Investigation on AIDS Awareness and Testing Willingness among Freshmen in 4 Higher Vocational Colleges in Chongqing City

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Abstract: Objectives: To understand the knowledge and testing willingness of new students in vocational colleges in Chongqing City towards HIV/AIDS, and provide reference for HIV/AIDS prevention education for vocational college students. Methods: A combined method of cluster sampling and random sampling was used to conduct the survey. In November 2022, four vocational colleges in Chongqing City were selected, and classes of new students were randomly chosen to participate in the survey. In addition, the questionnaire was distributed to new students of the four colleges through WeChat public platform, and students voluntarily responded to the survey. Results: The awareness rate of HIV/AIDS-related knowledge among new students in the four vocational colleges was 67.53% (938/1389), and the awareness rate among students in medical majors was 78.59% (P<0.05). Female students had a significantly higher testing willingness after engaging in high-risk sexual behavior than male students, with statistical differences (P<0.05). Male students had a more friendly attitude towards AIDS patients compared to female students (P<0.05). Conclusion: The awareness rate of AIDS among freshmen in vocational colleges in Chongqing is lower than in other regions of the country. Carrying out various forms of AIDS prevention and education in colleges plays a significant role in improving students' awareness of AIDS. By strengthening knowledge contents such as "Knowing that one cannot judge whether a person is infected with AIDS based on their appearance", the testing rate for AIDS can be increased. Male students have a higher level of friendliness towards people with AIDS compared to female students. Destigmatizing AIDS and guiding university students to adopt the correct attitude towards AIDS patients are also key focuses of education.

1. Introduction

HIV/AIDS, abbreviated from Acquired Immune Deficiency Syndrome, is a chronic infectious disease caused by the Human Immunodeficiency Virus (HIV)[1]. As of the end of 2021, there were 1.148 million HIV-infected individuals in China, with 1.066 million under treatment and 129,000 new cases reported[2]. Students in vocational colleges are mostly in the period of sexual maturity but not yet married, and they have a relatively high proportion of high-risk sexual behaviors for HIV transmission, such as multiple sexual partners and unprotected sex. Therefore, they are a key population for HIV/AIDS prevention and control[3][4]. In order to understand the knowledge and testing willingness of new students in vocational colleges in Chongqing City towards HIV/AIDS, this study conducted a survey and analysis on their HIV/AIDS-related knowledge, attitudes towards HIV/AIDS, testing willingness, and influencing factors. This provides a basis for future targeted prevention education and guidance for proactive testing among vocational college students in HIV/AIDS prevention and control.

2. Objectives and Methods

2.1. Objectives

A survey was conducted using a combination of cluster sampling and random sampling. In November 2022, five classes were randomly selected from the new students of four vocational colleges in Chongqing City (Chongqing College of Pharmacy, Chongqing Business Vocational College, Chongqing Electronic Engineering Vocational College, Chongqing Youth Vocational College), and all students from the selected classes participated in the survey. In addition, the questionnaire was distributed to new students of the four colleges through WeChat public platform, and students voluntarily and randomly responded to the survey.

2.2. Methods

A self-designed questionnaire was used for anonymous self-reporting survey. The main contents of the questionnaire included general demographic information, awareness of HIV/AIDS-related knowledge, attitudes towards

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HIV/AIDS-infected individuals and patients, and testing willingness. The questions about awareness of HIV/AIDS-related knowledge were based on the 8 essential knowledge points about HIV/AIDS (referred to as "Eight Points on AIDS") specified by the national guidelines, and an awareness threshold was set as answering correctly to at least 6 out of the 8 questions[4].

2.3. Quality Control

During the overall sampling survey, the students were informed that this survey does not record any personal information that can be traced back to specific individuals, and strictly adheres to the confidentiality provisions of the "Statistical Law of the People's Republic of China". There was also a specific prompt for questionnaire completion before the students saw the actual questions to ensure the authenticity of their responses. The questionnaire design was prepared by experts organized by the Chongqing Youth Sexual Health Education Research Association. Questionnaire results with response times of 120 seconds or less and logical validation errors were excluded from the statistical analysis.

2.4. Statistical Methods

Statistical analysis was conducted using SPSS Statistics 20.0. Chi-square test or Fisher's exact probability test was used for intergroup comparisons of count data. Logistic regression analysis was performed for regression analysis. The significance level for testing was set at 0.05 (two-tailed).

3. Results

3.1. Demographic Characteristics

A total of 2,099 students participated in the questionnaire survey, and 1,389 valid questionnaires were collected according to quality control standards. Among the valid questionnaires, there were 1,000 female students (71.99%) and 389 male students (28.01%). Concerning the academic disciplines, there were 211 students in the field of science (15.19%), 111 students in engineering (7.99%), 355 students in medicine (25.56%), 21 students in arts (1.51%), 4 students in education (0.29%), and 687 students in other disciplines (49.46%).

3.2. Awareness of HIV/AIDS-related Knowledge

The awareness rate of HIV/AIDS-related knowledge among new students in the four vocational colleges was 67.53% (938/1389). The overall correct answering rate for all surveyed students was 20.59% (286/1389), with medical students accounting for 31.82% (91/286) of the correct answers. There were statistically significant differences in the awareness rate of basic HIV/AIDS knowledge among students of different majors and those with and without sexual behaviors (P<0.05) (see Table 1). There were no statistically significant differences in the awareness rate of basic HIV/AIDS knowledge among students of different genders and from different places of origin (all P>0.05) (see Table 1).

Table 1. Comparison of the awareness rates of basic knowledge about AIDS among vocational college freshmen with different characteristics

Characteristics	Option	Number	Awareness	P-value
Gender	Male	389	260 (66.84)	0.124
	Female	1000	678 (67.80)	
Student-origin	Chongqing	1126	739 (65.63)	0.060
	Outside Chongqing	263	199 (75.67)	
Subject classification	Pedagogy	4	1 (25)	<0.001
	Neo-Confucianism	211	148 (70.14)	
	Engineering	111	81 (72.97)	
	Medicine	355	279 (78.59)	
	Art	21	16 (76.19)	
	Other	687	413 (60.12)	
sexual orientation	Heterosexuality	1219	816 (66.94)	0.081
	Homosexuality	20	12 (60.00)	
	Bisexual	68	54 (79.41)	
	Not knowing sexual orientation	82	56 (68.29)	
Whether or not a student has had sex instinct act	Yes	116	82 (70.69)	0.036
	No	1273	856 (67.24)	

Note: P<0.05 indicates a significant difference

3.3. Testing Willingness for HIV/AIDS

The survey results showed that 1,125 students (80.99%) expressed a willingness to get tested after engaging in high-risk sexual behaviors; 24 students (1.73%) indicated no willingness to get tested; and 240 students (17.28%) were uncertain. The testing willingness among females was higher than males and showed statistically significant differences (P<0.05) (see Table 2). Among the 116 students who had engaged in sexual behaviors, only 83

students (71.55%) expressed a willingness to get tested after engaging in high-risk sexual behaviors. Among the 1,273 students who had not engaged in sexual behaviors, 1,042 students (81.85%) expressed a willingness to get tested after engaging in high-risk sexual behaviors. The previous history of sexual behaviors had an impact on students' testing willingness and was statistically significant (P<0.05).

Table 2. Comparison of distribution of AIDS testing willingness among vocational college freshmen with different characteristics after high-risk sexual behaviors[n(%)]

Characteristics	Option	Number	Willingness to test for AIDS after high-risk sexual behavior			χ^2-value	*P*-value
			Yes	No	Indeterminacy		
Gender	Male	389	277(71.21)[a]	12(3.08)[a]	100 (25.71)[a]	34.360	<0.001
	Female	1000	848(84.80)[b]	12(1.20)[b]	140 (14.00)[b]		
Sexual orientation	Heterosexuality	1219	986(80.89)	20(1.64)	213 (17.47)	6.852	0.271
	Homosexuality	20	16(80.00)	0(0.00)	4(20.00)		
	Bisexual	68	61(89.71)	1(1.47)	6(8.82)		
	Not knowing sexual orientation	82	62(75.61)	3(3.66)	17(20.73)		
Whether or not a student has had sex instinct act	Yes	116	83(71.55)[a]	3(2.59)[a]	30(25.86)[a]	7.330	0.026
	No	1273	1042(81.85)[b]	21(1.65)[a]	210(16.50)[b]		

Note: P<0.05 indicates a significant difference

3.4. Factors Influencing Testing Willingness for HIV/AIDS

All 10 items, such as "Knowing that HIV/AIDS is a severe incurable infectious disease," were included as independent variables (assigned as unaware=0, aware=1), and the testing willingness (no willingness=0, willingness=1) was considered as the dependent variable in a single-factor logistic regression analysis. Subsequently, significant items were included in a multiple regression analysis model. The results showed that the awareness of the following five items had a significant impact on increasing the testing willingness after engaging in high-risk sexual behaviors: "Knowing that you cannot judge if a person is infected with HIV/AIDS based on their appearance," "Knowing that you should actively seek HIV/AIDS testing and counseling after engaging in high-risk behaviors," "Knowing that intentionally spreading HIV/AIDS carries legal responsibility," "Knowing that there are free voluntary counseling and testing (VCT) clinics for HIV/AIDS in our country," and "Knowing that specialized HIV test strips can be purchased on Taobao" (P<0.05). The awareness of the remaining items also had a certain influence on increasing the testing rate for students after engaging in high-risk sexual behaviors (see Table 3).

Table 3. Univariate and Multivariate factor logistic regression analysis of AIDS testing willingness and influencing factors of vocational college freshmen after high-risk sexual behaviors

Influencing factors	Univariate logistic regression analysis influencing factors			Multivariate logistic regression analysis		
	β-value	$\hat{OR}$-value(95%*CI*)	*P*-value	*β*-value	$\hat{OR}$-value(95%*CI*)	*P*-value
Understand that AIDS is a non-curable, severe infectious disease.	-0.003	0.997(0.736, 1.350)	0.983			
The group who are aware of homosexuality is the most adversely affected by AIDS	0.461	1.586(1.211, 2.078)	0.001			
Understand that it is impossible to judge whether a person is infected with AIDS by appearance.	0.896	2.449(1.728, 3.472)	<0.001	0.488	1.628(1.110, 2.389)	0.013
Understand that infection with other sexually transmitted diseases will increase the risk of AIDS infection	0.486	1.626(1.240, 2.134)	<0.001			

Understand that sticking to the correct use of condoms can reduce the risk of infection and transmission of AIDS	0.671	1.955(1.465, 2.610)	<0.001			
Understand that the use of new drugs will increase the risk of AIDS infection	0.471	1.601(1.216, 2.109)	0.001			
AIDS testing and counseling should be actively sought after knowing the occurrence of high-risk behaviors	1.687	5.404(3.770, 7.746)	<0.001	1.354	3.874(2.645, 5.673)	<0.001
Understand that intentional transmission of AIDS requires legal responsibility	1.154	3.172(1.904, 5.285)	<0.001	0.586	1.797(1.021, 3.161)	0.042
Understand that there are free AIDS voluntary counseling and testing (VCT) clinics in China	0.929	2.532(1.924, 3.332)	<0.001	0.554	1.740(1.261, 2.400)	0.001
Understand that you can purchase specialized HIV testing strips on Taobao	0.962	2.617(1.904, 3.597)	<0.001	0.476	1.610(1.113, 2.330)	0.011

3.5. Attitudes towards HIV/AIDS Individuals (Patients)

Regarding the willingness to study, work, or have meals with individuals infected with HIV/AIDS, 732 students (52.39%) were uncertain, and there was no statistically significant difference between male and female students (P>0.05). In terms of "believing that individuals infected with HIV/AIDS deserve sympathy and assistance," male students had a higher proportion of agreement, 44.9% (175), compared to female students, 34.50% (345), and this difference was statistically significant (P<0.05). Regarding "taking proactive measures to prevent transmission if infected with HIV" and "willingness to keep the HIV infection of a friend confidential," female students had a higher proportion compared to male students, and these differences were statistically significant (P<0.05) (see Table 4).

Medical students had significantly more positive attitudes towards individuals infected with HIV/AIDS compared to students from other majors, and this difference was statistically significant (P<0.05) (see Table 5).

Table 4. Comparison of distribution of attitudes and behaviors towards AIDS among vocational college freshmen of different genders[n(%)]

Description of the situation	Attitude	Gender		χ^2-value	*P*-value
		Male (*n*=389)	Female (*n*=1000)		
Recognize the situation that AIDS infected persons or patients deserve sympathy and help	Yes	175(44.99)[a]	345(34.50)[b]	13.229	0.001
	No	6(1.54)[a]	16(1.60)[a]		
	Indeterminacy	208(53.47)[a]	639(63.90)[b]		
Willing to study and work with AIDS infected persons or patients	Yes	110(28.28)	265(26.50)	0.860	0.650
	No	66(16.97)	160(16.00)		
	Indeterminacy	213(54.76)	575(57.50)		
Willing to eat with AIDS infected persons or patients	Yes	97(24.94)	211(21.10)	2.612	0.271
	No	91(23.39)	258(25.80)		
	Indeterminacy	201(51.67)	531(53.10)		
Willing take active measures to prevent the situation from being passed on to others when you are infected with AIDS	Yes	310(79.69)[a]	849(84.90)[b]	8.882	0.012
	No	36(9.25)[a]	87(8.70)[a]		
	Indeterminacy	43(11.05)[a]	64(6.40)[b]		
Willing to keep confidential for friends infected with AIDS	Yes	173(44.47)[a]	453(45.30)[a]	7.573	0.023
	No	133(34.19)[a]	277(27.70)[b]		
	Indeterminacy	83(21.34)[a]	270(27.00)[b]		

Note: P<0.05 indicates a significant difference

Table 5. Comparison of AIDS related attitudes and behaviors among vocational college freshmen in different disciplines [n(%)]

Description of the situation	Attitude	Subject classification						χ^2-value	*P*-value
		Pedagogy (*n*=4)	Neo-Confucianism (*n*=211)	Engineering (*n*=111)	Medicine (*n*=355)	Art (*n*=21)	Other (*n*=687)		
Recognize the situation that AIDS infected persons or patients deserve sympathy and help	Yes	1 (25.00)^{ab}	77 (36.49)^{ab}	42 (37.84)^{ab}	165 (46.48)^{b}	5 (23.81)^{ab}	230 (33.48)^{a}	—	<0.05
	No	0 (0.00)^{a}	2 (0.95)^{a}	0 (0.00)^{a}	6 (1.69)^{a}	0 (0.00)^{a}	14 (2.04)^{a}		
	Indeterminacy	3 (75.00)^{ab}	132 (62.56)^{ab}	69 (62.16)^{ab}	184 (51.83)^{b}	16 (76.19)^{ab}	443 (64.48)^{a}		
Willing to study and work with AIDS infected persons or patients	Yes	0 (0.00)^{ab}	63 (29.86)^{ab}	28 (25.23)^{ab}	116 (32.68)^{b}	7 (33.33)^{ab}	161 (23.44)^{a}	—	<0.05
	No	1 (25.00)^{ab}	26 (12.32)^{ab}	19 (17.12)^{ab}	43 (12.11)^{b}	0 (0.00)^{ab}	137 (19.94)^{a}		
	Indeterminacy	3 (75.00)^{a}	122 (57.82)^{a}	64 (57.66)^{a}	196 (55.21)^{a}	14 (66.67)^{a}	389 (56.62)^{a}		
Willing to eat with AIDS infected persons or patients	Yes	0 (0.00)^{ab}	60 (28.44)^{b}	20 (18.02)^{ab}	99 (27.89)^{b}	5 (23.81)^{ab}	124 (18.05)^{a}	—	<0.05
	No	2 (50.00)^{a}	43 (20.38)^{a}	27 (24.32)^{a}	75 (21.13)^{a}	1 (4.76)^{a}	201 (29.26)^{a}		
	Indeterminacy	2 (50.00)^{a}	108 (51.18)^{a}	64 (57.66)^{a}	181 (50.99)^{a}	15 (71.43)^{a}	362 (52.69)^{a}		
Willing take active measures to prevent the situation from being passed on to others when you are infected with AIDS	Yes	3 (75.00)	171 (81.04)	88 (79.28)	312 (87.89)	17 (80.95)	568 (82.68)	—	>0.05
	No	1 (25.00)	17 (8.06)	13 (11.71)	25 (7.04)	1 (4.76)	66 (9.61)		
	Indeterminacy	0 (0.00)	23 (10.90)	10 (9.01)	18 (5.07)	3 (14.29)	53 (7.71)		
Willing to keep confidential for friends infected with AIDS	Indeterminacy	1 (25.00)^{abc}	90 (42.65)^{c}	53 (47.75)^{abc}	197 (55.49)^{b}	9 (42.86)^{abc}	276 (40.17)^{a}	30.213	0.001
	Yes	2 (50.00)^{ab}	69 (32.70)^{ab}	27 (24.32)^{ab}	83 (23.38)^{b}	3 (14.29)^{ab}	226 (32.90)^{a}		
	No	1 (25.00)^{a}	52 (24.64)^{a}	31 (27.93)^{a}	75 (21.13)^{a}	9 (42.86)^{a}	185 (26.93)^{a}		
	Indeterminacy								

Note: P<0.05 indicates a significant difference

4. Discussion

Awareness is the first and crucial step in effectively preventing and treating HIV/AIDS. Numerous studies both domestically and internationally have shown that conducting health education in universities is the most effective method to increase awareness and prevent the spread of HIV/AIDS among young students [5][6]. The results of this survey showed that the HIV/AIDS awareness rate among new students in four vocational colleges in Chongqing (67.53%) is significantly lower than the rates reported by Xiao, et al., for new university students in Fengtai District, Beijing (87.18%), and Chen, et al., for new students in universities in Jiangsu Province (85.74%) [7][8]. The main reason is that over 80% of the students in these four vocational colleges come from western regions, mainly from Sichuan and Chongqing (with 1,126 students or 81.07% from Chongqing). The awareness rate of HIV/AIDS among young people in western regions is significantly

lower than the national average [9]. The results of this survey are consistent with the findings of Anguoqi [9], highlighting the gap in HIV/AIDS prevention and education between western regions and other provinces and cities in China. The western regions have been heavily affected by HIV/AIDS, requiring greater human and material resources to carry out HIV/AIDS prevention and education targeting young people. The awareness rate of HIV/AIDS among the surveyed students is also significantly lower than the rate reported by Liu Jirong, et al., for university students in China (81%) [10]. This is because the surveyed students were all new students in vocational colleges who have not yet participated in various HIV/AIDS prevention and education courses and activities at universities. This further demonstrates the effectiveness of conducting HIV/AIDS prevention education specifically for university students to increase their awareness.

Currently, the greatest bottleneck in controlling the spread of HIV/AIDS worldwide is testing. Testing not only promotes early detection and treatment, reducing secondary transmission, but also effectively encourages behavior change in both HIV-positive and HIV-negative individuals, thereby reducing new infections. Therefore, testing plays a crucial role in controlling the HIV/AIDS epidemic [11]. Among the 1,389 students surveyed from the four vocational colleges, 1,125 students (78.01%) expressed a willingness to get tested after engaging in high-risk sexual behaviors. This is higher than the testing willingness reported by Chen Tianqi, et al., for students in five universities in Beijing (68.7%), Lai Yuanyuan's report on testing willingness among students at Yunnan University (68.8%), and Xiao, et al.'s report on testing willingness among new students in Fengtai District, Beijing (62.98%)[12][13][14]. The main reason might be that among the surveyed students, 1,000 (71.99%) were female, and one of the surveyed colleges was a medical school. By conducting single-factor and multiple-factor logistic regression analyses on the testing willingness after engaging in high-risk sexual behaviors and its influencing factors, it was found that the awareness of five items, including "Knowing that you cannot judge if a person is infected with HIV/AIDS based on their appearance" and "Knowing that specialized HIV test strips can be purchased on Taobao," significantly promoted the testing rate among students. These five knowledge points can be highlighted in future HIV/AIDS prevention and education campaigns.

In terms of attitudes towards individuals infected with HIV/AIDS, male students showed slightly higher friendliness than female students regarding studying, working, or eating together, which is consistent with the research findings of Xu Yaji, et al. Additionally, students majoring in arts and education showed less friendliness towards HIV/AIDS patients compared to students from other disciplines, which is also in line with the research findings of Chen Yuanfang [15][16]. The prevalence of HIV/AIDS is closely related to attitudes and behaviors[17]. Discrimination and stigma decrease the testing rate for HIV/AIDS, resulting in a lower proportion of early detection and treatment for individuals living with HIV/AIDS and increasing the likelihood of secondary transmission. This severely hinders the achievement of the "Three 95s" targets for HIV/AIDS prevention and control. Therefore, in future HIV/AIDS prevention and education efforts, it is essential to focus on eliminating stigma associated with HIV/AIDS and provide guidance and education tailored to the gender characteristics and cultural backgrounds of students, in order to foster the correct attitudes towards HIV/AIDS and individuals living with the virus.

5. Conclusion

The awareness rate of AIDS among freshmen in vocational colleges in Chongqing is lower than in other regions of the country. Carrying out various forms of AIDS prevention and education in colleges plays a significant role in improving students' awareness of AIDS. By strengthening knowledge contents such as "Knowing that one cannot judge whether a person is infected with AIDS based on their appearance", the testing rate for AIDS can be increased. Male students have a higher level of friendliness towards people with AIDS compared to female students. Destigmatizing AIDS and guiding university students to adopt the correct attitude towards AIDS patients are also key focuses of education.

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