, Brennenstuhl, & Rueda, 2013; Monette et al. 2011). However, given these findings, we are also interested in the role that Aboriginal communities and culture may play in ameliorating the effects of homophobia.

Among APHA participants, males reported higher mental health than female / transgender participants. This indicates that gender is an important predictor of mental health even after controlling for the effect of other demographic and HIV marker variables. Due to risks of residual disclosure it was not possible to separately analyze cis-gender female participants and transgender participants (n=4). It is reasonable to expect that transgendered people have different social support and health outcomes than female participants, but this cannot be determined using these data. It would be important for future research to analyze data with more detailed groupings and consideration of sex and gender in order to improve the understanding and unique needs regarding social support and health of these individuals. The finding that women have worse mental health has been repeatedly reported in Canada (Canadian Mental Health Association, 2013) and North America (Centers for Disease Control, 2011). In fact, global cross-cultural studies have repeatedly shown that women are more likely than men to suffer from mental illness (World Health Organization, 2000; Seedat et al., 2009). Our findings agree: mental health among the female / transgender group was significantly lower than that of the male participants. Many reasons have been suggested for why women are more at higher risk of poor mental health: biological vulnerability (Kessler, 2003; Young, Korszun, & Altemus, 2002) and social inequality (Schulz, Israel, Williams, Parker, 2000) are strongly implicated. Notably, there was no difference in the level of social support between male and female / transgender groups in our sample, which was also in agreement with previous literature (Stewart et al., 2005).

STRENGTHS AND LIMITATIONS

Due to the nature of the data set, certain strengths are inherent to the unique data presented in the PSHP study. First, this PSHP survey is exclusive to HIV-positive individuals, allowing a focus on a group of participants who may have otherwise been underrepresented in a general health survey. This survey allows us to make comments on the state of social support and health in Aboriginal and two-spirit populations. Further, the PSHP is community-based, advocacy

focused, and serves as a good exemplar of GIPA principles.

Some limitations need to be considered when interpreting the results of this study. In light of the fact that the PSHP recruitment strategies relied primarily on using ASOs, CBOs, and other supportive centers, participants were likely to have been more representative of people living with HIV in Ontario who are connected to support services than of all HIV-positive people. This bias in sample selection limits the extent to which these findings can be generalized to larger populations of PHAs or APHAs. Another concern was the variables related to self-identified sexual orientation and gender and our reliance on this data (e.g. instead of honouring self-identified two-spirit participants). Due to the small number of transgender participants in the APHA subsample, transgender and female participants had to be combined into one “non male” category in order to protect the confidentiality of the participants. Thus, it was not possible to differentiate between the availability of social support / health outcomes for females and transgender APHAs.

FUTURE RESEARCH

More research needs to be conducted to understand better the role social support plays in improving the health of Aboriginal and two-spirit people living with HIV/AIDS in Canada. Specifically, continued efforts are required to learn about the role of social support in determining physical health outcomes among APHAs, preferably with a larger sample. Comparison of the effectiveness and importance of social support between the APHA and non-Aboriginal participants may also help contextualize the findings presented in this paper within the broader Canadian population. This work can help give rationale for and aid in the development and expansion of social support programming and services CBOs and ASOs. Further research should explore the unique experiences and needs of two-spirit people within the context of broader Aboriginal communities. Furthermore, analyzing the interaction between social support and health among APHAs over time could help inform health promotion and public health interventions. Finally, this work used dominant Western understandings of sexual orientation from gender and future research should proactively engage with and embrace indigenous ways of knowing (a simple example being the inclusion of an explicit question regarding two-spirit identity).

CONCLUSION

A total of 79 Aboriginal people living with HIV/AIDS participated in the Positive Spaces, Healthy Places baseline survey in 2006. The majority of these participants reported being male (n=52/79, 65.8%) and First Nations (n=50/79, 63.3%). Over half of the APHAs were two-spirit (n=43/79, 54.5%) and had completed high school or some form of post-secondary education (n=48/79, 60.8%). Overall, on the basis of the Medical Outcomes Survey for HIV patients, participants reported “moderate” overall social support scores (64.4 out of 100), “low” mental health scores (43.6 out of 100) and “low” physical health scores (44.8 out of 100). Multivariable

linear regression found that being older, being male, and having higher levels of emotional / informational support and higher levels of affectionate support were predictors of better mental health for APHAs. Physical health was not significantly associated with social support in our sample. Overall, Aboriginal people living with HIV in Ontario report lower physical health and mental health scores compared to HIV-positive people of other ethnicities (for example, see Monette et al., 2011). However, there appears to be no disparity in the health or in the level of social support availability between two-spirit and heterosexual APHAs in this sample. Nonetheless, increased social support services (especially those focused on improving emotional/informational and affectionate support) could help improve the mental health of APHAs. These results indicate the need for increased social support and mental health programs, which need to be culturally relevant, to improve the quality of life of APHAs. In particular, social support and mental health services and programs for Aboriginal people living with HIV should pay particular attention to the needs of and uptake by women and youth. Social support is an important factor to consider when developing strategies and programs to care for and support Aboriginal people living with HIV/AIDS.

RECOMMENDATIONS

These results support the need for accessible culturally relevant mental health and social support programs for APHAs. We recommend that, where possible, the need for social support is taken into consideration in the development of future programs (e.g. integration into housing services and health care delivery). In particular, special attention should be given to social support among APHAs and be integrated into mental health campaigns, programs, services and interventions.

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APPENDIX ONE

TRANSLATION INQUIRIES

Page / Paragraph	Term(s) causing issue	Translator's question or comment	Client's instructions
P. 80 / par. 2	(...) we only conducted multivariable linear on mental health summary scores as the main outcome of interest.	The adjectival group <i>multivariable linear</i> is missing a noun; could it be <i>regression</i> ?	Yes, should be multivariable linear regression
P. 80 / Par. 4	At the univariate level ($p < 0.20$), mental health was associated with five demographic variables (...) and four social support variables (emotional / information social support, affectionate social support, tangible social support, and positive social interaction)...	In this specific section, the word <i>social</i> is inserted after each <i>support</i> ; this is not done anywhere else in the document. Please confirm if this is intentional.	No, this was not intentional. Should be removed.
P. 80 / Par. 4	Aboriginal ethnicity was retained in the model as it confounded the relationship between affectionate support and mental health ($\beta = -1.435, p = 0.581$).	Please confirm whether <i>it</i> refers to <i>aboriginal ethnicity</i> or to <i>model</i> .	'It' refers to Aboriginal ethnicity and could be re-written as "this variable".
P. 82 / Par. 2	More popular is the theory proposed by Cohen and Willis (1985) known as the 'Buffering Model'.	Is there a typo in the name? In my searching, I found <i>Wills</i> rather than <i>Willis</i> .	Should be 'Wills'
P. 83 / par. 2	One important finding of our research is that social support did not differ by sexual orientation among these APHAs, contrary to some previous studies (Ueno, 2005; Williams et al., 2005) that found less social support availability among young populations of sexual minority groups (among all ethnicities).	Could it be <i>youth</i> populations?	'Adolescent' may be better. Otherwise 'youth' is better than 'young'.

Page / Paragraph	Term(s) causing issue	Translator's question or comment	Client's instructions
P. 83 / par. 3	It would be important for future research to analyze data with more detailed groupings and consideration of sex and gender in order to improve the understanding and unique needs regarding social support and health of these individuals.	Regarding <i>unique needs</i> , are we really talking about <i>improving needs</i> , or rather about <i>better responding</i> to unique needs?	"... in order to understand and respond better to unique needs regarding...
P. 84 / par. 2	Another concern was the variables related to self-identified sexual orientation and gender and our reliance on this data (e.g. instead of honouring self-identified two-spirit participants).	Please clarify in which sense the verb <i>honouring</i> is used: a) If you <i>honour</i> an arrangement or promise, you do what you said you would do. b) To <i>honour</i> someone means to treat them or regard them with special attention and respect.	Another concern was our reliance on variables related to self-identified sexual orientation and gender instead of self-identified two-spirit participants.
P. 84 / Par. 3 (last sentence)	Finally, this work used dominant Western understandings of <i>sexual orientation from gender</i> and future research should proactively engage with and embrace indigenous ways of knowing (a simple example being the inclusion of an explicit question regarding two-spirit identity).	This is what I gather from the sentence: The authors mean that the Western ideology makes a distinction between sexual orientation and gender, whereas these are one unique notion for Aboriginals. Can you please confirm if I understand the sentence correctly?	Yes, your understanding of the sentences is correct and provides more clear wording.

Page / Paragraph	Term(s) causing issue	Translator's question or comment	Client's instructions
P. 85 / Par. 1	These results indicate the need for increased social support and mental health programs, which need to culturally relevant, to improve the quality of life of APHAs.	For your information, a verb has been left out in the highlighted area. I have translated the sentence using the verb "be". Please confirm, or provide alternate instructions if necessary.	Should read: "..., which need to be"
P. 85 / par. 2	In particular, special attention should be given to social support among APHAs and be integrated into mental health campaigns, programs, services and interventions.	Please clarify what is the subject of the verb group <i>be integrated into</i> campaigns, programs (...)	Subject: Knowledge about social support among APHAs
P. 86	Brennan, D.J., Emler, C.A., Brennenstuhl, S., Rueda, S. (2013). Socio-demographic profile of older adults living with HIV/AIDS: Gender and Sexual Orientation Differences.	F.Y.I.: The document title that I found did not have the word <i>living</i> in it.	<i>Living</i> is not in the document title
P. 86	Canadian Mental Health Association (2013). Women's Mental Health. Retrieved from http://www.ontario.cmha.ca/women.asp .	F.Y.I.: The link did not lead me to this article. Also, I could not find the afore mentioned article on the website, so the link remains incorrect.	Link does not work – nor can I find that article anymore. I think it may be best to remove this reference altogether "The finding that women have worse mental health has been repeatedly reported in Canada (Canadian Mental Health Association, 2013) and North America (Centers for Disease Control, 2011)."

Page / Paragraph	Term(s) causing issue	Translator's question or comment	Client's instructions
P. 87	Monette, L.E., Rourke, SB., Gibson, K., Bekele T.M., Tucker R., Greene S., Sobota M., Koornstra, J., Byers, S., Marks, E., Bacon, J., Watson, J., Hwang S.W., Ahluwalia, A., Dunn, J.R., Guenter, D., Hambly, K., Bhuivan, S. (2011). Inequalities in Determinates of Health Among Aboriginal and Caucasian Persons Living with HIV/AIDS in Ontario: Results from the Positive Spaces, Healthy Places Study.	Please note that there is a typo in the title, which should read Inequalities in <i>Determinants</i> ...	Typo, should be: <i>Determinants</i>
P. 88	Revicki, D.A., Sorensen, S., Wu, A.W. (1998). Reliability and validity of physical and mental health summary scores from the Medical Outcomes Study of HIV Health Survey. <i>Med Care</i> , 36(2): 126-137.	According to this source: http://www.ncbi.nlm.nih.gov/pubmed/9475468 , there is a typo in the document title (<i>of</i> should be removed).	'Of' should be removed
P. 88	Ristock, J., Zoccole, A., Passant, L. (2010). Aboriginal Two-Spirit and LGBTQ Migration, Mobility and Health Research Project: Winnipeg, Final Report. Retrieved from http://www.2spirits.com/MMHReport.pdf	There is a typo in the link, which should read http://www.2spirits.com/PDFolder/MMHReport.pdf	Should be: http://www.2spirits.com/PDFolder/MMHReport.pdf
P. 89	Turner-Cobb, M., Felton-Gore, C., Marouf, F., Koopman, C., Kim, P., Israelski, D., Spiegel, D. (2002). Coping, Social Support, and Attachment Style as Psychosocial Correlates of Adjustment in Men and Women and HIV/AIDS.	According to this source: http://www.ncbi.nlm.nih.gov/pubmed/12136496 , there is a typo in the title, which should read "in Men and Women <i>with</i> HIV/AIDS".	Should be: " <i>with</i> "
P. 89	Wu, A.W. (1997). Evidence for reliability, validity and usefulness of the Medical Outcome Study of HIV Health Survey (MOS-HIV).	There seems to be a typo in the document title (<i>of</i> should be removed?).	<i>Of</i> should be removed