

Relationship Between Sexual Compulsivity and Sexual Risk Behaviors Among Chinese Sexually Active Males

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Abstract Compulsivity is defined as “an insistent, repetitive, intrusive, and unwanted urge to perform specific acts often in ritualized or routinized fashions.” Sexual compulsivity has been shown to be associated with some high risk sexual behaviors related to HIV and sexually transmitted infection (STI). In some Western countries, the 10-item Sexual Compulsivity Scale (SCS) has been developed to assess people’s sexual compulsivity but no Chinese version has been validated. This study validated the Chinese version of the SCS and investigated its associations with specific sexual behaviors. In 2008, a random telephone survey was conducted in the sexually active male general population in Hong Kong, interviewing 1,048 participants. The Chinese version of the SCS was found to be internally consistent (Cronbach’s $\alpha = 0.88$ for the overall scale), with a mean total score of 20.7 (SD = 4.7). An exploratory factor analysis

procedure extracted two factors that were named Controllability and Functional Consequences. Higher SCS scores were associated with multiple female sexual partnerships in the last 6 months, having had sex with either non-regular partner(s) or female sex worker(s) in the last 6 months, having contracted STI in the last 6 months, and inconsistent condom use with either non-regular partner(s) or female sex worker(s) in the last 6 months. The scale can be used to assess sexual compulsivity among sexually active Chinese men in Hong Kong. It can potentially be used in other Chinese communities. Further confirmatory studies are warranted.

Keywords Sexual compulsivity · Risk behavior · HIV · Sexually transmitted infection

Introduction

Compulsivity is defined as “an insistent, repetitive, intrusive, and unwanted urge to perform specific acts often in ritualized or routinized fashions” (Kalichman & Rompa, 1995). Among the several instruments which have been developed to assess the level of sexual compulsivity (Coleman, Miner, Ohlerking, & Raymond, 2001; Kalichman et al., 1994), the 10-item Sexual Compulsivity Scale (SCS) (Kalichman et al., 1994; Kalichman & Rompa, 1995) has been most widely used (Benotsch, Kalichman, & Kelly, 1999; Benotsch, Kalichman, & Pinkerton, 2001; Dodge, Reece, Cole, & Sandfort, 2004; Grov, Parsons, & Bimbi, 2010; Kalichman et al., 1994; Kalichman & Rompa, 1995, 2001; O’Leary et al., 2005; Schnarrs et al., 2010; Semple, Zians, Grant, & Patterson, 2006). The tool was originally developed in a study targeting men who have sex with men (MSM), reporting a Cronbach’s α of 0.89 (Kalichman et al., 1994); another study used it in a survey targeting male and female patients attending a

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sexually transmitted infection (STI) clinic. Its exploratory factor analysis (EFA) identified two factors: Social Disruption and Personal Discomfort (Kalichman & Cain, 2004). Furthermore, it had been translated into Spanish (Kalichman, Greenberg, & Abel, 1997).

The SCS has been applied to a number of HIV-related studies. Higher scores have been found to be associated with multiple sexual partnerships (Benotsch et al., 1999, 2001; Kalichman et al., 1994; Kalichman & Rompa, 2001; Schnarrs et al., 2010; Semple et al., 2006), unprotected sex (Benotsch et al., 1999, 2001; Dodge et al., 2004; Kalichman et al., 1994; Kalichman & Rompa, 2001; Schnarrs et al., 2010; Semple et al., 2006), self-reported STI (Benotsch et al., 1999; Kalichman & Rompa, 2001), substance use (Kalichman et al., 1994; Kalichman & Rompa, 1995; Semple et al., 2006), sexual sensation seeking (Kalichman et al., 1994; Kalichman & Rompa, 1995; Schnarrs et al., 2010; Semple et al., 2006), and perceived self-efficacy on condom use (O’Leary et al., 2005; Semple et al., 2006). It can hence be used to understand a wide range of sexual behaviors. The aforementioned studies, however, mainly targeted MSM (Benotsch et al., 1999; Grov et al., 2010; Kalichman et al., 1994; Kalichman & Rompa, 1995; Kelly et al., 2009; O’Leary et al., 2005; Schnarrs et al., 2010) and people living with HIV (Benotsch et al., 1999; Kalichman & Rompa, 2001). There is a dearth of data obtained from the male general population (Kalichman & Rompa, 1995).

Overall, the Chinese culture is sexually conservative. There are substantial differences between Western and Chinese populations in terms of attitudes influencing sexual behaviors that have potential impacts on the social construction of concepts related to sexual compulsivity. For instance, the norms and social meanings about number of partners, frequency of sexual intercourse, multiple sex partnerships, sexual negotiation, direct expression of sexual needs, gender power and submissiveness, and acceptance of casual sex or one-night stand, are all culturally dependent. These concepts may affect validation of the SCS. For instance, the scale includes items such as “My sexual appetite has gotten in the way of my relationships” and “I have to struggle to control my sexual thoughts and behaviors” and “It has been difficult for me to find sex partners who desire having sex as much as I want to” are cultural relevant. In Chinese culture, spouses and sex partners seldom discuss about their sexual needs and it is culturally inappropriate for women to express their sexually need so it is hard to assess sexual need of the female sexual partner, or whether the sexual appetite of a man is a factor affecting the quality of the relationship. Furthermore, Chinese are trained to exercise good self-control so the internal struggle when trying to exercise self-control over sexual desire may be different from that of Westerners. It is unknown whether such and other cultural differences would potentially affect psychometric

properties of the Chinese version of the SCS. It is hence necessary to validate the Chinese version of SCS before it can be used in Chinese populations. We therefore investigated whether a different factor structure would be identified.

It is warranted to investigate whether the concept of sexual compulsivity is applicable to explain sexual behaviors in Chinese populations. It is also important to investigate the impact of sexual compulsivity onto various health and social issues, such as condom use, STI, sexual dysfunction, sexual satisfaction, partner communication, and partner relationships. The absence of validated instruments is an obstacle hindering development of research on sexual compulsivity and its impacts in Chinese populations. This study translated the SCS into Chinese and investigated its psychometric properties and associations with specific sexual behaviors in the sexually active Hong Kong Chinese male general population.

Method

Participants

The inclusion criteria of this study were: heterosexual Hong Kong Chinese males, being 18–60 years old, and being sexually active (having had at least one female sexual partner in the last 6 months). The survey was one of the behavioral surveillance studies (BSS) series, which have been designed specifically to monitor changes in HIV-related sexual risk behaviors (e.g., inconsistent condom use with female sex workers) in the general male population in Hong Kong on a regular basis. Behavioral surveillance has been recommended by the World Health Organization as a part of the second generation HIV surveillance system (WHO/UNAIDS, 2000). BSS are cross-sectional in nature. Identical questionnaires and methodology were used to maximize comparability and to identify trends. A few studies have been published, based on the results of some of these BSS conducted in Hong Kong (e.g., Lau & Siah, 2001; Lau & Tsui, 2003). A series of eleven such BSS had been conducted in Hong Kong by our research center from the years 1998 to 2013. In 2008, some questions about SCS had been added to that round of the survey.

This study was one of the few random population-based surveys investigating topics on sexual behaviors in Chinese male general populations. The same survey methodology has been applied to many territory-wide studies conducted in Hong Kong (Lau, Kim, & Tsui, 2008; Lau et al., 2009; Lee, Ma, & Tsang, 2011; Leung et al., 2010). Up-to-date residential telephone directories were used as the sampling frame; a random sample of telephone numbers (random page, column and row) was selected. A male household member of age 18–60 years old, whose birthday was closest to the survey date, was invited to participate in the study.

The survey consisted of two parts. With informed consent, the well-trained interviewers asked some less sensitive questions in the first part to establish rapport. The interviewers then informed the participants that the second part would include some sensitive questions related to HIV, and that they would only need to key in their corresponding response categories according to the questions asked that were pre-recorded in a computerized phone-interview system. The interviewers then transferred the participant to the automated system and left the line. Previous studies showed that this combined interview-computer-assisted telephone survey system was able to reduce social desirability bias (Lau, Thomas, & Liu, 2000) and the system has been used in a number of published studies (Lau, Kim, Lau, & Tsui, 2004; Lau, Siah, & Tsui, 2002; Lau, Tang, & Tsui, 2003; Lau & Tsui, 2003). Participants were guaranteed that their phone number and personal information would be kept confidential. A total of 1,048 eligible participants completed the telephone interview. The response rate of the survey, defined by the number of completed questionnaires divided by the number of eligible prospective participants being invited to join the study, was 51.9 %.

Measures

The 10 items of the original SCS are shown in Table 2. Four-point Likert-type scales ranging from 1 (strongly disagree) to 4 (strongly agree) were used for rating responses. The scores range from 10 to 40, with higher scores indicating higher degree of compulsivity. The scale items were translated into Chinese and back-translated into English by the authors.

Information about sociodemographic characteristics and self-reported STI history in the last 6 months (yes and no) was collected. In addition, participants were asked about their sexual behaviors in the last 6 months, including the number of female sex partners in the last 6 months (coded as having multiple sex partners if response was greater than one), whether having had sexual intercourse (yes and no) with regular sex partner(s), and with either non-regular sex partner(s) or female sex worker(s). Participants were told that regular sex partners were defined as either the spouse or stable girlfriends; non-regular sex partners were defined as those who were neither regular sex partners, nor female sex workers. Female sex workers are commonly understood as those exchanging money for sex. Similar operational definitions have been used in some studies on sexual activities (Jin et al., 2010; Li et al., 2011; Lau, Tsui, Cheng, & Pang, 2010). Male sex partners were not included in this study as the prevalence of men having male sex partners in the last 6 months in Hong Kong was less than 3 % (Lau et al., 2004); the sample size of this group would hence be very small. Among those with the specific type(s) of sex partner, participants were asked further

about frequency of condom use during sexual intercourse with such sex partners (four response categories: never, seldom, often and every time). A binary variable of every time (consistent use) use versus the rest (inconsistent use) was recoded. Such questions and recoding has been commonly used in published studies (Gu et al., 2013; Yan, Lau, Tsui, Gu, & Wang, 2012).

Statistical Analysis

Cronbach's α was used to assess internal reliability. Item analysis was performed by computing the corrected item-to-total correlation coefficients for the overall scale and the subscales. EFA was performed using the principal components method with varimax rotation. The approach has been used in other validation studies (March, Parker, Sullivan, Stallings, & Conners, 1997; Myers, Stein, & Aarons, 2002). It was chosen for data analysis as the aforementioned cultural differences in practice and meanings may result in a different factor structure. Between-group and within-group differences were compared respectively by *t* test and ANOVA. The associations between SCS and sexual behaviors were investigated by using univariate and adjusted odds ratios (AOR) and their respective 95 % confidence intervals (CI). In addition, multiple logistic regression models were fit, adjusting for significant background variables. Statistical significance was defined as $p < .05$ and SPSS for Windows version 14.0 was used for all statistical analyses.

Results

Sociodemographic Characteristics and Sexual Behaviors

Participants were distributed about evenly into several age groups; 53.1 % of them had at least 12 years formal education; 68.7 % were currently married or were in cohabitation with someone. About two-thirds (66.7 %) of the participants agreed that condom use could effectively prevent HIV transmission and 20 % participants gave appropriate answers to all three questions on HIV-related knowledge (Table 1). The majority (86.1 %) of participants had had at least one regular sex partner; 69 % of these participants had not been using condoms consistently (every time) when having sex with the regular sex partner(s). Of all participants, 20.9 % had had either at least one non-regular sex partner or at least one female sex worker; 39.7 % of these participants had not been using condoms consistently when having sex with the non-regular sex partner(s) or with the female sex worker(s). In the last 6 months, 16.0 % of all participants had had multiple sex partners. Furthermore, 11 (1.0 %) participants reported having had contracted STDs in the last 6 months (Table 1).

Table 1 Participants' characteristics and associations with Sexual Compulsivity scores

	Column % (n = 1,048) ^a	SCS (total score)		<i>p</i> (<i>t</i> or ANOVA)
		M	SD	
Sociodemographic variables				
Age group				.017
18–30	283 (27.1)	20.3	5.0	
31–40	289 (27.7)	20.6	4.7	
41–50	292 (27.9)	20.6	4.2	
51–60	181 (17.3)	21.7	5.0	
Number of years of formal education				<.001
≤10	188 (18.0)	21.5	4.6	
11	301 (28.9)	21.4	4.6	
≥12	553 (53.1)	20.0	4.7	
Current marital status				ns
Single	305 (29.1)	20.7	5.0	
Married/in cohabitation	719 (68.7)	20.7	4.7	
Divorced/separated/widowed	23 (2.2)	20.3	3.8	
HIV-related variables				
HIV-related knowledge level (appropriate response)				.046
0	129 (12.3)	21.7	4.7	
1	313 (29.9)	20.8	4.4	
2	396 (37.8)	20.4	4.8	
3	210 (20.0)	20.6	5.1	
Perceived efficacy of condom use for HIV prevention				ns
Very high	89 (8.5)	20.7	4.1	
High	607 (58.2)	20.5	4.7	
Moderate	278 (26.7)	21.1	4.7	
Low	63 (6.0)	20.8	5.7	
Very low	6 (0.6)	18.8	7.6	
Sexual behaviors (last 6 months)				
Number of female sexual partners				<.001
1	880 (84.0)	20.4	4.7	
≥2	168 (16.0)	22.6	4.6	
Type of female sexual partners				
Regular sex partner(s)				.001
No	146 (13.9)	22.0	5.0	
Yes	902 (86.1)	20.5	4.6	
Non-regular sex partner(s) or Female sex worker(s) ^b				<.001
No	829 (79.1)	20.2	4.8	
Yes	219 (20.9)	22.5	4.6	
Inconsistent condom use with Regular sex partner(s) ^b				ns
Yes	280 (31.0)	20.4	4.6	
No	622 (69.0)	20.6	4.7	

Table 1 continued

	Column % (n = 1,048) ^a	SCS (total score)		<i>p</i> (<i>t</i> or ANOVA)
		M	SD	
Inconsistent condom use with either Non-regular sex partner(s) or Female sex worker(s)				.041
No	132 (60.3)	21.9	4.4	
Yes	87 (39.7)	23.3	5.4	
Whether contracted STD in the last 6 months				.007
No	1,037 (99.0)	20.7	4.7	
Yes	11 (1.0)	24.6	7.7	

^a The number of missing case was <6 for all questions

^b Among those who had had the corresponding type of sexual partner

Item Responses of the SCS

The frequency distributions of the items are shown in Table 2. Over 40 % of all participants agreed that it would be difficult to find sex partners who desire having sex as much as they want to (Item 10), while over 30 % agreed that their sexual appetite had gotten in the way of their relationships (Item 1) or agreed that they were thinking about sex while at work (Item 6).

Psychometric Properties of the Chinese Version of the SCS

The EFA procedure extracted two factors that explained 34.5 and 25.2 % of the total variance (eigenvalues of 3.45 and 2.52; KMO test = .91; χ^2 of Bartlett's test of Sphericity = 4420.74, $p < .001$). The factor loadings are shown in Table 3. These two factors were named Controllability Subscale (CS) and Functional Consequences Subscale (FCS). As Item 4 double-loaded almost equally on both factors, we recommend removing it from the Chinese version of SCS. Subsequent analyses excluded this item. Further EFA on the other nine items reproduced the same factor structure. The modified Chinese version of the SCS hence consisted of two subscales. Their ranges were 5–20 (CS) and 4–16 (FCS) (Table 3).

The Cronbach's α values were 0.88 for the Overall Scale, 0.83 for the CS, and 0.74 for the FCS. The item-to-total correlation coefficients ranged from 0.47 to 0.71 and the item-subscale correlation coefficients ranged from 0.55 to 0.72 and 0.40 to 0.63 for the CS and FCS, respectively (Table 3). The item responses skewed toward the category of "strongly disagree"; the frequencies of some of such item responses exceeded 20 % (Table 2).

Table 2 Items responses of the SCS (n = 1,048)

Items	n (%)				M	SD
	Strongly disagree	Disagree	Agree	Strongly agree		
1. My sexual appetite has gotten in the way of my relationships	110 (10.5)	551 (52.6)	295 (28.1)	92 (8.8)	2.4	0.8
2. My sexual thoughts and behaviors are causing problems in my life	158 (15.1)	653 (62.3)	186 (17.7)	51 (4.9)	2.1	0.7
3. My desires to have sex have disrupted my daily life	218 (20.8)	706 (67.4)	101 (9.6)	23 (2.2)	1.9	0.6
4. I sometimes fail to meet my commitments and responsibilities because of my sexual behaviors	238 (22.7)	643 (61.4)	136 (13.0)	31 (3.0)	2.0	0.7
5. I sometimes get so horny I could lose control	255 (24.3)	654 (62.4)	116 (11.1)	23 (2.2)	1.9	0.7
6. I find myself thinking about sex while at work	148 (14.1)	581 (55.4)	277 (26.4)	42 (4.0)	2.2	0.7
7. I feel that sexual thoughts and feelings are stronger than I am	285 (27.2)	684 (65.3)	66 (6.3)	13 (1.2)	1.8	0.6
8. I have to struggle to control my sexual thoughts and behaviors	216 (20.6)	674 (64.3)	137 (13.1)	21 (2.0)	2.0	0.6
9. I think about sex more than I would like to	171 (16.3)	705 (67.3)	150 (14.3)	22 (2.1)	2.0	0.6
10. It has been difficult for me to find sex partners who desire having sex as much as I want to	94 (9.0)	516 (49.2)	338 (32.3)	100 (9.5)	2.4	0.8

The translated Chinese version of SCS is available from the corresponding author upon request

Table 3 Factor loadings, item-subscale, and item-total correlations (n = 1,048)

Items	Factor loadings		Corrected correlation coefficients	
	Factor 1	Factor 2	Item-total	Item-subscale
Factor 1 (CS)				
5. I sometimes get so horny I could lose control	0.73	0.26	0.63	0.63
6. I find myself thinking about sex while at work	0.73	0.07	0.52	0.55
7. I feel that sexual thoughts and feelings are stronger than I am	0.77	0.31	0.71	0.72
8. I have to struggle to control my sexual thoughts and behaviors	0.74	0.28	0.66	0.67
9. I think about sex more than I would like to	0.70	0.24	0.61	0.60
Factor 2 (FCS)				
1. My sexual appetite has gotten in the way of my relationships	0.04	0.84	0.47	0.55
2. My sexual thoughts and behaviors are causing problems in my life	0.28	0.81	0.64	0.63
3. My desires to have sex have disrupted my daily life	0.49	0.62	0.68	0.56
10. It has been difficult for me to find sex partners who desire having sex as much as I want to	0.38	0.41	0.48	0.40
Item removed				
4. I sometimes fail to meet my commitments and responsibilities because of my sexual behaviors	0.56	0.56	0.70	NA

Factors Associated with Sexual Compulsivity

Age higher than 50 years, education level below Secondary 6, and giving an inappropriate answer for the three questions on HIV-related knowledge were associated with higher mean SCS scores ($p < .05$; Table 1). Adjusting for these three significant background variables, higher scores on the total scale and the two subscales were associated with higher likelihoods for having multiple female sexual partners (AOR = 1.11–1.24, $p < .001$) and having had sex with either non-regular sex partner(s) or female sex worker(s) in the last 6 months (AOR = 1.11–1.22, $p < .001$), and a lower likelihood of having had sex with regular sex partner(s) (AOR = 0.90–0.94, $p < .005$). Among those with either non-regular sex partner(s) or female sex worker(s), higher total scale scores and higher subscale scores were significantly associated with inconsistent condom use during sexual intercourse with such sex partners (AOR = 1.07–1.15, $p < .05$). Higher total scale scores and higher subscale scores were also associated with having ever contracted STI (AOR = 1.17, $p < .01$ on the total scale and AOR = 1.39, $p < .005$ on the CS subscale). The total scale scores and the two subscale scores were not significantly associated with inconsistent condom use with regular sex partner(s) (see Table 4).

Discussion

Acceptable psychometric properties of the Chinese version of the SCS were obtained in this study. Two factors had been identified by the EFA performed in the original validation study surveying 685 male and female African American STI

Table 4 Associations between the SCS and various types of sexual behaviors in the last 6 months

	Independent variables					
	Subscale 1 (CS)		Subscale 2 (FCS)		Total scale	
	OR _u (95 % CI)	AOR (95 % CI)	OR _u (95 % CI)	AOR (95 % CI)	OR _u (95 % CI)	AOR (95 % CI)
Female sex partner (≥ 2 vs. 1) ^a	1.19*** (1.11–1.27)	1.19*** (1.11–1.27)	1.22*** (1.13–1.32)	1.24*** (1.14–1.34)	1.11*** (1.07–1.15)	1.11*** (1.07–1.16)
Whether having regular sex partner(s) (yes vs. no)	0.88*** (0.82–0.95)	0.90*** (0.84–0.96)	0.90* (0.84–0.98)	0.91* (0.84–0.99)	0.94*** (0.90–0.97)	0.94*** (0.91–0.98)
Whether having non-regular sex partner(s) or female sex worker(s) (yes vs. no)	1.23*** (1.15–1.31)	1.22*** (1.15–1.31)	1.17*** (1.09–1.26)	1.18*** (1.10–1.27)	1.11*** (1.07–1.15)	1.11*** (1.07–1.15)
Inconsistent condom use ^b						
Inconsistent condom use with regular sex partner(s) (yes vs. no)	1.01 (0.96–1.07)	1.01 (0.95–1.06)	1.02 (0.95–1.09)	1.10 (0.95–1.08)	1.01 (0.98–1.04)	1.01 (0.98–1.04)
Inconsistent condom use with either non-regular sex partner(s) or female sex worker(s) (yes vs. no)	1.12* (1.00–1.24)	1.12* (1.00–1.26)	1.11 (0.98–1.25)	1.15* (1.01–1.31)	1.06* (1.00–1.12)	1.07* (1.01–1.14)
Whether contracted STD (yes vs. no)	1.42*** (1.17–1.72)	1.39*** (1.14–1.68)	1.20 (0.92–1.57)	1.23 (0.95–1.60)	1.17*** (1.05–1.31)	1.17*** (1.05–1.30)

^a Among those who had such sexual partners

^b AOR adjusting for age group, education level, and HIV-related knowledge level

*** $p < .001$; ** $p < .005$; * $p < .01$; * $p < .05$

patients (Kalichman & Cain, 2004): Social Disruption (Items 1–4) and Personal Discomfort (Items 5–10). Our modified Chinese version removed Item 4 from the original version. It consisted of two factors: Controllability (Items 5–9) and Functional Consequences (Items 1–3 and 10). Validation of SCS needs to consider sociocultural variations. Our results showed that the CS but not the FCS was associated with self-reported STI, which offers some support to discriminant validity. Chinese culture emphasizes on self-control (Lu, Bond, Friedman, & Chan, 2010; Russell & Yik, 1996), pragmatic considerations (Hong, 2009), and harmony (Anedo, 2012) and pays less attention to individualism and personal comfort (Russell & Yik, 1996). It is therefore interesting and reasonable to see that controllability and functional consequences replaces self-disruption and personal comfort as new constructs of the SCS. Our results therefore remind researchers that measure of sexual compulsivity, such as SCS, may be culturally dependent and cross-cultural comparisons should be made with caution.

Adjusting for the three significant background variables, higher total score and higher subscale scores were associated with various types of sexual behaviors. Higher SCS scores were associated with a lower likelihood for having regular sex partner(s), but higher likelihoods for having casual (either regular sex partner(s) or female sex worker(s)) sex partners, having multiple sex partners, and having contracted STI in the last 6 months. Such results can be seen as part of the validation (external correlations). Insights are gained that SCS has a wide range of applicability in understanding various types of sexual behaviors. Previous studies had mostly applied SCS to research targeting high risk populations. Our results showed that the scale is also potentially useful in the male general population.

Among those who had had sex with casual partners (non-regular partner or female sex workers), higher SCS total scores and higher subscale scores were significantly associated with inconsistent condom use during sexual intercourse with such sex partners. Such external correlations further support validation of the revised SCS. As the SCS is a short instrument (only 9 items) and is easy to use, it can be used to identify sexually compulsive men in settings such as STI clinics or HIV voluntary counseling and testing, and to assist HIV/STI prevention workers to perform better segmentation. It is interesting to note that the mean total score of our Chinese SCS of 20.7 (SD = 4.7) was significantly higher than those reported in other studies based on the English version of SCS, including those that were conducted among inner city low-income men (Kalichman & Rompa, 1995), adults who used the internet to seek sex partners (Cooper, Delmonico, & Burg, 2000), and heterosexual college students (Dodge et al., 2004). Although the Chinese culture tends to suppress public expression of sexual drive and public discussion of sex-related topics, suppression of sexual activities at the individual level was not apparent. The differences between our studies and other reports need to be interpreted with extreme

caution, as such studies may not be comparable due to methodological differences and may involve factor structures. In-depth quantitative and qualitative research studies are required to answer the research question on cultural differences.

The dispersion of the total Chinese SCS score also seemed different from those obtained from some Western studies. Kalichman suggested using the 80th percentile as a cut-off point to define higher and lower levels of sexual compulsivity in English-speaking populations. That definition ensures participants who were defined as sexually compulsive being at least one SD above the mean SCS score of the sample (Benotsch et al., 1999; Kalichman & Cain, 2004; Kalichman & Rompa, 2001). In our sample, the 80th percentile (24.0) was within one SD from the mean (25.4). There is currently no norm for the Chinese version of the SCS. It seems that Chinese populations may need different (lower) cut-offs for SCS scores as compared to those of Western populations.

We believe that the validated Chinese version of SCS can be used in other populations. First, standard Chinese writing which can be understood by people in mainland China and Taiwan was used. Second, the majority of the populations (over 95 %) in Hong Kong, mainland China, and in Taiwan are Hans and ethnic differences are small. Moreover, even minorities in China have been taught to use the same written Chinese. In fact, many instruments developed in Hong Kong have been used in mainland China (Zhang, Chen, Zhang, Zhou, & Wu, 2008) or in Taiwan (Ho et al., 2013). Furthermore, the life styles of the large cities in China, such as Beijing, Shanghai, Guangzhou, Shenzhen, and Hong Kong, have been converging as travel from one city to another has become very convenient and common. Applications of the SCS to rural areas may need more caution. More validation studies are warranted.

This study had several limitations. First, the response rate was relatively low though such response rates have been reported in some published studies involving sensitive behaviors (Lau & Tsui, 2003; Lau et al., 2002). Participants may be less conservative and differ in the level of sexual compulsivity as compared to non-participants. Our sample may hence be subject to selection bias. Second, social desirability may cause reporting bias though we used a special data collection method. Third, we only investigated sexually active males though some SCS studies involved females (Benotsch et al., 2001; Dodge et al., 2004; Kalichman & Cain, 2004; Kalichman & Rompa, 1995, 2001; Reece, Plate, & Daughtry, 2001). The decision was made for several reasons. The prevalence of risk behaviors in the female general population is much lower than that of males (Lau et al., 2002). Our sample size was quite large (almost 2,000 to start with), but in case of including females, the required sample size would even be much larger. The conservative Chinese culture also discourages discussion of sexual matters among women and sexually compulsive women are seen as immoral (Higgins, Zheng, Liu, & Sun, 2002; Kwok, Sullivan, & Cant, 2006), which might

create difficulties for us to obtain unbiased answers. Fourth, it is a limitation that we did not ask separate questions for non-regular partners and female sex workers as the two groups have different characteristics. Fifth, as our sample included those who were sexually active, we cannot compare the demographic composition against that of the census general population which included both sexually active and non-active individuals. Sixth, we did not investigate associations between sexual attitudes (e.g., conservativeness) and sexual compulsivity; future studies are warranted. Lastly, independent samples are required to investigate the relationship between sexual compulsivity and sexual behaviors as this was only a validation study.

Despite these limitations, this is the first study validating a tool to investigate sexual compulsivity and applying it to investigate risk behaviors among Chinese men. The sample size was quite large and special methodological attention was made to reduce reporting bias. A revised factor structure was obtained. The results allowed for new possibilities to investigate sexual behaviors and highlighted a new potential direction for HIV/STI prevention among Chinese men in the general population.

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