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Research paper

A cross-sectional study of associations between casual partner, friend discrimination, social support and anxiety symptoms among Chinese transgender women ☆

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ABSTRACT

Anxiety symptoms are the prevalent mental disorders for transgender women. However, only a few studies are available pertaining to this problem among Chinese Transgender women. Chinese Transgender women are a vulnerable population which is exposed to discrimination and loss of social support due to their gender identity and transition. This study was conducted to estimate the prevalence and factors associated with anxiety symptoms among Chinese transgender women. A cross-sectional study was performed by convenience sampling. This comprised of 209 Chinese transgender women in Shenyang, China. The Zung Self-Rating Anxiety Scale (SAS) was used to assess anxiety symptoms for these transgender women. Hierarchical multiple regression analysis was performed to explore the associated factors of SAS. The prevalence of anxiety symptoms in Chinese transgender women was found to be 34.5%. Regression analyses indicated that SAS was associated with casual partnership, friend discrimination and social support in the final model. Sexual partnership and discrimination contributed the most to the model, R-square, accounting for 19.2% and 15.5% of the total variance respectively. Chinese transgender women showed considerably high level of anxiety symptoms. It was also found that they were exposed to significant transition challenges, such as high risk sexual partnership, excessive discrimination and a reduction in social support. Furthermore, anxiety symptoms was best predicted by the absence or presence of a casual partner, friend discrimination and social support rather than the disclosure of their gender identity, knowledge of HIV prevention and health service. Improvement of social

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support, reduction of friend discrimination and determination of the characteristics of risky sexual partnerships especially for the casual partner can help to attenuate anxiety symptoms and increase mental well-being for transgender women.

1. Introduction

Transgender women are particularly vulnerable to discrimination by the general population, lack access to health care services, and are exposed to numerous stressful situations in their daily life because of gender identity and expression (Theo et al., 2015). Transgender women's perceptions of discrimination, harassment and challenges not only push them to the margin of society, but also have a significantly negative effect on their mental health (Boyce et al., 2012; Baral et al., 2011). A report roughly estimated that there are about 400,000 transgender people in China (Gao et al., 2005). With the growing voice of the sexual minority and the increased advocating for personal rights since China's establishment of the opening-up policy in 1978 (see http://baike.baidu.com/view/48598.htm), Chinese transgender women tend to be the "new face" of sexual minority population (De Santis, 2009) and society has slowly and gradually recognized their presence. Shenyang is famous for the "Errenzhuan" performance popular in the northeast of China, in which men can conduct song-and-dance performances in feminine roles, thus promoting the recognition and acceptance of transgender women by the general population. Moreover, Chinese transgender women are likely to relocate from one city to another. Many of them from north of China would aggregate in Shenyang, which is located in the northeast of China, and then migrate to the metropolis like Beijing and Shanghai.

Transgender women in particular, are at high risk of developing mental disorders, especially from anxiety symptoms (Budge et al., 2013). Anxiety symptoms are the most prevalent mental disorders. The lifetime prevalence of anxiety disorder in the sex minority population such as MSM and transgender people are notably high, over 5 times higher than that of the general population (13.6–28.8%) (Kessler et al., 2005; Alonso etal., 2004). One previous study revealed that the US transgender population had a disproportionately high rate of anxiety (33.2%) (Bockting et al., 2013). While, the lifetime prevalence of anxiety disorder in transgender individuals ranged from 26% to 38% (Hepp et al., 2005; Mustanski et al., 2010).

Gender nonconformity is stressful and has a profound impact on transgender women's lives. This is often associated with elevated odds of stress, psychological diseases and the decline of personal welfare (Nemoto et al., 2011a, 2011b, 2005). The impacts of gender nonconformity and transition tend to be tremendous, leading to high susceptibility to anxiety symptoms. These symptoms, if left untreated, can become debilitating and are capable of affecting their psychological health, especially in developing countries, like China, where the health care services are lacking for transgender individuals (Jiang et al., 2014).

Owing to Chinese culture of Confucianism, transgender people are usually the hidden population. This results in the HIV treatment and the prevention of high risk sexual behavior being neglected by society. In Confucian philosophy, it is of vital importance to obey the rules of nature. The gender identity and sexual orientation adopted by the vast majority of the general population are deemed correct. Therefore, those who belong to the sexual minority and go against the rules of nature are isolated and discriminated against by society. This makes them reluctant to disclose their gender identity and expression to their family members and society because of intrusion of privacy and fear of discrimination which could lead to mental disorders. Furthermore, transgender women tend to live together with their peers, sharing similar experiences and sufferings, and making strong connections with those belonging to the same gender identity (Prado Cortez et al., 2011). The anxiety associated with the disclosure of their gender identity stems from fear of rejection from friends and family, as well as social discrimination. This stress may delay or prevent them from disclosing their gender identity and transition, and may consequently result in increased anxiety symptoms. This was in agreement with prior studies, which stated that the disclosure of the gender identity was enormously stressful, and was correlated with social discrimination, family and peer rejection and distress (Peitzmeier et al., 2015). For transgender women, anxiety symptoms are of particular concern in light of the mental health and psychological vulnerability. A large amount of research revealed that anxiety symptoms could contribute to risky sexual behaviors in vulnerable populations in western countries, including men who have sex with men (MSM) (Golub et al., 2010). Additionally, a history of commercial sex was also associated with distress (Hoffman, 2014; Reisner et al., 2009). Similar findings have been observed in developing countries. However, there is a scarcity of research about Chinese transgender women.

The Meyer's minority stress model has been widely used to illustrate the factors that are correlated with distress in transgender women (Meyer, 2003). According to this stress model, discrimination and violence are associated with distress among transgender women. Individuals who are looked down upon by society are more likely to be discriminated against, which can result in low self-esteem, non-disclosure of his/her stigmatized status, and desire to keep his/her status hidden (Meyer, 2003; Hendricks and Testa, 2012). Meanwhile, minority stressors have deleterious effects on psychological coping resources and result in mental disorders, such as anxiety and depressive symptoms. The stress model (Meyer, 2003) also points out that the factors associated with distress can be conceptualized as proximal and distal factors. The distal factors include gender-related discrimination and insults. Proximal factors include sociodemiographic characteristics, social support and non-disclosure of their gender identity. Gender-based discrimination, financial need and non-disclosure of their gender identity may lead to these individuals resorting to commercial sex work and extremely risky behaviors. These are associated with high HIV acquisition rates (Brennan et al., 2012), further contributing to anxiety problems. Previous literatures have demonstrated that sexual partnerships are related to distress (Gamarel et al., 2014a, 2014b). Specifically, having a casual partner is shown to be a predictor of distress (Yang et al., 2015). There is more agreement that anxiety symptoms are correlated with lack of health care services and social support (Nemoto et al., 2011a, 2011b). Despite the urgent need of health care to address the concerns facing transgender persons, many of the needed services are not available either because of lack of resources or because of stigma and discrimination (Grant et al., 2011).

Social support was also found to be negatively associated with distress in transgender women. A large body of research has found high associations between social support and distress among transgender individuals (Budge et al., 2013; Hoffman, 2014; Simons et al., 2013; Budge et al., 2012). Social support (Cohen, 2004)

is the perception and actuality of the provision of resources from others that are beneficial to the recipient and is part of a supportive social network. Previous study revealed that social support was associated with increased psychological well-being in response to important life events (Cobb, 1976). Social support may play a positive role in attenuating anxiety symptoms (Liu et al., 2013; Casale et al., 2014), and could combat the adverse effect of gender transition on anxiety. Thus, social support, widely used to prevent and treat mental health problems, can promote psychological adjustment in conditions with chronic high stress like discrimination and HIV (Turner-Cobb et al., 2002).

In spite of awareness and access to health care services, opportunities to address specific health needs for transgender women are very limited. Improving the psychological well-being of transgender women is imperative in the care and support of people who are at risk of HIV/AIDS. Surprisingly, there are no reported studies concerning anxiety symptoms in Chinese transgender population, although there has been a dramatic rise of the sexual minority in the past three decades in China. This study, therefore, is aimed at assessing the prevalence of anxiety symptoms among Chinese transgender women and exploring the associated factors. It is hoped that the findings will enable policymakers and health care providers to deliver necessary health services and more social support to improve the mental functioning and well-being of transgender women who are in need of care.

2. Methods

2.1. Participants and procedure

This study was performed in Shenyang between January 2014 and July 2014, with a cross-sectional study design using convenience sampling. Eligible subjects were at least 18 years old, resided in Shenyang for the most recent 3 months and believed that the male biological sex assigned at the individual's birth was in conflict with the gender identity as a transgender woman. Those who were unlikely to participate in the survey and unable to communicate in Chinese were excluded. This study was implemented in collaboration with the local Non-Governmental Organization (NGO) working for sexual health, human rights and well-being of the transgender women. The participants were recruited through organizations within communities, community outreach, grassroots support groups, and personal referrals by other transgender individuals. A total of 209 Chinese transgender women were recruited in this study.

2.2. Ethics statement

All the respondents completed written informed consents before the study. The respondents could voluntarily choose to use a nickname, a pseudonym or to remain anonymous to sign their names. The eligible participants were well informed about the study background and purpose, screened, and interviewed by trained surveyors. Interviews lasted for approximately 20–30 min at the project office or at a convenient location that provided privacy. Face-to-face interviews were adopted in order to enhance the response rate. A gift card, worth 50 Yuan and a box of condoms were given to the respondents to compensate them for their time and effort. This study was supported by the National Natural Science of Foundation of China. The procedures followed were in accordance with and approved by the ethical standards of the Committee on Human Experimentation of China Medical University.

2.3. Measure

2.3.1. Assessment of anxiety symptoms

The Zung Self-Rating Anxiety Scale (SAS) (Zung, 1971) was used to assess anxiety symptoms in the present study. This SAS scale is composed of 20 items with 4 possible responses: (1) never, (2) rarely/sometimes, (3) frequently and (4) always. Each item was scored from 1 to 4 according to severity of anxiety disorder. The raw score was standardized according to the formula: standard score=int (1.25*raw score). A higher score indicated more serious anxiety disorder. According to the Chinese norm, when a score exceeded 50, it was determined that the person suffered from anxiety symptoms (Xu and Wei, 2013).

2.3.2. Sociodemographic characteristics

Sociodemographic characteristics included age, marital status (married/others, which included either unmarried/widowed/divorced/separated), level of education, monthly income, sexual orientation (homosexual/others, which included bisexual/heterosexual/not sure), period of living as a transgender woman and transition status. Level of education was categorized as '$\leq$junior middle school', 'senior middle school' or '$\geq$college'. Monthly income (dollars) was divided into groups of '$<$485', '485–806', and '$\geq$807'. Transition status was assessed by the question: 'whether or not you have the following presentations, feminine dress during daytime (yes/no), facial feminization survey (yes/no), breast augmentation surgery (yes/no), hormone use (yes/no) and genital sex-reassignment surgery (yes/no)'.

2.3.3. Sexual partnership

Sexual partnership was based on if the individual had regular partners or casual partners, or was selling/buying sexual services. Transgender women who had a regular partner in the most recent month were placed in the 'regular partners' category. Transgender women who had a casual partner, excluding those in commercial sex, in the past month, were placed in the 'casual partners' category. 'Selling sex' was taken as 'yes' if the survey participant had, during the past month, sold commercial sexual services. If the survey participant, in the last six months, had paid for commercial sexual services, then 'buying sex' was defined as 'yes'.

2.3.4. Discrimination and being chased or insulted by law enforcement officials

Discrimination was assessed using the three questions: (1) 'How serious is the discrimination from your family for being a transgender woman?', (2) 'How serious is the discrimination from your friends for being a transgender woman?', and (3) 'How serious is the discrimination from society for being a transgender woman?' The choices of the responses for each experience included (1) very serious/somewhat serious, (2) not sure, and (3) no discrimination at all. Being chased or insulted by law enforcement officials was assessed through the question: 'whether or not you have experienced being chased or insulted by law enforcement officials?', to which a respondent could choose between "yes" or "no".

2.3.5. Disclosure of gender identity

Disclosure of gender identity was assessed based on two questions: (1) 'Do your family members know that you are a transgender woman?' The choices of the responses were "yes"/"not sure"/"no" (2) 'How many of your friends know that you are a transgender woman?' The choices of the responses were "none"/"a few"/"majority"/"all".

2.3.6. Knowledge of HIV prevention and health service

Knowledge of HIV prevention and health service included

having consulted a psychological doctor, knowledge of HIV prevention, medical support and care. Having consulted psychological doctor was assessed through the question: 'whether or not you have consulted psychological doctor about your gender identity?', to which a respondent could choose between "yes" or "no". Knowledge of HIV prevention, medical support and care were found by the sum score of the United Nations General Assembly Special Session (UNGASS) indicators (Ochako et al., 2011).

2.3.7. Perceived social support

Perceived social support was measured by the Multidimensional Scale of Perceived Social Support (MSPSS) (Zimet et al., 1988), which included 12 items. All the items were rated on a scale from 1 to 7. A total mean score was calculated, with higher scores indicating greater perceived support. This scale has been widely used in China (Jiang, 2001). The Cronbach's alpha in this study was 0.935, indicating good reliability.

2.4. Data analysis

T-tests and one-way analysis of variance (ANOVA) were used to depict the distributions of SAS scores among different categorical variables. Pearson's correlation was performed to assess the correlations between the SAS scores and continuous variables. All the continuous variables were standardized in order to avoid multicollinearity (Preacher and Hayes, 2008) before performing the regression analysis. Hierarchical multiple regression (HMR) analysis was conducted to test the incremental variance by a set of independent variables. The SAS scores were used as dependent variables, and the independent variables were entered in the following steps: Step 1: sociodemographic characteristics of the transgender women; Step 2: sexual partnership; Step 3: discrimination and being chased or insulted by law enforcement officials; Step 4: disclosure of gender identity; Step 5: knowledge of HIV prevention and health service and Step 6: social support. Standardized parameter estimates (the standardized β) were used to make comparisons of the magnitudes of the associations across independent variables. The fit of the model was assessed with the R^2 value. The Statistical Package for Social Science Version 17.0 was performed to conduct statistical analyses, and a two-tailed probability value of less than 0.05 was considered to indicate statistical significance.

3. Results

Table 1 presents the baseline characteristics of the participants. Two hundred participants returned valid questionnaires in this study, resulting in the valid response rate of 95.69%. About 131 (62.68%) participants dressed in a feminine manner during the daytime, 37 (17.70%) participants used hormones, and 43 (20.57%) participants had a history of breast augmentation surgery. The age of the transgender women ranged from 18 to 45 years old (Mean=26.64, SD=4.32). The mean period of living as a transgender woman was 3.60 years (SD=2.64, ranging from 1 to 20 years). Overall, the majority of the transgender women (74.50%) had regular partners, and more than half (57.50%) of them had casual partners in the previous month. However, less than half (42.50%) of the participants had not engaged in commercial selling of sex in the past month. The percentage of the transgender women who had bought sex in the past six months accounted for 17.00%. Most transgender women had experienced discrimination from family and society (70.50% and 75.00%), and less than one third (30.50%) of the transgender women had experienced discrimination from friends.

In this study, 34.5% of transgender women suffered from

Table 1
The univariate analysis of factors related to SAS (N=200).

Variables	N	%	SAS
Age			
< 25	70	35.00	45.43 ± 10.65
25–29	88	44.00	42.83 ± 10.57
≥ 30	42	21.00	45.76 ± 12.38
Education level			
≤ Junior middle school	47	23.50	44.64 ± 13.28
Senior middle school	100	50.00	43.37 ± 10.25
≥ Colleague	51	25.50	46.22 ± 10.34
Missing values	2	1.00	
Marital status			
Married	184	92.00	44.01 ± 11.10
Others	16	8.00	48.32 ± 9.53
Monthly income (dollar)			
< 485(< 3000 Yuan)	71	35.50	46.89 ± 11.42**
485–806(3000–5000 Yuan)	80	40.00	41.76 ± 10.49
≥ 807(≥ 5001 Yuan)	49	24.50	44.92 ± 10.56
Shenyang permanent resident (Hukou)			
Yes	105	52.50	42.16 ± 10.67
No	94	47.00	46.73 ± 11.01**
Missing values	1	0.50	
Sexual orientation			
Homosexual	156	78.00	44.44 ± 11.42
Bisexual/heterosexual/not sure	40	20.00	44.31 ± 9.50
Missing values	4	2.00	
Regular partner			
Yes	149	74.50	46.12 ± 10.79**
No	49	24.50	39.27 ± 10.25
Missing values	2	1.00	
Casual partner			
Yes	115	57.50	47.36 ± 10.66**
No	74	37.00	39.03 ± 9.44
Missing values	11	5.50	
Selling sex			
Yes	115	57.50	44.29 ± 11.11
No	85	42.50	44.44 ± 10.98
Buying sex			
Yes	34	17.00	49.96 ± 11.52**
No	142	71.00	41.96 ± 10.23
Missing values	24	12.00	
Family discrimination			
Yes	141	70.50	43.95 ± 10.86
Not sure	41	20.50	44.21 ± 12.02
No	15	7.50	48.37 ± 10.27
Missing values	3	1.50	
Friend discrimination			
Yes	61	30.50	45.31 ± 11.16*
Not sure	97	48.50	45.39 ± 10.63*
No	38	19.00	39.90 ± 11.31
Missing values	4	2.00	
Social discrimination			
Yes	150	75.00	44.01 ± 10.74
Not sure	38	19.00	44.45 ± 12.14
No	9	4.50	49.39 ± 11.81
Missing values	3	1.50	

Table 1 (*continued*)

Variables	N	%	SAS
Being chased or insulted by law enforcement officials			
Yes	171	85.50	50.09 ± 9.81**
No	28	14.00	43.43 ± 10.99
Missing values	1	0.50	
Disclosure to friends			
None	37	18.50	47.64 ± 11.78*
Few	85	42.50	44.98 ± 10.88
Most	33	16.50	39.72 ± 9.98
All	26	13.00	42.22 ± 12.12
Missing values	19	9.50	
Disclosure to family members			
Known	42	21.00	43.56 ± 10.37
Possibly know	56	28.00	45.31 ± 11.00
Unknown	99	49.50	44.41 ± 11.34
Missing values	3	1.50	
Having consulted psychological doctor			
Yes	19	9.50	50.66 ± 11.42**
No	181	90.50	43.69 ± 10.80

* Significant at the 0.05 level (two-tailed).
** Significant at the 0.05 level (two-tailed).

anxiety symptoms (SAS score higher than 50). The participants' characteristics and the mean scores of anxiety symptoms based on the sociodemographic characteristics are shown in Table 1. Transgender women with monthly income less than 485 dollars exerted higher SAS scores than other corresponding groups. Transgender women who were not permanent residents of Shenyang reported significantly higher SAS scores (Mean ± SD: 46.73 ± 11.01) than transgender women who were permanent resident (Mean ± SD: 42.16 ± 10.67) ($P < 0.01$). Transgender women who had a regular or casual partner exerted significantly higher SAS scores (Mean ± SD: 46.12 ± 10.79, 39.27 ± 10.25) than those without a regular or casual partner (Mean ± SD: 47.36 ± 10.66, 39.03 ± 9.44) ($P < 0.01$). Transgender women who reported never experiencing discrimination from friends had much lower levels of anxiety symptoms than transgender women who had experienced discrimination from friends or those who were not sure ($P < 0.05$). Those who had experienced being chased or insulted by law enforcement officials suffered higher anxiety symptoms than those without that experience ($P < 0.01$). Transgender women with friends who were ignorant of their gender identity suffered higher levels of anxiety symptoms than the corresponding groups ($P < 0.05$). In addition, transgender women who had consulted psychological doctor about their gender identity suffered higher levels of anxiety symptoms than those who had not. However, differences in sex orientation, transition status, selling sex, or experienced family discrimination and social discrimination, and disclosure of gender identity to family members were not statistically significant.

The results of the analyses for correlations between SAS scores and continuous variables are presented in Table 2. Social support was negatively and significantly correlated with SAS scores ($P < 0.01$). Age and the period of living as a transgender woman were not correlated with SAS scores ($P > 0.05$).

The results of the hierarchical multiple regression models for clarifying the predictors of SAS are provided in Table 3. Except for demographic characteristics and disclosure of gender identity as well as knowledge of HIV prevention and health service (P values for all variables of blocks 1, 4 and 5 were not higher than 0.05), sexual partnership, discrimination and being chased or insulted by

Table 2
Correlation of SAS and related factors.

	M	SD	1	2	3	4
SAS	44.35	11.03	1			
Age	26.64	4.32	0.057	1		
Period of living as a transgender women	3.60	2.64	0.087	0.364**	1	
Social support	59.06	15.11	−0.305**	−0.115	0.421**	1

** Significant at the 0.05 level (two-tailed).

law enforcement officials and social support contributed significantly to the variance in anxiety symptoms. The final regression model explained a total of 39.3% of the variance. The R^2 changes indicated that the incremental variance explained by each block of variables was 7.8%, 19.9%, 15.5% 2.3%, 2.0% and 2.0%. This was contributed to by the sociodemographic characteristics of transgender women, sexual partnership, discrimination and being chased or insulted by law enforcement officials, disclosure of gender identity, knowledge of HIV prevention and health service and social support, respectively. This study also indicated that sexual partnership, discrimination and being chased or insulted by law enforcement officials contributed most to the variance of SAS scores. In the final model of the HMR, the predictors of anxiety symptoms included whether the women had a casual partner, experienced friend discrimination and the extent of social support. In model 5, being chased or insulted by law enforcement officials was also negatively associated with SAS scores.

4. Discussion

There is a dearth of research highlighting the factors related to anxiety symptoms among transgender women, however, very little is known in China. This study may provide an implication of how sexual minority people like transgender women in China are exposed to transition-related discrimination and high risk sexual partnership that place them at risk for negative mental health outcomes. The results of this study indicated that a large number (34.5%) of transgender women in China suffer from anxiety symptoms. This number is almost the same as that of US transgender population (33.2%) (Bockting et al., 2013), but much higher than the general population (ranging from 13.6% to 28.8%) (Kessler et al., 2005; Alonso et al., 2004). This result, in line with prior studies, revealed that nearly one third of transgender women experienced anxiety disorder during their lifetime (Hepp et al., 2005; Mustanski et al., 2010). However, the rate of anxiety symptoms in this study was much lower than that of the recent study conducted among American transgender women (40.4%) and transgender men (47.5%) (Budge et al., 2013). Overall, Chinese transgender women are particularly vulnerable to anxiety symptoms. Future efforts concerning anxiety symptoms among transgender women are therefore greatly warranted to better understand mental health concerns of these sex minority populations. This finding also suggested that increasing social support will be of more benefit in attenuating the prevalence of anxiety symptoms. In the final hierarchical regression model, casual partner, friend discrimination and social support were all highly associated with anxiety symptoms, which was indicated by a relatively high standardized β. Sexual partnership and discrimination played the most important parts in explaining extents of anxiety symptoms, accounting for 19.9% and 15.5% of the total variance respectively. Notably, casual partner and friend discrimination were significantly robust predictors of anxiety symptoms, whereas, social support played a positive role in alleviating the prevalence of

Table 3
The hierarchical multiple regression models of SAS.

Variables	SAS					
	Model 1 (Beta)	Model 2 (Beta)	Model 3 (Beta)	Model 4 (Beta)	Model 5 (Beta)	Model 6 (Beta)
Block 1 demographic characteristics						
Age	−0.018	0.002	−0.030	−0.058	−0.050	−0.072
Monthly income	−0.112	−0.024	−0.008	0.007	0.008	−0.011
Senior middle school vs. ≤ Junior middle school	0.019	−0.084	−0.091	−0.085	−0.091	−0.034
≥ Colleague vs. ≤ junior middle school	−0.072	−0.087	−0.065	−0.065	−0.026	−0.004
Marital status	0.082	0.050	0.050	0.059	0.053	0.059
Shenyang permanent resident (Hukou)	0.169	0.047	0.024	0.031	0.003	−0.026
Sexual orientation	−0.012	0.073	0.046	0.039	0.026	0.019
Period of living as a transgender woman	0.078	0.057	0.054	0.060	0.055	0.040
Transition status	0.069	0.037	0.027	0.042	0.023	−0.011
Block 2 sexual partnership						
Regular partner in last month (yes vs. no)		−0.148	−0.171*	−0.172*	−0.176*	−0.150
Casual partner in last month (yes vs. no)		−0.329**	−0.311**	−0.310**	−0.286**	−0.237*
Selling sex in last month (yes vs. no)		0.079	0.112	0.130	0.123	0.090
Buying sex in last six month (yes vs. no)		−0.210*	−0.145	−0.145	−0.134	−0.143
Block 3 discrimination and being chased or insulted by law enforcement officials						
Family discrimination			0.068	0.101	0.076	0.080
Friend discrimination			−0.150	−0.198*	−0.200*	−0.178*
Social discrimination			0.034	0.055	0.052	−0.002
Being chased or insulted by law enforcement officials			0.182*	0.193*	0.192*	0.139
Block 4 disclosure of gender identity						
Disclosure to friends				0.065	0.069	0.074
Disclosure to family members				0.125	0.143	0.106
Block 5 knowledge of HIV prevention and health service						
Having consulted psychological doctor					−0.110	−0.114
Knowledge of HIV prevention					−0.091	−0.110
Medical support and Care					−0.057	−0.122
Block 6 social support						−0.232*
R^2	0.078	0.277	0.324	0.338	0.359	0.393
ΔR^2	0.078	0.199	0.155	0.023	0.020	0.020

* Significant at the 0.05 level (two-tailed).
** Significant at the 0.05 level (two-tailed).

anxiety symptoms.

In this study, we found that anxiety symptoms were highly associated with having a casual partner. Transgender women with a casual partner reported higher levels of anxiety symptoms. Having a casual partner may increase the chance of exposure to HIV and is also a source of other transmitted diseases, because those transgender women would be more likely to engage in unprotected anal intercourse (UAI). This was in agreement with prior studies which revealed that casual partnerships had consistently been the type in which transgender women engage in high risk behaviors (Wilson et al., 2010). In addition, the HIV serostatus of casual partners is always unknown for transgender women, which presents potential risk for HIV acquisition. Transgender women are often marginalized by their friends. The high levels of anxiety symptoms among those with casual partners could also result from low support from those casual partners and their limited knowledge of HIV prevention. These women would be reluctant to discuss the knowledge of HIV prevention and their HIV status with casual partners, thus being more susceptible to unprotected sexual behaviors. Casual male partner is a possible source of gender validation for transgender women, which could undermine their intention to engage in protected sex behaviors.

Importantly, we found that, friend discrimination was significantly associated with anxiety symptoms. In light of the minority model, stressors may stem from discrimination, which could compromise the minority individuals coping capabilities and resources, resulting in distress (Gamarel et al., 2014a, 2014b). In this study, only 19% of the transgender women reported that they had not experienced friend discrimination. A large number of studies show that transgender individuals are more likely to perceive the discrimination than gay men, lesbians, and bisexuals (Balsam et al., 2011). The association between discrimination and anxiety has been well documented and confirmed to be strong among transgender women, which was consistent with previous study reporting that there was a positive relationship between discrimination and declining mental health such as anxiety symptoms (Nemoto et al., 2011a, 2011b; Bonomi et al., 2009). Specifically, most transgender women in China are likely to be exposed to excessive friend discrimination. This is because of the traditional views on sex orientation that pervade societies, and hence could exacerbate anxiety symptoms. They are scared of the views from their friends concerning their gender identity, and rarely accepted by their friends with the gender-normative models. As minority stress model, individuals who belong to gender minorities may suffer from more anxiety symptoms due to experiences of discrimination and rejection by their friends (Meyer, 2003). Recent research suggests that discrimination may help to explain transgender women's elevated levels of distress (Bazargan et al., 2012). As a result, they need to hide their gender transition life from friends, which restricts the possibilities of receiving medical services and results in engaging in unprotected sex behaviors. In addition, transgender women in the community are more likely to connect with their friends or peers, from whom they gain support, since they had negative encounters and were rejected by other friends, leading to the prevalence of anxiety symptoms. Thus, friend discrimination in particular, may confer greater vulnerability to distress, and have deleterious impacts on their mental health.

Specifically, being chased or insulted by law enforcement officials was also a significant predictor of anxiety symptoms in the model 5. In China, transgender women involved in prostitution are often exposed to insults or violence by law enforcement officials.

This adds to the susceptibility to anxiety symptoms. This is also consistent with previous studies which revealed that transgender women who had sold sex would experience police harassment, exploitation, arrest and violence in many countries (Poteat et al., 2015). One possible explanation is that cross dressing or impersonation of another sex are prohibited by Chinese laws, thus they often face more insults from law enforcement officials. Furthermore, the gender-transition legal identification cannot be obtained in China, unless the transition surgery has been conducted by the transgender individuals.

In addition, the extent of the anxiety symptoms did not rely solely on discrimination and high risky sexual partnership, but largely on social support that the individuals received as shown in this study. Social support was a consistent and robust predictor of anxiety symptoms, and it could ameliorate symptoms of anxiety symptoms. This was in agreement with the review indicating that social support seemed to reduce the risk of anxiety symptoms in transgender women (Budge et al., 2013; Pinto et al., 2008). While, less social support was associated with an increased vulnerability to mental health problems, especially for anxiety symptoms. A discrepancy of perceived social support was found among transgender women because of gender identity and transition. The scarcity of social support seemed to be especially serious for Chinese transgender women. In contrast, transgender individuals with more social support, who could receive assistance and resources to cope with the stress of their gender identity, in awkward situations, tend to positively respond to the life events and smoothness of gender transition (Budge et al., 2012). This also helped in attenuating the symptoms of anxiety. However, social support from family members, friends and society that the transgender individuals could take advantage of, are usually scarce, as consistent with Factor and Rothblum's study (Factor and Rothblum, 2007). Thus, social support may play an extremely important role in the adaptation to major life events such as the transition from male to female, by enabling them to attain their new gender role. Future intervention highlights the importance of social support in decreasing anxiety symptoms for transgender individuals.

Two limitations of the present study have to be acknowledged. First, this study is a cross-sectional research, resulting in the fact that one cannot derive conclusions about the causality of the associations observed between gender nonconformity and anxiety symptoms. Second, the convenience sampling method was used, which might limit the generalizability of this study to other populations. However, this study has notable strength despite the limitations. This study is the first to assess the anxiety symptoms among Chinese transgender women. Also, the face-to-face interviews used in this study, which facilitated the collection of information, resulted in a high response rate of the participants.

5. Conclusion

High levels of anxiety symptoms were reported by Chinese transgender women. Anxiety symptoms were best explained by whether transgender women have a casual partner, friend discrimination and social support rather than by the sociodemographic characteristics or disclosure of gender identity, knowledge of HIV prevention and medical care. Future efforts on reduction of anxiety symptoms of transgender women should target at eliminating friend discrimination and determining risky casual partners to prevent the prevalence of anxiety symptoms, as well as facilitating and improving social support to attenuate the effects of gender identity and transition on anxiety symptoms.

Declaration of interest

None.

Authors' contributions

Xiaoshi Yang contributed to the design and data collection, statistical analysis, and drafting and revision of the manuscript and was responsible for the development and design of the survey. Lie Wang contributed to the design and analysis of the data. Yuan Gu, Wei Song, Jinling Zhou and Qun Zhang contributed to the interpretation and collection of the data. Chun Hao contributed to the design and statistical analysis. Qun Zhao contributed to the design of the study. All authors read and approved the final manuscript.

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