

## 男男性行为人群无保护性肛交行为及其影响因素研究进展

卢姗 李东民

102206 北京,中国疾病预防控制中心性病艾滋病预防控制中心流行病学室

通信作者:李东民, Email:lidongmin@chinaaids.cn

DOI:10.3760/cma.j.issn.0254-6450.2017.11.029

**【摘要】** 近年来,我国MSM人群HIV感染率呈逐年上升趋势,该人群具有多性伴、无保护性肛交等高危行为。本文对无保护性肛交行为的流行情况以及年龄、文化程度、性伴数量与类型、新型毒品滥用、歧视等影响因素的研究进展进行综述,为开展该人群的靶向干预、预防和控制HIV在MSM人群中的蔓延提供参考。

**【关键词】** 男男性行为人群; 无保护性肛交; 艾滋病病毒; 影响因素

**Research progress on unprotected anal intercourse and its influencing factors in men who have sex with men** Lu Shan, Li Dongmin

*Department of Epidemiology, National Center for AIDS/STD Control and Prevention, Chinese Center for Disease Control and Prevention, Beijing 102206, China*

*Corresponding author: Li Dongmin, Email: lidongmin@chinaaids.cn*

**【Abstract】** The prevalence of HIV infections continues to rise among Chinese MSM. This population is prone to has high-risk behaviors including having multiple sexual partners, unprotected anal intercourse (UAI), etc. This paper summarizes the situation of UAI and related influencing factors, including age, educational level, number of sexual partners, recreational drug abusing and related status of discrimination, etc. The purpose of this article is to provide reference for targeted intervention and prevention of HIV among MSM population.

**【Key words】** Men who have sex with men; Unprotected anal intercourse; Human immunodeficiency virus; Influencing factors

我国HIV/AIDS报告病例中,男男同性传播所占比例已从2010年的10.8%上升至2016年的28.0%<sup>[1-2]</sup>;MSM人群HIV抗体阳性率由2010年的5.7%上升至2015年的8.0%<sup>[3]</sup>。MSM人群因性伴数量多、易发生无保护性行为、滥用毒品等行为特征,感染和传播HIV的风险高<sup>[4]</sup>,已成为我国HIV流行的重点人群。无保护性肛交行为已成为MSM人群感染HIV的主要高危行为<sup>[5-6]</sup>。

### 一、无保护性肛交的定义与流行情况

国内大多数研究将无保护性肛交定义为:MSM人群与同性发生未使用安全套的肛交性行为<sup>[7-8]</sup>。针对不同类型性伴发生无保护性肛交行为的研究较少<sup>[9]</sup>。国外一些研究将无保护性肛交的定义细化为:MSM人群与临时性伴、HIV感染状态不一致或感染状态未知者发生的插入性肛交行为时不使用安全套<sup>[10-11]</sup>。后者更加关注携带病毒风险高的性伴,但也增加了调查的实际困难。2008—2009年全国61个大城市MSM人群横断面调查显示,MSM人群与同性发生无保护性肛交的比例为51.0%<sup>[12]</sup>。涵盖64篇研究的Meta分析结果显示,我国MSM人群与同性性伴发生无保护性肛交行为的比例为53.0%<sup>[13]</sup>。

### 二、无保护性肛交的影响因素

#### 1. 年龄:泰国曼谷的队列研究发现,22~29岁的MSM发

生无保护性肛交的风险是≥30岁MSM的1.4倍<sup>[14]</sup>;一项病例交叉设计研究发现,受访者的临时性伴年龄<35岁者,更易发生无保护性肛交<sup>[15]</sup>;洛杉矶的调查发现,与≥55岁年龄组相比,18~24岁的MSM更易与HIV感染结果不一致的MSM发生无保护性肛交<sup>[16]</sup>。原因可能为年轻的MSM人群性活跃程度高,乐于追求性愉悦,而忽略安全性行为的重要性。也有较多研究发现年龄与无保护性肛交行为不存在统计学关联<sup>[17-18]</sup>。

2. 文化程度:有研究发现文化程度低是MSM发生无保护性肛交的危险因素<sup>[9,19-20]</sup>,高中文化程度者最近半年内发生无保护性肛交的可能性为大学文化程度者的1.69倍<sup>[20]</sup>。文化程度影响MSM人群的认知水平,认知水平较低的MSM缺乏艾滋病相关知识,不能充分了解降低病毒暴露风险的措施和无保护性行为的严重性;文化程度低的MSM自我认同状况较差<sup>[21]</sup>,隐匿性取向会使其接受宣传和干预服务的机会降低。近年来通过同伴教育、线上信息推广等干预措施,MSM人群安全套使用率虽有所提高<sup>[22]</sup>,但也有研究发现,具备艾滋病相关知识并不是安全性行为的充分必要条件<sup>[23]</sup>,具备知识未必会在性行为中采取保护性措施,即“知行分离”。因此,普及艾滋病相关知识可能并不能降低无保护性肛交的发生率。

3. 安全套的可及性:安全套的可及性对无保护性肛交行为有影响<sup>[17]</sup>。研究表明,发生性行为的场所中摆放安全套等宣传资料、MSM或其性伴携带安全套是发生保护性肛交行为的保护因素<sup>[15]</sup>。MSM是否有经济能力购买安全套和安全套宣传发放服务的覆盖面影响安全套的可及性。近年来,安全套宣传和发放服务的受众面不断扩大<sup>[22]</sup>,为降低MSM人群无保护性行为的风险提供了基础。

4. 性角色:MSM在肛交行为中可为插入方、被插入方和插入方与被插入方兼做者。不同性角色的MSM在心理、性行为特征以及HIV易感性上存在较大差异<sup>[24]</sup>。研究发现,被插入方、兼做插入方与被插入方发生无保护肛交行为的风险是插入方的2倍<sup>[7]</sup>。被插入方容易对性伴产生依赖感,性行为中是否使用安全套通常由插入方决定。插入方文化程度较低,性伴个数多,商业性行为安全套使用率低<sup>[24]</sup>,容易将HIV传染给被插入方。

5. 性伴数量:MSM人群性伴类型复杂,性伴数量多,导致其高危性行为的发生率高<sup>[25]</sup>。巴西的调查发现,最近半年性伴数>1人者所占比例超过80%<sup>[26]</sup>。我国MSM人群性伴数≥2人者约占52.4%<sup>[12]</sup>。研究表明,性伴个数与无保护性肛交行为间存在关联<sup>[8]</sup>,性伴数越多,越容易发生多伴性行为,安全套的使用率也随之下降<sup>[27]</sup>。

6. 性伴类型:与临时性伴相比,MSM人群与固定性伴发生无保护性肛交的概率更大<sup>[27]</sup>。其中的原因与性伴关系的亲密程度有关:早期双方为了追求性愉悦,增进信任而不使用安全套<sup>[28]</sup>;后期认为性伴关系稳定,自身HIV感染风险低而发生无保护性行为<sup>[29]</sup>。由于在MSM人群中,固定性伴间会商量是否允许对方与其他临时性伴发生性行为<sup>[30]</sup>,这给看似“安全”的固定性伴性行为带来感染风险。另外,MSM人群存在男男性工作者(money boy, MB)亚人群,以获取金钱为目的向以男性为主的客户提供性服务。MB普遍文化程度较低<sup>[31]</sup>,但对艾滋病和性病知识的知晓情况较非MB略好<sup>[32]</sup>,使用安全套的比例较高<sup>[33]</sup>,但也存在为满足客户需求而不使用安全套的情况<sup>[34]</sup>。MB也会发生异性性行为,虽然有研究表明MB与异性发生无保护性行为的比例较其他亚人群低<sup>[33]</sup>,但仍存在向一般人群传播HIV的风险。

7. 交友方式:酒吧、浴室等是MSM人群早期交友的主要场所,而今网络逐渐成为该人群建立性网络的主要平台<sup>[35]</sup>。美国一项调查显示,62%的MSM人群选择在网上交友并发生性行为<sup>[36]</sup>。重庆市的调查发现<sup>[37]</sup>,当地MSM人群使用QQ、微信等软件交友的比例较高,分别占59.7%和38.8%。Meta分析结果显示<sup>[38]</sup>,通过网络方式交友发生无保护肛交行为的风险是线下交友的1.24倍。其中的原因可能为:MSM人群在网络上更易与目标性伴交流HIV感染状态、性癖好等,双方达成约定后,将对方视为可发生无保护性肛交行为的性伴<sup>[36]</sup>。这种根据HIV感染状态或感染风险选择可发生无保护性肛交行为性伴的现象在国外研究中较为常见,称之为“血清分类”(serosorting),即MSM人群选择性地与HIV血清学检测结果一致的对象发生无保护性行为<sup>[39]</sup>。然而所谓

的“检测结果一致”可能是MSM自认为的结果,未感染HIV可能是抗体检测的“窗口期”,此时发生无保护性肛交极易传播病毒。

8. 新型毒品滥用:自2005年以来,新型毒品在MSM人群中流行,已逐渐取代传统毒品,成为该人群主要使用的毒品类型<sup>[40]</sup>。相对于传统毒品,新型毒品是人工化学合成的致幻剂、兴奋剂类毒品,直接作用于神经系统,使人兴奋或抑制,可产生依赖性,如冰毒、摇头丸等<sup>[41]</sup>。长沙地区的一项调查发现,招募的MSM人群中21.4%报告最近半年滥用过新型毒品<sup>[42]</sup>。新型毒品在我国MSM人群中呈现流行态势的时间晚于欧美国家<sup>[40]</sup>。研究表明,在发生肛交行为之前滥用新型毒品会增加无保护性肛交行为的可能性,容易感染HIV或性病<sup>[4,43]</sup>。主要是由于冰毒等苯丙胺类毒品促进肾上腺素和5-羟色胺的分泌<sup>[44]</sup>,性欲望增强,对性冲动的克制力降低<sup>[45]</sup>。也有调查发现,在调整人口学、心理社会因素后,滥用冰毒与发生无保护性肛交间的关联并无统计学意义<sup>[46]</sup>。

9. 心理因素:内源性、外源性歧视和敌视现象在MSM人群中广泛存在,可对MSM造成如抑郁、焦虑等心理伤害<sup>[47]</sup>。国内一项研究发现,最近半年因发生过同性性行为而感到羞耻的MSM,一夜情和肛交行为的发生次数较多;性伴数与无保护性行为发生次数随着自我歧视程度的加深而增加<sup>[21]</sup>。可能原因是在发生性行为时,自我歧视程度明显的个体在性伴提出使用安全套时,心理感到不舒服,更容易发生无保护性行为<sup>[48]</sup>。国外对歧视与无保护性行为间关系的研究结果存在争议。在纽约居住的MSM人群中,有15%的比例在最近3个月遭受过邻居或家人对其性取向或种族的歧视,这种外源性歧视与HIV阳性或感染状态不详的性伴发生无保护肛交与统计学关联( $OR=3.36$ )<sup>[49]</sup>,也有研究发现两者间呈负性相关,即歧视伤害水平越低,越容易感染HIV<sup>[50]</sup>。

综上所述,我国MSM人群发生无保护性肛交行为的比例高,且与年龄、文化程度、性伴数量与类型、新型毒品滥用、歧视等诸多因素相关。当前,亟需针对上述因素对我国MSM人群给予切实有效、靶向开展的干预和关怀服务,有效控制高危性行为,阻止HIV在我国MSM人群中的蔓延。

利益冲突 无

## 参 考 文 献

- [1] 黑发欣,王璐,秦倩倩,等.中国2006—2010年男男性行为者艾滋病疫情分析[J].中华流行病学杂志,2012,33(1):67-70. DOI: 10.3760/cma.j.issn.0254-6450.2012.01.015.  
Hei FX, Wang L, Qin QQ, et al. Epidemic characteristics of HIV/AIDS among men who have sex with men from 2006 to 2010 in China[J]. Chin J Epidemiol, 2012, 33(1): 67-70. DOI: 10.3760/cma.j.issn.0254-6450.2012.01.015.
- [2] 中国疾病预防控制中心,性病艾滋病预防控制中心,性病控制中心.2016年第2季度全国艾滋病性病疫情及主要防治工作进展[J].中国艾滋病性病,2016,22(8):585. DOI: 10.13419/j.cnki.aids.2016.08.01.  
National Center for STD/AIDS Control and Prevention, National Center for STD Control, Chinese Center for Disease Control and Prevention. Update on the AIDS/STD epidemic in China and

- main response in control and prevention the second quarter of, 2016 [J]. Chin J AIDS STD, 2016, 22(8): 585. DOI: 10.13419/j.cnki.aids.2016.08.01.
- [3] 葛琳, 李东民, 李培龙, 等. 2010—2015年中国艾滋病哨点监测人群HIV、梅毒和HCV感染状况分析[J]. 疾病监测, 2017, 32(2): 111—117. DOI: 10.3784/j.issn.1003-9961.2017.02.008.
- Ge L, Li DM, Li PL, et al. Population specific sentinel surveillance for HIV infection, syphilis and HCV infection in China, during 2010–2015 [J]. Dis Surveill, 2017, 32 (2) : 111–117. DOI: 10.3784/j.issn.1003-9961.2017.02.008.
- [4] Hoenigl M, Chaillon A, Moore DJ, et al. Clear links between starting methamphetamine and increasing sexual risk behavior: a cohort study among men who have sex with men [J]. J Acquir Immune Defic Syndr, 2016, 71 (5) : 551–557. DOI: 10.1097/qai.0000000000000888.
- [5] Vu L, Andrinopoulos K, Tun W, et al. High levels of unprotected anal intercourse and never testing for HIV among men who have sex with men in Nigeria: evidence from a cross-sectional survey for the need for innovative approaches to HIV prevention [J]. Sex Transm Infect, 2013, 89 (8) : 659–665. DOI: 10.1136/sextrans-2013-051065.
- [6] Berry M, Wirtz AL, Janayeva A, et al. Risk factors for HIV and unprotected anal intercourse among men who have sex with men (MSM) in Almaty, Kazakhstan [J]. PLoS One, 2012, 7 (8) : e43071. DOI: 10.1371/journal.pone.0043071.
- [7] 范颂, 孙燕鸣, 卢红艳, 等. 北京市男男性行为者安全套使用社会规范与无保护性肛交关系的研究[J]. 中华流行病学杂志, 2011, 32(5): 473–476. DOI: 10.3760/cma.j.issn.0254-6450.2011.05.012.
- Fan S, Sun YM, Lu HY, et al. Analysis on the relationship between condom social norms and unprotected anal intercourse among men who have sex with men in Beijing [J]. Chin J Epidemiol, 2011, 32(5): 473–476. DOI: 10.3760/cma.j.issn.0254-6450.2011.05.012.
- [8] 李佑芳, 章任重, 王珏, 等. 昆明市男男性行为人群无保护性肛交及其影响因素分析[J]. 中华疾病控制杂志, 2015, 19(7) : 743–744. DOI: 10.16462/j.cnki.zhjzkz.2015.07.024.
- Li YF, Zhang RZ, Wang J, et al. Analysis of the unprotected anal sex in men who have sex with men and its influential factors in Kunming city, China [J]. Chin J Dis Control Prev, 2015, 19(7) : 743–744. DOI: 10.16462/j.cnki.zhjzkz.2015.07.024.
- [9] 吕林芳, 张金艳, 赵丹鹤, 等. 北京市男男性行为者无保护性行为影响因素研究[J]. 中国艾滋病性病, 2016, 22(10) : 799–802. DOI: 10.13419/j.cnki.aids.2016.10.10.
- Lv LF, Zhang JY, Zhao DH, et al. Factors associated with unprotected anal intercourse among men who have sex with men in Beijing [J]. Chin J AIDS STD, 2016, 22(10) : 799–802. DOI: 10.13419/j.cnki.aids.2016.10.10.
- [10] Zablotska IB, Crawford J, Imrie J, et al. Increases in unprotected anal intercourse with serodiscordant casual partners among HIV-negative gay men in Sydney [J]. AIDS Behav, 2009, 13 (4) : 638–644. DOI: 10.1007/s10461-008-9506-x.
- [11] Xia Q, Molitor F, Osmond DH, et al. Knowledge of sexual partner's HIV serostatus and serosorting practices in a California population-based sample of men who have sex with men [J]. AIDS, 2006, 20(16) : 2081–2089. DOI: 10.1097/01.aids.0000247566.57762.b2.
- [12] Wu ZY, Xu J, Liu EW, et al. HIV and syphilis prevalence among men who have sex with men: a cross-sectional survey of 61 cities in China [J]. Clin Infect Dis, 2013, 57 (2) : 298–309. DOI: 10.1093/cid/cit210.
- [13] Wu J, Hu YF, Jia YJ, et al. Prevalence of unprotected anal intercourse among men who have sex with men in China: an updated Meta-analysis [J]. PLoS One, 2014, 9(5) : e98366. DOI: 10.1371/journal.pone.0098366.
- [14] Holtz TH, Pattanasin S, Chonwattana W, et al. Longitudinal analysis of key HIV-risk behavior patterns and predictors in men who have sex with men, Bangkok, Thailand [J]. Arch Sex Behav, 2015, 44(2) : 341–348. DOI: 10.1007/s10508-014-0427-7.
- [15] Li JH, Lau JTF, Gu J, et al. Event-specific risk factors predicting episodes of unprotected anal intercourse with male nonregular partners among men who have sex with men using case-crossover study design [J]. Bio Med Res Int, 2014, 2014: 475195. DOI: 10.1155/2014/475195.
- [16] Chen YH, Raymond HF, Grasso M, et al. Prevalence and predictors of conscious risk behavior among San Franciscan men who have sex with men [J]. AIDS Behav, 2013, 17 (4) : 1338–1343. DOI: 10.1007/s10461-012-0169-2.
- [17] Berg RC, Skogen V, Vinogradova N, et al. Predictors of HIV risk behaviors among a national sample of Russian men who have sex with men [J]. AIDS Behav, 2016, 1–9. DOI: 10.1007/s10461-016-1653-x.
- [18] Li DL, Li CR, Wang ZX, et al. Prevalence and associated factors of unprotected anal intercourse with regular male sex partners among HIV negative men who have sex with men in China: a cross-sectional survey [J]. PLoS One, 2015, 10 (3) : e0119977. DOI: 10.1371/journal.pone.0119977.
- [19] Kramer SC, Schmidt AJ, Berg RC, et al. Factors associated with unprotected anal sex with multiple non-steady partners in the past 12 months: results from the European Men-Who-Have-Sex-With-Men Internet Survey (EMIS 2010) [J]. BMC Public Health, 2016, 16: 47. DOI: 10.1186/s12889-016-2691-z.
- [20] Wang Y, Wang ZZ, Jia MM, et al. Association between a syndemic of psychosocial problems and unprotected anal intercourse among men who have sex with men in Shanghai, China [J]. BMC Infect Dis, 2017, 17: 46. DOI: 10.1186/s12879-016-2132-8.
- [21] 王毅, 张洪波, 徐杰, 等. 男男性行为者自我歧视与性行为和心理因素的关系[J]. 中华预防医学杂志, 2010, 44(7) : 636–644. DOI: 10.3760/cma.j.issn.0253-9624.2010.07.014.
- Wang Y, Zhang HB, Xu J, et al. Relations between self-discrimination of MSM and sexual behavior and psychological factors [J]. Chin J Prev Med, 2010, 44 (7) : 636–644. DOI: 10.3760/cma.j.issn.0253-9624.2010.07.014.
- [22] 邱兴庆, 赵云岩, 孟丽丽, 等. 湖北省襄阳市男男性行为人群艾滋病干预效果分析[J]. 中国健康教育, 2016, 32(12) : 1082–1085, 1102. DOI: 10.16168/j.cnki.issn.1002-9982.2016.12.006.
- Qiu XQ, Zhao YY, Meng LL, et al. Intervention effect on HIV/AIDS related knowledge and behaviors among MSM in Xiangyang city of Hubei province [J]. Chin J Health Educ, 2016, 32(12) : 1082–1085, 1102. DOI: 10.16168/j.cnki.issn.1002-9982.2016.12.006.
- [23] Persson KI, Tikkannen R, Bergström J, et al. Experimentals, bottoms, risk-reducers and clubbers: exploring diverse sexual practice in an Internet-active high-risk behaviour group of men who have sex with men in Sweden [J]. Cult Health Sex, 2016, 18 (6) : 639–653. DOI: 10.1080/13691058.2015.1103384.
- [24] 郭璐, 张敏, 刘黎, 等. 南京市不同性角色MSM的行为特征及HIV和梅毒感染现状[J]. 中国艾滋病性病, 2017, 23 (3) : 232–235, 243. DOI: 10.13419/j.cnki.aids.2017.03.16.
- Guo L, Zhang M, Liu L, et al. Sexual behavior and HIV/syphilis infection among MSM with different sexual roles in Nanjing [J]. Chin J AIDS STD, 2017, 23 (3) : 232–235, 243. DOI: 10.13419/j.cnki.aids.2017.03.16.
- [25] 石国政, 康来仪, 陈冬华, 等. 上海MSM人群对同志身份认同状况及其相关因素分析[J]. 中国艾滋病性病, 2012, 18(11) : 724–727. DOI: 10.13419/j.cnki.aids.2012.11.012.
- Shi GZ, Kang LY, Chen DH, et al. Study on identity status as gays and related factors among MSM in Shanghai [J]. Chin J AIDS STD, 2012, 18 (11) : 724–727. DOI: 10.13419/j.cnki.

- aids.2012.11.012.
- [26] Kerr LR, Mota RS, Kendall C, et al. HIV among MSM in a large middle-income country [J]. AIDS, 2013, 27(3) : 427–35. DOI: 10.1097/QAD.0b013e32835ad504.
- [27] Tang WM, Tang SY, Qin YL, et al. Will gay sex-seeking mobile phone applications facilitate group sex? A cross-sectional online survey among men who have sex with men in China [J]. PLoS One, 2016, 11(11):e0167238. DOI: 10.1371/journal.pone.0167238.
- [28] Nieto-Andrade B. The effect of HIV-discordance on the sexual lives of gay and bisexual men in Mexico city [J]. J Homosex, 2010, 57(1):54–70. DOI: 10.1080/00918360903445855.
- [29] Hoff CC, Chakravarty D, Beougher SC, et al. Relationship characteristics associated with sexual risk behavior among MSM in committed relationships [J]. AIDS Patient Care STDs, 2012, 26(12):738–745. DOI: 10.1089/apc.2012.0198.
- [30] Hoff CC, Beougher SC, Chakravarty D, et al. Relationship characteristics and motivations behind agreements among gay male couples: differences by agreement type and couple serostatus [J]. AIDS Care, 2010, 22(7):827–835. DOI: 10.1080/09540120903443384.
- [31] 蔡于茂,宋亚娟,刘惠,等.2011—2015年深圳市男男性行为者提供商业性服务状况及影响因素调查[J].中华预防医学杂志,2016,50(11):943–948. DOI: 10.3760/cma.j.issn.0253-9624.2016.11.005.
- Cai YM, Song YJ, Liu H, et al. Factors associated with commercial sexual behavior among men who have sex with men in Shenzhen, China, in 2011–2015 [J]. Chin J Prev Med, 2016, 50(11):943–948. DOI: 10.3760/cma.j.issn.0253-9624.2016.11.005.
- [32] 程伟彬,钟斐,文芳,等.广州市男男商业性服务人群HIV/梅毒感染及AIDS相关行为调查[J].中华预防医学杂志,2010,44(11):1027–1031. DOI: 10.3760/cma.j.issn.0253-9624.2010.11.016.
- Cheng WB, Zhong F, Wen F, et al. Investigation of HIV and syphilis infection and AIDS-related behaviors among money boys, in Guangzhou, China [J]. Chin J Prev Med, 2010, 44(11):1027–1031. DOI: 10.3760/cma.j.issn.0253-9624.2010.11.016.
- [33] 赖永晖,蔡于茂,宋亚娟,等.商业性服务MSM HIV/梅毒感染及高危行为调查[J].中国热带医学,2013,13(6):680–683. DOI: 10.13604/j.cnki.46-1064/r.2013.06.016.
- Lai YH, Cai YM, Song YJ, et al. HIV/syphilis infection and high risk behaviors among men who have sex with men previous to be money boys [J]. China Trop Med, 2013, 13(6):680–683. DOI: 10.13604/j.cnki.46-1064/r.2013.06.016.
- [34] Meng XD, Anderson AF, Wang L, et al. An exploratory survey of money boys and HIV transmission risk in Jilin province, PR China [J]. AIDS Res Ther, 2010, 7: 17. DOI: 10.1186/1742-6405-7-17.
- [35] 张海波,Au WW,赵锦. MSM交友应用程序的发展及对MSM危险性行为的影响[J].中国艾滋病性病,2015,21(10):912–915. DOI: 10.13419/j.cnki.aids.2015.10.29.
- Zhang HB, Au WW, Zhao J. The development of the gay dating App and its impact on sexual risk behavior among the men who have sex with men [J]. Chin J AIDS STD, 2015, 21(10):912–915. DOI: 10.13419/j.cnki.aids.2015.10.29.
- [36] Grov C, Hirshfield S, Remien RH, et al. Exploring the venue's role in risky sexual behavior among gay and bisexual men: an event-level analysis from a national online survey in the U.S. [J]. Arch Sex Behav, 2013, 42(2):291–302. DOI: 10.1007/s10508-011-9854-x.
- [37] 龙翠芳,严平.重庆市男男性行为者网络交友HIV感染情况[J].中国感染控制杂志,2016,15(7):461–465. DOI: 10.3969/j.issn.1671-9638.2016.07.005.
- Long CF, Yan YP. HIV infection among men who have sex with men through online dating in Chongqing [J]. Chin J Infect Control, 2016, 15(7): 461–465. DOI: 10.3969/j.issn.1671-9638.2016.07.005.
- [38] Lewnard JA, Berrang-Ford L. Internet-based partner selection and risk for unprotected anal intercourse in sexual encounters among men who have sex with men: a Meta-analysis of observational studies [J]. Sex Transm Infect, 2014, 90(4):290–296. DOI: 10.1136/sextrans-2013-051332.
- [39] Locicero S, Jeannin A, Dubois-Arber F. Men having sex with men serosorting with casual partners: who, how much, and what risk factors in Switzerland, 2007–2009 [J]. BMC Public Health, 2013, 13:839. DOI: 10.1186/1471-2458-13-839.
- [40] Xu JJ, Zhang C, Hu QH, et al. Recreational drug use and risks of HIV and sexually transmitted infections among Chinese men who have sex with men: mediation through multiple sexual partnerships [J]. BMC Infect Dis, 2014, 14: 642. DOI: 10.1186/s12879-014-0642-9.
- [41] 邹海欧,郭瑞卿,李峰.甲基苯丙胺滥用者对新型毒品的认知、态度以及滥用倾向[J].中国药物依赖性杂志,2012,21(6):459–463,477. DOI: 10.13936/j.cnki.cjdd1992.2012.06.007.
- Zou HO, Guo RQ, Li Z. Survey on knowledge, attitude and drug abuse intention among methamphetamine abusers [J]. Chin J Drug Depend, 2012, 21(6):459–463,477. DOI: 10.13936/j.cnki.cjdd1992.2012.06.007.
- [42] Chen X, Li XL, Zheng J, et al. Club drugs and HIV/STD infection: an exploratory analysis among men who have sex with men in Changsha, China [J]. PLoS One, 2015, 10(5):e0126320. DOI: 10.1371/journal.pone.0126320.
- [43] Melendez-Torres GJ, Bourne A. Illicit drug use and its association with sexual risk behaviour among MSM: more questions than answers? [J]. Curr Opin Infect Dis, 2016, 29(1):58–63. DOI: 10.1097/qco.0000000000000234.
- [44] Sulzer D, Sonders MS, Poulsen NW, et al. Mechanisms of neurotransmitter release by amphetamines: a review [J]. Prog Neurobiol, 2005, 75(6):406–433. DOI: 10.1016/j.pneurobio.2005.04.003.
- [45] Lorwick J, Bourgois P, Wenger LD, et al. Sexual pleasure and sexual risk among women who use methamphetamine: a mixed methods study [J]. Int J Drug Policy, 2012, 23(5):385–392. DOI: 10.1016/j.drugpo.2012.07.005.
- [46] Fernández MI, Bowen GS, Warren JC, et al. Crystal methamphetamine: a source of added sexual risk for Hispanic men who have sex with men? [J]. Drug Alcohol Depend, 2007, 86(2/3):245–252. DOI: 10.1016/j.drugalcdep.2006.06.016.
- [47] Russell ST, Ryan C, Toomey RB, et al. Lesbian, gay, bisexual, and transgender adolescent school victimization: implications for young adult health and adjustment [J]. J Sch Health, 2011, 81(5):223–230. DOI: 10.1111/j.1746-1561.2011.00583.x.
- [48] Ross MW, Smolenski DJ, Kajubi P, et al. Measurement of internalized homonegativity in gay and bisexual men in Uganda: cross-cultural properties of the internalized homonegativity scale [J]. Psychol Health Med, 2010, 15(2):159–165. DOI: 10.1080/13548500903527746.
- [49] Frye V, Nandi V, Egan J, et al. Sexual orientation-and race-based discrimination and sexual HIV risk behavior among urban MSM [J]. AIDS Behav, 2015, 19(2):257–269. DOI: 10.1007/s10461-014-0937-2.
- [50] Raymond HF, Chen YH, Stall RD, et al. Adolescent experiences of discrimination, harassment, connectedness to community and comfort with sexual orientation reported by adult men who have sex with men as a predictor of adult HIV status [J]. AIDS Behav, 2011, 15(3):550–556. DOI: 10.1007/s10461-009-9634-y.

(收稿日期:2017-04-12)

(本文编辑:斗智)