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Measures of condom and safer sex social norms and stigma towards HIV/AIDS among Beijing MSM

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Abstract

Social norms around condom use and safe sex as well as HIV/AIDS stigma are used to identify persons at higher risk for HIV. These measures have been developed and tested in a variety of settings and populations. While efforts have been undertaken to develop context specific measures of these domains among Chinese MSM, the feasibility of using existing measures is unknown. A survey of MSM, based on respondent-driven sampling (RDS), was conducted in Beijing. Existing measures of condom social norms, attitudes towards safer sex and HIV/AIDS stigma were piloted. Internal consistency of all measures was high. As expected higher levels of condom social norms and positive attitudes towards safer sex were associated with condom use. HIV / AIDS stigma and discrimination had a significant relationship with never having an HIV test and lack of discussion of HIV/AIDS with male partners. Correlates of low condom social norms were age, education, employment and resident status. Existing measures of condom social norms, attitudes towards

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Authors' contributions
YH performed data retrieval and statistical analyses to prepare and write the initial draft of the manuscript. YR and YX was the PI of this study and constructed the conceptual framework of the work. HL, YS, SF, contributed to data collection and survey organization. HFR assisted with the development of the study that collected the data, the conceptualization of the paper, and contributed to revising and editing the final draft of the paper. JS, YJ, XH and YS offered help for the conception of this paper. WM consolidated the intellectual content of the study, and guided the data analysis. All authors have read and approved the final version of the manuscript.

Conflict of interest statement
None declared

safer sex and HIV/AIDS stigma appear to be appropriate for use among Chinese MSM. Using existing measures as opposed to developing new measures has the potential to expedite investigations into psychosocial correlates of HIV risk behavior.

Keywords

men who have sex with men; condom social norms; safer sex; HIV/AIDS stigma; China

Introduction

Sexual transmission has become the main route of HIV transmission in China since 2007 (1). Men who have sex with men (MSM) bear a disproportionate share in new HIV diagnoses. According to a 2011 estimate (2, 3). By the end of 2011, it was estimated that 780,000 people would be living with HIV/AIDS (PLHIV) in China with 17.4% estimated to have been contracted through male homosexual contact (4). Unprotected anal intercourse (UAI) remains the riskiest sexual behavior for HIV acquisition and/or transmission outside of injection drug use (5, 6).

Reduction of HIV risk and engagement in HIV preventive behaviors is dependent on more than knowledge of HIV and HIV risks (7–9). Studies have shown that although Chinese MSM may have high levels of HIV knowledge they still engage in risk taking (10, 11). Social norms around condom use and safe sex as well as HIV/AIDS stigma have been used to identify those persons at higher risk for HIV transmission and HIV acquisition (8, 12, 13). These measures have been developed and tested in a variety of settings and populations including MSM. While other efforts have been undertaken to develop context specific measures of these domains among Chinese MSM, whether using existing measures is feasible is unknown. With this in mind a cross-sectional study to pilot existing measures of condom social norms, attitudes towards safer sex and HIV/AIDS stigma among a sample of Chinese MSM in Beijing, PRC was conducted. These measures' associations with safer sex behaviors (consistent condom use) and HIV preventive behaviors (HIV testing and HIV disclosure) were explored with the intent to document whether existing measures could be recommended for use among Chinese MSM.

Methods

A cross-sectional survey of MSM in Beijing based on respondent-driven sampling (RDS). The details of the recruitment methods have been reported previously as round1 recruitment in 2009 (14). In brief, five hundred MSM were recruited from September to October, 2010. Participants were eligible if they were male, 18 years age or older, a Beijing resident, had sex with another man in the past 12 months (sex can be defined as oral, anal, or mutual masturbation), had a valid study recruitment coupon, had not previously participated in the survey, and were able to provide written informed consent. The study was approved by the Committees for Human Research of the National Center for AIDS of the China Center for Disease Control and Prevention, Vanderbilt University and the University of California San Francisco. A computer-assisted, interviewer-administrated questionnaire was used to collect information including demographic information (e.g., age, ethnicity, education, marital

status, occupation, residence, income, and health insurance status), and sexual behaviors (e.g., age of the sexual debut with male and female partners, self-identified sexual orientation, role in anal sex, and the number and types of male and female sex partners in the past 6 months). Existing measures of condom social norms using a four point scale of totally agree to totally disagree (15), attitudes towards safer sex using a four point scale of totally agree to totally disagree (16) and HIV/AIDS stigma where each item was scored yes or no (12) were piloted. These measures have been previously that have been used among MSM and other populations highly affected by HIV.HIV/AIDS Stigma measures also contained three sub-scales that measured “shame, blame and social isolation”, “perceived discrimination” and “equity. Measures were translated into Chinese and pilot tested with MSM community members. The present analysis focuses on the internal consistency of the measures within a sample of Chinese MSM and their relationship to HIV risk reduction behaviors (e.g. consistent condom use) and HIV prevention behaviors (e.g., HIV testing). Sexual behavior, condom use and HIV status disclosure questions for the most recent male partner and most recent female partner within the prior 6 months were measured. Finally, demographic correlates of these measures were explored.

Statistical analysis

Basic demographic and risk characteristics were tabulated. For condom social norms and attitudes towards safer sex Cronbach’s alpha were calculated from the raw scores. Four point responses were dichotomized into agree / disagree to illustrate overall agreement or disagreement with each item. For HIV/AIDS Stigma total scores were calculated (coding items asked in the positive reversed) for each observation within the overall scale and the three sub-scales. Cronbach’s alphas for HIV/AIDS stigma overall and the three sub-scales were calculated.

The measures whose Cronbach’s alpha was > 0.70 were analyzed with HIV risk taking and HIV prevention behaviors. For Condom social norms and attitudes towards safer sex the outcome of interest was condom use during anal sex with male and vaginal sex with female partners. For Stigma and discrimination and the two sub-scales with Cronbach’s alpha >0.70 the outcome of interest was “never had an HIV test” and “never talked about HIV/AIDS with male partners”. For each of these analyses odds ratios (OR), 95% Confidence Intervals (CIs) and p values using bivariate logistic regression were calculated. For multivariable analyses logistic regression was used to calculate adjusted odds ratios, 95% CIs and p values. All analyses were conducted using Statistical Analysis System (SAS 9.3 for Windows; SAS Institute Inc., NC, USA) software.

Results

Table 1 describes the demographics and sexual behaviors among our sample of Chinese MSM. The majority of men in this study were Han (93.8%), had a high school or higher educational attainment (74.6 %) and currently employed (83.8%). Few men held local residence permits (19.6%) which reflects the low median number of years resident in Beijing (5, Standard Deviation (SD) 13.0). While 77 (15.4%) reported being married to a woman, only 29 (5.8%) reported living with their wife. A majority reported living alone

(62.0%) and 21.8% reported living with a boyfriend. Fully 55.5% reported their sexual orientation as homosexual while 45.5% being bisexual, respectively. In terms of partnerships, a majority (95.8%) of men in this study reported having at least one male sex partner in the past six months while the median number of partners was 4.9 (SD 12.7) in this same timeframe. A majority (57.0%) of partnerships were with primary male partners. Men in this study reported a wide range of anal sex roles with almost a third (25.1%) reporting being exclusively insertive and only 12.4% reporting being exclusively receptive. Two-thirds (62.4%) reported some level of engaging in both insertive and receptive anal sex. When asked about condom use during insertive and receptive anal sex similar proportions of men reported never using condoms during insertive (10.2%) and receptive (13.8%) anal sex. Men also reported on female sex partners and sexual behaviors with these partners. About 12 percent of the sample reported having a female partner in the past six months. Never using condoms with female partners during vaginal sex was reported by only 8.2 % of all MSM.

Table 2 presents the measures, showing the proportion of participants who endorsed each individual item and the overall Cronbach's alpha for each composite measure. For the condom social norms, the Cronbach's alpha coefficient was 0.97. While a majority of participants endorsed condom social norms, they did not unanimously endorse every item with between 12% to 14% of participants not endorsing individual condom social norm statements. For attitudes and perceptions about safe sex the Cronbach's alpha coefficient was 0.95. Again, the proportion of men endorsing these statements was high while a large minority (10% to 30%) were not able to endorse individual items. Stigma and discrimination towards HIV/AIDS overall was measured using three sub-scales. The Cronbach's alpha for all three sub-scales combined was 0.83. The shame, blame and social isolation sub-scale, the perceived discrimination sub-scale and the equity sub-scale had Cronbach's alphas of 0.83, 0.78 and 0.72, respectively,

Table 3 shows the results of bivariate analyses of condom social norms and attitudes and perceptions of safe sex in relation to condom use during sexual intercourse by gender of partner and sexual act. Higher levels of endorsement of condom social norms were significantly associated with always using condoms during insertive anal sex with a man (Odds Ratio (OR) 2.39, $p < 0.001$), always using condoms during receptive anal intercourse with a man (OR 1.90, $p < 0.001$) and with always using condoms during any anal sex with male partners (OR 2.49, $p = 0.001$). Higher levels of endorsement of condom social norms were also associated with condom use during vaginal sex with a female partner (OR 5.28, $p=0.027$). Higher levels of endorsement of positive attitudes and perceptions of safer sex were also significantly associated with always using condoms during insertive anal sex with a man (OR 9.44, $p < 0.0001$), always using condoms during receptive anal intercourse with a man (OR 6.86 $p < 0.001$) and with always using condoms during any anal sex with male partners (OR 13.38, $p < 0.001$) but only marginally significantly associated with condom use during vaginal sex with a female partner (OR 3.68, $p=0.146$).

Table 4 shows the results of bivariate analyses of stigma and discrimination towards HIV/AIDS and their relationship with two important HIV prevention related behaviors. The overall measure of stigma and discrimination towards HIV /AIDS had a significant

relationship with never having an HIV test (OR 1.94, p =0.049) and with lack of discussion of HIV /AIDS with male sexual partners (OR 2.04, p=0.032). Following previous analyses of this scale, the shame blame and social isolation and the perceived discrimination sub-scales were tested against the same two outcomes. Increased shame, blame and social isolation scores had a significant association with never having an HIV test (OR 6.40, p < 0.001) and with lack of discussion of HIV /AIDS with male sexual partners (OR 5.32, p< 0.001). Perceived discrimination did not have significant associations with either outcome.

Finally, the exploration of demographic correlates of these measures suggest only a relationship between low condom social norms and older age (adjusted odds ratio (AOR) 1.36, p = 0.013), less education (AOR 1.36, p = 0.0417), low employment (AOR 2.09, p = 0.0356) and not being a registered Beijing resident (AOR 2.37, p = 0.0434). Low positive attitudes towards safer sex and high shame, blame and social isolation had no significant demographic correlates.

Discussion

While HIV risk research in China among MSM has typically focused on knowledge and behaviors, complex psychometric measures that measure underlying attitudes that influence behaviors have received less attention. Existing measures of condom social norms, attitudes and perceptions towards safer sex and HIV/AIDS stigma and discrimination appear to be appropriate for use among Chinese MSM. Overall, all three measures had high internal reliability suggesting construct validity among Chinese MSM. Moreover, condom social norms and attitudes towards safer sex had the expected positive relationships with condom use with male sex partners but not with condom use during vaginal sex with female partners. Attitudes of shame, blame and social isolation HIV/AIDS were positively associated with never having an HIV test and never talking about HIV/AIDS with male sex partners. A finding similar to that of Genberg et.al (12, 17), 2009. Our results also suggest that in perhaps some cases measures and scales developed in other settings (12, 18, 19) (e.g. outside of China or Asia) can readily be tested in China and found to be valid for use among Chinese MSM rather than entirely new measures being developed through extensive development and psychometric testing/analysis. While the exploration of demographic correlates found few significant relationships between the measures tested here, low condom social norms were associated with a number of specific characteristics. This finding offers the opportunity to focus HIV prevention efforts around changing condom use norms towards a segment of the MSM community most in need of this intervention.

There are limitations to this study. First, this study was among MSM in Beijing, the capital of China. Results may not apply to all MSM throughout China particularly in less urban or rural settings (20, 21). Nonetheless, it appears that these measures can be used among Chinese MSM and should can be implemented in various settings throughout China. Second, although RDS was used to accrue the study sample RDS weights were not used to generate population prevalence estimates of the psychometric measures tested here. RDS weighting is designed to give population prevalence estimates for simple univariate indicators. It is unclear how RDS weighting would perform when used with measures of complex constructs (22, 23). Additionally, it is unclear if a sample of 500 can adequately

represent the entire MSM population of a mega-city the size of Beijing. With these considerations in mind, the analysis and inference was focused on the sample at hand and to focus on internal rather than external validity.

Despite these limitations, the present findings suggest a variety of new ways to measure important determinants of behavior among Chinese MSM. Moreover, these results suggest that existing psychometric measures may well be useful among Chinese MSM even if they were developed in a different culture or context. Being able to use existing measures has the potential to expedite this type of inquiry among a population highly impacted by HIV (24, 25). Though overall condom use rate is comparatively low, we cautiously recommend the use of these measures among Chinese MSM.

Finally, using these types of measures in other communities of MSM may help identify segments of the MSM population most in need of tailored HIV prevention interventions. Furthermore, identification of specific aspects of stigma in our study (i.e., shame blame and social isolation) towards HIV/AIDS as a factor related to not engaging in key HIV risk reduction behaviors, suggests that stigma reduction initiatives need to be tailored to specific aspects of stigma to have maximum impact among Chinese MSM.

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Table 1

Sample characteristics, men who have sex with men, Beijing, China, 2010 (N=500).

Demographics or behaviors	Total, N=500(%)
Age* (median ± SD, year)	28±9.4
Ethnicity	
Han	469(93.8)
Other	31(6.2)
Year of highest level of schooling	
Never attended	1(0.2)
Elementary primary school	14(2.8)
Middle school	112(22.4)
High school	161(32.2)
College or above	212(42.4)
Currently employed	419(83.8)
Personal monthly income last year (US Dollar)	
>462	186(37.2)
≤462	314(62.8)
Has health insurance	275(55.0)
Has a local residence permit (HUKOU)	98(19.6)
Years lived in Beijing (median± SD, year)	5±13.0
Currently married	77(15.4)
Living situation	
Living with wife	29(5.8)
Living with other female sexual partner	4(0.8)
Living with boyfriend	109(21.8)
Living with other male sexual partner	48(9.6)
Alone	310(62.0)
Sexual orientation	
Homosexual	275(55.0)
Bisexual	225(45.0)
No. of male partners, last 6 months (mean, median ± SD, year)	4.9,2±12.7
Relationship type, most recent male partner	
Primary	273(57.0)
Casual	206(43.0)
Anal sex role with male partners	
Exclusively insertive	121(25.1)
Largely insertive anal sex	87(18.0)
Almost equally insertive and receptive anal sex	157(32.5)
Largely receptive anal sex	58(12.0)
Exclusively receptive anal sex	60(12.4)
Condom use during insertive anal sex over last 6 months	
Never	49(10.2)

Demographics or behaviors	Total, N=500(%)
Sometime	70(14.6)
Always	192(40.1)
No such sex	168(35.1)
Condom use during receptive anal sex over last 6 months	
Never	66(13.8)
Sometime	54(11.3)
Always	132(27.6)
No such sex	227(47.4)
Any female partners, last 6 months	60(12.0)
Condom use during vaginal sex, female partners	
Never	41(8.2)
Sometime	10(2.0)
Always	9(1.8)
Condom use during anal sex, female partners	
Never	1(0.2)
Always	1(0.2)
No anal sex	58(11.6)
Ever had HIV test	
No	148(29.6)
yes	352(70.4)
Ever talked about HIV/AIDS with male partners	
No	157(32.8)
yes	322(67.2)

Note: Individual categories may not add up total due to missing data for the specific variables

Table 2

Psycho-social scales, responses and internal reliability scores, men who have sex with men, Beijing, China, 2010 (N=500).

Condom Social Norms (alpha = 0.97)	**% agreeing**
1. My friends always use condoms when having anal sex with new partners.	87.8
2. My friends think it is important to use a condom when having anal sex with a new partner.	88.4
3. Most of my friends think you should avoid unsafe sex.	88.8
4. Most men I know who have sex with other men engage in safer sex practices with other men all the time.	86.4
5. Most of my friends think you should always have safer sex.	88.0
Attitudes and perceptions about safer sex (alpha = 0.95)	
1. Most gay men I meet only engage in safer sex practices.	85.6
*2.I have trouble letting a sex partner know I want to have safer sex.	13.6
3. I am able to avoid behavior that may put me at risk of HIV infection.	88.8
4. My friends think it is important to use condoms.	88.2
5. I can choose safer sex with a man I have sex with regularly.	77.6
6. I can choose safer sex with a man I have sex with casual.	92.6
*7.I find it difficult to have safer sex with a man I have very strong sexual feelings for.	16.2
*8. I find it difficult to have safer sex when high or drunk.	8.4
*9. I am less concerned about having anal sex without a condom now that new anti-HIV drug combination treatments are available.	5.8
*10.Someone can talk me out of safer sex by persuading me they are HIV-negative.	11.8
11. If I ever did something risky, I am confident that I would go back to having safer sex right away.	96.0
12. I am confident that I can have safer sex even if my partner really doesn't want to.	93.8
*13. I find it difficult telling a sex partner I won't have anal intercourse without a condom.	8.6
14. I can use condoms with any sexual partner I might have.	89.6
15. My friends encourage me to practice safer sex.	86.6
Stigma and discrimination (alpha = 0.83)	
Shame, blame, social isolation sub-scale (alpha = 0.83)	
1. People living with HIV/AIDS should be ashamed.	32.2
2. People with AIDS should be isolated from other people.	11.4
3. People who have HIV/AIDS are cursed.	1.8
4. People living with HIV/AIDS deserve to be punished.	2.8
*5.A person with HIV/AIDS should be allowed to work with other people.	92.2
6. Families of people living with HIV/AIDS should be ashamed.	15.4
7. It is reasonable for an employer to fire people who have HIV/AIDS.	8.0
8. People with HIV/AIDS are disgusting.	13.4
*9. People who have HIV/AIDS deserve compassion.	76.8
*10. People with HIV should be allowed to participate fully in the social events in this community.	92.2
Perceived discrimination sub-scale (alpha =0.78)	
1. People living with HIV/AIDS face neglect from their family.	64.0

2. People living with HIV/AIDS face physical abuse.	27.6
*3.People want to be friends with someone who has HIV/AIDS.	18.8
4. People living with HIV/AIDS face ejection from their homes by their families.	80.2
5. Most people would not buy vegetables from a shopkeeper or food seller that they knew had AIDS.	90.2
6. People who have HIV/AIDS face verbal abuse.	91.0
7. People living with HIV/AIDS face rejection from their peers.	93.2
8. People who are suspected of having HIV/AIDS lose respect in the community.	92.4
Equity sub-scale (alpha= 0.72)	
*1.People living with HIV/AIDS should be treated similarly by health care professionals as people with other illnesses.	99.2
*2.People who have HIV/AIDS should be treated the same as everyone else	99.0
3. People with HIV/AIDS do not deserve any support.	0.4
4. People with HIV/AIDS should not have the same freedoms as other people.	4.0

*Item reversed in scale.

Table 3

Psycho-social facilitators and barriers' associations with consistent condom use, MSM, Beijing, China, 2010.

Outcome	Always uses condom, insertive anal sex (n=192)		Always use condom, receptive anal sex (n=132)		Always use condom with anal intercourse with male partners (n=62)		Always use condom with vaginal intercourse (n=9)	
Scale	**OR (95% CI)**	**p**	**OR (95% CI)**	**p**	**OR (95% CI)**	**p**	**OR (95% CI)**	**p**
Condom social norms	2.39(1.72–3.33)	<0.001	1.90(1.31–2.76)	<0.001	2.49 (1.47 – 4.20)	0.001	5.28 (1.21 – 23.13)	0.027
Attitudes and perceptions, safer sex	9.44(5.40–16.48)	<0.001	6.86(3.60–13.10)	<0.001	13.38 (4.49– 39.87)	<0.001	3.68 (0.64 – 21.24)	0.146

Table 4

MSM, Beijing, China, 2010.

Outcome	Never had HIV test (n=148/N=500)		Never talked about HIV/AIDS with male partners (n=157/ N=479)	
Scale	**OR (95% CI)**	**p**	**OR (95% CI)**	**p**
Stigma and discrimination				
All Items	1.94 (1.00–3.74)	0.049	2.04 (1.06–3.91)	0.032
Shame, blame, social isolation	6.40 (2.39– 17.17)	<0.001	5.32 (2.0–14.13)	<0.001
Perceived discrimination	0.75 (0.31–1.80)	0.520	0.97 (0.41–2.34)	0.951

Table 5

Demographic correlates of condom social norms, attitudes to safer sex, and stigma and discrimination towards HIV/AIDS among MSM in Beijing, 2010.

Outcome	Variable	Adjusted OR (95%CI)	P value
Low condom social norms	Increasing age	1.36 (1.07–1.74)	0.0130
	Decreasing education	1.36 (1.01–1.83)	0.0417
	Employed less than full time	2.09 (1.05–4.17)	0.0356
	No Beijing hukou* (migrant)	2.37 (1.03–5.45)	0.0356
Low positive attitudes towards safer sex	Increasing age	1.04 (0.83–1.29)	0.7524
	Decreasing education	1.28 (0.97–1.69)	0.0781
	Employed less than full time	1.31 (0.69–2.5)	0.4115
	No Beijing hukou* (migrant)	0.84 (0.45–1.59)	0.5987
High shame blame, social isolation score	Increasing age	0.92 (0.74–1.14)	0.4591
	Decreasing education	1.04 (0.79–1.37)	0.7723
	Employed less than full time	1.08 (0.55–2.12)	0.8184
	No Beijing hukou* (migrant)	0.81 (0.43–1.52)	0.5134

*Residence Permit