

Mental Health and HIV-related Risky Sexual Behaviors Among Cisgender, Transgender, and Gender Non- Conforming MSM in China

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Abstract

Background

The new recognition of sub-groups among gender minorities (i.e transgender and gender non-conforming) who also identify as men who have sex with men (MSM) play a considerable role in new HIV infections in China. However, while research focuses on the prevalence of MSM, it ignores the diversity of gender minorities within the MSM population. Furthermore, information on the mental health and HIV-related risky sexual behavior also requires consideration to understand the prevalence and new rates of infection both of MSM and within these gender minority sub-groups.

Methods

From September 2017 to December 2017, MSM were recruited in Wuhan, Nanchang, and Changsha cities in China. Participants were asked to fill out a structured self-designed questionnaire to assess depression, perceived social support, resilience, identify concealment, and HIV-related risky sexual behaviors.

Results

A total of 715 MSM completed the structured questionnaire, the number of gender minorities identifying as MSM were 63 and accounted for 8.8% of the population. Compared with the cisgender MSM population, transgender MSM had a significantly lower likelihood of identity concealment ($P = 0.016$, 95%CI = 0.16, 5.79), were more likely to have one-night stand/occasional partner in the past six months (AOR = 3.90, 95% CI = 1.17–13.03), have sex after drug use (AOR = 2.84, 95%CI = 1.18–6.79), and engage in commercial sexual behavior in the past six months (AOR = 6.09, 95%CI = 1.003–36.94). In terms of gender non-conforming MSM, the differences were not significant for mental health and HIV-related risky sexual behaviors in comparison to the cisgender MSM population.

Conclusions

It is critical to create targeted interventions tailored towards the different gender minority identities among the MSM population. Further research is necessary to understand the relationship between gender identity, mental health, and HIV-related risky sexual behaviors.

Background

Gender minorities are considered those whose gender identity is not the same as their birth-assigned sex (transgender) and those whose gender identity is not defined by the binary categories of women/men (gender non-conforming) [1, 2]. In recent studies, there has been a call for further analysis of gender identity among men who have sex with men (MSM) for HIV interventions around the world [3, 4]. Previous

international studies have shown that transgender and gender non-conforming MSM account for over 23% of the MSM population[5]. In Jobson's survey of one city of South African, it was also reported that 9% of individuals identified as gender minorities among the MSM population [6]. These studies suggested that MSM gender minorities are around 9–23% of the total MSM population on a global scale.

Individual MSM who self-report as a gender minority have been found to have a higher likelihood of HIV risks in comparison with those who agreed with their birth-assigned sex [7, 8]. For example, compared to those who agreed with their birth-assigned sex among the MSM population, transgender MSM were a higher risk population of new HIV infections due to sociodemographic information, higher rates of substance use, and being more likely to engage in commercial sexual activity [9]. In a systematic review of MSM in low and middle income countries, transgender MSM had a higher prevalence of HIV and self-reported that they are more likely to accept receptive anal intercourse without condom use.[8, 10]. According to a recent research in Shanghai, transgender and gender non-conforming MSM bore a higher HIV burden (with a HIV-infected rate of 12.4% and a higher new HIV infection rate of 8.0%) among the total MSM population [11].

To date, the associated sub-groups within the MSM population, transgender and gender non-conforming, have not been largely considered as separate sub-groups in the MSM population in China [11]. Previous studies have often focused on the MSM population as a whole and corresponding intervention measures have been generalized to target the whole MSM population, bringing limited information around the impact on new HIV acquisition and transmission among MSM gender minorities [11–13].

Therefore, the present study aims to give due attention to these under-studied sub-groups in order to create more effective HIV interventions. Firstly, this study identifies the prevalence of transgender and gender non-conforming individuals among the MSM population. Secondly, this study assess the HIV-related risky sexual behaviors and mental health of MSM population, separated by gender identity, in order to provide new evidence for targeted interventions among the different MSM gender identities.

Methods

2.1 Participants

Between September 2017 and January 2018, we completed a baseline survey of a four-year cohort study in three provincial capitals of China: Wuhan, Nanchang, and Changsha. Participants were recruited by the local Centers for Disease Control and Prevention (CDC) and MSM support services. The inclusion criteria for the study was: (1) they were 16 years or older; (2) they had experience of being a man who have sex with men; (3) they were sexually active during the prior 6 months; (4) they were informed of the purpose of this study fully and provided written informed consent to participate. The participants were asked to complete the electronic questionnaire on tablets (e.g. iPads) during face-to-face interviews, and our trained students or volunteers would explain some questions if they were unsure what the question was asking. In addition, participants who finished the survey could receive 50 RMB (approximately US \$7) as

compensation for their time in this base-line study. This study was approved by the Medical Ethics Committee of Wuhan University, China.

2.2 Data Collection

Socio-Demographic Characteristics

Socio-demographic information included: age, ethnicity, current education level, current employment, current marital status, and monthly income. Gender identity was measured by the question “Do you agree with your biological sex?” The following three options were included: “yes”, “no”, and “non-conforming”. The question has been widely used both in China and the world [6, 14]. In the study, we divided the MSM population into three categories according to gender identity, i.e cisgender MSM (those who agreed with their birth-assigned sex), transgender MSM (those who disagreed with their birth-assigned sex) and gender non-conforming MSM. Sexual identity was measured with four options, “gay”, “bisexual”, “heterosexual”, and “unsure”.

Mental health outcomes

The Center for Epidemiological Studies Depression (CES-D) was used for screening the symptoms of depression [15]. The CES-D is a 20-item, 4-point Likert scale, for the past week. A higher total score indicates a higher level of depression symptoms. The Cronbach’s alpha was 0.92 in this research.

The Multidimensional Scale of Perceived Social Support (MSPSS) was used to measure social support [16]. The scale consists of three subscales and each subscale includes four items. The score of each item range from 1 (very strongly disagree) to 7 (very strongly agree). A higher total score indicates a higher level of perceived social support. The Cronbach’s alpha was 0.94 in this research.

The 10-item Connor-Davidson Resilience Scale (CD-RISC10) was used to measure resilience [17]. The CD-RISC10 is a 10-item, five-point Likert scale, and the total score ranges from 0 to 40, with a higher total score indicating a higher level of resilience. The Cronbach’s alpha was 0.87 in this research.

Identity concealment was measured by a six-item, five-point Likert subscale on gender diversity investigation [18]. The total score is summed by the six items and a higher total score indicates a higher likelihood of sexual orientation concealment. The Cronbach’s alpha was 0.91 in this study.

HIV-related sexual behaviors

HIV-related risky sexual behaviors information from the past six months, included multiple sexual partners, male partner type (fixed partners/acquaintances, one-night stand/occasional partner, and both), sex after drugs, sex after drinking, commercial sexual behavior, and inconsistent condom use.

2.3 Statistical Analysis

The data was analyzed using SPSS19.0 and R software (version 3.6.1). Chi-square test (Fisher’s exact test) were performed to explore the differences of socio-demographic characteristics and HIV-related risky

behaviors by gender identify. In terms of mental health outcomes, one-way ANOVAs and Least-Significant-Difference (LSD) analysis were explored the relationships between different gender identity groups. Multivariate logistic analysis was used to further explore the relationship between HIV-related risky sexual behaviors and gender identify. In the multivariate logistic analysis gender identity was coded as an independent variable and HIV-related risky sexual behaviors in the past six months were coded as the dependent variables. The level of $P < 0.05$ (two-sides) was set for statistical significance in this study.

Results

As is shown in Table 1, a total of 715 MSM's data were analyzed in this research. Transgender and gender non-conforming MSM accounted for 8.8% (95%CI: 6.7% -10.9%) of the total MSM population. The sub-group of transgender were 3.6%, gender non-conforming individuals were 5.2%, and 91.2% were cisgender MSM. More than half of MSM (55.4%) were between 16 to 25 years of age and around three fourths (74.9%) of the participants had completed college or higher education. The majority of the participants (84.5%) were unmarried and around 15.5% were married or divorced. 92.7% were employed and 50.6% described that their disposable income exceed 3000 RMB monthly. 91.7% reported that they were homosexual or bisexual, whereas 8.3% reported as heterosexual or unsure.

Table 1
Socio-demographic characteristics separated by gender identity

Variables	Total, n (%)	Cisgender MSM n (%)	Gender non-conforming n (%)	Transgender n (%)	χ^2	<i>P</i>
Total		652(91.2)	37(5.2)	26(3.6)		
Age group (in years)					0.29	0.99
16–25	396(55.4)	360(55.2)	22(59.5)	14(53.8)		
26–35	211(29.5)	193(29.6)	10(27.0)	8(30.8)		
≥ 36	108(15.1)	99(15.2)	5(13.5)	4(15.4)		
Ethnic					-	0.29*
Han group	677(94.7)	618(94.8)	36(97.3)	23(88.5)		
others	38(5.3)	34(5.2)	1(2.7)	3(11.5)		
Education level					6.54	0.04
High school or lower	180(25.2)	156(23.9)	13(35.1)	11(42.3)		
College or higher	535(74.8)	496(76.1)	24(64.9)	15(57.7)		
Marital status					0.66	0.73
Unmarried	604(84.5)	553(84.8)	30(81.0)	21(80.8)		
Married/divorced	111(15.5)	99(15.2)	7(18.9)	5(19.2)		
Employment status					-	0.62*
Employed	663(92.7)	605(92.8)	35(94.6)	23(88.5)		
Unemployed	52(7.3)	47(7.2)	2(5.4)	3(11.5)		
Monthly income (RMB)					10.18	0.12
< 1000 Yuan	91(12.7)	80(12.3)	6(16.2)	5(19.2)		
1001–3000 Yuan	262(36.6)	242(37.1)	10(27.0)	10(38.5)		
3001–6000 Yuan	229(32.0)	215(33.0)	8(21.6)	6(23.1)		
> 6000 Yuan	133(18.6)	115(17.6)	13(35.1)	5(19.2)		
*Fisher's exact test						

In terms of mental health outcomes, the differences of depression, perceived social support, and resilience were not significant by gender identity and are shown in Table 2. For identity concealment, *P* value was at 0.051, so we further explored the relationship with identity concealment by gender identity through LSD analysis (Fig. 1). We found the mean difference of identity concealment significant (*P* = 0.016, 95%CI = 0.16, 5.79) between cisgender MSM and transgender, while the difference was not significant for gender non-conforming MSM in comparison with the other two groups.

Table 2
Mental health outcomes separately by gender identity

Variables	Total, Mean (SD)	Cisgender MSM, Mean (SD)	Gender non- conforming Mean (SD)	Transgender, Mean (SD)	F	P
Depression	17.66(10.50)	17.52(10.46)	19.54(11.27)	18.58(10.43)	0.749	0.473
Perceived social support	60.42(12.55)	60.57(12.38)	60.46(14.89)	56.46(13.03)	1.342	0.262
Resilience	36.70(8.48)	36.75(8.51)	36.14(8.45)	36.38(8.11)	0.110	0.896
Identity concealment	17.05(6.63)	17.19(6.61)	16.68(6.15)	14.00(7.07)	2.980	0.051

Table 3
HIV-related risky behaviors separated by gender identity

Variables	Total, n (%)	Cisgender MSM, n (%)	Gender Non-Conforming, n (%)	Transgender n (%)	χ^2	<i>P</i>
Multiple sexual partners					0.692	0.708
yes	381(53.3)	306(46.9)	15(40.5)	13(50.0)		
no	334(46.7)	346(53.1)	22(59.5)	13(50.0)		
Male partner type *					-	0.081
all were one-night stand/occasional partner	79(12.6)	68(11.9)	5(15.2)	6(28.6)		
all were fixed partners/acquaintances	335(53.5)	313(54.7)	16(48.5)	6(28.6)		
both of them	212(33.9)	191(33.4)	12(36.4)	9(42.9)		
Sex after drugs					6.318	0.042
Yes	100(14.0)	87(13.3)	5(13.5)	8(30.8)		
No	615(86.0)	565(86.7)	32(86.5)	18(69.2)		
Sex after drinking					0.850	0.654
Yes	281(39.3)	258(39.6)	12(32.4)	11(42.3)		
No	434(60.7)	394(60.4)	30(81.0)	21(80.8)		
Commercial sexual behavior					-	0.049*
Yes	12(1.9)	9(1.6)	1(3.0)	2(9.5)		
No	614(98.1)	563(98.4)	32(97.0)	19(90.5)		
Consistent condom use					1.805	0.405
Yes	295(50.8)	274(51.6)	12(40.0)	9(45.0)		
No	286(49.2)	257(48.4)	18(60.0)	11(55.0)		
*Fisher's exact test						

Table 4

The relationship between gender identity and HIV-related risky sexual behaviors (Multivariate logistic regression analysis)

Variables ^b	Gender non-conforming ^a			Transgender ^a		
	P	OR	95%CI	P	OR	95%CI
Multiple sexual partners (yes)	0.47	0.78	0.39–1.54	0.75	1.14	0.54–2.51
Male partner type						
All were fixed partners/acquaintances	ref	ref	ref	ref	ref	ref
Both of them	0.74	1.14	0.52–2.51	0.15	2.19	0.76–6.32
All were one-night stand/occasional partner	0.39	1.59	0.55–4.63	0.03	3.90	1.17–13.03
Sex after drugs (yes)	0.97	1.02	0.38–2.73	0.02	2.84	1.18–6.79
Sex after drinking (yes)	0.32	0.70	0.34–1.43	0.92	1.04	0.47–2.33
Commercial sexual behavior (yes)	0.57	1.88	0.21–16.82	0.049	6.09	1.003–36.94
Inconsistent condom use (yes)	0.21	0.61	0.28–1.32	0.66	0.81	0.32–2.05
Note: a Independent variable: cisgender MSM as ref.						
b controlling for age/ethnic/education level/marital status/employment status/monthly income.						

The logistics regression compared cisgender MSM to transgender. The model was significant and showed that transgender were more likely to have a one-night stand/occasional partner in the past six months (AOR = 3.90, 95% CI = 1.17–13.03), were more likely to have sex after drug use (AOR = 2.84, 95% CI = 1.18–6.79), and have engaged in commercial sexual behavior in the past six months (AOR = 6.09, 95%CI = 1.003–36.94). As for those who were identified as gender non-conforming, it was not significant whether the individuals were prone to engaging in HIV-related sexual risky behaviors when compared with those cisgender MSM.

Discussion

To our best knowledge, this is the first study to explore mental health and HIV-related risky sexual behaviors among the MSM population separated by gender identity sub-groups in China. In the current study, we found that, when compared with cisgender MSM, transgender were more likely to engage in HIV-related risky sexual behaviors and have a lower likelihood of identity concealment, while gender non-conforming MSM were not significantly having engaged in HIV-related risky sexual behaviors and having some psychological characteristics. Consistent with Geoffrey' research, gender identity factor plays an important role in HIV transmission among the MSM population [6]. Hence, it is essential to note that

research on the MSM population should be separated by gender identity sub-groups, which is necessary for targeted interventions to be developed.

The study showed that the prevalence of transgender and gender non-conforming identifying MSM accounted for 8.8% of the total population. A previous study reported that 23% of sample were identified as gender minorities among the MSM population[5], while yet another study found that 9% of the MSM population were identified as transgender women [19]. This existing discrepancies among different studies could be attributed to various assessment tools of gender identify, different districts, and cultural norms, etc. And though our sample was recruited from the central part of China, it is noteworthy that this study helps us establish the initial understanding of the epidemic profile of risk factors for transgender and gender non-conforming MSM in China.

We found that it was not significant that depression and perceived social support were associated with their gender identity in MSM population, which is consistent with Sandfort's studies [8]. In terms of identity concealment, the cisgender MSM population was found to be more likely to report it than transgender MSM. The lower likelihood of identity concealment among transgender identifying MSM possibly made them have to tolerate more discrimination when compared with the cisgender MSM population[20], increasing the frequency of condomless anal sex[21] and could in turn increase the risk of HIV infection. Thus, it is necessary in future research to make further efforts to provide new evidence linking gender identity with mental health and explore the complex relationship within the MSM sub-populations.

Some studies conducted in community population showed that transgender individuals were more likely to have one-night stand/occasional partners, sex after drug use, or engage in commercial sexual behavior when compared to the MSM population [11, 22]. A study surveyed in Brazil reported that transgender individuals engaged in more HIV-related risky sexual behaviors than MSM individuals, including the number of sex partners, commercial sex activities, and so on [23]. Similarly, our study conducted among MSM population found that compared with those cisgender MSM, transgender MSM were more likely to have sex after drug use, have one-night stand/occasional partners, and engage in commercial sexual behaviors. This is possibly because that transgender MSM have a dual minority identity being both transgender and MSM [24], while cisgender MSM population do not. The dual minority identity of transgender MSM are endowed with higher level of discrimination and risk sexual behaviors[6]. In the study, gender non-conforming MSM were not found to have a significant correlation with HIV-related risky sexual behaviors in comparison with the cisgender MSM. It can be accounted for by the fact that gender non-conforming MSM may or may not self-considered themselves to be transgender. Consequently, these results suggested that we should pay more attention to transgender MSM within the larger groups of MSM.

There are several limitations to this current study. First, this study was a baseline survey of a four-year cohort study conducted in three Chinese central cities, which limited the representative of samples and the integrality of the whole research. Second, mental health outcomes were measured by four self-

reported questionnaires, which did not consider other mental health like anxiety, self-esteem etc. It is necessary that additional mental health outcomes are incorporated in further research exploring the relationship between gender identity, mental health, and HIV-related risky sexual behaviors. Third, the study did not look at differences within the transgender community, further research is needed to understand the difference between transgender women and transgender men in China.

Conclusions

In conclusion, the prevalence of transgender and non-conforming identifying MSM was 8.8% (95%CI: 6.7%-10.9%) in China. And compared with the cisgender MSM population, transgender MSM had a lower likelihood of identity concealment and were more likely to engage in HIV-related risky sexual behaviors, including having no-fixed sexual partner, having sex after drug use, and engaging in commercial sexual behavior. It is crucial to provide targeted interventions for the transgender MSM accordingly. Further research need focus on the mechanism of the relationship between gender identity, mental health, and HIV-related risky behavior among MSM sub-groups, in order to continue to effectively put in interventions to reduce the risk of HIV infection within these communities.

Abbreviations

MSM

men who have sex with men; HIV:human immunodeficiency virus; CDC:the local Centers for Disease Control and Prevention; LSD:Least-Significant-Difference analysis; CI:Confidence interval.

Declarations

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Authors' contributions

Zhizhou Duan analyzed this data and wrote manuscript; Liyin Wang and Menglan Guo collected this data; Changmian Ding and Danqin Huang revised this manuscript; Hong Yan designed this research and revised manuscript; Amanda Wilson modify the language of manuscript and Shiyue Li designed this manuscript. All authors approved the publication of this manuscript.

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Availability of data and materials

The analyzed data are available from the corresponding author on reasonable request.

Ethics approval and consent to participate

All participants gave written consent and this study was approved by the Medical Ethics Committee at Wuhan University, China.

Consent for publication

Not applicable

Competing interests

There is no conflict of interest among all authors.

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Figures

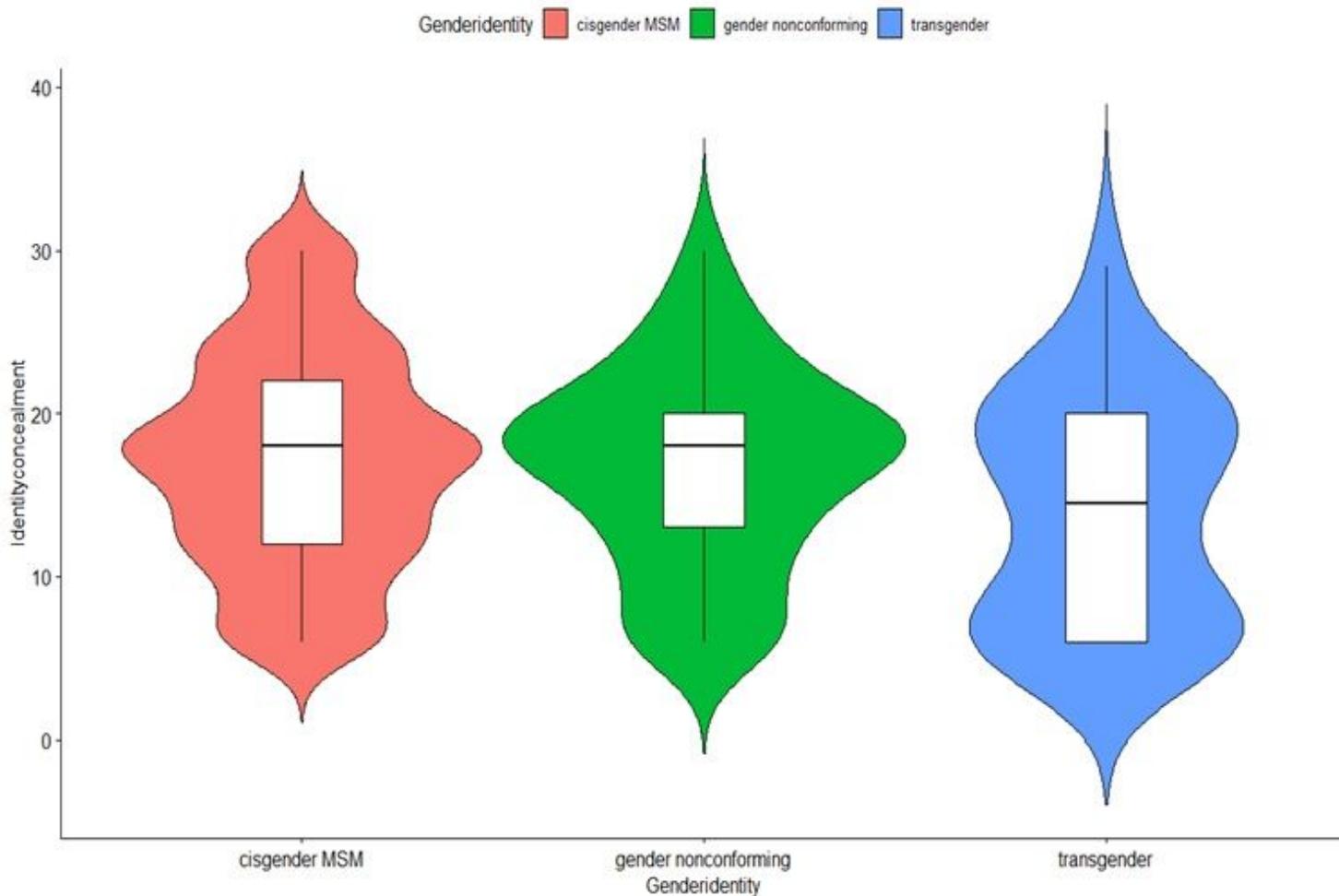


Figure 1

The Identity concealment characteristics separated by gender identity. Note: *:p<0.05