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INTERGENERATIONAL SEX AS A RISK FACTOR FOR HIV AMONG YOUNG MEN WHO HAVE SEX WITH MEN: A SCOPING REVIEW

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Abstract

An emerging body of evidence suggests that intergenerational sexual partnerships may increase risk of HIV acquisition among young men who have sex with men (YMSM). However, no studies have comprehensively evaluated literature in this area. We applied a scoping review methodology to explore the relationships between age mixing, HIV risk behavior, and HIV seroconversion among YMSM. This study identified several individual, micro-, and meso-system factors influencing HIV risk among YMSM in the context of intergenerational relationships: childhood maltreatment, coming of age and sexual identity, and substance use (individual-level factors); family and social support, partner characteristics, intimate partner violence, connectedness to gay community (micro-system factors); and race/ethnicity, economic disparity, and use of the Internet (meso-system factors). These thematic groups can be used to frame future research on the role of age-discrepant relationships on HIV risk among YMSM, and to enhance public health HIV education and prevention strategies targeting this vulnerable population.

Keywords

young men who have sex with men (YMSM); HIV seroconversion; HIV risk intergenerational sex; age mixing

INTRODUCTION

HIV among Young Men Who Have Sex With Men

The number of men who have sex with men (MSM) living with HIV continues to increase around the world [1], despite advances in combination prevention strategies, including the expanding use of highly active antiretroviral therapy (ART) [2]. Recent estimates suggest that MSM account for 61% of new HIV infections in the United States (US) [3], 45% of new infections in Canada [4], and 43% of HIV infections in the World Health Organization (WHO) European region [5]. Populations of young MSM (YMSM, which we define broadly as MSM between the age of 14 and 29) have particularly elevated HIV incidence in some contexts. For example, evidence from the US shows that between 2008 and 2010, the number of new HIV infections among MSM aged 13–24 years grew by 22% compared to 12% in the general MSM population [6]. In Germany, surveillance estimates from 2009 found the greatest proportion of new HIV infections among MSM <30 years of age [7]. In Bangkok, Thailand, HIV incidence has been found to be significantly higher among MSM aged 21 years, compared to men aged 30 years [8]. Slightly different patterns of HIV incidence have emerged in other settings. In British Columbia (BC), Canada, HIV incidence among YMSM increased rapidly in the early 2000s [9]; however, in most recent years, MSM aged <30 years contribute only about 22% of the total number of new infections among MSM in BC [10,11]. In the Netherlands, prospective studies monitoring 20-year trends in HIV incidence found that new infections have remained stable among MSM <30 years [12]. Collectively, these studies suggest that trends in HIV incidence among YMSM are context-specific, and highlight the need to better characterize risk factors influencing HIV incidence in this population.

YMSM and Unprotected Anal Intercourse

Unprotected anal intercourse (UAI), specifically receptive intercourse, is considered to be the primary direct risk factor for HIV acquisition among MSM due to its high per-act transmission probability [1]. A salient explanation for elevated HIV incidence among YMSM is the ‘young age risk effect’, which assumes that YMSM engage in more high-risk sexual behavior than older men. However, evidence supporting this hypothesis is conflicting. Several studies have found that YMSM were more likely to engage in UAI (i.e. “barebacking”) than older men [13–15]. A population-based study of MSM in California found that younger age was significantly associated with engagement in sero-discordant UAI [15]. More recently, a cross-sectional study involving 4,295 MSM in sites across the US found YMSM were more likely to engage in unprotected insertive anal intercourse (UIAI) and unprotected receptive anal intercourse (URAI) with partners of unknown-HIV status compared to older MSM [16].

In contrast, other studies have found no difference in sexual risk-taking behavior between younger and older MSM [17–18,10]. A recent study involving 5,625 MSM across three cities in Australia found no association between age and likelihood of risky sex [19]. In fact, contrary to the “young age risk effect” hypothesis, this study found that YMSM were less likely to engage in casual sex, including group sex, and had fewer recent sex partners compared to their older counterparts [19]. Similarly, a recent study involving 235 MSM in Vancouver, BC found that men <30 years of age were significantly less likely to engage in high risk UAI compared to men ≥30 years old [20]. Further research is required to elucidate the underlying causes for the observed inconsistencies in evidence supporting the “young age risk effect” hypothesis.

Intergenerational Sex as a Potential Risk Factor for HIV Acquisition

Age-discrepant trends in HIV incidence among MSM, combined with elevated HIV prevalence among older MSM [21] have raised the hypothesis that intergenerational sex may be an important behavioral risk factor for HIV acquisition among YMSM [22]. While no universal definition for intergenerational sex exists, salient studies evaluating the relationship between age discrepant sexual partnerships and HIV risk have applied operational definitions that define intergenerational relationships as constituting partnership age gaps of ≥5 and 10 years [23••, 24]. The phenomenon of intergenerational sex has been extensively described in literature exploring Southern Africa’s heterosexual HIV epidemic [25, 26], where sexual relations with older men have been associated with elevated risk of HIV acquisition among young women [24].

Intergenerational sexual relationships are commonly reported among MSM, and are a function of both partnership selection and age distribution of the MSM community [22]. A growing body of evidence suggests that age mixing may be an important risk factor for HIV infection among YMSM. Notably, a study involving YMSM in San Francisco found that having exclusively older sexual partners was associated with five times greater odds of HIV infection [27]. A cross-sectional survey involving MSM aged 23–29 years in Los Angeles reported a 20% reduction in the relative odds of HIV acquisition for African American participants compared with White participants, after controlling for the effects of having an older partner [28]. More recently, a cross-sectional study of 74 MSM in North Carolina found that participants with sexual partners aged ≥5 and ≥10 years older had two and four times increased odds of primary HIV infection, respectively [23]. A study involving 1,864 MSM across 4 cities in China found that having a partner at least 10 years older was independently associated with a two-fold increased risk of HIV infection [29]. Finally, a recent longitudinal study involving 1,427 HIV-negative MSM in Australia found that individuals who reported having a few, and half to most, of their partners being much older in age were 2.2 and 2.4 times more likely to HIV seroconvert, after controlling for age, number of partners, and sexual risk behavior [30••]. However, some findings are not consistent with this literature.

The observed discrepancies in the epidemiological literature suggest that factors influencing YMSM’s engagement in high-risk sex in the context of intergenerational relationships are highly complex and highlight an urgent need for further research in this area. In order to

inform future research directions and improved HIV prevention interventions for YMSM, this study sought to explore the relationships between age-mixing, HIV risk behavior, and seroconversion in this population.

METHODS

Search strategy

This study employed a scoping review methodology [31], which aims to map key concepts regarding a proposed research area to its main sources of evidence and salient thematic categories. Scoping reviews are considered useful for examining complex and emerging areas of study that can only be reviewed by covering a broad range of literature [31], and have been successfully used to summarize existing evidence and delineate new areas of research in HIV/AIDS [16, 32].

We first performed an exploratory search of Google Scholar and MEDLINE® to characterize the existing literature on the subject and to identify salient terminology and concepts for key search terms. From March to July 2013, we then conducted a comprehensive literature search using the following online databases: MEDLINE®, Embase, CSA Sociological Abstracts, PsycINFO®, Web of Science, and CINAHL; abstracts from the International AIDS Society (IAS); and grey literature from relevant organizations (e.g. WHO, UNAIDS). Three main search term categories were applied: HIV; MSM, gay, bisexual, homosexual; and intergenerational (intergeneration*; inter-generation*; (age adj3 mixing); (age adj3 gap); (age adj3 disparit*); (older adj3 partner*); (young* adj3 partner*); cross-age; (age adj2 difference*); assortative mixing; (select* adj4 partner); sugar dadd*; (young* men adj4 old* men); dadd*; (relationship* adj5 young*); (relationship* adj5 old*); crossgeneration*; (partner* character* adj3 age); age categor*; birth cohort; age discord*).

Abstracts and manuscripts underwent independent review by three researcher assistants (BS, JG and GM) and by lead researcher (AA). Abstracts were considered eligible for review if they included all three core themes. Full texts were reviewed if they discussed older/younger partnerships or intergenerational sexual relationships; compared older versus younger MSM for HIV risk; and identified age as a statistically significant factor for HIV-related risk behavior or seroconversion. Manual reviews of reference lists were also performed.

In line with the scoping review methodology, the data extraction and analysis process involved compiling relevant findings into narrative descriptions and summarizing key findings in thematic categories [31]. We categorized findings based on an ecological theory of development by Bronfenbrenner which understands child development as directly and indirectly influenced by multiple environmental systems [33]. We selected this model on the basis that has been previously used to frame and interpret prevention research among youth populations [34], and has been specifically adapted by Mustanski *et al.* to delineate HIV risk and protective factors among YMSM [35]. Accordingly, we grouped findings into 'individual', 'micro-system' and 'meso-system' factors.

RESULTS

Our review of electronic databases and key journals identified an initial pool of 2,730 manuscripts. Screening of abstracts led to elimination of 2,368 articles were excluded on the basis that they did not meet review inclusion criteria (described above). Full texts of 362 manuscripts were downloaded and reviewed in duplicate by the research team.

Findings from our review uncovered individual-level, micro- and meso-system factors influencing HIV risk among YMSM in the context of intergenerational relationships (Fig 1): childhood maltreatment, coming of age and sexual identity, and substance use (individual factors); family and social support, partner characteristics, intimate partner violence, connectedness to gay community (micro-system factors); and race/ethnicity, economic disparity, and use of the Internet (meso-system factors).

Individual-Level Factors

Childhood Maltreatment—MSM have reported high levels of childhood maltreatment, which has been associated with high risk sexual behaviors and HIV infection among adult MSM [36]. Studies examining these relationships have focused largely on the effect of childhood sexual abuse (CSA), and have identified significant associations between CSA and: unprotected anal intercourse [37–42], transactional sex [37, 40], greater number of partners [43], frequent casual sex [39, 40, 44–46] and HIV-positive serostatus [37, 39–41, 44, 48]. This trend has also been observed among YMSM; however, evidence is more limited. In a study of 439 YMSM, men reporting a history of nonconsensual sex were significantly more likely to have recently had UAI with casual partners [49]. A recent study involving 287 HIV-negative YMSM in Vancouver, BC found that individuals reporting a history of childhood physical abuse had almost five times the risk of HIV seroconversion after a median of 6.6 years of follow-up [50]. The power dynamic implicit in the experience of childhood maltreatment is believed to alter MSM's intimacy in relationships, ability to negotiate safe sexual practices, choice of partners, and meaning associated with sexual conduct [51, 45]. In a study involving 575 MSM in Brazil, early childhood sexual experience with older men were recalled as both positive and negative experiences, and typically perceived as abuse only when pain was involved [43]. We did not uncover any studies that specifically evaluated the relationships between childhood sexual maltreatment, HIV risk and intergenerational relationships among YMSM. The high prevalence of childhood abuse, its association with HIV risk and seroconversion, and lack of research in the context of intergenerational relationships among YMSM point towards an important area for future research. Further studies involving men who experienced childhood abuse would be essential to delineate the possible psychological and psychosocial influences affecting YMSM's sexual risk behaviors in the context of age-discrepant relationships.

Coming of Age & Sexual Identity—Coming of age as a gay or bisexual man and the process of 'coming out' have been associated with high levels of psychological distress and poor self-esteem [52], and several aspects of this experience – such as age of sexual debut and failure to disclose gay identity – have been associated with high-risk sexual activity. For example, MSM who report having first anal intercourse at age 16 years or younger have

been found to be more than twice as likely to have had UAI and over 10 sexual partners in the past year [53,54], and to have engaged in transactional sex [55]. Failure to disclose one's sexual orientation and not self-identifying as gay have also been associated with high-risk sexual behavior [56–58].

Intergenerational relations may play an important role in young men's coming of age, sexual identity, and sexual debut. Compared to heterosexual youth, MSM are more likely to experience their first sexual debut with partners >5 years older [59]. This experience can introduce power differentials that may place YMSM at an increased risk of HIV acquisition. In qualitative interviews, for example, YMSM reporting first sexual debut with older partners have reported feelings of captivation by their older partner [60]. In this study, youth who were receptive partners during first penetrative sex expressed uncertainty around condom use, non-use of condoms, and feelings of loss of control [60••]. A recent cross-sectional study evaluating HIV prevention behaviors at first anal intercourse among 2,200 MSM in Switzerland found that a discrepancy in age of 10 years between partners was negatively associated with condom use [61]. Collectively, evidence regarding the relationship between early sexual debut and risky sex, the role of intergenerational relationships in young men's coming of age and sexual identity formation, and emerging evidence regarding the HIV risks associated with first intercourse with older men, suggests this is an important area for further research and public health inquiry.

Substance Use—Studies suggest that the prevalence of heavy drug and alcohol use including polydrug use among YMSM is high. The CDC's Young Men's Survey involving 3,500 YMSM found that approximately 90% reported alcohol use in the past six months, 66% reported illicit drug use, and 28% reported polydrug use [62]. Several studies have highlighted both global and event-specific associations between substance use and sexual risk among YMSM [63–68]. For example, a longitudinal study involving 4,295 MSM found that YMSM aged 16–25 years were more likely to report heavy (i.e., 3 times per week) alcohol and drug use in the past six months than their older counterparts [16]. In the same cohort, YMSM were also found to be more likely to engage in insertive and receptive UAI and anal intercourse with presumed HIV-uninfected partners. In a cohort of HIV-negative YMSM in Vancouver, BC, MSM who reported recent injection drug use (IDU) also reported more casual sexual partners and were found to be twice as likely to report URAI with casual partners compared to MSM/non-IDU [69]. Studies examining event-specific encounters have also found positive associations between substance use (directly prior to sex) and reduced odds of condom use [64, 65, 70,71]. These studies suggest that substance use directly prior to or during sex may reduce inhibitions, interfere with inter-partner communication, and compromise YMSM's ability to negotiate condom use [16, 68]. Qualitative interviews have found that older men have encouraged substance use among YMSM in the context of sexual debut to 'help them relax' [60••]. A study involving 200 gay and bisexual men aged 15–22 years in Chicago and Miami reported that receptive anal intercourse while intoxicated was associated with having a partner aged 5 years [72••]. In the context of intergenerational sex, these patterns may be compounded by inherent power dynamics and age-specific patterns of drug utilization [16, 64]. Given the high prevalence of substance use among YMSM, the relationship of substance use to risky sex, and the role of

substance use in intergenerational sexual experiences, continued research is warranted. In particular, there is a need for further research to unpack the differential impacts of distinct types of substances on sexual risk behavior among YMSM in the context of age-discrepant relationships.

Micro-System Factors

Family and Social Support—An ongoing area of research is the role of social and family support on sexual risk behavior among YMSM. A recent systematic review of 31 studies involving lesbian, gay and bisexual youth found that the vast majority experience negative parental influence [73]. Studies have additionally reported an association between family rejection and victimization among YMSM who come out, and engagement in sexual risk behavior [73, 74]. In a study involving 224 self-identified lesbian, gay, and bisexual young adults in San Francisco, the experience of family rejection during adolescence was associated with 3.4 times increased odds of engaging in unprotected sexual intercourse [74]. For YMSM experiencing family rejection and victimization, intergenerational sexual relations may act as surrogates for emotional and structural support, which may positively or negatively influence HIV risk behaviors. YMSM have reported being attracted to older partners because of the maturity, stability and decisiveness they offer [75], as well as emotional support, particularly when emotional support from family is lacking [60]. We were unable to identify any studies that specifically explored the relationship between family support, intergenerational relationships, and HIV risk among YMSM, pointing towards the need for further research in this area.

Partner Characteristics—With the exception of one study [76], research has consistently uncovered an increased likelihood of engaging in UAI among YMSM in committed or serious partnerships, compared to casual ones [8, 28, 67, 75, 77–79]. Mathematical modeling of HIV seroconversion among MSM across five cities in the U.S. estimated that approximately 80% of new HIV infections among YMSM were from main partners [80]. In a recent study of 122 YMSM, being in a serious relationship was associated with an almost eight-fold increase in the rate of UAI [81]. Several explanations have been provided for these observations, including the fact that YMSM in primary partnerships report high levels of trust and familiarity with each other, agree on conditions of safer sex strategies, and share a perception that condoms reduce intimacy [82, 83]. The belief that primary partnerships are low-risk may be further enhanced by an assumption that a partner is HIV-negative, which has been reported by some YMSM [84].

YMSM have reported intentionally seeking out age-discrepant sexual partners because of the perceived relationship stability associated with older men [60]. However, young men in stable relationships with older men have also reported experiencing sexual coercion and forced UAI, highlighting the vulnerability of younger men in this relationship dynamic [85]. More research is required to investigate the specific contexts and power dynamics implicit in age-discrepant relationships that are associated with engagement in HIV risk among YMSM.

Our review revealed a paucity of studies that have examined the prevalence of and HIV risk within intergenerational, serodiscordant relationships among MSM. A study by Hurt et al. [23] observed a dose-response relationship between sex partner age (relative to the participant's age) and increased odds of primary HIV infection, independent of sexual activity with a partner that was serodiscordant or of unknown HIV status. Given that HIV prevalence among MSM increases with age [21], the risk of HIV acquisition among younger MSM in relationships with older, serodiscordant partners is likely substantial and requires further investigation.

Intimate Partner Violence—Studies suggest that YMSM may be at increased risk of experiencing emotional or physical violence from sexual partners [86]. For example, in a study involving 2,881 MSM in San Francisco, 34% experienced psychological/symbolic battering, 22% cited physical battering, and 5% reported sexual battering, while being younger in age was significantly associated with experiencing all forms of battery [86]. A history of intimate partner violence has also been associated with increased odds of risky sex [87] and HIV seropositivity [88] among YMSM. A study involving 539 YMSM aged 15–22 years in New York found that men reporting a history of threats and violence by family or partners had approximately twice the odds of reporting recent UAI, compared to men reporting no history of violence [89]. Our review yielded no studies have evaluated whether violence experienced by YMSM is related to having a partner of an older age. Research overwhelmingly support the notion that patterns of intimate partner violence are transmitted across generations, such that people who have observed inter-parental violence in childhood have a strong likelihood of enact the same behaviors as adults [90]. In addition to psychological power dynamics implicit in inter-generational relationships and HIV risk, YMSM engaged in sexual relations with older partners that have a history of inter-parental violence may be particularly at HIV risks associated with intimate partner violence. Collectively, the high burden of intimate partner violence among YMSMS, associated HIV risks, and power differential implicit in age-discrepant relationships point towards an important area for future research.

Connectedness to Gay Community—Research suggests that being connected to a gay community is associated with heightened access to HIV prevention, education and care services [35]. An empirically-derived conceptual model examining the coming-out process and its adaptational and health-related associations among gay, lesbian, and bisexual youths found that limited involvement in gay/lesbian community activities was associated with having more unprotected sex [52]. However, attending gay community events has also been associated with increased HIV risk, as it exposes YMSM to social networks and norms such as the 'circuit parties', 'party n' play', sex parties, and barebacking subculture [35]. YMSM engaged in intergenerational relationships may have increased connectedness to the gay community by virtue of the fact that older MSM have been part of the community for a longer period of time, and the impact of these connections may be protective or encourage HIV risk. We did not find any studies that specifically explored the relationship between connectedness to the gay community, intergenerational relationships, and HIV risk, highlighting a critical area for further investigation. Future studies are necessary to untangle whether participation in gay community acts as a risk or protective factor for YMSM in

intergenerational relationships. These studies should consider the different ways in which YMSM may participate in gay community with older men, including on the Internet which has transformed how MSM ‘interact, meet, socialize and mobilize’ and increased YMSM exposure to gay communities [35].

Meso-System Factors

Race/Ethnicity—Studies suggest that YMSM belonging to racial/ethnic minorities are more likely to be HIV positive [89, 91]. The US provides a revealing example, as 63% of all HIV-positive YMSM aged 13–24 years in 2009 were Black, compared to 18% White YMSM and 16% Hispanic/Latino YMSM [92]. Disparities in HIV prevalence between ethnic groups are not explained by individual sexual risk behaviors alone; a review of 53 studies found no difference in UAI, commercial sex work, sex with a known HIV-positive partner, or HIV testing history by ethnicity [93]. Studies in the US suggest that the high prevalence of sexual homophily (same-race partnerships) among African American MSM and smaller sexual networks inherent in the African American MSM community may explain racial differences in HIV incidence and prevalence among YMSM [94–98]. Research also suggests that sexual partnerships with older men are common in the African American YMSM community. For example, a study involving 1,574 MSM in San Francisco found that African American men were >10 times more likely to have sexual partners that were 10 years or older, compared with White MSM [92]. A case control study involving 110 African American men aged 16–25 years old in Mississippi found that having an older partner was associated with an almost 2-fold increased odds of being HIV positive [99••]. A more recent cross-sectional study involving 723 African American and Latino MSM aged 18 to 35 years found that participants who reported having partners at least four years older had significantly higher odds of receptive UAI and unrecognized HIV infection [100••]. A recent study involving 143 ethnically diverse MSM aged 16–40 years uncovered a 3-way interaction between participant age, race and intergenerational sexual partnership; specifically, men with older sexual partners had significantly increased odds of sexual risk behavior among African American men only [96••]. Collectively, these studies suggest that race/ethnicity poses an important meso-system factor influencing intergenerational sexual risk among YMSM in the US. Further research is needed in other settings to understand to what extent these associations may apply in other YMSM communities.

Economic Disparity—Research has uncovered an association between low levels of education and socio-economic status among YMSM and risky sexual behavior [101]. A study involving 592 HIV-negative YMSM in New York City observed that perceived low socio-economic status was associated with increased sexual risk behavior [102]. Economic disparity may influence young men’s desire to engage in intergenerational relationships. Interviews with YMSM found that men were attracted to older partners because of the perceived financial stability and success of older men and out of desire to exchange sex for money or goods [60]. In a study involving 448 MSM aged 8–24 years in Baltimore, a greater number of older partners were found among young men who reported exchanging sex for money [103]. However, the perceived economic benefits of intergenerational relationships among YMSM may be outweighed by the negative effects of power inequalities [60]. Young MSM have reported coercion into unwanted sex by older partners

which is exacerbated by imbalances in economic power [85]. Further research is needed to identify the extent to which economic disparity and dependency of YMSM on older sexual partners may influence their decision-making regarding sexual risk behavior.

Internet Use—Previous studies have reported high levels of Internet use among YMSM to meet sexual partners [104, 105], and the Internet has also been shown to be an important mechanism for YMSM to find their first sexual partner [106]. A cross-sectional study involving 270 YMSM found that men using the Internet to meet sexual partners are more likely to engage in risky sexual behavior at sex clubs and bathhouses [105]. Several studies also suggest that YMSM intentionally use the Internet or chat rooms to seek out older sexual partners [60, 105, 107]. A descriptive study examining 1,020 profiles on an MSM website found that 71% of YMSM expressed a preference for older men [108]. Taken together, the high prevalence of Internet use among YMSM to meet sexual partners and the fact that YMSM may use the Internet to intentionally seek out older partners points to a possible growing role of intergenerational sex on HIV risk and acquisition among YMSM that requires further study.

CONCLUSION

We identified a growing body of evidence regarding the association between intergenerational sex and HIV risk and seroconversion among YMSM. This scoping review identified individual-level, micro-, and meso-system factors that may influence HIV risk behavior in the context of intergenerational sexual relationships, and identified promising avenues for future research. Findings from this review also support the need for age-specific public health HIV education and prevention strategies. While interventions aimed at addressing sexual networks, such as sexual preferences by age and ethnicity are likely not feasible [94], our findings suggest that YMSM may benefit from enhanced public health messaging about HIV risks inherent in intergenerational relationships. There is notable gap in HIV prevention programs targeted specifically at YMSM [109], and no gold standard exists for the delivery of HIV prevention programs to YMSM [110]. However, HIV prevention messaging regarding HIV risks associated with intergenerational sex may be integrated into different types of interventions, including school-based sexual education regarding sexual health and identity formation, family-based HIV preventions programs, Web-based and community-based outreach services.

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