Published in final edited form as:
J Gay Lesbian Soc Serv. 2014 January 1; 26(3): 279–302. doi:10.1080/10538720.2014.924458.

Associations between social support network characteristics and receipt of emotional and material support among a sample of male sexual minority youth

Farzana Kapadia,
Center for Health, Identity, Behavior and Prevention Studies, Steinhardt School of, Culture, Education & Human Development, New York University, NY

Department of Population Health, Division of General Internal Medicine, Langone School, of Medicine, New York University

Perry Halkitis,
Center for Health, Identity, Behavior and Prevention Studies, Steinhardt School of, Culture, Education & Human Development, New York University, NY

Department of Population Health, Division of General Internal Medicine, Langone School, of Medicine, New York University

Staci Barton,
Center for Health, Identity, Behavior and Prevention Studies, Steinhardt School of, Culture, Education & Human Development, New York University

Daniel Siconolfi, and
Department of Health, Behavior and Society, Johns Hopkins Bloomberg School of Public, Health, Baltimore, Maryland

Rafael Perez Figueroa
Center for Health, Identity, Behavior and Prevention Studies, Steinhardt School of, Culture, Education & Human Development, New York University

Abstract

Few studies have examined how social support network characteristics are related to perceived receipt of social support among male sexual minority youth. Using egocentric network data collected from a study of male sexual minority youth (n=592), multivariable logistic regression analyses examined distinct associations between individual and social network characteristics with receipt of (1) emotional and (2) material support. In multivariable models, frequent communication and having friends in one's network yielded a two-fold increase in the likelihood of receiving emotional support whereas frequent communication was associated with an almost three-fold higher likelihood of perceived material support. Finally, greater internalized homophobia and personal experiences of gay-related stigma were inversely associated with perceived receipt of emotional and material support, respectively. Understanding the evolving

Correspondence concerning this article should be addressed to Farzana Kapadia, PhD MPH, New York University, 411 Lafayette Street, 5th Floor, New York, NY 10012, Farzana.kapadia@nyu.edu.

social context and social interactions of this new generation of male sexual minority youth is warranted in order to understand the broader, contextual factors associated with their overall health and well-being.

Keywords

social support; social networks; youth/adolescents; sexual minority

For male sexual minority youth, the period between late adolescence and young adulthood is a time during which these youth are likely to be negotiating their sexual identities (Ott et al., 2011) in peer groups and family environments often characterized by stigma, discrimination (Huebner et al., 2004; Kann et al., 2011; Ryan et al., 2009) toward gay, bisexual and lesbian youth and potential rejection from said peers and family members. The confluence of such factors have been linked to a number of behavioral and health-related outcomes such as greater alcohol and drug use (Clatts et al., 2003; Mutchler et al., 2011; Talley et al., 2010; Wong et al., 2010), multiple sexual partnerships (Bauermeister et al., 2011; Halkitis et al., 2011), unprotected sexual activity (Pollock & Halkitis, 2009; Wilson et al., 2009), sexual activity while high or intoxicated (Newcomb et al., 2011; Rusch et al., 2004; Stueve et al., 2002), heightened levels of depression and depressive symptoms (Mustanski et al., 2010; Salomon et al., 2009), suicidality and suicide ideation (Mustanski et al., 2010; O'Donnell et al., 2011; Remafedi, 2002), experiences with sexual and interpersonal violence and victimization (Kann et al., 2011; Wong et al., 2010) and heightened risk for HIV and other sexually transmitted infections (Kipke et al., 2007; Mark et al., 2005) among male sexual minority youth. Moreover, the onset of such risk behaviors as well as related physical and mental health conditions during the period of adolescence and young adulthood among sexual minority youth has a significant impact on the presence and persistence of these behaviors and health states into adulthood.

It is well documented that social processes and social behavior have a profound impact on the health and well-being of adolescents. As such, there is a large body of literature indicating that among adolescents the presence of supportive interpersonal relationships with peers and family members is related to individual-level engagement in healthy behaviors and positive health outcomes. Often, these studies employ a social network approach, grounded in social network theory, which focuses on the relationships or ties between individuals within a social system (Wasserman & Faust, 1994). Finally, the study of social networks employs either an egocentric or sociometric approach to understanding ties between individuals. An egocentric approach relies on obtaining information from an individual on their direct personal ties as well as characterization of those ties. The sociometric, or complete network, approach involves identifying all ties or relationships among and between multiple individuals (Wasserman & Faust, 1994).

Furthermore, this social network perspective postulates that information or resources are transmitted across ties amongst individuals within a network via social processes or interactions. Therefore, the ability of social networks to influence individual-level, health-related behavior is measured by the structure (e.g. the size, relationship with and

characteristics of network members) of an individual's social network ties and the type and quality of content shared between network members. Most frequently, the type of content transmitted across social ties, or shared between network members, includes normative attitudes, behavioral information, and support in the form of information and material resources that may ultimately influence the health-related attitudes and behaviors of an individual.

Despite theoretical frameworks that provide distinct mechanisms of action linking social networks and social processes and a pro-analytic tech, most empirical investigations examining the influence of these factors on health behavior and health conditions have examined them as disjointed factors. This dichotomy in investigating the role of social networks and social processes is reflected in the extant empirical evidence linking these factors to health outcomes among sexual minority youth. For example, a number of studies have examined variations in the structural characteristics of social and sexual networks such as size, composition, density, and partner concurrency with regard to HIV/STI transmission dynamics (Kapadia et al., 2013; Latkin et al., 2010a). In addition, more recent research has considered factors such as social embeddedness, isolation and social status with regard to outcomes ranging from depression, and anxiety to suicide and suicidal ideation among sexual minority youth (Hatzenbuehler et al., 2012). With regard to social processes, the bulk of research has been directed at understanding the role of normative influences, in terms of injunctive as well as descriptive norms within peer networks, for their potential to influence HIV-related sexual and drug use behaviors (Davey-Rothwell et al., 2012; Jones et al., 2008; Latkin et al., 2010b; Tyler & Melander, 2012).

Finally, beyond normative influences, social processes such as differential receipt of social support from social network members play a salient role in the production of health related disparities among sexual minority youth. In fact, the absence of social support is considered a fundamental cause of illness and disease (Link & Phelan, 1995; Phelan et al., 2010). Thus, the presence and receipt of social support is postulated to be a protective factor against stressors associated with psychological or physiological outcomes (Thoits, 1995). This, buffering effect, may be particularly salient to the lives of sexual minority youth, for whom there is compelling evidence indicating that experiences of internalized homophobia (Brooks et al., 2005; Choi et al., 2011; Kubicek et al., 2009; Stokes & Peterson, 1998), prejudice, stigma and discrimination based on sexual orientation, and extent of ethnic versus gay community affiliation (Gold et al., 1994; Holt, 2011), act as stressors (Meyer, 2003) and in turn, play a salient role in the production of health related disparities among sexual minority youth compared to their heterosexual counterparts.

In summary, although different approaches to assessing the influence of social interaction and social networks among sexual minority youth have been utilized, these findings nonetheless provide strong evidence for health promotion and intervention efforts on the network level as a crucial component to improving the health and overall well-being of sexual minority youth (Amirkhanian et al., 2005; Egan et al., 2011; Fuqua et al., 2011; Kelly et al., 2010; Latkin & Knowlton, 2005; Peterson et al., 2009; Tobin & Latkin, 2008). Thus, in order to tap into the potential of social support as a protective factor among sexual minority youth, investigation of social support network characteristics as they relate to

receipt of social support is warranted. More specifically, exploring key factors characterizing social support networks and their relationship to the types of perceived support provided by these network members of sexual minority youth, may help researchers identify the social structures or ties that are most likely to facilitate or impede provision of network-level supportive influences. Within this context, the objective of the present study was to examine key social support network characteristics for their relationship with perceived receipt of emotional and material support after controlling for individual level sociodemographic and psychosocial factors among a new generation of sexual minority youth.

Method

Study Design and Sample

For the present analysis, we employed baseline data from a prospective cohort study of male sexual minority youth who are diverse with regard to socioeconomic status as well as race/ethnicity. The full details of the parent study are already published (Halkitis et al., 2013b; Halkitis et al., 2013a). Briefly, participants were recruited in New York City via a combination of active and passive modalities ranging from recruiting potential participants at community events, bars/club, etc. to website advertisement or social networking sites, etc. Eligible participants had to be born biologically male; between 18 and 19 years old; self-report having had sex with a man in 6 months preceding the screening interview; and also self-report an HIV-negative or unknown serostatus. After providing written, informed consent, participants completed an audio-computer administered survey instrument (ACASI) to provide data on individual-level sociodemographic characteristics and a comprehensive range of psychosocial factors. A social support network inventory was used to ascertain information on up to 10 network members whom study participants considered to be ‘significant or important’ in their lives as well information on receipt of emotional support and material support from these members (Norbeck et al., 1981).

Among the 2,068 individuals screened for this study, n=598 completed the baseline assessment. In this baseline sample, n=6 were identified as HIV-seropositive and therefore excluded from the present analysis as receipt of social and emotional support is likely to be associated with HIV status and the limited sample size restrictions prevent further analyses. Thus, the final sample size for the present study is n=592. This study protocol was approved by New York University’s Institutional Review Board (IRB), and a Certificate of Confidentiality was obtained from the Department of Health and Human Services. All participants were remunerated for their time and effort in accordance with local community guidelines.

Dependent Variables

Perceived social support was examined in terms of two distinct domains salient to the lives of male sexual minority youth: perceived receipt of emotional support and material support. A 6-item measure comprised of two sub-scales was used to ascertain information on the perception of types of support received; responses to these items were rated on a 5-point scale ranging from ‘not at all’ to ‘a great deal’ with higher scores indicating higher levels of

perceived support. The emotional support sub-scale consisted of 4-items such as '*How much does this person make you feel liked or loved*?' The material aid sub-scale consisted of 2-items such as 'If you were confined to bed for several weeks, how much could this person help you?' These subscales also have high internal validity (Cronbach $\alpha = 0.97$ and 0.91 for emotional support and material support, respectively). For the present analysis perceived receipt of emotional and material support were dichotomized as high versus low. This dichotomization is based on prior research indicating that higher levels of perceived support are more likely to be associated with actual support rather than when perceived support increases incrementally.

Independent Variables

Sociodemographic Characteristics—A number of sociodemographic characteristics were examined. Participants' self-reported racial/ethnic identity was examined as: Latino/Hispanic, Black/non-Hispanic, White/non-Hispanic, and Asian/mixed race/other. Educational status was assessed via a single item ascertaining whether participants were currently enrolled in school (yes/no). Socio-economic status (SES) was ascertained by asking participants about their perceived social class since at their age of enrollment they were unlikely have their own yearly income and also less likely to accurately recall their family income. Perceived SES was categorized as lower, middle and upper class. Foreign-born status was determined by ascertaining whether participant had been born in the US versus outside the US. Current housing was dichotomized as stably housed (i.e. reside in one's own/family home) versus unstably housed/homeless (i.e. reside in a shelter, public space, etc.) (Aidala et al., 2005). In addition, residential instability was analyzed by considering the number of times participants reported moving since birth. Participants reporting more than 2 moves were classified as having a higher degree of residential instability versus those with ≤2 moves. We examine residential mobility as participants who experience greater mobility prior to ages 18–19 may also be likely to experience changes in their network characteristics, which in turn may impact perceived receipt of social support. The dichotomization of housing status and residential stability variables was conducted to allow for comparisons across studies of sexual minority youth. Sexual identity was measured using the Kinsey scale which ranges from 0 to 6 (exclusively heterosexual to exclusively homosexual). For the present study, sexual identity was dichotomized as 'exclusively homosexual' versus 'not exclusively homosexual' in order to be able to determine whether there were any empirical differences in perceived receipt of social support among participants who fully identified with a homosexual identity or same sex preference versus participants whose sexual identities were still in development. Finally, participants were also asked whether or not they were currently in a relationship with a man (yes/no).

Health Status and Psychosocial Factors—Overall health status was assessed using a one-item self-rated health measure. The item, "*In general, would you say that your health was…?*" was measured on a five point scale with responses ranging from excellent to poor. The role of psychosocial factors in relationship to physical and mental health outcomes has been widely researched. However, little attention has been given to the role of both psychosocial factors in relation to receipt of social and material support among sexual

minority youth. As such, we examined a number of factors salient to the lives of sexual minority youth for their relationship to the receipt of emotional and social support. First, participants were asked to report on their ethnic identity affinity using the 12-item Multigroup Ethnic Identity Measure (e.g. 'I have a lot of pride in my ethnic group', etc.); responses ranged from "strongly agree" to "strongly disagree" and for the purposes of this analysis were dichotomized as low (≤2) versus high (>2) (Phinney, 1992). Second, gay community affiliation was assessed using a 1-item measure: '*I feel a part of the gay community in New York City*'; responses ranged from "strongly agree" to "strongly disagree" and were dichotomized as high (≤2) versus medium/low (≥3) (O'Donnell et al., 2002). Third, two types of gay related stigma were also assessed in this study: personalized and public gay related stigma (Frost et al., 2007). Personalized gay related stigma was measured via a 3-item measure (e.g. '*I have been hurt by how people reacted to learning I'm gay*', etc.) with responses ranging from 'strongly agree' to 'strongly disagree.' Experience of gay related stigma in public venues was measured via a 2-item measure (e.g. '*Most people think a person who is gay is disgusting*', etc.) with responses also ranging from 'strongly agree' to 'strongly disagree.' Both measures of personalized and public gay-related stigma were dichotomized as high versus low. Fourth, feelings of internalized homophobia (e.g. '*Sometimes I dislike myself for being gay/bisexual*', etc.) were measured on a 4-item scale with responses ranging from 'strongly disagree' to 'strongly agree'; internalized homophobia was dichotomized as high versus low for the present analysis (Thiede et al., 2003). Finally, we asked participants to report on whether their peers knew of their same sex behaviors. This measure was not included in the social support network inventory as our goal was to understand, writ large, whether these participants had come out to a larger and broader group of acquaintances who may or may not have been close friends. The categorical covariates described here were dichotomized for the present analysis by employing theoretically meaningful cut points that also facilitate interpretation of the results obtained.

Social Support Network Characteristics—To identify the characteristics of participants social support networks, participants were first asked to identify "*…persons who provide personal support for you or who are important to you now*." Once network members were enumerated, participants were asked to identify their relationship to each one of these nominated network member (e.g. family/relative, friends, etc.). It is important to note that participants used a broader definition of family member than that employed in traditional network analyses by including family members of choice in addition to biological family members. This decision is rooted in the rejection by biologic family members that many YMSM, particularly Black and Latino/Hispanic YMSM may experience upon coming out (Serovich et al., 2011). Initial exploration of the distribution of reported network members yielded a non-normal distribution for network size with the distribution skewed to the right (mean= 7.76, SE=0.10; median= 8, SD=2.3, IQR=6–10). As such, network size was dichotomized as <8 versus ≥8. Next, participants provided information on the duration of each relationship by responding to the question "*How long have you known this person*" (responses ranged from <6 months to >5 years). For the present study, average duration of network relationships was dichotomized as < 2 years versus ≥2 years. This dichotomization has both empirical and conceptual merit. First, 2 years was the also the median length of

reported relationships. Second, this cut-point allows an examination of differences in receipt of emotional and material support in recently formed networks versus those of longer duration. Finally, participants were asked to report on communication frequency with each network member on a 5-point scale ranging from 'daily' to 'once a year or less.' Communication frequency was dichotomized as ≤monthly versus ≥weekly. This dichotomization was also supported by empirical evidence as, on average, participants reported communicating with network members on a weekly basis in the present sample. Conceptually, more frequent communication is also associated with stronger network ties than less frequent communication.

Statistical Analysis

Initially, univariable analyses were completed to describe the extent of emotional and material support in this sample of male sexual minority youth. Next, separate bivariable analyses were undertaken to examine sociodemographic characteristics and psychosocial factors associated with emotional support and material support. In addition, social network structural characteristics such as size, composition, duration and frequency of contact were also examined for their associations with emotional and material support, respectively. Statistical significance was evaluated using chi-square and Fishers exact statistics, as appropriate, for all bivariable associations assessed here. Based on findings from bivariable associations well as a priori hypotheses, separate multivariable logistic regression models, for emotional and material support, were built to identify distinct sets of factors independently associated with each of the support measures under study here. In this way, models for each outcome, emotional and material support, were built by first including one distinct social support network characteristic. Next, we added sociodemographic and then psychosocial characteristics found to have a statistically significant association ($p<0.05$), or based on a priori knowledge, with emotional and material support, respectively, in conceptually related group. Model building was guided by comparing the −2 log likelihood value to obtain the final models of best fit for emotional and material support.

Results

In this sample of young, emerging adult men, we found that 17% reported low levels of perceived emotional support whereas 28% reported lack of perceived material support from their nominated social support network members. In bivariable analysis, (Table 1) YMSM who reported lower perceived SES (44% vs. 31%, p=0.037) and a not an 'exclusively homosexual' sexual identity (68% vs. 57%, p=0.023) were more likely to report low levels of perceived social support. In addition, YMSM who reported higher levels of personalized gay-related stigma (58% vs. 47%, p=0.024) and internalized homophobia (38% vs. 24%, p=0.004) were more likely to low levels of perceived emotional support. With regard to perceived receipt of material support, YMSM who reported lower perceived SES (45% vs. 29%, p=0.001), non-exclusively homosexual identity (64% vs. 56%, p=0.045), and higher levels of personalized gay-related stigma (58% vs. 45%, p=0.002) were also more likely to report low levels of perceived material support.

Next, upon examining social support network characteristics and their relationship to perceptions of emotional and material support, YMSM who reported friends as members of their social support networks were more likely to report higher levels of perceived emotional support (95% vs. 89%) compared to those not reporting friends as part of these networks (p=0.041). Further, individuals with family members in their social support networks were less likely to report perceived emotional support, although this relationship was marginally significant (p=0.090). YMSM who reported more frequent communication with their social support network members (≥weekly communication) were more likely to report perceived emotional support (84% vs. 71%, p=0.002). Finally, those with longer duration of relationships, on average, with their social support network members were more likely to report lower levels of perceived emotional support, although this relationship did not reach statistical significance (p=0.082). In terms of perceived receipt of material support, those reporting family members in their social support networks (96% vs. 92%, p=0.042) and having more frequent communication with their social support network members, across relationship type (87% vs. 70%) as well as, on average, longer duration of relationship with their social support network members (69% vs. 61%, p=0.044)were more likely to report higher levels of material support.

In multivariable analyses controlling for sociodemographic characteristics and psychosocial factors, YMSM reporting friends as part of their social support networks were more than two times more likely to report higher levels of perceived emotional support (AOR = 2.31, 95% CI 1.05, 5.02) (Table 3). Similarly, YMSM who reported greater communication frequency with their social support network members were also more than two times more likely to report higher perceptions of emotional support (AOR = 2.18, 95% CI 1.28, 3.70). Whereas in multivariable analyses examining social support network characteristics associated with perceived receipt of material support (Table 4), YMSM who reported more frequent communication with social support network members were almost three times more likely to report higher levels of material support (AOR = 2.93, 95% CI 1.87, 4.64).

Discussion

For sexual minority adolescents and young adults, health and well-being is a product of a complex constellation of risk and protective factors that may influence myriad health related behaviors and outcomes. One of the most essential of these determinants is the social context within which sexual minority youth and young adults are nested, as well as the type and quality of their relationships to peers, family members, partners and others within this context. In the present study, we sought to initiate an exploration of these factors and provide some insights into the potential role of social network characteristics as they relate to the perceived receipt of two distinct types of social support – emotional and material support. The main findings of this study suggest that sexual minority youth in this sample reported, on average, a high level of perceived social support. This finding is in contrast with prior studies that have noted lower levels of perceived social support from peers and family members of sexual minority youth compared to their heterosexual counterparts (Crawford et al., 2002; Jamil et al., 2009; Martinez & Hosek, 2005; Pearson & Wilkinson, 2013). One possible explanation for this finding may be that perceived social support was

examined across different types of social network ties (e.g. peers, family members, etc.) rather than per specific relationship types.

In terms of social support network characteristics, index participants who indicated the presence of friends in one's social network as well as more frequent communication with network members were more likely to report increased emotional support. One potential explanation for the relationship between emotional support and the presence of friends in one's social network may be that by late adolescence/young adulthood, sexual minority youth have identified and associate with a core group of peers whom they trust and who are, therefore, more likely to provide the types of emotional support required during this dynamic period of development. Second, this finding suggests that frequent communication via active engagement and interaction with network members is an indicator for social integration within one's network for sexual minority youth. Consequently, fostering better integration with a core group of trusted peers through frequent communication and interaction may not only increase social support but also have the potential to mitigate feelings of isolation and symptoms associated with depression, thereby promoting positive mental and physical health outcomes among male sexual minority youth.

In addition, greater communication frequency was again associated with reports of perceived material support. However, it is also of interest to note that while reporting a family member in one's social support network as well as longer, average duration of relationships with network members were each associated with receipt of material support in bivariable analysis, these factors were only marginally statistically significant in multivariable analyses. While prior work has noted lower level of social support from family members of sexual minority youth, these findings indicate that family members may still play an integral role in providing instrumental support or aid to sexual minority youth. It is also important to note that youth may not have reported family network members who provide no social support, or negative social support, and so the family members indicated may represent a select group of family members who provide positive support. Furthermore, it may also be that family members as defined here include both biological and non-biological family ties as sexual minority youth sustain or create ties that will support them during this critical time period.

Finally, in addition to the social support network characteristics discussed, it is of importance to note that three distinct individual level factors were associated with perceived receipt of social support in different directions. First, better self-rated health was associated with higher levels of perceived receipt of both emotional and material support in this sample of male sexual minority youth. Two explanations for this finding are offered. First, those reporting better overall health may be doing so because of a greater ability to harness both emotional and material support from their network members. Alternatively, it may be that those reporting better health states do so because of the greater emotional and material support already received from their network members. The existence of these possibilities is likely a reflection of the fact that what we are measuring is perceived receipt of social support rather than actual receipt of social support in a cross-sectional study. Second, male sexual minority youth reporting a lower perceived SES were more likely to indicate lower levels of perceived emotional and material support. One reason for this finding may be that

youth from more economically disadvantaged neighborhoods may be more likely to include family/relatives as well as other youth from similar economically disadvantaged backgrounds as social support network members. Further, it has been suggested that there may be fewer opportunities for male sexual minority youth to interact and engage with network members from similarly disadvantaged backgrounds. Thus, these limited social interactions may be linked to lower levels of perceived receipt of emotional support as well. Third, greater internalized homophobia was associated with lower levels of perceived emotional support. Despite efforts geared toward fostering greater acceptance of male same sex youth (Cahill et al., 2013), the internalization of same sex stigma and experiences of discrimination are still present during the period of late adolescence. As such, youth who experience greater internalized homophobia may not fully disclose their sexual orientation to social support networks and thus less likely to obtain or solicit the requisite levels of emotional support. This finding also confirms that sexual minority youth are at a heightened vulnerability via both internal and external mechanisms that may serve to increase their likelihood for experiencing negative mental health outcomes.

Before we can draw final conclusions from these results, certain study limitations must be considered. First, as these findings are derived from cross-sectional data, temporality cannot be established and as such, it is not possible to assess the causal relationship between social support network characteristics and perceived receipt of emotional and material support within this sample of sexual minority youth. For example, it may be that social support network characteristics shape the distinct types of social support provided to sexual minority youth or that these youth seek out and maintain relationships with peers who are more likely to provide the supportive environments that are critical to health and well-being during this period of transition from adolescence to young adulthood. Second, data on social network characteristics and social support were obtained via interviewer-administered assessments whereas sociodemographic and psychosocial characteristics were ascertained via ACASI. Consequently, there may be some response bias motivated by social desirability responding. Third, these data derive from an egocentric network data collection methodology. As such, these measures of perceived receipt of emotional and material support may not be fully reflective of the actual levels of emotional and material social support provided by each nominated network member. In addition, our measures of social support are unidirectional and do not tap into provision of social support by index participants to their respective network members. Consequently, we are unable to assess the bidirectional nature of social support as it relates to fostering and sustaining ties with network members, and how this would relate to overall health and well-being. However, the broader literature on social support indicates that perceived receipt of social support is more predictive of health compared to provision of support. Nonetheless, future studies employing a complete network or sociometric approach and thereby identifying and surveying nominated network members would be able to more accurately capture actual levels of social support received from social support network members as well as levels of social support provided to their social support network members. On a related note, a complete network assessment would allow for a more accurate assessment of network homophiliy and how social support differs among networks of high versus low homophily. For example, information on the proportion of nominated network members who also identify as sexual minority youth would allow for

an assessment of whether network characteristics such as relationship duration and frequency of communication as well as perceived receipt of social support differ by sexual minority status of network members. Finally, we did not assess negative social support, or relationship strain, which may also have significant implications for sexual minority youth mental health and well-being.

Despite these study limitations, key study strengths merit acknowledgement as well. First, this sample is derived from a large scale study of a socioeconomically and racially/ethnically diverse sample of sexual minority youth. Second, to our knowledge, this is the first study to initiate examination of both social network characteristics and two distinct types of social support – emotional and material support –in this vulnerable population. Finally, we examine these social determinants of health among sexual minority youth coming of age at a time characterized by important transitions in the sociopolitical and health contexts of the lived experiences of gay men in the United States. In conclusion, a more nuanced understanding of contextual factors that shape the social organization of health among sexual minority youth is warranted. Specifically, further investigation is required to provide greater insight into the social dynamics through which social networks and social support influence and sustain the health and well-being of this new generation of sexual minority youth as they enter into adulthood.

Acknowledgments

This study was funded by the National Institute on Drug Abuse, Contract #R01DA025537 awarded to Perry N. Halkitis.

References

Aidala A, Cross JE, Stall R, Harre D, Sumartojo E. Housing status and HIV risk behaviors: implications for prevention and policy. AIDS and Behavior. 2005; 9(3):251–265. [PubMed: 16088369]

Amirkhanian YA, Kelly JA, Kabakchieva E, Kirsanova AV, Vassileva S, Takacs J, et al. A randomized social network HIV prevention trial with young men who have sex with men in Russia and Bulgaria. AIDS. 2005; 19(16):1897–1905. [PubMed: 16227798]

Bauermeister JA, Leslie-Santana M, Johns MM, Pingel E, Eisenberg A. Mr. Right and Mr. Right Now: romantic and casual partner-seeking online among young men who have sex with men. AIDS and Behavior. 2011; 15(2):261–272. [PubMed: 20953689]

Brooks RA, Etzel MA, Hinojos E, Henry CL, Perez M. Preventing HIV among Latino and African American gay and bisexual men in a context of HIV-related stigma, discrimination, and homophobia: perspectives of providers. AIDS Patient Care and STDs. 2005; 19(11):737–744. [PubMed: 16283834]

Cahill S, Valadez R, Ibarrola S. Community-based HIV prevention interventions that combat anti-gay stigma for men who have sex with men and for transgender women. Journal of Public Health Policy. 2013; 34(1):69–81. [PubMed: 23151921]

Choi KH, Han CS, Paul J, Ayala G. Strategies for managing racism and homophobia among U.S. ethnic and racial minority men who have sex with men. AIDS Education and Prevention. 2011; 23(2):145–158. [PubMed: 21517663]

Clatts MC, Goldsamt L, Neaigus A, Welle DL. The social course of drug injection and sexual activity among YMSM and other high-risk youth: an agenda for future research. Journal of Urban Health. 2003; 80(4 Suppl 3)

Crawford I, Allison KW, Zamboni BD, Soto T. The influence of dual-identity development on the psychosocial functioning of African-American gay and bisexual men. Journal of Sex Research. 2002; 39(3):179–189. [PubMed: 12476265]

Davey-Rothwell MA, Villarroel MA, Grieb SD, Latkin CA. Norms, Attitudes, and Sex Behaviors among Women with Incarcerated Main Partners. Journal of Urban Health. 2013; 90(6):1151–1165. [PubMed: 22872432]

Egan JE, Frye V, Kurtz SP, Latkin C, Chen M, Tobin K, et al. Migration, neighborhoods, and networks: approaches to understanding how urban environmental conditions affect syndemic adverse health outcomes amiong gay, bisexual and other men who have sex with men. AIDS and Behavior. 2011; 15 Suppl 1:S35–S50. S35–S50. [PubMed: 21369730]

Frost DM, Parsons JT, Nanin JE. Stigma, concealment and symptoms of depression as explanations for sexually transmitted infections among gay men. Journal of Health Psychology. 2007; 12(4):636–640. [PubMed: 17584814]

Fuqua V, Chen YH, Packer T, Dowling T, Ick TO, Nguyen B, et al. Using Social Networks to Reach Black MSM for HIV Testing and Linkage to Care. AIDS and Behavior. 2011; 16(2):256–265. [PubMed: 21390535]

Gold RS, Skinner MJ, Rosenthal DA. Links with the gay community and the maintenance of safer sex. The Medical Journal of Australia. 1994; 160(9):591–592. [PubMed: 8164569]

Halkitis PN, Brockwell S, Siconolfi DE, Moeller RW, Sussman RD, Mourgues PJ, et al. Sexual behaviors of adolescent emerging and young adult men who have sex with men ages 13–29 in New York City. Journal of Acquired Immune Deficiency Syndrome. 2011; 56(3):285–291.

Halkitis PN, Kapadia F, Siconolfi DE, Moeller RW, Figueroa RP, Barton SC, et al. Individual, Psychosocial, and Social Correlates of Unprotected Anal Intercourse in a New Generation of Young Men Who Have Sex With Men in New York City. American Journal Public Health. 2013a; 103(5):889–895.

Halkitis PN, Moeller RW, Siconolfi DE, Storholm ED, Solomon TM, Bub KL. Measurement model exploring a syndemic in emerging adult gay and bisexual men. AIDS and Behavior. 2013b; 17(2): 662–673. [PubMed: 22843250]

Hatzenbuehler ML, McLaughlin KA, Xuan Z. Social networks and risk for depressive symptoms in a national sample of sexual minority youth. Social Science and Medicine. 2012; 75(7):1184–1191. [PubMed: 22771037]

Holt M. Gay men and ambivalence about 'gay community': from gay community attachment to personal communities. Cultural, Health & Sexuality. 2011; 13(8):857–871.

Huebner DM, Rebchook GM, Kegeles SM. Experiences of harassment, discrimination, and physical violence among young gay and bisexual men. American Journal of Public Health. 2004; 94(7): 1200–1203. [PubMed: 15226143]

Jamil OB, Harper GW, Fernandez MI. Sexual and ethnic identity development among gay-bisexual-questioning (GBQ) male ethnic minority adolescents. Cultural Diversity and Ethnic Minority Psychology. 2009; 15(3):203–214. [PubMed: 19594249]

Jones KT, Johnson WD, Wheeler DP, Gray P, Foust E, Gaiter J. Nonsupportive peer norms and incarceration as HIV risk correlates for young black men who have sex with men. AIDS and Behavior. 2008; 12(1):41–50. [PubMed: 17436075]

Kann L, Olsen EO, McManus T, Kinchen S, Chyen D, Harris WA, et al. Sexual identity, sex of sexual contacts, and health-risk behaviors among students in grades 9–12--youth risk behavior surveillance, selected sites, United States, 2001–2009. MMWR Surveillance Summaries. 2011; 60(SS07):1–133.

Kapadia F, Siconolfi DE, Barton S, Olivieri B, Lombardo L, Halkitis PN. Social support network characteristics and sexual risk taking among a racially/ethnically diverse sample of young, urban men who have sex with men. AIDS and Behavior. 2013; 17(5):1819–1828. [PubMed: 23553346]

Kelly JA, Amirkhanian YA, Seal DW, Galletly CM, Difranceisco W, Glasman LR, et al. Levels and Predictors of Sexual HIV Risk in Social Networks of Men who Have Sex with Men in the Midwest. AIDS Education and Prevention. 2010; 22(6):483–495. [PubMed: 21204625]

Kipke MD, Kubicek K, Weiss G, Wong C, Lopez D, Iverson E, et al. The health and health behaviors of young men who have sex with men. Journal of Adolescent Health. 2007; 40(4):342–350. [PubMed: 17367727]

Kubicek K, McDavitt B, Carpineto J, Weiss G, Iverson E, Kipke MD. "God Made me Gay for a Reason": Young Men who have Sex with Men's Resiliency in Resolving Internalized Homophobia from Religious Sources. Journal of Adolescent Research. 2009; 24(5):601–633. [PubMed: 20160996]

Latkin C, Weeks MR, Glasman L, Galletly C, Albarracin D. A dynamic social systems model for considering structural factors in HIV prevention and detection. AIDS and Behavior. 2010a; 14(Suppl 2):222–238. [PubMed: 20838871]

Latkin CA, Knowlton AR. Micro-social structural approaches to HIV prevention: a social ecological perspective. AIDS Care. 2005; 17(Suppl 1):S102–S113. S102–S113. [PubMed: 16096122]

Latkin CA, Kuramoto SJ, Davey-Rothwell MA, Tobin KE. Social norms, social networks, and HIV risk behavior among injection drug users. AIDS and Behavior. 2010b; 14(5):1159–1168. [PubMed: 19466537]

Link BG, Phelan J. Social conditions as fundamental causes of disease. Journal of Health and Social Behavior. 1995:80–94. Spec No:80–94. [PubMed: 7560851]

Mark HD, Sifakis F, Hylton JB, Celentano DD, Mackellar DA, Valleroy LA, et al. Sex with women as a risk factor for herpes simplex virus type 2 among young men who have sex with men in Baltimore. Sexually Transmitted Diseases. 2005; 32(11):691–695. [PubMed: 16254544]

Martinez J, Hosek SG. An exploration of the down-low identity: nongay-identified young African-American men who have sex with men. Journal of the National Medical Association. 2005; 97(8): 1103–1112. [PubMed: 16173325]

Meyer IH. Prejudice, social stress, and mental health in lesbian, gay, and bisexual populations: conceptual issues and research evidence. Psychological Bulletin. 2003; 129(5):674–697. [PubMed: 12956539]

Mustanski BS, Garofalo R, Emerson EM. Mental health disorders, psychological distress, and suicidality in a diverse sample of lesbian, gay, bisexual, and transgender youths. American Journal of Public Health. 2010; 100(12):2426–2432. [PubMed: 20966378]

Mutchler MG, McKay T, Candelario N, Liu H, Stackhouse B, Bingham T, et al. Sex drugs, peer connections, and HIV: Use and risk among African American, Latino, and Multiracial young men who have sex with men (YMSM) in Los Angeles and New York. Journal of Gay and Lesbian Social Services. 2011; 23(2):271–295. [PubMed: 21731406]

Newcomb ME, Clerkin EM, Mustanski B. Sensation seeking moderates the effects of alcohol and drug use prior to sex on sexual risk in young men who have sex with men. AIDS and Behavior. 2011; 15(3):565–575. [PubMed: 20960048]

Norbeck JS, Lindsey AM, Carrieri VL. The development of an instrument to measure social support. Nursing Research. 1981; 30(5):264–269. [PubMed: 7027185]

O'Donnell L, Agronick G, San DA, Duran R, Myint U, Stueve A. Ethnic and gay community attachments and sexual risk behaviors among urban Latino young men who have sex with men. AIDS Education and Prevention. 2002; 14(6):457–471. [PubMed: 12512847]

O'Donnell S, Meyer IH, Schwartz S. Increased risk of suicide attempts among Black and Latino lesbians, gay men, and bisexuals. American Journal of Public Health. 2011; 101(6):1055–1059. [PubMed: 21493928]

Ott MQ, Corliss HL, Wypij D, Rosario M, Austin SB. Stability and change in self-reported sexual orientation identity in young people: application of mobility metrics. Archives of Sexual Behavior. 2011; 40(3):519–532. [PubMed: 21125325]

Pearson J, Wilkinson L. Family relationships and adolescent well-being: are families equally protective for same-sex attracted youth? Journal of Youth and Adolescence. 2013; 42(3):376–393. [PubMed: 23196375]

Peterson JL, Rothenberg R, Kraft JM, Beeker C, Trotter R. Perceived condom norms and HIV risks among social and sexual networks of young African American men who have sex with men. Health Education Research. 2009; 24(1):119–127. [PubMed: 18281710]

Phelan JC, Link BG, Tehranifar P. Social conditions as fundamental causes of health inequalities: theory, evidence, and policy implications. Journal of Health and Social Behavior. 2010; 51(Suppl):S28–S40. S28–S40. [PubMed: 20943581]

Phinney JS. The multigroup ethnic identity measure: a new scale for use with diverse groups. Journal of Adolescent Research. 1992; 7(2):156–176.

Pollock JA, Halkitis PN. Environmental factors in relation to unprotected sexual behavior among gay, bisexual, and other MSM. AIDS Education and Prevention. 2009; 21(4):340–355. [PubMed: 19670969]

Remafedi G. Suicidality in a venue-based sample of young men who have sex with men. Journal of Adolescent Health. 2002; 31(4):305–310. [PubMed: 12359375]

Rusch M, Lampinen TM, Schilder A, Hogg RS. Unprotected anal intercourse associated with recreational drug use among young men who have sex with men depends on partner type and intercourse role. Sexually Transmitted Diseases. 2004; 31(8):492–498. [PubMed: 15273583]

Ryan C, Huebner D, Diaz RM, Sanchez J. Family rejection as a predictor of negative health outcomes in white and Latino lesbian, gay, and bisexual young adults. Pediatrics. 2009; 123(1):346–352. [PubMed: 19117902]

Salomon EA, Mimiaga MJ, Husnik MJ, Welles SL, Manseau MW, Montenegro AB, et al. Depressive symptoms, utilization of mental health care, substance use and sexual risk among young men who have sex with men in EXPLORE: implications for age-specific interventions. AIDS and Behavior. 2009; 13(4):811–821. [PubMed: 18709453]

Serovich JM, Grafsky EL, Craft SM. Does family matter to HIV-positive men who have sex with men? Journal of Marital and Family Therapy. 2011; 37(3):290–298. [PubMed: 21745231]

Stokes JP, Peterson JL. Homophobia, self-esteem, and risk for HIV among African American men who have sex with men. AIDS Education and Prevention. 1998; 10(3):278–292. [PubMed: 9642425]

Stueve A, O'Donnell L, Duran R, San DA, Geier J. Being high and taking sexual risks: findings from a multisite survey of urban young men who have sex with men. AIDS Education and Prevention. 2002; 14(6):482–495. [PubMed: 12512849]

Talley AE, Sher KJ, Littlefield AK. Sexual orientation and substance use trajectories in emerging adulthood. Addiction. 2010; 105(7):1235–1245. [PubMed: 20491728]

Thiede H, Valleroy LA, MacKellar DA, Celentano DD, Ford WL, Hagan H, et al. Regional patterns and correlates of substance use among young men who have sex with men in 7 US urban areas. American Journal of Public Health. 2003; 93(11):1915–1921. [PubMed: 14600066]

Thoits PA. Stress, coping, and social support processes: where are we? What next? Journal of Health and Social Behavior. 1995:53–79. Spec No:53–79. [PubMed: 7560850]

Tobin KE, Latkin CA. An examination of social network characteristics of men who have sex with men who use drugs. Sexually Transmitted Infections. 2008; 84(6):420–424. [PubMed: 19028939]

Tyler KA, Melander LA. Individual and Social Network Sexual Behavior Norms of Homeless Youth at High Risk for HIV Infection. Children and Youth Services Review. 2012; 34(12):2481–2486. [PubMed: 23162182]

Wasserman, S.; Faust, K. Social network analysis: methods and applications. Cambridge, MA: Cambridge University Press; 1994.

Wilson PA, Diaz RM, Yoshikawa H, Shrout PE. Drug use, interpersonal attraction, and communication: situational factors as predictors of episodes of unprotected anal intercourse among Latino gay men. AIDS and Behavior. 2009; 13(4):691–699. [PubMed: 18985447]

Wong CF, Weiss G, Ayala G, Kipke MD. Harassment, discrimination, violence, and illicit drug use among young men who have sex with men. AIDS Education and Prevention. 2010; 22(4):286–298. [PubMed: 20707690]

Table 1

Sociodemographic characteristics and perceived receipt of emotional and material support among sexual minority youth, NYC, 2009–2011, n=592

		Emotional Support			Material Support		
	Total	**High (n=490)**	**Low (n=100)**	**p-value**	**High (n=428)**	**Low (n=163)**	**p-value**
	% (n)	**% (n)**	**%(n)**		**% (n)**	**%(n)**	
Race/ethnicity							
Black/African American	16.3 (96)	16.1 (79)	17.7 (17)	0.799	15.7 (67)	17.8 (29)	0.934
Hispanic/Latino	38.0 (224)	38.6 (189)	35.0 (35)		38.6 (165)	36.8 (60)	
White	30.3 (179)	29.6 (145)	34.0 (34)		30.4 (130)	30.1 (49)	
Asian/mixed/other	15.4 (91)	15.7 (77)	14.0 (14)		15.4 (66)	15.3 (25)	
Current level of in schooling							
JHS/HS	19.7 (100)	18.6 (79)	25.0 (21)	0.118	18.4 (69)	23.0 (31)	0.157
College/Univ	80.3 (408)	81.4 (345)	75.0 (63)		81.6 (305)	77.0 (104)	
Perceived SES							
Lower	33.2 (196)	31.0 (152)	44.0 (44)	0.037	29.0 (124)	44.8 (73)	0.001
Middle	36.9 (218)	37.8 (185)	33.0 (33)		39.3 (168)	30.7 (50)	
Upper	29.8 (176)	31.2 (153)	23.0 (23)		31.8 (136)	24.5 (40)	
Foreign born (yes)	11.0 (65)	10.4 (51)	14.0 (14)	0.190	10.3 (44)	12.9 (21)	0.222
Residential Instability							
High	56.6 (334)	55.5 (272)	62.0 (62)	0.139	56.5 (242)	56.4 (92)	0.528
Low	43.4 (256)	44.5 (218)	38.0 (38)		43.5 (186)	43.6 (71)	
Current Housing							
Stably housed	94.9 (555)	95.1 (462)	93.9 (93)	0.398	94.8 (402)	95.1 (154)	0.546
Unstably housed	5.1 (30)	4.9 (24)	6.1 (6)		5.2 (22)	4.9 (8)	
Sexual identity[a]							
Exclusively homosexual	41.4 (244)	43.3 (212)	32.0 (32)	0.023	43.7 (187)	35.6 (58)	0.045
Not exclusively homosexual	58.6 (346)	56.7 (278)	68.0 (68)		56.3 (241)	64.4 (105)	

		Emotional Support			Material Support		
	Total	**High (n=490)**	**Low (n=100)**	**p-value**	**High (n=428)**	**Low (n=163)**	**p-value**
	% (n)	**% (n)**	**%(n)**		**% (n)**	**%(n)**	
Relationship status							
In male-male relationship	26.6 (157)	27.8 (136)	21.0 (21)	0.101	27.1 (116)	25.2 (41)	0.356
Not in a relationship	73.4 (433)	72.2 (354)	79.0 (79)		72.9 (312)	74.8 (122)	
Ethnic Identity/Affinity *(high)*	38.1 (225)	39.2 (192)	33.0 (33)	0.147	38.6 (165)	36.8 (60)	0.385
Gay community affiliation *(high)*	42.0 (248)	43.5 (213)	35.0 (35)	0.072	42.1 (180)	42.3 (69)	0.512
Gay related stigma –personalized *(high)*	48.5 (286)	46.5 (228)	58.0 (58)	0.024	44.6 (191)	58.3 (95)	0.002
Gay related stigma –public *(high)*	47.6 (281)	46.7 (229)	52.0 (52)	0.197	45.8 (196)	52.1 (85)	0.099
Internalized homophobia *(high)*	26.4 (156)	24.1 (118)	38.0 (38)	0.004	25.5 (109)	28.8 (47)	0.233
Peer knowledge of same sex behavior							
Some/few don’t know	69.0 (407)	70.0 (343)	64.0 (64)	0.144	70.6 (302)	65.0 (106)	0.115
Most/all know	31.0 (183)	30.0 (147)	36.0 (36)		29.4 (126)	35.0 (57)	

Table 2

Social network characteristics and perceived receipt of emotional and material support among sexual minority youth, NYC, 2009–2011, n=592

		Emotional Support			Material Support		
	Total	**High (n=490)**	**Low (n=100)**	**p-value**	**High (n=428)**	**Low (n=163)**	**p-value**
	% (n)	**% (n)**	**%(n)**		**% (n)**	**%(n)**	
Network Size							
≤8 members	51.2 (302)	51.2 (251)	51.0 (51)	0.527	51.6 (221)	50.3 (82)	0.422
>8 members	48.8 (288)	48.8 (239)	49.0 (49)		48.4 (207)	49.7 (81)	
Network composition*							
Sexual Partner	22.4 (132)	22.7 (111)	21.0 (21)	0.415	22.9 (98)	21.5 (35)	0.401
Family members	94.9 (560)	94.3 (462)	98.0 (98)	0.090	96.0 (411)	92.0 (150)	0.042
Friends	93.6 (552)	94.5 (463)	89.0 (89)	0.041	93.2 (399)	94.5 (154)	0.365
Frequency of communication							
≤monthly	18.0 (106)	15.7 (77)	29.0 (29)	0.002	13.3 (57)	30.1 (49)	<0.001
≥weekly	82.0 (483)	84.3 (412)	71.0 (71)		86.7 (370)	69.9 (114)	
Average duration of relationships							
< 2 years	33.4 (197)	34.8 (170)	27.0 (27)	0.082	31.4 (134)	39.3 (64)	0.044
≥2 years	66.6 (392)	65.2 (319)	73.0 (73)		68.6 (293)	60.7 (99)	

* categories are not mutually exclusive

Table 3

Multivariable logistic regression models for factors associated with perceived receipt of emotional support among sexual minority youth

		Model 1	Model 2	Model 3	Model 4	Model 5
	Unadjusted OR (95% CI)	**AOR (95% CI)**	**AOR (95% CI)**	**AOR (95% CI)**	**AOR (95% CI)**	**AOR (95% CI)**
Perceived SES						
Lower	0.52 (0.30, 0.90)	0.49 (0.26, 0.91)	0.47 (0.25; 0.88)	0.49 (0.27; 0.93)	0.46 (0.25; 0.86)	0.48 (0.26; 0.91)
Middle	0.84 (0.48, 1.50)	0.69 (0.38; 1.27)	0.69 (0.37; 1.26)	0.68 (0.37; 1.26)	0.66 (0.39; 0.99)	0.70 (0.38; 1.28)
Upper	1.00	1.00	1.00	1.00	1.00	1.00
Self-rated health						
Excellent/very good	2.66 (1.68, 4.21)	2.38 (1.47, 3.84)	2.33 (1.44, 3.78)	2.40 (1.48, 3.89)	2.37 (1.46, 3.85)	2.42 (1.49, 3.92)
Good/fair/poor	1.00	1.00	1.00	1.00	1.00	1.00
Sexual identity						
Identify as exclusively gay	1.62 (1.03, 2.56)	1.53 (0.95, 2.50)	1.51 (0.93, 2.46)	1.52 (0.94, 2.47)	1.48 (0.91, 2.41)	1.50 (0.92, 2.44)
Nonexclusively gay identity	1.00	1.00	1.00	1.00	1.00	1.00
Gay related stigma – personalized						
High	0.63 (0.41, 0.97)	0.61 (0.39, 0.96)	0.61 (0.38, 0.95)	0.60 (0.38, 0.95)	0.63 (0.40, 1.00)	0.59 (0.37, 0.93)
Low	1.00	1.00	1.00	1.00	1.00	1.00
Internalized homophobia						
High	0.52 (0.33, 0.82)	0.58 (0.36, 0.95)	0.59 (0.36, 0.95)	0.57 (0.35, 0.92)	0.58 (0.36, 0.95)	0.58 (0.36, 0.93)
Low	1.00	1.00	1.00	1.00	1.00	1.00
Network composition						
Sexual Partner	1.10 (0.65, 1.86)	0.94 (0.54, 1.64)	--	--	--	--
Network composition						
Family members	0.4 (0.08, 1.43)	--	0.33 (0.08, 1.42)	--	--	--
Network composition						
Friends	2.12 (1.01, 4.43)	--	--	2.31 (1.05, 5.02)	--	--

		Model 1	Model 2	Model 3	Model 4	Model 5
	Unadjusted OR (95% CI)	**AOR (95% CI)**	**AOR (95% CI)**	**AOR (95% CI)**	**AOR (95% CI)**	**AOR (95% CI)**
Frequency of communication						
≥weekly	2.19 (1.33, 3.59)	--	--	--	2.18 (1.28, 3.70)	--
≤monthly	1.00				1.00	
Average duration of relationships						
≥2 years	0.69 (0.43, 1.21)	--	--	--	--	0.63 (0.38, 1.04)
< 2 years	1.00					1.00
−2 Log Likelihood		500.064	497.139	496.061	491.851	496.269

Adjusted models control for race/ethnicity

Table 4

Multivariable logistic regression models for factors associated with perceived receipt of material support among sexual minority youth

		Model 1	Model 2	Model 3	Model 4	Model 5
	Unadjusted OR (95% CI)	**AOR (95% CI)**	**AOR (95% CI)**	**AOR (95% CI)**	**AOR (95% CI)**	**AOR (95% CI)**
Perceived SES						
Lower	0.50 (0.32, 0.79)	0.48 (0.29, 0.79)	0.49 (0.29, 0.81)	0.47 (0.28, 0.78)	0.43 (0.26, 0.73)	0.47 (0.28, 0.78)
Middle	0.99 (0.62, 1.59)	0.90 (0.55, 1.48)	0.90 (0.55, 1.49)	0.90 (0.55, 1.48)	0.85 (0.51, 1.42)	0.89 (0.54, 1.46)
Upper	1.00	1.00	1.00	1.00	1.00	1.00
Self-rated health						
Excellent/very good	1.73 (1.15, 2.62)	1.50 (0.98, 2.29)	1.52 (0.99, 2.33)	1.49 (0.97, 2.29)	1.49 (0.96, 2.30)	1.47 (0.96, 2.26)
Good/fair/poor	1.00	1.00	1.00	1.00	1.00	1.00
Sexual identity						
Identify as exclusively gay	1.41 (0.97, 2.04)	1.47 (0.99, 2.18)	1.48 (1.01, 2.20)	1.47 (0.99, 2.17)	1.42 (0.95, 2.10)	1.51 (1.02, 2.24)
Nonexclusively gay identity	1.00	1.00	1.00	1.00	1.00	1.00
Gay related stigma – personalized						
High	0.58 (0.40, 0.83)	0.55 (0.38, 0.80)	0.55 (0.38, 0.81)	0.55 (0.38, 0.80)	0.56 (0.38, 0.82)	0.57 (0.39, 0.83)
Low	1.00	1.00	1.00	1.00	1.00	1.00
Network composition						
Sexual Partner	1.09 (0.70, 1.68)	0.98 (0.63, 1.54)	--	--	--	--
Network composition						
Family members	2.10 (0.99, 4.42)	--	2.03 (0.94, 4.38)	--	--	--
Network composition						
Friends	0.80 (0.37, 1.73)	--	--	0.75 (0.34, 1.66)	--	--
Frequency of communication						
≥weekly	2.80 (1.81, 4.31)	--	--	--	2.93 (1.85, 4.64)	--
≤monthly	1.00				1.00	

		Model 1	Model 2	Model 3	Model 4	Model 5
	Unadjusted OR (95% CI)	**AOR (95% CI)**	**AOR (95% CI)**	**AOR (95% CI)**	**AOR (95% CI)**	**AOR (95% CI)**
Average duration of relationships						
≥2 years	1.41 (0.97, 2.06)	--	--	--	--	1.41 (0.96, 2.09)
< 2 years	1.00					1.00
−2 Log likelihood		665.535	662.403	664.999	644.265	661.908

Adjusted models control for race/ethnicity