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RESEARCH ARTICLE

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Condom use social norms and self-efficacy with different kinds of male partners among Chinese men who have sex with men: results from an online survey

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Abstract

Background: Social norms and self-efficacy play important roles in promoting consistent condom use among men who have sex with men (MSM). Few studies have investigated the association between social norms, self-efficacy and consistent condom use with different kinds of male partners among MSM. We conducted an online survey of MSM to evaluate this in China.

Methods: A cross-sectional online survey was conducted in 2015. Participants completed a validated questionnaire covering socio-demographic information, consistent condom use, condom use social norms and self-efficacy. Eligible participants were 16 or older, born biologically as a male, engaged in anal sex with a man at least once during their lifetime, engaged in condomless anal or vaginal sex in the last three months. In this study, we further restricted to people who had sex with male partners in the last three months. Participants were classified into three groups: engaged in sex only with regular partners, engaged in sex only with casual partners and engaged in sex with both regular partners and casual partners.

Results: Participants were recruited from 32 provinces in China. Among 1057 participants, 451(42.7%), 217(20.5%), and 389(36.8%) engaged in sex with regular partners only, casual partners only and both types in the last three months, respectively. Men engaged in sex only with regular partners in the last three months had a higher condom use self-efficacy than with other two types of partners ($P < 0.01$). Both social norms (regular partners: adjusted OR:1.59, 95% CI: 0.97–2.60; casual partners: adjusted OR: 1.58, 95% CI: 1.19–2.09; both types: adjusted OR: 1.48, 95% CI: 1.13–1.95) and self-efficacy (regular partners: adjusted OR: 2.88, 95% CI: 1.59–5.22; casual partners: adjusted OR: 2.35, 95% CI: 1.69–3.26; both types: adjusted OR: 2.45, 95% CI: 1.81–3.32) were positively associated with consistent condom use. No interaction effect was detected between condom social norms and self-efficacy on consistent condom use among Chinese MSM ($p > 0.05$).

Conclusions: Both social norms and self-efficacy were positively correlated with consistent condom use with any types of partners among Chinese MSM. Tailored interventions that aimed to improve social norms and self-efficacy has the potential to improve overall condom use among Chinese MSM.

Trial registration: ClinicalTrials.gov: [NCT02516930](https://clinicaltrials.gov/ct2/show/study/NCT02516930). August 6, 2015.

Keywords: Social norms, Self-efficacy, consistent condom use, men who have sex with men, regular partners, casual partners

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Background

Promoting consistent condom use is an important strategy for HIV/STIs control among men who have sex with men (MSM) [1]. However, studies in China showed that the rate of consistent condom use remains and persists low among Chinese MSM [2–4], even though extensive efforts on promoting consistent condom use had been made (e.g., the 100% Condom Use Program, condom promotion in venues, and peer education) [5, 6]. For example, a national wide serial cross-sectional study showed that only 48.8% of 42,680 MSM had consistently used condoms with men in the last six months in 2013 [7]. Previous studies have documented several reasons for the limited condom use among Chinese MSM, which including but not limited to low HIV risk perception, and low condom use social norms and self-efficacy [8, 9]. Condom use social norms are interpreted as the perception of society's approval of condom use behavior [10]. Condom use self-efficacy is conceptualized as a person's confidence in their ability to use condoms [11]. Self-efficacy and social norms are two social cognitive factors that are theorized to play a key role in determining behavior and behavior change [12]. Altering condom use social norms and self-efficacy are considered to be two vital methods for promoting condom use [8, 9].

Quite a few studies have explored the association between consistent condom use, social norms and self-efficacy among MSM [12–16]. These studies indicated that MSM with higher condom use social norms or higher condom use self-efficacy were less likely to engage in condomless sex [13–15]. There have been several studies examining the association among different sexual partner types as well [12, 16]. A study conducted in the United States found that, condom use self-efficacy was associated with decreased rates of unprotected anal intercourse with casual partners [12]. Another study of young gay-identified men in Amsterdam found that intention to use condom was the best predictor of consistent condom use with regular partners, while the best predictor for condom use with casual partners was perceived behavioral control defining as the evaluation of one's abilities and opportunities to engage in protected anal sex [16]. However, studies on examining the association between social norms, self-efficacy and consistent condom use with different kinds of male partners among Chinese MSM are limited. Given higher levels of social stigma and discrimination [17], and the different likelihood of engaging in condomless intercourse with regular and casual partners among Chinese MSM [18], it is critical to explore the association to support a design of tailored intervention program for Chinese MSM.

Therefore, our study aims to evaluate the patterns of social norms and self-efficacy regarding condom use

among Chinese MSM, and their associations with consistent condom use with different kinds of partners.

Methods

Study design and participants

This study was the baseline of a randomized control trial which aimed to evaluate the potential effect of crowdsourcing intervention in promoting condom use among Chinese MSM [19]. Crowdsourcing allows a group to solve a problem, then shares the solution widely with the public [20, 21]. For the baseline survey, we conducted a cross-sectional online survey of MSM in China from November 2nd to 7th 2015 (see Additional file 1 for the study questionnaire). Study recruitment was conducted through Danlan.org (the largest online gay portal in China,) and its associated gay mobile dating app (Blued) as well as Weibo (a microblogging platform) and WeChat (a messaging app). A banner advertisement was put on the platforms mentioned above, and participants entered the survey by clicking on the banner, which directed them to a survey website hosted on Qualtrics (Provo, Utah).

All participants who clicked the link for the survey were screened for eligibility. Inclusion criteria included: born biologically as a male, engaged in anal sex with a man at least once during their lifetime, engaged in condomless anal or vaginal sex in the last three months, and at least 16 years of age. In this study, we further restricted to people who engaged in sex with male partners in the last three months.

Measures

The participants were further classified into three groups according to their reporting sexual partner types in the last three months: engaged in sex only with regular partners, engaged in sex only with casual partners and engaged in sex with both regular partners and casual partners. In our study, the regular partner was defined as main partners to whom the participant feels committed, such as a spouse, lover or boyfriend [22]. A casual partner was defined as any sexual partner that the participant did not consider to be his regular partner [23].

Socio-demographic and consistent condom use

Socio-demographic information included: age in completed years (continuous), education (highest grade completed), marital status (not married/married), student (yes/no), annual income and sexual orientation (Gay/bisexual). Participants who reported using condoms every time during sex with male partners in the last three months were considered to be consistent condom users, and those who reported using condoms most of the time, sometimes, and never

were considered as inconsistent condom users. The condom use variables were dichotomized as consistent versus inconsistent for the current analysis.

Condom use social norms

Condom use social norms were measured using a 6 item subscale from the original scale developed by Dana D. DeHart and John C. Birkimer [24], which intended to measure participants' perception of their friends' attitudes towards condom use and safe sex. For example, one item is "If I had sex and told my friends that I did not use a condom, they would be angry or disappointed." Responses were rated on a 5-point Likert scale: strongly agree (5), agree (4), neutral (3), disagree (2), strongly disagree (1). The subscale has been widely validated and used among college students [24] and MSM [25, 26]. The detailed information for the six items was listed in the Supplementary Table [see Additional file 1: Table S1]. In the present study, the internal consistency (Cronbach's alpha) for the six items was 0.770 [27]. The overall score was calculated for each participant, which a higher score indicated the higher self-reported strength of social norm for condom use.

Condom use self-efficacy

This is a 7-item scale that measures self-efficacy on using condoms in multiple situations and settings [28]. Participants again responded to statements on a 5-point Likert format ranging from 1 strongly disagree to 5 strongly agree. These seven items were selected from the Condom Use Self-Efficacy Scale developed by Brafford and Beck's (1991) [28] to measure participants' confidence in being able to use a condom and in being able to communicate with a partner about condom use. For example, one item is "I feel confident that I could refuse to have sex with a partner who did not want me to use a condom." The Condom Use Self-Efficacy Scale has been validated and applied among MSM [29, 30] and other populations [31]. In the current study, the Cronbach's alpha for the scale was 0.823 [27]. We also calculated the overall score for each participant, with higher scores indicating greater condom use self-efficacy. The seven items were listed in the Supplementary Table as well [see Additional file 2: Table S1].

Statistical analysis

Data analysis was performed using SPSS version 17.0. Descriptive statistics were used to describe socio-demographics, consistent condom use, condom social norms and self-efficacy.

Univariate and multivariable logistic regressions were used to determine the association between condom use social norms, condom use self-efficacy and consistent condom use with different kinds of partners, while

demographic characteristics, including age, marital status, and income, were adjusted in the multivariable logistic regression models.

Logistic regression and maximum likelihood parameter estimation methods were used to analyze the multiplicative effect and additive effect between condom social norms and self-efficacy on the consistent condom use among all participants, respectively.

Results

A total of 1597 participants meeting inclusion criteria and providing informed consent were recruited from 269 cities in 32 out of 34 provinces of China. Of those participants, 1189 completed the survey, with a completion rate of 74.5%. One hundred and thirty-two participants were further excluded, as they did not report the type of sexual partner they had sex with during the last three months. Overall, 1057 participants who have male partners were included in this study.

Study participants

Of the 1057 participants, 451 (42.7%), 217 (20.5%), and 389 (36.8%) engaged in sex with regular partners only, casual partners only and both types in the last three months, respectively. The majority were less than 25 years old (63.9%, 673/1054), not students (63.6%, 672/1057), never married (83.3%, 881/1057), had a college degree (63.3%, 670/1057), and had an annual income less than \$5000 USD (53.8%, 569/1057). Nearly three-fourth participants self-identified as gay (71.1%, 751/1057), of whom 82.8% (622/751) engaged in condomless sex in the last three month. Almost one-third self-identified as bisexual (28.9%, 306/1057), and 76.5% (234/306) of those engaged in condomless sex in the last three month. One-fourth (19.8%, 43/174) of casual partners were paid (with money or gifts) to have sex. The rate of consistent condom use with any type of male partners in the last three months was only 15.1% (151/1001). 96.2% (1017/1057) of participants engaged in condomless anal intercourse in the last three month. Men engaged in sex only with casual partners (19.8%, 36/182) had a higher rate of consistent condom use than only with regular partners (13.5%, 61/451) or both types (13.2%, 40/264) (Table 1).

Condom use social norms and self-efficacy characteristics

The median (IQR) score of condom use social norms for men engaged in sex with regular partners, casual partners and both regular and casual partners were 23 (22.2–22.9), 22 (21.6–22.7) and 23 (22.3–23.1), respectively. However, there is no statistical difference in the median score among those three types ($P > 0.05$).

The median (IQR) score of condom use self-efficacy for men engaged in sex with regular partners, casual

Table 1 Socio-demographic characteristics and condom use among high-risk MSM with different kinds of partners in China, 2015 (N = 1057)

		Regular partner		Casual partner		Both types		Total ^a	
		No.	%	No.	%	No.	%	No.	%
Age(yrs)	16–25	292	64.9	147	68.1	234	60.3	673	63.9
	26–35	131	29.1	52	24.1	115	29.6	298	28.3
	36–45	23	5.1	10	4.6	32	8.2	65	6.2
	> 45	4	0.8	7	3.2	7	1.8	18	1.7
Education	High school or below	142	31.5	80	36.9	116	29.8	338	32
	College	287	63.6	127	58.5	256	65.8	670	63.3
	Graduate education	22	4.9	10	4.6	17	4.4	49	4.6
Marital status	Not married	381	84.5	187	86.2	313	80.5	881	83.3
	Married	70	15.5	30	13.8	76	19.6	176	16.6
Student	Yes	174	38.6	98	45.2	113	29	385	36.4
	No	277	61.4	119	54.8	276	71	672	63.6
Annual income (USD)	5000 or less	252	55.9	137	63.2	180	46.2	569	53.8
	5001–15,000	166	36.8	70	32.3	182	46.8	418	39.5
	> 15,000	33	7.3	10	4.6	27	6.9	70	6.6
Sexual orientation	Gay	329	72.9	154	71	268	68.9	751	71.1
	Bisexual	122	27	63	29	121	31.1	306	28.9
Paid to have sex in the last 12 month	Yes	41	9.1	43	19.8	53	13.6	137	13.0
	No	410	90.9	174	80.2	336	86.4	920	87.0
Consistently condom use with male partners	Yes	61	13.5	36	19.8	40 ^b	13.2	151	15.1
	No	377	86.1	146	80.2	264	86.8	850	84.9

^athe whole population^bThese participants engaged in condomless sex with female partners in the last three months

partners and both regular and casual partners were 29 (27.9–28.8), 26 (26.1–27.4) and 28 (27.4–28.4), respectively. Men engaged in sex only with regular partners had a higher median score of condom use self-efficacy than with other two different types of partners ($P < 0.01$).

Multivariable analysis

For men only engaged in sex with regular partners, both social norms (adjusted OR: 1.59, 95% CI: 0.97–2.60) and self-efficacy (adjusted OR: 2.88, 95% CI: 1.59–5.22) were positively associated with consistent condom use. For men only engaged in sex with casual partners, participants with higher social norms (adjusted OR: 1.58, 95% CI: 1.19–2.09) and higher self-efficacy (adjusted OR: 2.35, 95% CI: 1.69–3.26) were more likely to use a condom consistently. Again, for men engaged in sex with both regular and casual partners, both social norms (adjusted OR: 1.48, 95% CI: 1.13–1.95) and self-efficacy (adjusted OR: 2.45, 95% CI: 1.81–3.32) were significantly correlated with consistent condom use. No multiplicative (OR: 0.99, 95% CI: 0.98–1.01) and additive effect were detected between social norms and self-efficacy on consistent condom use among MSM ($p > 0.05$) (Tables 2, 3 and 4).

Discussion

Knowing the situation of condom use social norms and self-efficacy among Chinese MSM are critical for designing tailored interventions to initiate and sustain condom use. Our study extended the existing literature by evaluating the pattern of self-efficacy and social norms among Chinese MSM, assessing the association with different types of partners among Chinese MSM, and exploring the interaction between social norms and self-efficacy on consistent condom use. Our findings indicated that condom use social norms and self-efficacy were positively associated with consistent condom use with all the three types of partners.

Our study observed that for men who have higher condom use social norms are more likely to use condoms consistently with either regular partners or casual partners. These findings are consistent with the results of previous studies that focused on exploring the association with all partners together [32–34]. For example, a study conducted among Chinese MSM found positive correlations between social norms and practices of condom use [33]. As indicated in the previous studies [13, 34], one of the reasons for this phenomenon is that men who perceive stronger social norms for condom

Table 2 Factors associated with consistent condom use among high-risk MSM with different sex partner types in China, 2015 (N = 1057)

Variables	Both types ^a		Regular ^a		Casual ^a	
	Crude model	Adjusted model	Crude model	Adjusted model ^b	Crude model	Adjusted model ^b
	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)
Student						
Yes	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
No	1.04(0.71–1.51)	1.06(0.66–1.71)	0.93(0.63–1.38)	0.82(0.5–1.34)	1.23(0.83–1.84)	1.14(0.7–1.87)
Sexual orientation						
Gay	0.53(0.23–1.26)	0.52(0.22–1.24)	0.59(0.24–1.41)	0.60(0.25–1.45)	1.47(0.46–4.71)	1.46(0.45–4.73)
Bisexual	0.84(0.35–2.06)	0.86(0.35–2.1)	0.66(0.26–1.67)	0.68(0.27–1.72)	1.64(0.5–5.43)	1.65(0.5–5.49)
Unsure/other	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
Education						
High school or below	1.1(0.41–2.96)	1.09(0.4–2.98)	0.81(0.31–2.08)	0.83(0.31–2.2)	0.55(0.22–1.37)	0.58(0.23–1.47)
Some college	1.98(0.74–5.27)	1.97(0.73–5.31)	1.44(0.57–3.68)	1.48(0.57–3.84)	1.02(0.41–2.52)	1.04(0.41–2.58)
College/Bachelors	1.15(0.43–3.07)	1.11(0.41–2.98)	0.83(0.33–2.11)	0.84(0.32–2.17)	1.04(0.43–2.54)	1.05(0.43–2.59)
Masters or PhD	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
Social norms	1.61(0.98–2.64)*	1.59(0.97–2.60)*	1.59(1.20–2.09)*	1.58(1.19–2.09)*	1.49(1.14–1.95)*	1.48(1.13–1.95)*
Self-efficacy	2.92(1.62–5.25)*	2.88(1.59–5.22)*	2.36(1.70–3.26)*	2.35(1.69–3.26)*	2.50(1.85–3.37)*	2.45(1.81–3.32)*

* $p < 0.01$ ^aAdjusted model was adjusted for age(continuous),income and marital status

use were more likely to hold stronger beliefs in their ability to use condoms, and had stronger intentions to practice safer sex. Additionally, we also found that a large minority (7.7 to 29.5%) of participants were not able to endorse every item of social norms. An effective intervention strategy for promoting condom use typically was determined by three components: (a) attitudes, (b) social norms, and (c) self-efficacy [35]. That is, the intervention strategy could make participants feel positively about always use a condom, increase participants' perception of society's approval of condom use, and believe that one could use a condom consistently [35]. Our results echoed this finding of social norms being an important part of an effective intervention, and encourage an inclusive of peer intervention to strengthen social norm regarding condom use [36].

Similarly, our results pointed out that condom use social self-efficacy played a positive role in facilitating consistent condom use with any types of partners. These findings were also observed in previous studies aiming to explore the association with all partners together [33, 37, 38]. For example, two studies

conducted in the United States [37, 38] and one study in China [33] among MSM suggested that enhancing self-efficacy is an important factor improving condom use behavior. Additionally, our study found that men engaged in sex only with regular partners in the last three months have the highest condom use self-efficacy, specifically for the setting of refusing to have sex with a partner who did not want to use a condom. This phenomenon can be explained by the committed and trustful relationship with regular partners [39]. This highlights a need to make tailored interventions, such as cognitive-behavioral interventions (e.g., interactive counseling) [38], to enhance condom use self-efficacy when engaging in sex with casual partners among MSM.

To know the interaction between social norms and self-efficacy would help us to further understand the mechanism of how social norms and self-efficacy working together on altering condom use. Several studies reported that social norms may have an indirect effect on condom use via self-efficacy [40, 41]. One study

Table 3 Multiplicative effect between social norms and self-efficacy on consistent condom use among Chinese high-risk MSM, 2015 (N = 1057)

Variables	B	SE B	Wald	OR (95% CI)
Social norms	0.15	0.16	0.88	1.17(0.84–1.60)
Self-efficacy	0.24	0.13	3.72	1.27(0.99–1.63)
Social norms × Self-efficacy	−0.01	0.01	0.95	0.99(0.98–1.01)

Table 4 Additive effect on consistent condom use between social norms and self-efficacy among Chinese high-risk MSM, 2015 (N = 1057)

Variables	B	SE B	Wald	95% CI	
				lower	upper
Social norms	0.019	0.02	0.35	0.01	0.02
Self-efficacy	−0.0004	0.02	0	−0.04	0.0009
Social norms +Self-efficacy	0	0.0007	0	0	0.0001

conducted among American MSM pointed out that the effect of social norms on unsafe sex was diminished once the effect of self-efficacy was taken into account [12]. However, we did not identify the interaction in the current study, neither for any kind of partner types. One potential reason for this phenomenon is the participants in our study are extremely skewed, as all of them were either engaged in condomless sex with male or female in the last three months, which limited the power to test this interaction (the power for the multiplicative effect and additive effect in this study is 0.032 and 0.025, respectively). This may explain why only 15% of participants in this study consistently used a condom with male partners in the last three months.

Our study also showed that men engaged in sex only with casual partners have a higher rate of consistent condom use than with the other two types of partners. This finding is inconsistent with a study conducted in India [22] but supported by other studies conducted in China, which showed that condomless sex among MSM was more likely to occur when regular partners were involved [42–44]. The potential reasons for this include that MSM have a higher awareness of self-protection when having sex with casual partners [45], and using a condom with regular partners would be considered as an insult to the partner [39]. Even like this, previous studies indicated that a large proportion of Chinese MSM persistently engaged in condomless sex with casual partners [46, 47]. Considering multi-sexual partnerships are common, and HIV prevalence is high [48, 49], there is a high likelihood that the HIV burden among Chinese MSM will further worsen. To avert this trend, intervention package that including social norms and self-efficacy promotion strategies are further needed.

Our study has several limitations. First, our study was conducted online, and the participants tended to be younger and more educated, which might lead to underestimation of the findings when generalized to the whole MSM population in China [50]. Second, all the data was obtained through self-reported, which may be influenced by social desirability bias. This bias could cause underestimation of the association between social-norms and self-efficacy on consistent condom use. However, a computer-based survey has the potential to reduce this kind of bias. Third, this study was cross-sectional, so relations should be interpreted as associations that might or might not be causal. Fourth, the data we used for this study were baseline data of a randomized control trial that aimed to promote condom use, while all the participants either engaged in condomless sex with male or female in the last three months. Last but not the least, 19.8% of the participants who have casual partners had sexual clients in the last 12 months, and we did not

separate clients from other casual partners, while these two groups of partners are potentially different.

Conclusion

To conclude, altering condom use social norms and self-efficacy are two promising strategies to promote condom use among Chinese MSM. Social norms and self-efficacy are positively associated with consistent condom use with either regular partners or casual partners, further suggesting the importance of structural intervention on promoting condom use based on social norm and self-efficacy theories. Future studies that aimed to understand the mechanism on how social norm and self-efficacy work together on altering condom use are still needed.

Additional files

Additional file 1: Study questionnaire. (DOCX 86 kb)

Additional file 2: Table S1. The list of items of Social norms and Social self-efficacy. (DOCX 36kb)

Abbreviations

HIV: Human immunodeficiency virus; MSM: Men who have sex with men; USD: US dollars

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Availability of data and materials

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

Authors' contributions

CW, WT and LL participated in all stages and wrote the manuscript, JDT and CL helped collect the data; JDT and HZ helped design the study and reviewed the manuscript. All authors read and approved the final manuscript.

Ethics approval and consent to participate

Ethics review committees in China(Guangdong provincial center for Skin diseases and STI Control)and the United States(the University of North Carolina at Chapel Hill and the University of California, San Francisco) provided study approval, and participants completed an online informed consent process.

Consent for publication

Not applicable

Competing interests

The authors declare that they have no competing interests.

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