

Predictors of Intention to Use Condoms Among Chinese College Students

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Abstract China is experiencing one of the fastest growing human immunodeficiency virus (HIV) epidemics in the world. Condom use is consistently low among Chinese college students. The purpose of this study was to identify the predictors that determine the intention to use condoms among Chinese college students applying the theory of planned behavior (TPB). A non-probability convenience sample of 433 participants was drawn from three universities in Central, Eastern, and Southwestern China, respectively. An anonymous written questionnaire was self-administered. Data were collected and analyzed descriptively and statistically using Predictive Analytical Software 19.0. Multiple linear regression was performed to identify the predictors among 402 participants with non-missing data. Eighteen percent (78/433) of the participants reported being sexually active in the past 6 months. The percentage of times these individuals reported using condoms during

intercourse was 38.19 %. Intention to use condoms was statistically significantly ($R^2 = 50.4\%$) predicted by attitudes ($\beta = 0.213$), subjective norms ($\beta = 0.259$), and perceived behavior control (PBC) ($\beta = 0.332$). All predictors were statistically significant at the 0.001 level ($p < 0.001$). PBC was the strongest predictor of intention to use condoms. The study findings indicated that the TPB could be used as a framework to determine the predictors of intention to use condoms among the Chinese college students. It is recommended that the HIV education programs should increase the intention to use condoms through promoting positive attitudes, subjective norms and PBC of condom use in Chinese college students.

Keywords Condom use · Human immunodeficiency virus · Theory of planned behavior · Sexual behavior · Chinese college students

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Introduction

China is experiencing one of the fastest growing human immunodeficiency virus (HIV) epidemics in the world, with a 30 % increase of reported cases yearly [13, 33]. A report from the Chinese Ministry of Health along with the World Health Organization (WHO) and the Joint United Nations Program on HIV/AIDS (UNAIDS) revealed that the estimated number of people living with HIV in China was 740,000 as of December 2009. It is estimated that 48,000 people were newly infected with HIV in 2009 [23]. The joint report indicated that sexual transmission continues to be the primary mode of transmission in China [23]. In 2007, heterosexual transmission contributed 44.7 % of the new infections in China [32]. Among the reported infections, the majority occurred in young people, including college students [27]. Many young adults do not perceive the danger of HIV infection and other sexually transmitted diseases.

Condom use is one of the effective strategies to prevent HIV/AIDS infection. However, condom use is consistently low in China [16]. The study completed by Ma et al. [20] revealed that frequent (always/often) condom use during the previous year was reported by only about 40 % of both male and female university students. Another study conducted by Sheng and Cao [31] indicated that 40 % of sexually active Chinese students never used condoms. Not much is known about what factors influence this population's intention to use condoms among Chinese college students.

Conceptual Framework

The conceptual framework used for this study was the theory of planned behavior (TPB) [3], an extension of the theory of reasoned action (TRA) by Ajzen and Fishbein [4]. The TPB uses three constructs (attitudes, subjective norms, and perceived behavioral control) to predict an individual's behavioral intentions. Behavioral intentions are then used to predict an individual's behavior. According to the TPB, human action is influenced by three major factors: a favorable or unfavorable evaluation of the behavior (attitudes toward the behavior), perceived social pressure to perform or not perform the behavior (subjective norms), and self-efficacy in relation to the behavior (perceived behavioral control). In combination, attitudes toward the behavior, subjective norms, and perception of behavioral control lead to the formation of a behavioral intention. As a general rule, the more favorable the attitudes and subjective norms, and the greater the perceived behavioral control, the stronger the person's intention to perform the behavior is. Given a sufficient degree of actual

control over the behavior, people are expected to carry about their intentions when the opportunity arises. Intention is thus assumed to be an immediate antecedent of behavior. However, because many behaviors pose difficulties of execution that may limit volitional control, it is useful to consider perceived behavior control (PBC) in addition to intention. To the extent that people are realistic in their judgments of a behavior's difficulty, a measure of perceived behavioral control can serve as a proxy for actual control and contribute to the prediction of the behavior in question [1].

When applied to condom use, the TPB suggests that the intention to use condoms, combined with PBC will predict the likelihood that a person will use condoms. Intention to use condoms, in turn, is determined by attitudes toward condom use, by perceived social pressure to use condoms (subjective norms), and by perception of control over this behavior.

The TPB has been widely applied to explore intention to use condoms among various groups, such as men who have sex with men [35], injection drug users [21], female commercial sex workers [17, 19], and high school-age adolescents [9, 28, 34]. The results in a meta-analysis study indicated that the TPB variables were among the strongest predictors of condom use [29]. This theory has also proved useful in predicting both intention to use condoms and condom use [7]. The TPB has been utilized as a conceptual framework for predicting condom use in such populations as Europeans, Africans, and Asians [10–12, 22, 24, 25], but few studies have been conducted using the TPB to investigate the influence of attitudes, social pressures, and perceived barriers affecting Chinese college students' condom use [14, 36].

Theories that may apply to some populations may not be suitable for other populations due to differences in culture, language, history, and education in different parts of the world. While the constructs of the TPB are universal, it is recognized that cultural differences influence the dynamics of attitudes, subjective norms, and perceived behavioral control. Given the fact that China has a long history that differs from cultures in western countries, it is necessary to study the Chinese population to identify if the TPB could be a useful framework to examine the factors that influence the intention to use condoms among Chinese college students.

Therefore, the purpose of this study was to twofold: (1) to use the TPB to study sexually active Chinese college students to examine their personal beliefs and attitudes with respect to the decision to use condoms and (2) to use this information to predict their intention of condom use behavior. The outcomes of this study would provide useful information and insights for developing HIV/AIDS education and prevention programs about effective behavior

interventions for Chinese college students to halt the spread of HIV infection among Chinese young people.

Methods

Research Design

An exploratory, cross-sectional, descriptive, and non-experimental design was utilized to identify the determinants of intention to use condoms among Chinese college students. A self-administered questionnaire developed by Janepanish [18] was used. Minor modifications to this questionnaire were made based on the present study population.

Study Sample and Setting

For this study, a non-probability convenience sample of 433 participants was drawn from the three Chinese universities. The participants: (1) self-identified as Chinese college students enrolled into the Chengdu University of Technology (CDUT), Henan Institute of Education (HIE), and Shandong Medical College (SMC); and (2) voluntarily participated in this study.

This research took place in CDUT, HIE, and SMC. CDUT is located in the city of Chengdu, which is a cultural, educational, political, and economic center in Southwest China. CDUT consists of 14 colleges with specialties in science and engineering with an enrollment of more than 25,000 full time students between the ages of 18 and 24. Geographically, most students who were enrolled in this university came from Southwest China and a small portion of students were from other regions of China.

Henan Institute of Education in Zhengzhou, capital of Henan Province, is located in Central China and is considered the “cradle” of Chinese nation. HIE is a normal university which mainly educates primary and secondary school teachers and educational administrators. The Institute offers over 38 undergraduate programs in humanities, sociology, science, and management with an enrollment of over 10,000 students including distance students.

Shandong Medical College in Jinan, capital of Shandong Province, is located in Northern China. SMC consists of 11 academic departments, such as medicine, pharmacy, nursing, clinical laboratory science, radiographic science, and other health related programs with an enrollment of over 7,834 students.

CDUT, HIE, and SMC were chosen as the research sites because the national statistics showed that Sichuan and Henan had the highest percentage of HIV infection in China [23]. Therefore, these chosen research sites were

Table 1 Internal consistency reliability of the instrument

Variables	Number of items	Coefficient alpha (this study)	Coefficient alpha (Janepanish’s study)
Attitudes toward condom use	9	0.85	0.87
Subjective norms	3	0.85	0.78
Perceived behavioral control	5	0.63	0.73
Intention to use condoms	3	0.82	0.76

appropriate to the study problem. Additionally, many students at the three universities were originally from all parts of China, so the sample obtained from CDUT, HIE, and SMC was the population of interest to this study.

Instrumentation

The TPB variables in the self-administered questionnaire developed by Janepanish were used for this study because the constructs in Janepanish’s questionnaire were designed based on the TPB [1–3]. The researcher made minor modifications to demographic variables due to this study population. To determine the content validity, the TPB measurement in Janepanish’s study was evaluated by three experts who had worked with TPB in relation to condom use [18]. Cronbach’s alpha analysis was conducted to assess the internal consistency reliability of the TPB constructs, such as attitudes toward condom use, subjective norms, PBCs, and intention to use condoms. The internal consistency reliability coefficient alpha of each subscale ranged from 0.63 to 0.85. See Table 1 internal consistency reliability of the instrument. The Cronbach’s alpha analysis indicated that three of the constructs met acceptable levels of reliability in this study. The PBC was slightly under the recommended level of 0.7 or higher. In addition, the Cronbach’s alpha for this study was similar to those found by Janepanish [18]. See Table 1. Psychometric properties of the instrument. Attitudes toward condom use, subjective norms, PBC, and intention to use condoms were assessed on a seven-point Likert-type response scale.

The questionnaire in this study contained items that were related to demographic information, intentions to use condoms, PBC of condom use, subjective norms, attitudes to condom use, HIV knowledge, and sexual experiences. The translation/back-translation process involved four steps [6]. The bilingual researcher first constructed the questionnaire in English, and then translated it from English into Chinese. Once the first translation of the questionnaire was completed, a bilingual native Chinese faculty

member at Idaho State University translated the questionnaire back from Chinese into English. The original and back-translated versions were compared and adjustments were made as necessary. The purpose of doing this was to maintain functionally equivalent versions of the instrument in both English and Chinese.

To determine the clarity and accuracy of the instrument, a pilot test of the questionnaire in Chinese was conducted among 10 Chinese students at Idaho State University, located in Pocatello in December 2010. These 10 students were freshman, sophomore, junior, senior, master, and PhD candidates. They were all born in China and knew Chinese very well. Following the piloted test, modification was made based on the feedback from these participants.

Data Collection

Prior to the implementation of the self-administered survey, approval for the protection of human subjects was received from the Idaho State University Human Subjects Committee. The letter of support was obtained from the CDUT, HIE, and SMC, respectively, to allow the researchers to conduct the study at the three research sites.

A total of 433 Chinese students participated in this study. An anonymous questionnaire was self-administered from December 2010 through early February 2011 among the participants at the three universities. Before the questionnaires were administered, the participants were informed of the purpose of the study and that the data would be kept confidential. Each participant read the informed consent letter at the beginning of the survey to determine if they would like to voluntarily take the survey. The participants were also advised that they could withdraw freely at any time during the survey and abstain from answering any questions with which they were uncomfortable. The participants who decided to volunteer in this study spent about 20 min completing the survey.

Data Analysis

Following the completion of the survey, the data were entered into an Excel file and then imported to Predictive Analytical Software (formerly known as SPSS) 19.0. Descriptive statistics, including means and SD, were applied to analyze the demographic characteristics, sexual experiences, attitudes toward condom use, subjective norms, PBC, and intention to use condoms. Frequencies and percentages were used to summarize nominal level variables. Multiple linear regression was performed to examine: (1) the effects of demographic, sexual experiences, and TPB construct variables on condom use; (2) which were the strongest predictors (attitudes toward condom use, subjective norms, and (3) PBC) for predicting intention to use condoms among

Chinese college students when controlling for demographic variables (education, gender, age, and so forth). The parameters used for statistical analysis in this research were the level of significance (α) of 0.05.

Results

Demographic Characteristics

Out of the total participants, 63.3 % (274/433) were females and 36.7 % (159/433) males. The average age of the participants was 22.2 years, ranging from 17 to 36 years ($SD = 2.8$). The majority of the participants were single (88.3 %). Of the 433 participants, 48.3 % (209/433) were from SMC, 17.3 % (75/433) from HIE, and 34.4 % (149/433) from CDUT. The majority of the participants were from Shandong (47.8 %), Henan (19.9 %), Sichuan (18.0 %), and the rest of the participants (14.3 %) were from various other parts of China.

As for the educational level, 49.9 % of participants were sophomores, 12 % juniors, 18.7 % seniors, and 18.3 % were graduate level masters and doctoral students. Out of the 433 participants, 48.5 % majored in health/medicine, 30.3 % science/engineering, and 21.2 % social sciences. Concerning religion, 86.4 % of participants did not indicate a preferred religion. Of those who did, 6.5 % were Buddhist, 3.0 % Christian, 0.9 % Muslim, and 3.2 % practiced other religions.

Sexual Behaviors and Condom Use

Out of the 433 participants, 22.9 % reported having a history of sexual intercourse and 72.5 % did not report such a history. Eighteen percent of the participants reported having been sexually active in the past 6 months. The percentage of times these individuals reported using condoms during intercourse was 38.2 % of the time in the past 6 months. Out of the 78 participants who were sexually active, 18 % reported consistent condom use, 57 % inconsistent use, and 25 % reported no condom use. The majority of the participants (83 %) did not use condoms when they had sexual intercourse for the first time. The age of having the first sex experience ranged from 13 to 30 years old (mean = 21.34).

Of the 433 participants, 402 completed the survey on attitudes toward condom use, subjective norms, PBC, and intention to use condoms. The descriptive statistics of attitude toward condom use, subjective norm, PBC, and intention to use condoms was conducted on the 402 participants. See the results on Table 2.

Before running the multiple linear regression model, the descriptive statistics of attitudes toward condom use,

Table 2 Descriptive statistics of the TPB constructs variables in Chinese college students (n = 402)

Variables	Mean	SD	N
Attitude	4.96	1.10	402
Subjective norm	5.05	1.53	402
Perceived behavior control	4.94	1.08	402
Intention to use condoms	4.94	1.64	402

The scale ranged from 1 = strongly disagree to 7 = strongly agree, where 7 represented the most positive score on attitude, subjective norms, perceived behavior control, and intention to use condoms

Table 3 Predicting intention to use condoms in Chinese college students (n = 402)

Independent variables	Standardized coefficients beta	t value	p value
Attitude	0.213***	4.679	<0.001
Subjective norm	0.259***	5.651	<0.001
Perceived behavior control	0.332***	7.21	<0.001
Education level	0.097*	2.361	0.019
Male	-0.189***	-4.748	<0.001
HIV knowledge score	-0.147***	-4.074	<0.001
Married	-0.048	-1.311	0.191
Religion	-0.012	-0.342	0.732

$R_{adj}^2 = 0.504$, $F_{8,393} = 51.968$, *** $p < 0.001$, * $p < 0.05$

subjective norms, PBC, and intention to use condoms was conducted on the 402 participants. Then, a Kolmogorov–Smirnov test with a Lilliefors correction was conducted to assess the assumption of normality of the residuals. This assumption was not violated ($p = 0.092$). In addition, a residual plot was constructed to assess the assumptions of linearity and homoscedasticity. No curvilinearity or increasing or decreasing amounts of variation were noted in the plot.

Multiple linear regression was used to identify the factors that were significant predictors of the intention to use condoms on the 402 participants who reported having or not having sexual experiences. The results showed that intention to use condoms was statistically significantly $R^2 = 50.4\%$, $p < 0.001$) predicted by the TPB constructs: attitudes toward condom use ($\beta = 0.213$), subjective norms ($\beta = 0.259$), and PBC ($\beta = 0.332$) given the other five variables (gender, education, marital status, religion and knowledge score) were in the model. The model explained 50.4 % of the total variance in intention to use condoms.

All constructs were statistically significant at the 0.001 level ($p < 0.001$) given the demographic variables and the knowledge score was used in the model. The PBC was the strongest predictor of intention to use condoms among the TPB construct variables given that it had the highest standardized coefficient. The results also indicated that the higher level of education the participants had, the higher

their intention to use condoms ($\beta = 0.097$, $p = 0.019$). However, the higher HIV/AIDS knowledge score the participants had, the lower the intention to use condoms ($\beta = -0.147$, $p < 0.0001$). Males showed lower intention to use condoms ($\beta = -0.189$, $p < 0.0001$) than did females. Neither marital status nor religion was significant in predicting intention to use condoms. See Table 3.

Discussion

The purpose of this present study was to examine the predictors of condom use among Chinese college students. The predictors of interest were derived from the TPB [1–3]: (a) attitudes toward condom use, (b) subjective norms about condom use, (c) perceived behavioral control of condom use, and (d) intention to use condoms. Many studies have been conducted using the TPB in western countries, but few studies have been carried out applying the TPB to predict the intention to use condoms in Chinese populations. This study has expanded the application of the TPB to Chinese college students in order to identify the predictors that determined the intention to use condoms in this population. Although Chinese culture, history, and language are different from those in western countries, the study results indicated that the TPB constructs were predictive of intention to use condoms among Chinese college students. For instance, attitudes toward condom use in this study referred to Chinese students' positive or negative feelings or thoughts about condom use. The findings of this study showed that attitudes toward condom use were predictive of intention to use condoms among Chinese college students. The result was consistent with the meta-analysis review by Albarracin et al. [5] and Bennett and Bozionelos [7].

Subjective norms in this present study referred to Chinese college students' perceptions of important others' desire for them to use or not use condoms. In this study, subjective norms were a significant predictor of intention to use condoms among Chinese college students. The finding of this study was consistent with the previous studies [5, 7, 8, 15, 24, 29].

Perceived behavioral control in this research referred to Chinese college students' perception of the ease or difficulty of using condoms. The results showed that PBC was the strongest predictor of intention to use condoms among the 402 participants who completed the survey on the TPB questions. Previous studies in the literature indicated that PBC predicted the intention to use condoms over and above attitudes toward condom use and subjective norms about condom use [26, 28, 30]. This study supports the findings of the above researchers. However, the results of this study were not consistent with Bennett and Bozionelos [7], whose study showed that PBC of condom use had no effects on intention to use condoms.

Overall, attitudes toward condom use, subjective norms, and PBC were significantly predictive of intention to use condoms among Chinese college students. The results of this study confirmed the applicability of the TPB for Chinese college students. The researcher agrees with Gu et al. that there was a potential of using the TPB to better understand condom use behaviors among Chinese populations. Gu et al. [14] conducted a study in using the TPB to investigate condom use behaviors among female injecting drug users who are also sex workers in China.

Limitations

One major limitation of this study was the use of a convenience sample. The study population, therefore, was not representative of the whole population of university students in China. The survey data were only generalizable to the certain communities and populations with similar demographic characteristics. Another limitation of this study was the use of a cross-sectional design. This research design did not allow for the establishment of causality.

Implications of the Study

The results of this study indicated that attitudes toward condom use, subjective norms, and PBC were significantly predictive of intention to use condoms among 402 Chinese college students. Promoting condom use of the HIV/AIDS educational programs among Chinese college students should emphasize these three predictors.

Future Research

Further study is needed to explore how to promote intention to use condoms through enhancing attitudes, subjective norms, and PBC among Chinese college students. This advocacy and education is needed in order to enhance condom use among Chinese college students to prevent HIV infections. A follow-up study that focuses on whether the knowledge gained in this study can lead to actual changes in condom use among Chinese college students.

Conclusion

The TPB provided the conceptual framework for this study to predict intention to use condoms among Chinese college students. The study results indicated that intention to use condoms was significantly predicted by the following TPB constructs: (a) attitudes toward condom use, (b) subjective norms, and (c) PBC. In addition, PBC was the strongest predictor of intentions to use condoms among Chinese college students. It is recommended that the HIV education

programs should increase the intention to use condoms through promoting positive attitudes, subjective norms and PBC of condom use in Chinese college students.

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