

# HIV/AIDS Awareness and Knowledge among Secondary School Students in China

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## Abstract

With a goal of helping design appropriate HIV/AIDS education and prevention programs for adolescents in China, we analyzed data from 995 secondary school students in Nanjing. Our analysis examined the students' sources of HIV/AIDS information and assessed the overall level, and possible gender and grade (middle school vs. high school) differences, in their HIV/AIDS awareness and knowledge. Data in the current study indicated an overall low and inconsistent level of AIDS knowledge among secondary school students in China. Most of the students could identify models of HIV transmission, but a large proportion held misconceptions regarding symptoms, activities that did not transmit the virus, treatment and preventive measures. The level of using school, family and peers for obtaining information about HIV/AIDS was generally low. There was a discrepancy between the level of utilization and trust of mass media as the main source of HIV/AIDS knowledge. Findings are discussed in terms of implications for HIV/AIDS prevention and education among adolescents in China.

## Introduction

While the actual human immunodeficiency virus (HIV) seroprevalence in China remains uncertain, the current official estimate of numbers of persons infected exceeds 740,000 (China Daily 2009). The majority of reported cases are young adults from 20 to 39 years of age (Chen et al. 2004). The steady increase of HIV infection in China underscores the urgent need for education and intervention efforts (Gill 2006; Wu et al. 2007). One area of concern for the Chinese government has been the low level of HIV/AIDS awareness and knowledge among the general population (Gill 2006; Wu et al. 2007). While still controversial (Helweg-Larsen and Collins 1997; Svenson et al. 1997), research in the United States and other Western countries has suggested that sufficient knowledge regarding AIDS is a necessary, albeit inadequate, first step toward effective AIDS prevention and intervention efforts (DiMatteo 1991; Fisher and Fisher 1992). Global literature has found that lack of knowledge is often accompanied by initiating or maintaining risky behaviour, limited adoption of preventive measures and negative attitudes toward people living with HIV and AIDS (Herek et al. 2002). The Chinese government has repeatedly emphasized the importance of AIDS knowledge and education (e.g., State Council 1998; Wu et al. 2007).

While limited data are available about the level of HIV/AIDS awareness and knowledge among adolescents and young adults, existing studies in China suggest an inadequate level of AIDS knowledge and awareness for young adults and other populations. For example, a previous study among 1081 students from eight colleges in two metropolitan areas (Beijing and Nanjing) revealed an inconsistent level of AIDS knowledge among students, with a significant gender and grade difference (Li et al. 2004). While HIV/AIDS knowledge is limited among young adults and in the general population in China, lack of knowledge among adolescents might be even more alarming. This population is at a critical stage of developing sexual intentions and behaviours and forming attitudes toward sexuality and HIV/AIDS-related issues. Because the behaviours and attitudes of a new generation of young people will affect China's future HIV/AIDS epidemic, education and prevention efforts targeting adolescents have great potential to curtail that epidemic. To develop culturally and developmentally appropriate HIV/AIDS education and prevention programs among adolescents in China, it is necessary to assess their knowledge and awareness of the disease. However, with a few exceptions (e.g., Ip et al. 2001), most existing studies of HIV/AIDS knowledge and attitudes among young people were conducted in college populations (Gao et al. 2001; Higgins and Sun 2007; Li et al. 2004), and limited data are available for secondary school students. Therefore, the current study was designed to assess the overall level of HIV/AIDS awareness and knowledge and to explore possible gender and grade (i.e., middle school vs. high school) differences in AIDS knowledge among secondary school students. The study goal was to help design appropriate HIV/AIDS education and prevention programs for adolescents.

## Methods

### Participants

Data were collected from 10 secondary schools ( $N = 995$ ) in Nanjing, the capital city of Jiangsu province, with a population of 5.3 million. Secondary education in China consists of middle schools (Grades 7 through 9) and high schools (Grades 10 through 12). The local research team members, who were educational researchers in Nanjing and had extensive experience in conducting research in the local schools, were asked to identify schools based on a number of criteria. Participating schools had to serve the general public from a wide range of socio-economic backgrounds and had to be representative of local schools in terms of number of student enrolled and student-teacher ratio. The study protocol was approved by the Institutional Review Boards at West Virginia University in the United States and the Institute of Higher Education Research at Nanjing University in China.

### Survey Procedure

School administrators were approached for permission to conduct the survey in their schools. Once the local research team received this permission, they randomly approached classrooms in the schools

and recruited students in the classrooms. Approximately 100 students were recruited from each participating school. The research team informed the students that the survey was for research only and that participation was voluntary. Informed consent was obtained before students participated in the survey. A self-administered questionnaire was distributed to the students in attendance in the selected classrooms on the day of survey. Teachers (including those who provided assistance with recruitment) were asked to leave the classrooms during survey administration. Responses were anonymous, and participants were assured of the confidentiality of their response. Each participant was assigned an arbitrary identification number. No identifiable personal information was recorded in the survey or database. Approximately 99% of those approached agreed to complete the questionnaire.

### Measures

*Individual characteristics.* Individual characteristics assessed were gender, age, grade, ethnicity (Han or non-Han, with Han accounting for 92% of the total population nationwide), school performance (4-point scale ranging from “mostly A’s” to “mostly D’s”) and perceived physical health (4-point scale ranging from “excellent” to “poor”). Students were also asked whether they were student leaders or representatives of various groups in the school (e.g., study group, students’ clubs and class- or school-wide organizations). They were also asked whether they received an allowance from parents and whether they were an only child. As well, they were asked if they were dating and whether they had engaged in a number of pre-coital activities (e.g., hugging, kissing and foreplay).

*Family characteristics.* Students were asked about their family composition (e.g., living with both birth parents, parents divorced). Paternal and maternal education levels were measured on a 6-point scale ranging from “below elementary school” to “graduate school.” Paternal and maternal occupations were measured using an 11-point response option (e.g., workers, peasants, professionals, administrators, government employees, unemployed). Perceived family economic status was measured using family monthly income on a 6-point scale: below 300 yuan, 300–500, 500–1000, 1000–3000, 3000–5000 and more than 5000 yuan (6.82 Chinese yuan = approximate 1 US dollars).

*HIV/AIDS awareness.* Students were asked about their perceived overall AIDS awareness on a 4-point scale: “a lot,” “some,” “little” and “nothing.” Students were also asked whether they knew that AIDS is caused by a virus called “human immunodeficiency virus” (yes/no).

*Source of AIDS information.* Students were asked whether they had received AIDS information in the past month from any of 16 sources (e.g., television, radio, magazine, newspaper and billboard). They were asked to select one source they believed could provide the most reliable information. As well, they were asked whom they would turn to if they had a question about AIDS (e.g., doctors, parents, teachers, friends or an AIDS hotline).

*AIDS knowledge.* There were three sets of 25 AIDS knowledge questions in different formats. The first consisted of 11 true/false items assessing knowledge of definition and causation. The second contained 12 questions querying modes of HIV transmission on a 5-point scale (very likely, likely, not sure, unlikely and very unlikely). For the purpose of data analysis, the “very likely” and “likely” responses were combined into “likely.” Similarly, “unlikely” and “very unlikely” were combined into “unlikely.” The third set consisted of two questions about AIDS symptoms and preventive measures, with a 4-point scale ranging from “strongly agree” to “strongly disagree.” Responses were combined into two categories, “agree” (strongly agree and agree) and “disagree” (disagree and strongly disagree).

These 25 items were reorganized into five categories of AIDS knowledge: AIDS definition/symptoms (three items), true transmission modes (four items), false transmission modes (ten items), clinical outcomes (three items) and treatment/prevention (five items). The percentage of correct answers was used as a composite score for each of the categories.

### Analysis

First, differences in individual and family characteristics by gender and grade (i.e., middle school vs. high school) were examined using ANOVA (for continuous variables) and the Chi-square test (for categorical variables). Second, the associations between AIDS awareness and selected individual

and family characteristics were assessed using ANOVA or the Chi-square test. Third, sources of AIDS knowledge were examined by gender and grade. The “most reliable” ranking was calculated using percentage of endorsement for each of the information resources. Fourth, AIDS knowledge was examined by gender and grade using the Chi-square test. Finally, general linear model (GLM) analysis was performed to assess the effects of gender, grade and their interaction on AIDS knowledge. To control for the potentially confounding effect of family socio-economic status (SES), family income was employed as a proxy of family SES to be included in GLM analysis as a covariate.

## Results

### Sample Characteristics

The sample consisted of 41% middle school students and 59% high school students, with equal proportions of males and females. The mean age was 15.16 years, with 13.75 for middle school students and 16.10 for high school students. Ninety-six percent of the sample was of Han ethnicity, and 89% lived with both birth parents. As shown in Table 1, there were some gender and grade differences in demographic characteristics. More female than male students reported being a student/club leader (57% vs. 49%;  $p < .01$ ), but fewer of them reported excellent/good health (74% vs. 82%;  $p < .01$ ). More middle school than high school students reported having divorced parents (12% vs. 6%;  $p < .0001$ ) and receiving top academic performance (e.g., mostly A's) in school (24% vs. 11%;  $p < .0001$ ). As well, middle school students reported a higher level of parental education, although only the difference regarding maternal education reached statistical significance ( $p < .01$ ). Consistent with their developmental stages, more high school than middle school students reported dating (27% vs. 8%;  $p < .0001$ ) and engaging in pre-coital activities (23% vs. 13%;  $p < .0001$ ).

**Table 1. Sample characteristics of 995 secondary students in China**

	Gender			Grade	
	Overall	Male	Female	Middle school	High school
<i>N</i> (%) <sup>a</sup>	995 (100%)	495 (50%)	487 (50%)	408 (41%)	586 (59%)
Mean age ( <i>SD</i> )	15.16 (1.37)	15.20 (1.34)	15.12 (1.39)	13.75 (.69)	16.10 (.76)****
Boys	50%	–	–	53%	49%
High school	59%	58%	61%	–	–
Han ethnicity	96%	97%	94%	95%	96%
Single child	93%	94%	92%	93%	93%
Student/club leaders	53%	49%	57%**	52%	53%
Excellent/good health	78%	82%	74%**	79%	78%
Had allowance	59%	56%	61%	60%	59%
Mostly A's at school	17%	15%	18%	24%	11%****
Dating	19%	21%	17%	8%	27%****
Pre-coital activities	19%	19%	19%	13%	23%****
Parents divorced	9%	8%	9%	12%	6%***
Live with both parents	89%	90%	87%	85%	91%**
Father finished college	42%	42%	42%	43%	41%

Table 1. Continued

Mother finished college	33%	32%	33%	38%	29%**
Father has a professional job	43%	43%	43%	46%	42%
Mother has a professional job	35%	34%	37%	38%	33%
Mean monthly family income ( <i>SD</i> ) <sup>b</sup>	3.93 (.98)	3.96 (.98)	3.90 (.98)	3.88 (1.09)	3.96 (.90)

<sup>a</sup> Thirteen students did not provide data on gender and one student did not provide data on grade.

<sup>b</sup> Coding for monthly family income: 1 = less than 300 yuan; 2 = 300–500 yuan; 3 = 500–1000 yuan; 4 = 1000–3000 yuan; 5 = 3000–5000 yuan; 6 = more than 5000 yuan.

\* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ . \*\*\*\* $p < .0001$ .

### HIV/AIDS Awareness

As shown in Table 2, 66% of students felt that they knew “a lot or some” about AIDS and 34% knew “little or nothing.” AIDS awareness (or perceived AIDS knowledge) differed significantly by age, as older adolescents (e.g., high school students) perceived themselves knowledgeable about AIDS ( $p < .0001$ ). Students’ AIDS awareness level differed significantly according to their parents’ level of education ( $p < .01$ ), whether their parents had a professional job ( $p < .05$ ) and family monthly income ( $p < .0001$ ). Regarding the question of whether they knew about AIDS being caused by HIV, male gender, higher age, being an only child and higher family SES (i.e., higher parental education, professional job and higher family income) were associated with higher levels of awareness. Among students who knew the cause of AIDS, 16% reported they had been dating, compared with 22% of students who said they did not know the cause of AIDS ( $p < .05$ ). There was no difference in terms of HIV/AIDS awareness by engagement in pre-coital activities (hugging, kissing and foreplay), although more students engaging in these activities thought that they knew “a lot or some” about AIDS.

Table 2. HIV/AIDS awareness among secondary students in China

	How much known about AIDS		Had known about HIV	
	Lots/some	Little/nothing	Yes	No
<i>N</i> (%)	644 (66%)	333 (34%)	479 (49%)	502 (51%)
Mean age ( <i>SD</i> )	15.31 (1.33)	14.87 (1.40)****	15.24 (1.31)	15.05 (1.40)*
Boys	51%	47%	57%	44%****
High school	66%	47%****	63%	55%*
Han ethnicity	95%	96%	95%	96%
Single child	93%	92%	95%	90%**
Student/club leaders	53%	53%	54%	52%
Excellent/good health	80%	75%	81%	76%
Had allowance	61%	56%	61%	57%
Mostly A's at school	17%	16%	19%	15%
Dating	19%	19%	16%	22%*

Table 2. Continued

Pre-coital activities	20%	16%	19%	19%
Parents divorced	9%	9%	8%	10%
Live with both parents	89%	88%	90%	88%
Father finished college	47%	33%****	52%	33%***
Mother finished college	36%	27%**	40%	26%****
Father has a professional job	46%	38%*	51%	37%****
Mother has a professional job	39%	29%**	41%	30%****
Mean monthly family income ( <i>SD</i> ) <sup>a</sup>	4.03 (.97)	3.74 (.97)****	4.13 (.95)	3.76 (.96)****

<sup>a</sup> Coding for monthly family income: 1 = less than 300 yuan; 2 = 300–500 yuan; 3 = 500–1000 yuan; 4 = 1000–3000 yuan; 5 = 3000–5000 yuan; 6 = more than 5000 yuan.

\* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ . \*\*\*\* $p < .0001$ .

### Sources of AIDS Information

Sixty-eight percent of the sample reported having received, in the previous month, information about AIDS from newspapers, 61% from television programs, 60% from the health department/physicians and 48% from magazine articles (Table 3). Forty-five percent reported the source as public information/news boards, 40% as radio programs, 36% as books, 33% as bill posts and 31% as school. Twenty-nine percent reported having received the information from displays in shop windows, 24% from their friends and peers or community organizations, 23% from parents or relatives, 14% from displays in the airport, 13% from the AIDS hotline and 12% from displays on a bus or taxi. While more female students received AIDS information from newspapers (71% vs. 65%;  $p < .05$ ), more male students received it from other channels (e.g., a bus or taxi display, an airport display, the AIDS hotline). More high school than middle school students received AIDS information from newspapers ( $p < .001$ ) and magazine articles ( $p < .05$ ), health professionals ( $p < .05$ ), radio programs ( $p < .01$ ) and public news/information boards ( $p < .01$ ).

Thirty-four percent of the middle and high school students identified television programs as the “most reliable source” of AIDS information, and 32% endorsed health department/physicians (23% middle and 38% high school students; data not shown). Thirteen percent endorsed AIDS hotlines (16 middle and 12% high school students), followed by books (8%) and newspapers (4%). About 2% of students endorsed radio programs, school and family members. Less than 1% of the sample endorsed community organizations, friends/peers, magazines or various public displays. Endorsements were similar between males and females across all sources.

As shown in the lower section of Table 3, about half of the youth said they would ask physicians or turn to an AIDS hotline for AIDS-related questions in the future. More high school than middle school students said they would ask physicians (60% vs. 44%,  $p < .0001$ ). Forty percent of the sample (47% males vs. 34% females,  $p < .0001$ ) said they would go to local health departments. One quarter (21% male vs. 29% females,  $p < .01$ ) said they would ask their parents, and about one tenth said they would ask their friends.

### AIDS Knowledge

As shown in Table 4, students responded correctly to 56% of the AIDS knowledge questions. The subcategory with the highest correct response rate was the true transmission mode (87% correct responses), while false transmission mode had the lowest (34% correct responses). Males were more knowledgeable than females in general (57% vs. 54%,  $p < .01$ ). Males were more knowledgeable about definition/symptoms (61% vs. 54%,  $p < .0001$ ), false transmission mode (37% vs. 31%,

$p < .01$ ) and treatment/prevention (68% vs. 64%,  $p < .01$ ). Females were more knowledgeable about the true transmission mode (89% vs. 85%,  $p < .01$ ). Overall, high school students were more knowledgeable than middle school students on all categories, although there was no difference between the two groups' knowledge of definition/symptoms and clinical outcomes.

**Table 3. Sources of HIV/AIDS knowledge among secondary school students in China (%)**

Sources	Overall	Gender		Grade	
		Male	Female	Middle	High
<b>Where did you receive HIV/AIDS information in the previous month (%)</b>					
Newspaper	68	65	71*	61	72***
Television	61	61	61	58	63
Health dept./physician	60	59	61	56	62*
Magazine	48	45	50	43	51*
Information boards	45	44	46	39	49**
Radio	40	42	38	34	43**
Books	36	39	34	36	36
Bill post	33	33	32	29	35
School	31	32	29	28	32
Shop window	29	29	29	27	31
Community organization	24	24	25	25	24
Friends/peers	24	24	24	22	26
Parents/relatives	23	21	25	25	22
Airport	14	16	11*	14	14
AIDS hotline	13	16	10*	15	12
Bus/taxi display	12	14	10*	13	12
<b>Whom will you ask if you have a question about HIV/AIDS (%)</b>					
AIDS hotline	55	53	58	54	56
Physician	54	53	54	44	60****
Health department	40	47	34****	37	42
Parents	25	21	29**	24	26
Friends	12	13	12	11	13
School teachers	11	10	12	12	9
Others	5	7	3***	5	5

\* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ . \*\*\*\* $p < .0001$ .

Table 4. AIDS knowledge (% of correct answers) among Chinese adolescents by gender and grade

	Overall	Gender		Grade	
		Male	Female	Middle	High
<b>AIDS knowledge full scale</b>	<b>56</b>	<b>57</b>	<b>54**</b>	<b>52</b>	<b>58****</b>
<b>Definition/symptoms</b>	<b>58</b>	<b>61</b>	<b>54****</b>	<b>56</b>	<b>59</b>
AIDS is caused by a virus (True)	83	85	82	83	84
Person can be infected with HIV and not have AIDS (True)	35	38	32*	31	38*
Person who has HIV can look and feel healthy (True)	58	65	52****	58	58
<b>True transmission mode</b>	<b>87</b>	<b>85</b>	<b>89**</b>	<b>81</b>	<b>91****</b>
Person with HIV can pass it on during sexual intercourse (True)	95	94	95	90	98****
Pregnant woman who has HIV can give the virus to her baby (True)	95	95	96	93	97**
Sharing needles for drug use with someone who has HIV (Likely)	82	78	86*	74	88****
Having sex with someone who has HIV (Likely)	81	77	85*	73	87****
<b>False transmission mode</b>	<b>34</b>	<b>37</b>	<b>31**</b>	<b>31</b>	<b>35*</b>
Working/studying near someone with HIV (Unlikely)	50	49	51	43	54**
Eating in a restaurant where the cook has HIV (Unlikely)	38	40	36	35	40
Sharing plates, fork or glasses (Unlikely)	31	35	28*	30	32
Using public toilets (Unlikely)	26	31	21****	27	26
Being coughed or sneezed on by someone who has HIV (Unlikely)	27	30	24**	26	27
Attending school with a child who has HIV (Unlikely)	45	46	45	40	49**
Being bitten by mosquitoes or other insects (Unlikely)	20	21	18	20	20
Being cared for by a nurse, doctor or dentist who has HIV (Unlikely)	27	32	22***	27	28
Using public swimming pool (Unlikely)	24	29	17****	22	25
Shaking hands with or hugging (Unlikely)	57	59	54	46	65****
<b>Clinical outcomes</b>	<b>68</b>	<b>67</b>	<b>68</b>	<b>68</b>	<b>68</b>
AIDS can reduce the body's natural protection against disease (True)	94	93	95	91	96**
AIDS can damage the brain (True)	48	43	52**	57	41****
AIDS patients die in a short period of time (Disagree)	65	67	62*	59	79***
<b>Treatment/prevention</b>	<b>66</b>	<b>68</b>	<b>64**</b>	<b>59</b>	<b>70****</b>
Drugs available that can lengthen the life of a person infected (True)	71	72	69	70	71
Early treatment can reduce symptoms in an infected person (True)	74	73	75	75	74
Vaccine available that protects a person from getting HIV (False)	53	53	53	41	61****
There is medical cure for the AIDS (False)	78	79	77	71	83****
Using condoms can prevent HIV (Agree)	61	69	53****	51	68****

\* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ . \*\*\*\* $p < .0001$ .

Table 5. Multivariate analysis (GLM) of AIDS knowledge among adolescents in China

	Gender	Grade	Gender by grade	Income
Multivariate test ( <i>F</i> for Pillai's Trace)	8.254***	15.352***	1.722	12.252***
Definition/symptoms	15.846***	2.615	4.990*	1.987
True transmission routes	9.962**	40.426***	2.330	42.463***
False transmission routes	6.777**	5.506*	<1	3.668
Clinical outcomes	<1	<1	<1	2.045
Treatment/prevention	8.722**	49.908***	<1	29.954***

\* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .0001$ .

Within all subcategories except true transmission mode, there was substantial variation by item in terms of percentage of correct responses. For example, correct responses ranged from 35% to 83% for definition/symptoms, 20% to 57% for false transmission modes, 48% to 94% for clinical outcomes and 53% to 78% for treatment/prevention.

While students were knowledgeable about the true transmission modes of HIV, there were many misconceptions about false transmission modes. More than two thirds of the sample thought (or were not sure) that a person could contract HIV by "sharing plates, fork or glass," "using a public toilet," "being coughed or sneezed on," "receiving medical care from someone who has the AIDS virus" or "using a public swimming pool." Only about one fifth did not think they would be likely to get the AIDS virus from being bitten by mosquitoes or other insects.

General linear model (GLM) analysis conducted on mean scores of five categorical scores of AIDS knowledge (Table 5) confirmed the results of bivariate analysis, with significant main effects of gender (Pillai's  $F = 8.254$ ,  $p < .0001$ ) and grade (Pillai's  $F = 15.352$ ,  $p < .0001$ ). All the bivariate differences in various categories of AIDS knowledge by gender and grade remained similar in GLM analysis. In addition, family income was a significant covariate of AIDS knowledge in GLM.

## Discussion

Given the early stage of the HIV/AIDS epidemic in China, awareness and appropriate knowledge may play an important role in preventing further spread of the disease among adolescents and young adults. Data in the current study indicated an overall low and inconsistent level of AIDS knowledge among secondary school students in China. More than one third of students had limited awareness of HIV and AIDS. Consistent with findings from other countries (e.g., Dias et al. 2006; Mahat and Scoloveno 2006), most could identify true transmission modes, but a large proportion held misconceptions about symptoms, activities that did not transmit the virus, treatment and preventive measures.

Consistent with findings in the United States (e.g., DiClemente et al. 1986; Dorman and Rienzo 1988) and other countries (e.g., Tavoosi et al. 2004; Yoo et al. 2005), as well as findings from other populations in China (Li et al. 2008, 2009), secondary school students in China appear to rely on the mass media (e.g., newspaper, television) as their primary source of AIDS information. Likewise, students ranked television and health department/physicians as the top sources they believed provided the most reliable information about HIV/AIDS. However, only 4% endorsed the newspaper as a reliable source, despite about two thirds of the students having reported getting AIDS/HIV information from newspaper articles.

Data in the current study revealed a significant gender difference in AIDS knowledge among secondary school students, with males being more knowledgeable than females, particularly in the areas concerning HIV/AIDS definition/symptoms, false transmission modes and treatment and

prevention. This finding is consistent with studies among college students in China (Li et al. 2004) and other cultures such as Kuwait (Al-Owaish, et al. 1999).

The data suggest that the majority of Chinese secondary school students did not get or did not intend to get HIV/AIDS information from their parents, friends/peers or school teachers. This points to the challenge of discussing sex-related matters or other taboo topics (including HIV/AIDS) with family members, friends and school teachers in Chinese society (Gao et al. 2001; Li 2004).

These data may be limited in their representativeness of the general adolescent population in China, since the sample was largely urban, and about 70% of the Chinese population is rural. The data in the current study suggest that AIDS awareness varies among students based on family socio-economic status, with a higher level of awareness in students from wealthier families. This finding is consistent with that from a previous study, which suggested that HIV/AIDS knowledge was much lower in rural than in urban areas in China (Chen et al. 2004). These findings underscore the importance of HIV/AIDS education among adolescents and young adults in rural areas and from socio-economically disadvantaged families and environments.

The findings in the present study, as one of the few efforts in assessing HIV/AIDS knowledge among adolescents in China, have several implications for HIV/AIDS prevention and education among Chinese adolescents and young adults. First, education and wider health promotion and prevention programs targeting adolescents are needed. While these efforts should include both middle and high school students, clearly programs need to begin at an earlier age level (e.g., middle or even elementary schools). HIV/AIDS education and prevention programs need to provide students with accurate information, particularly in dispelling misconceptions about causal contagion of HIV, as these misconceptions may foster negative attitudes in adolescents toward people with HIV/AIDS (Chen et al. 2004).

Second, the students' low utilization of schools, family and peers in acquiring HIV/AIDS knowledge underscores the great potential of these traditional information channels in HIV/AIDS education and prevention. As current efforts in China in HIV awareness promotion and prevention have largely relied on peer education (Gao et al. 2001) and mass media campaigns (Wu et al. 2007), the mobilization and active involvement of healthcare providers, schools and parents in education and prevention would be critical in fighting the HIV/AIDS epidemic in China.

Third, the knowledge gap between mode of transmission and preventive measures suggests that education and prevention efforts should emphasize the role of condoms and other components of "safer" sex. While a majority (95%) recognized that HIV could be transmitted through sexual intercourse, only about 60% of students agreed that using condoms could prevent HIV. In addition, a substantial global experience supports the observation that mere possession of accurate information does not necessarily lead to behavioural change (Hays and Hays 1992; Mann et al. 1992). Other components of effective prevention, including efficacy building, stigma reduction and skill acquisition regarding preventive measures (e.g., condom use) are needed, beyond information dissemination. Finally, the discrepancy between levels of utilization and trust of mass media (e.g., newspapers) among adolescents warrants the attention of educators and policy-makers. The role of mass media in AIDS awareness promotion in China needs to be improved, as mass media serves as one of the main channels for the disseminating AIDS knowledge among adolescents and young adults.

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