The effects of recruitment method on demographics, psychosocial variables, and drug use among a sample of men who have sex with men in Shanghai, China.

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Background
Men who have sex with men (MSM) in China are unified by the term, tongzhi. It describes a political and cultural context that unifies individuals amongst the heteronormative culture. ¹

In 1997, same-sex sexual behavior was decriminalized. ¹

In 2001, the updated CCDM-3 de-pathologized “homosexuality,” but tongzhi that experience distress are still considered in a diagnostic category. ¹

MSM are disproportionately affected by mental illness and psychosocial health problems. ²
Psychosocial Health Problems Affecting MSM

- **Depression**: rates among several samples of urban MSM range from 20-80%.\(^2\),\(^3\),\(^4\) A 2012 study in Foshan found that 34.8% of their sample exhibited depressive symptoms.\(^5\)

- **Intimate partner violence**: Cross sectional studies of urban MSM in America found that men experiencing IPV were at a 1.6 times greater odds of experiencing depression than those not abused by their partners.\(^6\),\(^7\)

- **Drug Use**: History of drug use is associated with high levels of depression, and MSM are more likely to have risky sexual behavior.\(^8\)

- **Sexual concurrency**: Among a sample of MSM in Chennai, India, for every additional male sexual partner in the last three months, there was a 4% increase in the existence of depressive symptoms.\(^9\)
The large majority of sampling techniques utilized for studies conducted with MSM are convenience samples that contain an over-representation of bar patrons. Guo et al. in 2011 utilized four sampling methods; peer outreach, informal social network, Internet, and venue-based, with the goal to recruit a more representative sample of MSM in Beijing.

They analyzed: sociodemographic and behavioral factors, as well as the rate of HIV and Syphilis infections among young migrant MSM.

Characteristics that varied significantly across the four recruitment methods were: nearly all demographic characteristics, prevalence of Syphilis, number of sexual partners in their lifetime, involvement in commercial sex work in the last six months, and drug use differed significantly across the four recruitment methods.
Methodology
This study seeks to extend these findings by understanding the effects of recruitment method on:

1. sample demographics,
2. psychosocial variables,
3. substance use,
4. and sexual risk behaviors among a highly marginalized population of MSM and money boys in Shanghai, China.
Population of MSM in Shanghai, China

- General men who have sex with men (MSM).
  - 11.1% of MSM in Shanghai self-identified as openly gay/bisexual, **85.3% identified as closed gay/bisexual**, and **3.4% are heterosexual**.\(^{12}\)

- Money boys are a unique sub-population of rural-to-urban migrants that engage in transactional sex.
  - 13.2% are openly gay/bisexual, **73.5% closed gay/bisexual**, and **13.5% are heterosexual**.\(^{12}\)
Data Collection

- **Data Collection Procedures:**
  - Shanghai Men’s Study was initiated in July of 2008 and continued for five years.
  - Pencil-and-paper survey, in Chinese, that consisted of three sections:
    - (1) **basic information and social support**, CES-D Short Form Depression Screening Questionnaire, and
    - (2) experience as a gay or bisexual person, attitudes about sex, CES-D Short Form Depression Screening Questionnaire, and
    - (3) attitudes about health issues, health status, treatment for STDs, **sexual behaviors, and substance use/abuse.**
All participants of the Shanghai Men’s Study were recruited voluntarily by networking within the MSM and money boy communities at various venues in Shanghai that are frequented by MSM and money boys. Recruitment methods:

1. respondent driven sampling (RDS),
2. community popular opinion leader (CPOL),
3. venue-based sampling (VBS).
For RDS, study staff initially recruited eight seeds\textsuperscript{13, 14}:

- **4 MSM** (2 gay-identified and 2 non-gay-identified)
- **4 money boys** (two gay-identified and two non-gay-identified)

Each seed recruited up to three peers and gave them each three recruitment coupons to distribute to their peers. Coupons were used to track recruitment, affirm relationships, and prevent recruitment overlap.
40 community popular opinion leaders (CPOLs) from different segments of the money boy and MSM populations by a local NGO, Shanghai Piaoxue Cultural Media Limited.\textsuperscript{15, 16}

- 20 were money boys and 20 were general MSM
- Each CPOL was asked to recruit 10-15 money boys or general MSM. If interested, the recruited participant would be contacted by study staff to determine eligibility and privately complete the survey.
(3) Venue-Based Sampling

- VBS was conducted at each of the three following venues:
  - 1) **Internet applications**, such as “QQ” which is a short messaging service, JACKD and GRINDR
  - 2) **Bath houses**, and
  - 3) **Bars**

- Fliers were hung at bath houses and bars, and participants could call a hotline to learn more of the study.

- Semi-private rooms were reserved in order to speak with and determine the preliminary eligibility of the participants.

- If the participant was interested in the study, staff followed up with an appointment at the central office of Shanghai Piaoxue Cultural Media Limited, where the participant was consented and asked to complete the survey.
Overall sample N=1352

Respondent Driven Sampling (RDS) n=404
- money boys n=200
- MSM n=204

Community Popular Opinions Leader (CPOL) n=402
- money boys n=203
- MSM n=199

Venue-based Sampling (VBS) n=546
- Internet n=300
  - money boys n=142
  - MSM n=158
- Bath House n=116
  - money boys n=58
  - MSM n=89
- Bar n=129
  - money boys n=27
  - MSM n=89

In Total: 1,352 MSM
631 money boys
721 general MSM
Analysis

1. Descriptive statistics and frequencies for the survey items were conducted and stratified by recruitment method.

2. In order to test for significant differences between comparison groups ANOVAs were conducted for continuous variables, and Chi-square tests for categorical variables.

3. Simple linear regressions were conducted to assess the correlation between depression and demographics, IPV, gender role beliefs, drug use, and sexual concurrency.
   a. Pearson correlation coefficients were used for continuous variables.
   b. Spearman correlation coefficients for categorical variables.
Results
### Demographic results

**RDS:**
- Lowest monthly income
- Largest proportion of openly gay/bisexual

**CPOL:**
- Youngest age at 1st sexual contact with men or women
- Smallest proportion of married participants

**VBS:**
- Oldest
- Largest proportion of closeted gay/bisexual
- Greatest proportion of married participants

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>RDS n= 404</th>
<th>CPOL n= 402</th>
<th>VBS n= 546</th>
<th>Overall N=1,352</th>
<th>Sig. (F or X², p)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mean (SD)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age (years)</td>
<td>29.7 (10.4)</td>
<td>27.7 (7.9)</td>
<td>30.8 (9.9)</td>
<td>29.5 (9.6)</td>
<td>F=12.2, p=.000</td>
</tr>
<tr>
<td>Age at first sexual contact with men</td>
<td>19.9 (6.1)</td>
<td>18.9 (5.5)</td>
<td>21.0 (6.1)</td>
<td>20.0 (6.0)</td>
<td>F=14.2, p=.000</td>
</tr>
<tr>
<td>Age at first sexual contact with women</td>
<td>20.4 (4.5)</td>
<td>19.5 (3.9)</td>
<td>21.1 (4.4)</td>
<td>20.4 (4.3)</td>
<td>F=9.0, p=.000</td>
</tr>
<tr>
<td><strong>n (%)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ethnicity</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Han</td>
<td>386 (95.5)</td>
<td>400 (100)</td>
<td>517 (94.7)</td>
<td>1303 (96.4)</td>
<td>X²=259.4, p=.000</td>
</tr>
<tr>
<td>Other</td>
<td>16 (4.0)</td>
<td>0 (0)</td>
<td>29 (5.3)</td>
<td>45 (3.3)</td>
<td></td>
</tr>
<tr>
<td>Hukou</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shanghai</td>
<td>82 (20.3)</td>
<td>96 (23.9)</td>
<td>129 (23.6)</td>
<td>307 (22.7)</td>
<td>X²=2.0, p=.372</td>
</tr>
<tr>
<td>Other</td>
<td>322 (79.7)</td>
<td>304 (76.5)</td>
<td>417 (76.4)</td>
<td>1043 (77.1)</td>
<td></td>
</tr>
<tr>
<td>Level of Education</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Middle School or less</td>
<td>148 (36.6)</td>
<td>119 (29.6)</td>
<td>157 (28.8)</td>
<td>424 (31.4)</td>
<td>X²=19.2, p=.014</td>
</tr>
<tr>
<td>High School or equivalent</td>
<td>161 (39.9)</td>
<td>150 (37.3)</td>
<td>150 (27.5)</td>
<td>516 (38.2)</td>
<td></td>
</tr>
<tr>
<td>College or more</td>
<td>93 (23.0)</td>
<td>133 (33.1)</td>
<td>133 (24.4)</td>
<td>410 (30.3)</td>
<td></td>
</tr>
<tr>
<td>Monthly Income (Yuan)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;1000</td>
<td>25 (6.2)</td>
<td>29 (7.2)</td>
<td>14 (2.6)</td>
<td>68 (5.0)</td>
<td>X²=91.5, p=.000</td>
</tr>
<tr>
<td>1000-2999</td>
<td>204 (50.5)</td>
<td>112 (27.9)</td>
<td>169 (31.0)</td>
<td>485 (35.9)</td>
<td></td>
</tr>
<tr>
<td>3000-4999</td>
<td>115 (28.5)</td>
<td>164 (40.8)</td>
<td>177 (32.4)</td>
<td>456 (33.7)</td>
<td></td>
</tr>
<tr>
<td>≥5000</td>
<td>59 (14.6)</td>
<td>95 (23.6)</td>
<td>186 (34.1)</td>
<td>340 (24.2)</td>
<td></td>
</tr>
<tr>
<td>Sexual Orientation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Openly gay/bisexual</td>
<td>49 (12.1)</td>
<td>31 (7.7)</td>
<td>41 (7.5)</td>
<td>121 (9.0)</td>
<td>X²=60.9, p=.000</td>
</tr>
<tr>
<td>Closeted gay/bisexual</td>
<td>321 (79.5)</td>
<td>332 (82.6)</td>
<td>485 (88.8)</td>
<td>1138 (84.2)</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>34 (8.4)</td>
<td>39 (9.7)</td>
<td>20 (3.7)</td>
<td>93 (6.9)</td>
<td></td>
</tr>
<tr>
<td>Marital Status</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Married</td>
<td>59 (14.6)</td>
<td>47 (11.7)</td>
<td>115 (21.1)</td>
<td>221 (16.4)</td>
<td>X²=45.7, p=.000</td>
</tr>
<tr>
<td>Other</td>
<td>345 (85.4)</td>
<td>348 (86.6)</td>
<td>431 (78.9)</td>
<td>1124 (83.1)</td>
<td></td>
</tr>
</tbody>
</table>
What is the rate of depression and intimate partner violence among the sample?

### Description of Depressive Symptoms amongst the Sample, Stratified by Recruitment Method

<table>
<thead>
<tr>
<th>Recruitment Method</th>
<th>Variable</th>
<th>RDS n=404 n (%)</th>
<th>CPOL n=402 n (%)</th>
<th>Venue-based n=546 n (%)</th>
<th>Overall N=1352 n (%)</th>
<th>F-value, p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimal Depressive Symptoms</td>
<td></td>
<td>259 (64.1)</td>
<td>249 (61.9)</td>
<td>384 (70.3)</td>
<td>892 (66.0)</td>
<td>F=4.31, p=.014</td>
</tr>
<tr>
<td>Somewhat Elevated Depressive Symptoms</td>
<td></td>
<td>100 (24.8)</td>
<td>92 (22.9)</td>
<td>105 (19.2)</td>
<td>297 (22.0)</td>
<td>F=0.85, p=.429</td>
</tr>
<tr>
<td>Very Elevated Depressive Symptoms</td>
<td></td>
<td>32 (7.9)</td>
<td>31 (7.7)</td>
<td>32 (5.9)</td>
<td>95 (7.0)</td>
<td>F=3.64, p=.030</td>
</tr>
<tr>
<td>Overall CES-D sum score (µ, σ)</td>
<td></td>
<td><strong>20.9 (6.1)</strong></td>
<td><strong>20.6 (6.7)</strong></td>
<td><strong>19.7 (6.2)</strong></td>
<td><strong>20.4 (6.3)</strong></td>
<td>F=5.1, p=.006</td>
</tr>
</tbody>
</table>

### Description of Intimate Partner Violence amongst the Sample, Stratified by Recruitment Method

<table>
<thead>
<tr>
<th>Recruitment Method</th>
<th>Variable</th>
<th>RDS n=404 n (%)</th>
<th>CPOL n=402 n (%)</th>
<th>Venue-based n=546 n (%)</th>
<th>Overall N=1352 n (%)</th>
<th>X², p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>IPV: 1 – 2 forms of abuse</td>
<td></td>
<td><strong>146 (36.1)</strong></td>
<td>110 (27.4)</td>
<td>187 (34.2)</td>
<td>443 (32.8)</td>
<td>8.0, .019</td>
</tr>
<tr>
<td>IPV: 2+ forms of abuse</td>
<td></td>
<td>58 (14.4)</td>
<td>45 (11.2)</td>
<td>83 (15.2)</td>
<td>186 (13.8)</td>
<td>3.3 .191</td>
</tr>
</tbody>
</table>
What is the rate of drug use among the sample?

<table>
<thead>
<tr>
<th>Participant Type</th>
<th>RDS</th>
<th>CPOL</th>
<th>Venue-based</th>
<th>Overall N=1,352</th>
<th>X² or F, p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variable</td>
<td>n= 402</td>
<td>n= 400</td>
<td>n=546</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Have used drugs</td>
<td>69 (17.1)</td>
<td>67 (16.7)</td>
<td>132 (24.2)</td>
<td>268 (19.8)</td>
<td>10.9, .004</td>
</tr>
<tr>
<td>Have used ice or methamphetamine</td>
<td>38 (9.4)</td>
<td>18 (4.5)</td>
<td>52 (9.5)</td>
<td>108 (8.0)</td>
<td>9.6, .008</td>
</tr>
<tr>
<td>Have used stimulants</td>
<td>28 (6.9)</td>
<td>56 (13.9)</td>
<td>175 (32.1)</td>
<td>259 (19.2)</td>
<td>104.7, .000</td>
</tr>
<tr>
<td>Have used Ecstasy</td>
<td>32 (7.9)</td>
<td>4 (1.0)</td>
<td>14 (2.6)</td>
<td>50 (3.7)</td>
<td>30.4, .000</td>
</tr>
<tr>
<td>Have used drugs other</td>
<td>29 (7.2)</td>
<td>9 (2.2)</td>
<td>12 (2.2)</td>
<td>50 (3.7)</td>
<td>19.6, .000</td>
</tr>
<tr>
<td>than stimulants, Heroin, Ecstasy or Ice</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quantity of drugs used per day in the last 3 months</td>
<td>0.05 (0.48)</td>
<td>8.2 (17.2)</td>
<td>5.7 (15.7)</td>
<td>1.8 (8.9)</td>
<td>F=34.8, p=.000</td>
</tr>
</tbody>
</table>

RDS: Greatest use of Ecstasy and smallest quantity of drugs/day
CPOL: Lowest use of methamph. and Ecstasy. Greatest quantity of drugs/day
VBS: Greatest use of drugs ever, with large proportion using stimulants
What is the rate of sexual concurrency among the sample?

### Sexual Concurrency in the Last 30 days, Stratified by Recruitment Method

<table>
<thead>
<tr>
<th># Partners</th>
<th>No partners</th>
<th>1-3 partners</th>
<th>4-6 partners</th>
<th>7-9 partners</th>
<th>10+ partner</th>
<th>$X^2$, p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variable</td>
<td>RDS</td>
<td>CPOL</td>
<td>VBS</td>
<td>RDS</td>
<td>CPOL</td>
<td>VBS</td>
</tr>
<tr>
<td>MSM 30 days</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>40 (9.9)</td>
<td>45 (11.2)</td>
<td>52 (9.5)</td>
<td>199 (49.3)</td>
<td>169 (42.0)</td>
<td>303 (55.5)</td>
</tr>
<tr>
<td>MSM 30 days</td>
<td>313 (77.5)</td>
<td>360 (89.6)</td>
<td>437 (80.0)</td>
<td>81 (20.0)</td>
<td>100 (25.0)</td>
<td>2 (0.5)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>No partners</th>
<th>Only male partners</th>
<th>Only female partners</th>
<th>Male and female partners</th>
<th>$X^2$, p</th>
</tr>
</thead>
<tbody>
<tr>
<td>RDS</td>
<td>CPOL</td>
<td>VBS</td>
<td>RDS</td>
<td>CPOL</td>
</tr>
<tr>
<td>MSM+ MSF 30 days</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>32 (7.9)</td>
<td>42 (10.4)</td>
<td>41 (7.5)</td>
<td>289 (71.5)</td>
</tr>
</tbody>
</table>

RDS: Highest proportion of 1-3 female sexual partners in the last 30 days

CPOL: Highest proportion of 10+ male sexual partners in the last 30 days and only male concurrent sexual partners

VBS: Highest proportion of 1-3 male sexual partners in the last 30 days
What is the rate of condomless (unprotected sex) among the sample?

<table>
<thead>
<tr>
<th>Variable</th>
<th>Recruitment Method</th>
<th>RDS n=402 n (%)</th>
<th>CPOL n=400 n (%)</th>
<th>Venue-based n=546 n (%)</th>
<th>Overall N=1348 n (%)</th>
<th>X², p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unprotected Sex with a Man and a Woman Ever</td>
<td>Yes</td>
<td>377 (93.3)</td>
<td>158 (39.5)</td>
<td>233 (42.9)</td>
<td>768 (57.0)</td>
<td>X²=311.4, p=.000</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>27 (6.7)</td>
<td>242 (60.5)</td>
<td>310 (57.1)</td>
<td>579 (43.0)</td>
<td></td>
</tr>
<tr>
<td>Unprotected Anal Sex without a Condom Ever</td>
<td>Yes</td>
<td>308 (76.2)</td>
<td>334 (84.3)</td>
<td>409 (75.7)</td>
<td>1051 (78.4)</td>
<td>X²=11.6, p=.003</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>96 (23.8)</td>
<td>62 (15.7)</td>
<td>131 (24.3)</td>
<td>289 (21.6)</td>
<td></td>
</tr>
<tr>
<td>Unprotected Sex with a Casual Partner (man or woman) Ever</td>
<td>Yes</td>
<td>171 (42.9)</td>
<td>84 (40.2)</td>
<td>232 (44.5)</td>
<td>487 (43.1)</td>
<td>X²=1.2, p=.56</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>228 (57.1)</td>
<td>125 (59.8)</td>
<td>289 (55.5)</td>
<td>642 (56.9)</td>
<td></td>
</tr>
</tbody>
</table>

RDS: Highest proportion of unprotected sex with a **man and a woman** ever

CPOL: Highest proportion **unprotected anal sex** without a condom ever

VBS: Highest proportion unprotected sex with a **casual partner (man or woman)** ever
CONCLUSIONS

- Recruitment method affected nearly every variable assessed in this study.

- The varying rates of depression, sexual concurrency, and drug use, confirm that multiple recruitments should be utilized in order to gather a more representative sample of MSM.
  - RDS participants reported the highest rate of depression, intimate partner violence, and greatest proportion of male and female sexual partners in the last 30 days
  - CPOL participants reported the greatest quantity of drugs in the last 30 days and highest proportion of 10+ male sexual partners in the last 30 days and only male concurrent sexual partners
  - VBS reported the greatest use of stimulants and the highest proportion unprotected sex with a casual partner ever

- MSM and money boys in Shanghai are at risk of depression, violent relationships, risky sexual behavior, and substance abuse problems.
  - Because these risks still exist among this population, additional research and interventions are required in order to reduce these risks among the MSM population in Shanghai, China.
STRENGTHS AND LIMITATIONS

STRENGTHS

1. The utilization of multiple recruitment methods allowed for a more representative sample of MSM in Shanghai, China.
2. This is the first study to assess the existence of co-existing psychosocial variables among MSM and money boys in Shanghai.
3. This sample recruited a large sample size of both money boys and general MSM.

LIMITATIONS

1. This study relied on self-reported behaviors, which no doubt yielded some bias in the results.
2. This study was based upon data gathered in Shanghai, and the results do not apply to various MSM communities across China.
3. This study utilized purposive sampling. This sampling technique is prone to researcher bias and is not representative of the entire MSM population of China.
Implications for future research

• Future research of the health issues facing MSM and money boys should utilize multiple methods of recruitment in order to gather a more representative sample.

• Future studies should focus on the high rates of intimate partner violence, sexual concurrency, and drug use among MSM in Shanghai.
  • If a study were to be designed for the purpose of understanding the rate of psychosocial correlates, then we could have a greater understanding of the severity and associations between psychosocial health problems.

• Depression remains underreported in China, and mental illness is highly stigmatized in China. A study should be designed to understand the stigma behind depression among the MSM population in Shanghai.
REFERENCES


