



# A Study of Young Students' Online Socialization and HIV-Related High-Risk Sexual Behavior: A Case Study of Universities in Chengdu of China

Bo Qin<sup>1,2</sup> and Anuchit Phanumartwiwath<sup>2</sup>(✉)

<sup>1</sup> School of Foreign Languages, University of Electronic Science and Technology of China, Chengdu, China

<sup>2</sup> College of Public Health Sciences, Chulalongkorn University, Bangkok, Thailand  
anuchit.p@chula.ac.th

**Abstract.** The popularity of online social networking has created new conditions for high-risk sexual behaviors and brought new challenges to AIDS prevention and treatment. Taking young students in Chengdu as an example, this paper investigates their differences in knowledge, attitudes, and behaviors related to HIV/AIDS, as well as their network use and network communication. Further, it analyzes the extent of the influence of network social networking on HIV-related high-risk sexual behaviors of young college students in Chengdu. The results show that the impact of online social networking on young students presents a complicated situation, mainly affecting the acquisition of sexual knowledge. However, the network information that is difficult to distinguish between true and false may harm the AIDS awareness rate. The Internet helps young students find sexual partners, but they still prefer to develop sexual relationships in the real world. In addition, “differing knowledge and practice” is relatively common, and the atmosphere of sexual openness is widely prevalent among young students. Therefore, we must pay attention to the norms of network information and strengthen the network sex education work. Still, we also need to pay attention to the role of family sex education.

**Keywords:** young students · HIV awareness · HIV-related attitudes · HIV-related behaviours · online socialization

## 1 Background

### 1.1 HIV Infection Rate Among Young People in China Remains High

Chinese youth are becoming a high-risk group for HIV. As of 2020, nearly 3,000 new cases of young students aged 15–24 have been reported in China, with 98.6% of infections being sexually transmitted. [1] In addition, there is a high prevalence of HIV in localised areas and in specific populations. According to China's National Health Planning Commission, three provinces - Yunnan, Guangxi and Sichuan - account for 45% of

the country's infected and sick people, with Sichuan province having the highest number of new infections and AIDS patients. [2] From the results of the study, it is clear that multiple partners and unprotected sex remain the most significant factors contributing to HIV infection. [3] In a study conducted in five universities in Sichuan province, 13.8% of respondents admitted to having sex, 25% of whom had sex with someone other than their lover or spouse. 20.6% had multiple partners, 28.5% and 28.6% respectively would "always" or "occasionally" use a condom when having sex, and 27.6% would take other safety measures but for contraception. Condoms are used "always" or "occasionally" during sex, and 27.6% use other safety measures, but for contraceptive purposes. [4] Another survey, also on condom use among students in Chengdu universities, noted that 14.79% of respondents admitted to having had sex, 67.74% used condoms for their first sexual encounter and 78.63% used condoms for their most recent sexual encounter, and that condom use was higher when having sex with a romantic partner than with other partners [5].

## 1.2 Online Socialising Encourages High-Risk Sex

From the results of previous studies, traditional demographic factors (age [6], gender [7], ethnic or racial origin [8] education level [9], family situation [10], etc.), social factors (economic development [11], regional differences [12], social openness [13], etc.), the prevalence of sex education [14] and online socialization [15] may influence HIV-related knowledge and attitudes, and thus the prevalence of HIV-related high-risk behavior. This influence has become more complex with the rise of online social networking.

The popularity of the Internet and the rise of various dating apps have created conditions for high-risk sexual behavior among higher-education students. The difference between online and traditional social networking has created new challenges for HIV prevention and treatment. A study shows that the internet facilitates 70% of one-night stands and that the anonymity and invisibility of the internet have led to an expanding population of one-night stands and may lead to the risk of sexual addiction. [15] More than 10.0% of adolescents believed that peer influence contributed to high-risk sexual behaviour, and more than 45.0% admitted that they could not refuse peer pressure. Peer pressure can also have positive effects, such as increased knowledge about HIV, willingness to test and willingness to treat. [16] At the same time, however, the development of the Internet has also facilitated sex education efforts. A study conducted by the Shanghai Family Planning Research Association in collaboration with WHO showed that secondary school and university students who regularly visited the sex education website designed and produced by the China Family Planning Association had significantly improved their knowledge of reproduction, contraception, HIV and sexually transmitted diseases (STIs), had more positive and healthy attitudes towards sex and were more aware of self-protection. [14] This suggests that Internet sex education is a fruitful form of sex education that can, to some extent, counteract the negative effects of the proliferation of sexual information and behaviour on some networks [17].

Based on the above, this thesis investigates the differences in HIV-related knowledge, attitudes, and behaviors among young students studying in Chengdu, as well as their internet use and online interactions, and further analyses the extent to which online social

interaction influences HIV-related high-risk sexual behavior among young students in Chengdu's universities. The study was conducted in four main areas:

- (1) Basic characteristics of HIV-related knowledge, attitudes, and behaviors of young students in Chengdu universities.
- (2) To compare the differences in HIV-related knowledge, attitudes, and behaviors among students of different genders and majors.
- (3) To analyze the influence of AIDS-related knowledge and attitudes on HIV-related high-risk sexual behavior.
- (4) To analyze the influence of Internet use and online social interaction on HIV-related high-risk sexual behavior among young students in Chengdu's universities.

## 2 Data and Variables

This paper adopts a "snowball" approach by sending electronic questionnaires via WeChat and QQ platforms. The questionnaire consisted of three main areas: basic demographic information about the respondents; their internet usage and socialization; and their HIV-related knowledge, attitude and behavior. The questionnaire was sent to young students aged between 18 and 40 in Chengdu, excluding those who were uninformed, did not understand, did not volunteer, and was not suitable to participate in this questionnaire survey. After testing Cronbach's Alpha = 0.948 and KMO = 0.798, the reliability and validity of the questionnaire were good, and the next step of the study could be carried out.

SPSS 26.0 software was used for cleaning and statistical analysis of the data. Descriptive analysis of continuous variables was performed using means and standard deviations, categorical variables using frequency distributions or percentages; one-way and multi-way analyses were performed using chi-square tests, logistic regression models, and one-way analyses using X-tests or logistic regression models for inclusion of screening independent variables prior to analysis, with the inclusion criterion of  $P < 0.20$ . Ratio ratios (OR) were calculated to estimate the strength of the association between the influencing factors and the outcome variables, and the reliability of the results was judged by the range of 95% confidence intervals.  $P < 0.05$  was used as the criterion for a statistically significant difference (all statistical tests were two-sided with a test level of  $\alpha = 0.05$ ).

## 3 Descriptive Analysis

### 3.1 Personal Information of the Interviewees

#### 3.1.1 Respondents' Gender, Age, Sexual Orientation, Grade, Profession and Marital Status

Among the 728 respondents, slightly more were male, accounting for 53.984 percent; Most of them were between 18 and 25 years old (89.97%). In terms of grades, 78.3% of respondents are college students and 18.68% are master students; In terms of majors, 17.22% of respondents were medical students, 25.824% were science and engineering students, 17.72% were humanities and social sciences students, 8.93% were arts and

sports students, and 28.16% were agriculture and forestry students. It is worth noting that in terms of sexual orientation, 28.571% of the respondents are heterosexual, 11.40% are homosexual, 17.58% are bisexual, and 42.45% of the students express “not fixed” or “uncertain”, which is surprising. It reflects that the sexual concept of contemporary young students has been quite open. It must be pointed out that Chengdu, as an important city in southwest China, is more common than other cities in China for various reasons, and the phenomenon of gender and sexual orientation diversification is more obvious. Therefore, this paper is based on the survey data of university students in Chengdu, which may be biased from the survey data of the whole China, but the survey in this paper still has certain universal significance. In terms of marital status, 71.43% of respondents are currently in a relationship without any partner, 25% are in a relationship or married, 0.82% are divorced but currently have a sexual partner and none of these three categories are unfaithful. 1.37% are unfaithful and a further 1.37% of single respondents have multiple sexual partners.

### **3.1.2 Respondents' Family Status, Ethnicity (race), Religious Affiliation and Addictive Behaviors**

Nearly 80% of the students in the sample came from cities. Of these, 45.05% came from first-tier cities, 14.29% came from provincial capitals or large cities with a population of over 1 million; 19.23% came from medium-sized cities or counties with a population of 500,000–1 million; 15.66% came from the latter counties of smaller cities with a population of less than 500,000; 19.23% came from rural areas, and a few A few students came from abroad (6, 0.82%). In terms of ethnicity and race, the vast majority of students were Han Chinese (630, 86.54%); 11.81% belonged to one of the 55 ethnic minorities other than Han Chinese (Chinese nationality); and 1.64% were not Chinese but belonged to the East Asian race. No race other than East Asian was sampled in this sample. Regarding religious beliefs, most students are atheists, and some are Buddhist and Taoist. A small number have other religions, including Christian, Catholic, or Orthodox. Regarding parental education, around 80% of parents have a high school education or less, approximately 10% have a college degree, and less than 10% have a bachelor's degree. In terms of living expenses, the majority of students (73.08%) were concentrated between RMB 1,000 and 2,000. In terms of childhood experiences, 62.36% of students lived with their parents until the age of 15, while 24.73% lived with their grandparents until the age of 15. In terms of Addictive Behaviors, the vast majority of respondents did not have any addictive behaviors, the few addictive behaviors were mainly smoking and drinking, some admitted to being exposed to drugs, and a small number had other types of addictive behaviors. This item is a multiple choice question and the goodness of fit test showed significance ( $\chi^2 = 1599.879$ ,  $p = 0.000 < 0.05$ ), meaning that the proportion of choices for each item was significantly different.

## **3.2 Respondents' Access to the Internet**

### **3.2.1 Length of Time Respondents Spend Online and Use of Internet Software**

Young students in higher education generally spend a lot of time online. More than half of the respondents spent between 3 and 7 h online, while the rest of the respondents

spent 1–3 h or 7–9 h online, with a small number of respondents spending more than 9 h online and very few spending less than 1 h online.

This study classifies students' online software usage as chatting software for instant messaging, video software for leisure and entertainment, socially focused dating software, shopping software, and general social forums for sharing information and exchanging ideas, to name a few. This is a multiple-choice question. Analysis of the distribution of the proportion of choices for each option shows that the goodness-of-fit test shows significance ( $\chi^2 = 488.415$ ,  $p = 0.000 < 0.05$ ), implying that the ratio of choices for each item is significantly different. Respondents often use the following online software: chatting software such as WeChat and QQ; video software such as Jieyin and Racer; shopping software such as Jingdong, Taobao, and Jindo; and social forums such as Weibo, Zhihu, and Twitter. Not many respondents use social networking software such as "soul" or "stranger." However, young students are still keen on making friends. Apart from shopping apps, chatting apps, video apps, and social forums are rich in social functions, while dating apps such as "Soul" and "Stranger" are mainly for those who need to get married. The primary purpose of dating software such as "soul" and "stranger" is to serve people needing marriage. In other words, young students have a wide range of social purposes, and marriage is not their primary purpose, but they still need to look for marriage partners on various platforms.

### 3.2.2 The Situation of the Respondents' Online Dating

In the survey on respondents' online dating situation, I set up a "logical jump" in the questionnaire so that only respondents who selected "have online friends of the opposite sex" could answer the questions "Is it easy and casual to communicate with online friends of the opposite sex?" and "Have you ever had any experience of becoming friends with someone of the opposite sex? Respondents were explicitly told that an "online friend" was someone they only met and interacted with on the internet, but had never met in real life. Moreover, respondents had been in contact with their online friends for a more extended period, usually at least three months. Under this definition, 212 respondents indicated they had online friends of the opposite sex. Most admitted to being more relaxed and casual when communicating with internet friends of the opposite sex. At the same time, 27.36% of the respondents said they were average, and very few disagreed.

With 52 people have had the experience of becoming boyfriend and girlfriend with an online friend of the opposite sex, it is evident that although many people feel more comfortable chatting with the opposite sex online, this does not help them to develop a romantic relationship. Nearly 80% of respondents agreed that the internet would increase people's chances of finding a sexual partner. Still, when asked if they would be willing to use the power of the internet to develop a sexual relationship for themselves, it was 80% said no. Respondents may prefer that both parties get to know each other in the real world or that respondents' needs can already be met in reality.

### 3.2.3 Comparison of Respondents' Real and Online Sex-Related Behaviors

In this paper, we try to understand the differences between respondents' behaviors in real life and those in the network and find that their goodness of fit tests is significant

( $\chi = 559.367$ ,  $p = 0.000 < 0.05$ ;  $\chi = 377.296$ ,  $p = 0.000 < 0.05$ ). According to the comparison, interviewees focus on “searching for sexual knowledge” and “watching erotic novels, videos, movies, etc.” on the Internet and in real life. When it comes to addressing sexual needs, respondents are more likely to read or watch pornography than to seek a temporary partner. There were also a significant number of respondents who did not engage in any sexual behavior. However, it is worth noting that in real life, the proportion of these people (31.74%) is twice that of those on the Internet (14.13%), which indicates that the respondents are not without sexual needs but challenging to meet in real life. The Internet provides a more convenient way for them.

In addition, the paper also sought to investigate the differences between respondents' real and online friendships, and found that respondents were more restrained in their behaviour when interacting with friends of the opposite sex in real life. They rarely share more sensitive images with the opposite sex (but are slightly more daring online), although almost a third of respondents have shared sex-related topics with their real friends of the opposite sex, either in person or online. Of the 212 respondents who had dated online friends of the opposite sex, 41.51% had shared sexually explicit topics, and 30.19% had shared sensitive images with them. This aligns with respondents' perception that “communication with online friends is more relaxed and casual,” with most respondents agreeing that the internet is more helpful in helping people find potential sexual partners.

### **3.3 Respondents' Knowledge of HIV-Related Issues**

#### **3.3.1 Sources of Respondents' HIV-Related Knowledge**

This was a multiple-choice question where respondents were asked to select three answers (answers in no particular order), and the distribution of the proportion of choices for each option was analyzed. The goodness of fit test was found to be significant ( $\chi = 693.532$ ,  $p = 0.000 < 0.05$ ), meaning that the proportion of choices for each item was significantly different. Specifically, respondents' knowledge about HIV came mainly from school and the Internet, and the ratio of these two options was much higher than the other options. In addition, television, radio, and government or neighborhood committee or property brochures also played a critical role in acquiring knowledge about AIDS. This shows the effectiveness of school education and social awareness in China. It is worth noting that family education plays a small role in acquiring HIV-related knowledge respondents (5.02%) and somewhat less than the publicity in newspapers and magazines (6.47%). Chinese parents, who are more influenced by traditional Eastern culture, rarely share topics related to sex education with their children.

#### **3.3.2 Respondents' Knowledge of HIV-Related Issues**

In this thesis, eight questions on HIV knowledge from the 2017 edition of the Operation Manual of the National AIDS Sentinel Surveillance Programme issued by the Chinese Centre for Disease Control and Prevention were used to conduct the survey. Otherwise, they were considered “not aware.” Regarding the knowledge rate of individual questions, the knowledge rate of the symptoms of AIDS, such as “Can you tell if someone is infected with AIDS by their appearance”, was relatively high at 76.37%. The other

seven questions were all about the ways of HIV transmission, and their knowledge rates were low. However, for issues such as blood transfusion, shared syringes, mother-to-child transmission, and condom use, the awareness rate was just over half. As for the knowledge that multiple partners can transmit HIV, the awareness rate is only 47.25%. Furthermore, it can be seen that the proportion of respondents who chose “don't know” was also high compared to those who chose the wrong answer directly. This suggests that respondents may not have received formal and systematic education on sexual safety at all, and does not exclude the possibility that they may have been disturbed by information from various sources. The overall knowledge rate, or the probability of answering 6 out of 8 questions correctly, was 67.35%.

### **3.3.3 Perceptions of Risky Sexual Behaviour**

With 37.36% of respondents approving of pre-marital sex and 39.29% holding a neutral attitude, it is clear that young contemporary students are relatively open-minded about sex. However, they are generally more safety conscious, with 86.81% of respondents believing that even intimate male and female friends must use condoms when engaging in sexual activity. 38.19% of respondents believe that a single person can have sex with someone they like who is not necessarily their lover, and 28.85% are neutral. However, when asked if they would be willing to have sex with another person to solve their physical needs, 67.31% of the respondents were against it, with another 18.13% being neutral. It is evident that although most respondents approved of pre-marital sex, they still believed that the prerequisite for having sex should be out of affection and not purely for physical needs. When asked if it was acceptable to have two or more sexual partners at the same time, 78.3% of respondents said it was not acceptable, while 10.16% were neutral. When asked if they had received or participated in HIV prevention services in the past year, 57.97% of respondents said “yes” and 42.03% said “no”. This shows that there is still much room for improvement in the promotion of HIV prevention and treatment in Chinese society.

## **3.4 Respondents' Attitudes Towards Sex**

### **3.4.1 Attitudes towards “ONLINE Dating”**

The vast majority of respondents did not consider themselves to be in the high-risk group (89.84%) and 72.80% said that they would seek counselling and testing services afterwards if they had high-risk sex. This paper simultaneously attempts to understand which is more conducive to promoting feelings, the real environment or the virtual environment of the internet. Respondents were asked to answer whether they found the internet more conducive to expressing emotions and to score on a ten-point Likert scale, with higher levels of certainty being associated with higher scores. It was then concluded that the respondents' attitudes were relatively neutral (mean = 4.99). The highest number of respondents scored 1 and 6, and finally, it was found that respondents generally did not think that the internet was a great facilitator of relationships. In response to the question “which is more likely to have sex online or face-to-face”, more than 60% of respondents said that face-to-face is better (64.01%).

### 3.4.2 Attitudes towards Multiple Sexual Partners

In HIV-related research, multiple sexual partners are considered to be the most important cause of HIV infection. In this paper, several questions were designed to find out respondents' attitudes towards multiple sexual partners, such as "spouse swapping" and "group sex". Statistically, the vast majority of respondents expressed a strong aversion to "spousal exchange" and "group sex". Only a very small number of people said that they had "tried it", "felt good", "liked it" and "it was exciting".

### 3.5 Respondents' Sexual Behaviour and Condom Use

252 (34.62%) respondents admitted to having had sex, although 140 refused to answer when asked about the age of their first sexual encounter. 20.63% of respondents had sex after being in a relationship with the person they were having sex with for 3–6 months, and 32.54% had been in a relationship for more than six months, which adds up to more than half of the respondents. However, 11.11% of respondents also had sex within only one week of dating. 22.22% of respondents admitted to having had two or more sexual partners. Twenty respondents admitted that their sexual behaviour in the last two years involved money, of which 10 paid the other person and the other 10 paid themselves. Overall, the incidence of sexual activity among respondents was not particularly high, and the incidence of multi-partner sex was relatively low. The questionnaire found that the overall condom use rate was low, with only 7.55% of respondents choosing "use every time", 12.23% choosing "use often", 35.44% choosing "never use", 26.65% choosing "rarely use" and 18.13 choosing "occasionally use". The largest number of respondents chose "never use", accounting for 35.44%, while 26.65% and 18.13% chose "rarely use" and "occasionally use" respectively. In addition to condoms, 38.1% of respondents would choose "in vitro ejaculation", 35.6% would "only use condoms", 16.9% would "have sex during the female safe period" and very few would choose other safety measures. "Only a small number of respondents chose other safety measures. When asked about the reasons for using condoms, "contraception" was the highest response rate, followed by "prevention of STIs". It can be seen that the definition of "safe" was mainly "not to cause pregnancy" rather than "to reduce the probability of contracting an STI". Likewise, we can analyse the reasons why respondents do not use condoms. Specifically, "not necessary", "the other person does not want to use it", "forget to use it" and "I do not want to use it" "The response rate and prevalence rate of the four items were significantly higher. It can be seen that the respondents are indifferent to the use of condoms, and that they are not willing to use them themselves or with each other.

### 3.6 Respondents' Sexual Relationships and Self-assessment

There were 252 respondents who admitted to having had sex. Of these, 26.19% had been in a long-term sexual relationship with someone of the opposite sex other than a lover or spouse, and 33.33% had had at least one sexual relationship with someone of the opposite sex other than a lover or spouse whom they had known for more than three months. When asked about the time interval between meeting and having sex, 116 respondents gave their answers. Most occurred within a week to a month (27.59%),



followed by more than six months (20.69%), and many also occurred within one week (18.97%, possibly a one-night stand).

## 4 Correlation Analysis

### 4.1 Factors Influencing HIV Awareness, HIV-Related Attitudes and HIV-Related Behaviours

Firstly, a linear regression model was used to analyse the effects of respondents' personal information, internet usage, friendships and self-evaluation on their HIV awareness, HIV-related attitudes and HIV-related behaviours respectively, resulting in:

Effect on HIV awareness: sexual orientation ( $t = 6.204$ ,  $p < 0.01$ ), father's education ( $t = 4.183$ ,  $p < 0.01$ ) had a significant positive impact on awareness; major ( $t = -2.371$ ,  $p < 0.01$ ), mother's education ( $t = -4.035$ ,  $p < 0.01$ ) had a significant negative effect on awareness; having heterosexual online friends ( $t = 3.061$ ,  $p < 0.01$ ), whether they had shared topics about sex with heterosexual online friends ( $t = 2.303$ ,  $p < 0.05$ ), whether they had sent pictures of private parts to each other with heterosexual online friends ( $t = 3.403$ ,  $p < 0.01$ ), whether they thought it was more comfortable and casual to communicate online with people of the opposite sex whom they already knew in reality ( $t = 2.994$ ,  $p < 0.01$ ), and thought that the internet would increase the likelihood of developing sexual relationships ( $t = 3.143$ ,  $p < 0.01$ ), which would have a significant positive relationship on knowing; whether it was more comfortable and casual to communicate with people of the opposite sex online ( $t = -2.994$ ,  $p < 0.01$ ), whether you felt that the internet made you better understand and integrate into the current society ( $t = -5.66$ ,  $p < 0.01$ ), and whether you felt that the internet helped you find more like-minded people ( $t = -3.23$ ,  $p < 0.01$ ) would have a significant negative effect on awareness; whether the opposite sex you know in reality has shared some pictures of exposed parts face-to-face ( $t = 2.106$ ,  $p < 0.05$ ) would have a significant positive effect on awareness; whether you belong to a high-risk group ( $t = -3.108$ ,  $p < 0.01$ ) and willingness to use the power of the internet to develop sexual relationships for oneself ( $t = -6.478$ ,  $p < 0.01$ ) had a significant negative effect on the rate of awareness.

Impact on HIV-related attitudes: sexual orientation ( $t = 8.547$ ,  $p < 0.01$ ) and profession ( $t = 5.249$ ,  $p < 0.01$ ) had a significant positive effect on HIV-related attitudes; whether or not they had sex ( $t = -2.647$ ,  $p < 0.01$ ), whether or not they had known someone of the opposite sex who had sex for no more than 3 months ( $t = -2.742$ ,  $p < 0.01$ ) ( $t = -2.284$ ,  $p < 0.05$ ) had a significant negative effect on HIV-related attitudes; the number of people who had had sex ( $t = 15.522$ ,  $p < 0.01$ ) had a significant positive effect on HIV-related attitudes; and the perception that the variety of online social networking software or channels available today would increase the chances of finding a sexual partner ( $t = 13.02$ ,  $p < 0.01$ ) had a significant negative effect on HIV-related attitudes. ( $t = 13.02$ ,  $p < 0.01$ ), which had a significant positive effect on HIV-related attitudes.

Effects on HIV-related high-risk sexual behavior: grade ( $t = -6.335$ ,  $p < 0.01$ ), father's education ( $t = -5.118$ ,  $p < 0.01$ ), and marital status ( $t = -4.8$ ,  $p < 0.01$ ) had a significant negative effect on HIV-related behavior; ethnicity and race ( $t = 3.413$ ,  $p < 0.01$ ), mother's education ( $t = 3.047$ ,  $p < 0.01$ ) had a significant positive effect

on HIV-related behaviours; the number of hours spent online per day ( $t = 2.748$ ,  $p < 0.01$ ), whether it was easy and casual to communicate with heterosexual Internet users ( $t = 2.438$ ,  $p < 0.05$ ), whether they developed into male and female friends with heterosexual Internet users ( $t = 12.359$ ,  $p < 0.01$ ), whether they understood “literary love” ( $t = 4.399$ ,  $p < 0.01$ ), would have a significant positive relationship on HIV-related behaviours; whether or not they had had sex ( $t = -2.589$ ,  $p < 0.01$ ), age at first sex ( $t = -4.614$ ,  $p < 0.01$ ), contact with the person they first had sex with location ( $t = -2.013$ ,  $p < 0.05$ ), number of people who had sex ( $t = -2.264$ ,  $p < 0.05$ ), whether there were non-romantic heterosexuals who had been in a long-term sexual relationship ( $t = -2.593$ ,  $p < 0.01$ ), whether there were heterosexuals who had known each other for no more than 3 months who had sex ( $t = -2.671$ ,  $p < 0.01$ ), and the length of contact ( $t = -2.517$ ,  $p < 0.05$ ), would have a significant negative effect relationship on HIV-related behaviours; time spent with the other person prior to initial sex ( $t = 5.181$ ,  $p < 0.01$ ), and whether money was involved ( $t = 2.033$ ,  $p < 0.05$ ) would have a significant positive effect relationship on HIV-related behaviours.

Effects on HIV-related high-risk sexual behaviour behaviours: self-rating of sexual desire ( $t = -2.528$ ,  $p < 0.05$ ), HIV testing ( $t = -2.425$ ,  $p < 0.05$ ) had a significant negative effect relationship on HIV-related behaviours; self-rating of sexual competence ( $t = -2.763$ ,  $p < 0.01$ ), being a high-risk group ( $t = 3.79$ ,  $p < 0.01$ ), willingness to seek counselling and testing services after risky sex ( $t = 3.165$ ,  $p < 0.01$ ), reliance on online chat for developing sexual relationships ( $t = 4.137$ ,  $p < 0.01$ ), willingness to get tested for HIV ( $t = 5.351$ ,  $p < 0.05$ ), perceived pleasure from condoms ( $t = 4.677$ ,  $p < 0.01$ ), attitude towards attitudes and experiences of “spouse swapping” ( $t = 9.579$ ,  $p < 0.01$ ), perceptions of group sex ( $t = -2.763$ ,  $p < 0.01$ ), and willingness to use the power of the internet to develop sexual relationships for themselves ( $t = 9.896$ ,  $p < 0.01$ ), had a significant positive influence relationship.

#### **4.2 Impact of Willingness to Develop Sexual Relationships Through the Internet on HIV Awareness, Attitudes and Behaviours**

The effect of willingness to develop sexual relationships through the internet on knowledge, attitudes and behaviours related to HIV was analysed separately by means of a chi-square test and it was concluded that:

Effect on HIV awareness: willingness to develop sexual relationships online did not show significance ( $p > 0.05$ ) for “whether mosquito bites can transmit HIV” and “whether a person can be seen to be infected with HIV”. “Can you get AIDS if you eat with an HIV-infected or sick person”, “Can you get AIDS if you give blood with HIV”, “Is it possible to get AIDS if you share a syringe with an HIV-infected person? Do you think it is possible to get AIDS from having sex with only one partner? ( $p < 0.05$ ), implying that there was a difference in the willingness to develop sexual relationships online for all seven items.

Influence on attitudes related to AIDS: “I think it’s right for couples to have premarital sex,” “I think it’s right for couples to have premarital sex,” “I think it’s right for a single person to have sex with someone they like,” and “I think it’s right for a single person to have sex with someone else in order to solve their physical needs,” Five items of “it is acceptable to have two or more sexual partners at the same time” showed significant

significance ( $p < 0.05$ ); There was no significant difference between “whether you have shared sexual topics with the opposite sex netizens” ( $p > 0.05$ ), “whether you have accepted or participated in the publicity service of AIDS prevention in the last year”, “have the opposite sex netizens”, “whether you are relaxed and casual when communicating with the opposite sex netizens”, “whether to the opposite sex netizens, Or the other person has sent you pictures of private parts”, “have the experience of becoming boyfriend and girlfriend with the opposite sex online friends”, “understand the love of culture”, “do you think that even if you already know the opposite sex, it is more comfortable and casual to communicate online”, “do you think that the Internet makes it easier for people to find sexual partners? Develop sexual relationships”, “Do you feel that the Internet has given you the opportunity to communicate and get to know people around you, and has made it possible for you to develop sexual relationships”, “Do you feel that the Internet has broadened your horizons, Make you better understand and integrate into the current society”, “Do you think the Internet helps you find more like-minded people”, 11 items showed significant ( $p < 0.05$ ).

Impact on AIDS-related high-risk sexual behaviors: For “knowledge channel of first sexual intercourse”, “total number of people who have had sexual intercourse with (excluding commercial sex)”, “total number of people who have had sexual intercourse with (including commercial sex)”, “maximum number of people who have had sexual intercourse at the same time”, “whether the sexual intercourse in the last two years involved money”, “Frequency of condom use”, “whether you are a high-risk group”, “how you were infected with HIV”, “pleasure of using condoms during sex”, “views and experiences of ‘group sex’” showed no significant difference ( $p > 0.05$ ). For “ever had sex”, “the age of first sex”, “the time of contact with the other party before first sex”, “have two or more sexual partners at the same time”, “willing to seek counseling and testing services after having risky sex”, “met a good opposite sex in reality”, A total of 11 items showed significant differences ( $p < 0.05$ ), including “the possibility of developing sexual relationship through online chat”, “which is more likely to have sexual relationship through online chat or face to face chat”, “the way of HIV testing”, “the results of the latest HIV test”, “the attitude and experience of ‘changing partners’”, and “the views and experience of ‘group sex’”.

### 4.3 Relationship Between HIV Knowledge, HIV-Related Attitudes, HIV Testing and HIV-Related High-Risk Sexual Behaviour

Finally, a linear regression model was used to analyse the relationship between respondents' HIV awareness, HIV-related attitudes and HIV surveillance and HIV-related high-risk sexual behaviour.

Hypothesis 1: Respondents' personal factors positively influence the use of protective measures;

Hypothesis 2: Perceived risk of HIV infection positively influences the use of protective measures;

Firstly, it is necessary to assign values to each factor for the regression model calculations. The assignments for each variable is shown in Table 1 as follows:

**The basic model  $Y = b_0 + b_1x_1 + b_2x_2 + b_nx_n$  was proposed**, and after repeated regression, the following specific model was obtained:

**Table 1.** Assignment Scale

Item	Explanations	
<b>Personal factors</b>		
X2	Gender of the respondent	Female = 1, Male = 2
X3	Respondent's grade	Freshman = 1, Sophomore = 2, = 3, Senior = 4, Master's student = 5, Doctoral student = 6, Other = 7
X4	The city where the respondent is located	Tier 1 cities = 1, other provincial or large cities = 2, medium cities or counties = 3, small cities or counties = 4, rural areas = 5, foreign countries = 6
X5	The sexual orientation of the respondent	Homosexuality = 1, Bisexuality = 2, Heterosexuality = 3, Irregularity = 4, Uncertainty = 5
X6	Respondent's marital status	Unmarried, never in a relationship = 1, unmarried, in a relationship = 2, unmarried, in a relationship and faithful to their partner = 3, in a de facto marriage or cohabitation = 4, married and faithful to their marriage = 5, married but having extramarital affairs or sex outside marriage = 6, divorced and without sex = 7, unmarried, not in a relationship but with sex partners from time to time = 8, Divorced and having only one stable sexual partner = 9, divorced and having multiple sexual partners over a long period = 10
X7	Respondent's religion	Atheist = 1, Christian, Catholic or Orthodox = 2, Buddhist = 3, Taoist = 4, Islamic = 5, Other = 6
X8	Respondent's major	Medicine = 1, Science and Technology = 2, Arts and Sports = 3, Humanities and Social Sciences (including Economics and Management) = 4, Others = 5
X9	Cost of living of the respondent	Less than 1000 yuan = 1, 1000–1500 yuan = 2, 1501–2000 yuan = 3, 2001–3000 yuan = 4, 3001–4000 yuan = 5, 4001–6000 yuan = 6, More than 6000 yuan = 7
X10	Father's education	Primary school and below = 1, middle school = 2, high school = 3, junior college = 4, Bachelor's degree = 5, master's degree = 6, doctoral degree = 7
<b>Perception of risk of HIV infection</b>		

*(continued)*

**Table 1.** (continued)

Item	Explanations	
<b>Personal factors</b>		
X12	Knowledge of HIV transmission	Yes = 1, No = 2, Don't know = 3
X13	Recognition of intimacy	Strongly agree = 1, Somewhat agree = 2, Neutral = 3, Somewhat disagree = 4, Strongly disagree = 5
X14	Whether to participate in AIDS advocacy	Yes = 1, No = 2
<b>Social and sexual information</b>		
X15	Hours per day on the Internet	Up to 1 h = 1, 1-3 h = 2, 3-5 h = 3, 5-7 h = 4, 7-9 h = 5, 9+ hours = 6
X16	Is it easy and casual to communicate with people of the opposite sex online?	Strongly agree = 1, Somewhat agree = 2, Neutral = 3, Somewhat disagree = 4, Strongly disagree = 5
X17	Have you ever had sexual intercourse?	Yes = 1, no = 2, not sure what sex is = 3
X18	How many people have you had sex with in total so far?	0 = 1, 1 = 2, 2-4 = 3, 5-10 = 4, 11-20 = 5, 21-40 = 6, 41-60 = 7, 61-99 = 8, 100 or more = 9
<b>HIV testing</b>		
X19	How would you prefer to be tested for HIV	Go to a hospital or CDC = 1, buy test strips yourself = 2, other = 3, chain beauty shops = 4, mall counters/brand name shops = 5
X20	"How do you Get AIDS?"	Sexual intercourse = 1, mother-to-child transmission = 2, drug use = 3, medical malpractice = 4, accidental contact with a person with HIV or an object with HIV = 5, other = 6
X21	In terms of pleasure alone, do you think	Not using a rubber condom during sex feels better = 1, using a rubber condom during sex feels better = 2, using or not using it is about the same = 3
X22	What do you think about group sex	Very exciting and desirable and enjoyable = 1, either with or without = 2, extremely bad, never try = 3

(continued)

**Table 1.** (continued)

Item	Explanations	
<b>Personal factors</b>		
X23	Today, various online social networking software or channels give people the opportunity to find a sexual partner	Hardly increases effective chances = 1, Not very much increases effective chances = 2, Average probability of increasing effective chances = 3, Fairly increases effective chances = 4, Very much increases effective chances = 5
Y	“Frequency of condom use”	Never = 1, Rarely = 2, Occasionally = 3, Often = 4, Every time = 5

Frequency of condom use =  $-0.181 + 0.151* \text{gender} + 0.160* \text{sexual orientation} + 0.091* \text{major} + 0.450* \text{Having had sex with several people} + 0.173* \text{opportunities to find a partner online} + 0.372* \text{channels of HIV transmission}$ .

The result of the regression model calculation is shown in Table 2 as follows:

The R-square value of the model is 0.385, which means that gender, sexual orientation, major, how many people have had sex with, the opportunity to find a partner online, and the channel of HIV infection can explain 38.5% of the variation in the frequency of condom use. An F-test of the model found that the model passed the F-test ( $p < 0.05$ ), which means that at least one of gender, sexual orientation, having sex with net friend, niche hobbies and circles, HIV knowledge, HIV risk perception, and knowledge of HIV testing facilities had an influential relationship on condom use frequency. In addition, the model was tested for multicollinearity and found that all VIF values in the model were less than 5, implying that there was no cointegration; and the D-W values were around the number 2, thus indicating that there was no autocorrelation in the model and that the sample data were not correlated with each other and the model was good.

The final specific analysis reveals that: The regression coefficient values were 0.205 for gender ( $t = 2.520, p = 0.012 < 0.05$ ), 0.191 for sexual orientation ( $t = 6.635, p = 0.000 < 0.01$ ), 0.133 for professionalism ( $t = 3.844, p = 0.000 < 0.01$ ), and 0.363 for the chances of the internet allowing one to find a sexual partner value was 0.363 ( $t = 9.985, p = 0.000 < 0.01$ ); the regression coefficient value for knowledge and awareness of HIV was 0.407 ( $t = 3.201, p = 0.001 < 0.01$ ). In other words, gender, sexual orientation, profession, the variety of current online social networking software or channels that allow a person to find a sexual partner, and knowledge of HIV awareness have a significant positive effect on the frequency of condom use.

**Table 2.** Relationship between HIV knowledge, HIV-related attitudes, HIV testing and HIV-related high-risk sexual behaviour

Multiple Linear Regression( $n = 728$ )									
	Unstandardized Coefficients		Standardized Coefficients	t	p	VIF	R <sup>2</sup>	Adj. R <sup>2</sup>	F
	B	Standard error	Beta						
Constant	0.394	0.295	-	1.338	0.181	-	0.270	0.265	F (5, 722) = 53.540,
p = 0.000									
gender	0.205	0.081	0.080	2.520	0.012*	1.007			
Sexual orientation	0.191	0.029	0.230	6.635	0.000**	1.186			
major	0.133	0.035	0.127	3.844	0.000**	1.072			
How many people have you had sex with	0.363	0.036	0.342	9.985	0.000**	1.160			
Find a mate online	0.407	0.127	0.106	3.201	0.001**	1.080			

Dependent variable "frequency of condom use"

D-W value = 1.788

\*  $p < 0.05$  \*\*  $p < 0.01$

## 5 Conclusion

### 5.1 "Sexual Minorities" are Growing

In this sample, 11.4% of the respondents were homosexual, 17.582% were "bisexual," 42.445% were "not fixed" or "unsure" Only 28.571% of the respondents indicated that they were heterosexual. The chi-square and linear regression analyses suggest that sexual orientation positively impacts sexual knowledge, attitudes and behavior. Some sexual minorities may be aware of their high association with the risk of HIV infection. However, these 'majority' 'sexual minorities' were not further screened and discussed in this survey. The reason for not excluding these sexual minorities is that it would have been challenging to collect the responses. Still, on the other hand, it is possible to get a fair amount of information about their sexual knowledge, attitudes, and behavior from their responses. Therefore, these questionnaires are of some value.

## **5.2 The Internet Helps Sexually Motivated Behavior, but it's not Obvious**

Respondents generally spend more time online. The questionnaire results showed that respondents' most frequently used software was chat software such as WeChat and QQ, video entertainment software such as Douyin and Kuaishou, and shopping software such as Taobao and Jingdong. In contrast, professional dating software was less used. Respondents prefer first to look for like-minded partners to meet their everyday social needs through daily self-presentation and communication and then look for potential love partners. It is worth noting that there is no significant positive relationship between online dating and high-risk sexual behaviors, and the factors that significantly affect whether college students use condoms are still HIV risk perception and HIV awareness. People who are more likely to meet or have sex with online friends and have niche social groups do not significantly affect whether they use condoms when having sex. For college students, using the Internet is a modern way of life. Network communication is mostly a translation of the actual relationship, and the probability of them having sex with strangers is not high. While nearly 80 percent of respondents believe the Internet helps find a sexual partner, almost 80 percent are unwilling to use the Internet to develop a sexual relationship for themselves. Only 29.12 percent of respondents had an online friend for over three months, and only 52 developed romantic relationships with their online friends. The help of the Internet for interviewees is mainly reflected in that they can more conveniently search for sex knowledge and watch erotic literature and artworks. In reality, 31.74% of respondents do not engage in sexually motivated behavior, but this percentage drops to 14.13% on the Internet. Respondents do restrain their behavior more in real life, while online, they are more likely to share some intimate topics or pictures with the opposite sex, regardless of whether they know each other in real life.

## **5.3 Complex Information in the Internet Age Affects Young University Students' HIV Knowledge, Attitudes and Behaviours**

It is found that young students in colleges and universities have a low level of knowledge about HIV/AIDS. There is a considerable knowledge blind area for the transmission of AIDS, and there is a difference in awareness rate due to gender, grade, and family reasons. Compared with the knowledge rate of more than 80% obtained by other researchers, the awareness rate of AIDS-related knowledge of respondents in this paper was only 65.37%. The highest awareness rate of a single question was only 76.3%. In addition, the internet has given rise to new forms of sexuality, such as the question in this survey, "Have you ever tried clerical sex?" Seven hundred respondents answered this question. The term "textual sex" is a new internet term that means sex with words, where both parties describe and tease each other to release their sexual needs. 29.71% of respondents said they had heard of the term, 8.29% had tried it, and 4.29% were interested. As an emerging and niche orientation, it is difficult to characterize the act of 'sexting,' and no laws regulate it. "It does not spread sexual diseases, but it is certainly a product of "sexual openness" and "sexual freedom," stimulating people's sexual needs and influencing their sexual attitudes and perceptions. In turn, it impacts their natural sexual behaviour .



#### **5.4 Overall HIV-Related Knowledge, Attitudes and Behaviours of Young Students Need to be Improved**

The study found a fragmentation between knowledge, attitudes and behaviour: students possess relatively complete knowledge of HIV, but there are still outstanding knowledge blind spots; attitudes are not taken seriously, there is a sense of luck and a low awareness of risk; sexual behaviour occurs at an early age, multiple sexual partners are combined and there is a high proportion of unprotected high-risk sexual behaviour. Young students are more open-minded about sexuality, less aware of the risks of HIV and lack self-protection. High-risk sexual behaviours such as unprotected sex and casual sex partners still exist among young students. The study also found a significant correlation between young students' knowledge of HIV and their grades, majors and gender. Young students in arts and sports majors were less aware of HIV than students in science and technology majors. The prevalence of high-risk sexual behaviour was significantly higher among young students in arts and sports than among young students in science and technology. Male students had better awareness of HIV than female students, and female students had a higher rate of positive attitudes towards HIV than male students, but male students had significantly higher rates of high-risk sex than female students.

#### **5.5 Sex Education in the Family Cannot be Ignored**

The study found that young students' knowledge, attitudes, and behaviors related to HIV were significantly correlated with parental education and whether they lived with their parents before age 15 and were not significantly correlated with family economic status and urban/rural differences. Respondents who lived with their parents before age 15 were more knowledgeable about sex, had more positive attitudes towards sex, and were less likely to engage in risky sex. The parent-child relationship in families where children are left behind is often distant or strained, leading to a lack of emotional needs in adolescence and a strong desire to compensate in adulthood, which may lead to high-risk sexual behaviour. The traditional Chinese culture is relatively conservative, and it is almost impossible to talk about 'sex' in public. Even within families, sex-related topics are rarely discussed between members. Sex education between parents and children has long been lacking. In recent years, Chinese parents have gradually become aware of the importance of sex education for children, but there is no standardized training on how to provide proper sex education.

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