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·*Original Article*·

Sexual and reproductive health service needs of university/college students: updates from a survey in Shanghai, China

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Abstract

Aim: To promote the provision of reproductive health services to young people by exploring the attitudes and perceptions of university students in Shanghai, China, toward reproductive health. **Methods:** From July 2004 to May 2006, 5 243 students from 14 universities in Shanghai took part in our survey. Topics covered the demands of reproductive health-care services, attitudes towards and experience with sex, exposure to pornographic material, and knowledge on sexual health and sexually transmitted infections (STIs)/AIDS. **Results:** Of the 5 067 students who provided valid answer sheets, 50.05% were female and 49.95% were male, 14.86% were medical students, and 85.14% had non-medical backgrounds. A total of 38.4% of respondents had received reproductive health education previously. The majority of students supported school-based reproductive health education, and also acquired information about sex predominantly from books, schoolmates, and the Internet. Premarital sexual behavior was opposed by 17.7% of survey participants, and 37.5% could identify all the three types of STIs listed in the questionnaire. Although 83.7% knew how HIV is transmitted, only 55.7% knew when to use a condom and 57.8% knew that the use of condoms could reduce the risk of HIV infection. **Conclusion:** The reproductive health service is lagging behind current attitudes and demands of university students. Although students' attitudes towards sexual matters are liberal, their knowledge about reproductive health and STIs/AIDS is still limited. It is therefore necessary to provide effective and confidential reproductive health services to young people. *(Asian J Androl 2008 Jul; 10: 607–615)*

Keywords: reproductive health; reproductive health services; safe sex; sexual behavior; sexuality

1 Introduction

With the growing incidence of young people (aged 15–24 years) engaging in sexual activity and the spread of sexually transmitted infections (STIs) and AIDS, concern for the sexual and reproductive health of youths in this age bracket has increased in recent years. Under-25s form the largest demographic age group in China today, and are also the greatest hope for turning the tide against STIs/AIDS and unintended pregnancy. In China, as in other developing countries, rapidly increasing economic prosperity has been accompanied by a conflict between traditional and contemporary values on sex; this has had complicated effects on the sexual health of young people. In China, as a 23 million-strong community of

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youth, university/college students also have to deal with reproductive health matters. Yet few services focus on the provision of reproductive health care to university/college students. Furthermore, there is little research to help health-care services become more attractive and specific to this section of the population. These problems can only be solved with an understanding of the unique demands and attitudes of this group as well as the dissonant factors that increase their vulnerability to poor reproductive health outcomes. This study was conducted to evaluate the reproductive health attitudes, perceptions, and behavior of university/college students in Shanghai, one of the most economically developed cities in China with more than 300 university/college students per 10 000 people, and placing these in the wider context of China today.

2 Materials and methods

2.1 Participants

Between July 2004 and May 2006, 5 243 students from a wide range of disciplines and faculties were enrolled from 14 state-run universities in Shanghai (approximately 300–500 students from each university). All the students undertook the survey voluntarily. Stratified sampling was used to enrolled students according to gender, disciplines, and education levels. Generally, the number of enrolled students depended on the scales of the universities. We selected 400–600 students from universities in which the total number of students was more than 5 000 (eight universities), and selected 200–400 students from universities in which the total number of students was between 3 000 and 5 000 (six universities). The enrolled students' disciplines included medicine, literature, law, science, engineering, arts, economics, management, and education. The final data included results from a small preliminary study conducted from July 2004 to March 2005 [1].

2.2 Survey procedure

The self-completed questionnaire was designed after a thorough review of similar published reports. The questionnaire consisted of an introduction, a personal details section (gender, age, discipline, and education level) and 72 items covering four topics: demands of reproductive health-care services, attitudes towards sexual issues and experience in sexual activity, exposure to pornographic material, and knowledge of sexual health and STIs/AIDS. We selected 14 Shanghai universities covering different faculties and scales. With the approval of the university administrators, trained investigators, who are themselves medical students, approached volunteers in their classrooms. The purpose of this survey was explained to the volunteers and they were told that because no personal identifiers were included in the questionnaire and data were to be presented only in an aggregated manner, confidentiality of their responses would be assured. Investigators distributed a self-administered questionnaire to enrolled students then collected the completed questionnaires *locus in quo*. All answer sheets were anonymous and tagged by arbitrary coding.

2.3 Data analysis

Collected data were inputted into the Microsoft Office Excel 2003 program (Microsoft, Seattle, WA, USA) and analyzed using the Statistical Analysis System (version 6.12; SAS, Cary, NC, USA). The responses to discipline type were dichotomized into "medical" and "non-medical". The χ^2-test was used to compare the answers given by groups of different gender, disciplines, and exposure to reproductive health education. $P < 0.05$ was considered statistically significant.

3 Results

3.1 Sample characteristics

A total of 5 067 students provided valid answer sheets that supplied details of gender and discipline, and contained responses to more than 75% of the questions. The participants were aged between 15 and 34 years. Of these, 50.05% (2 536/5 067) were female students and 49.95% (2 531/5 067) were male, 14.86% (753/5 067) were medical students, and 85.14% (4 314/5 067) were non-medical. Figure 1 describes the education levels of the sample.

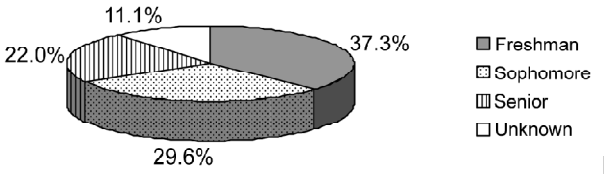

Figure 1. Education levels distribution of the sample of Chinese university/college students. "Senior" represented third-year, fourth-year, fifth-year, and postgraduate students; "unknown" represented the students who did not respond to the question regarding grade.

3.2 Highlights of findings

3.2.1 Demands of reproductive health-care services

The results showed that 66.4% (3 365/5 067) of the sample understood the exact definition of reproductive health, 74.4% (3 770/5 067) thought "formal reproductive education" refered to school courses, 71.9% (3 645/5 067) thought reproductive education should include doctor's instruction, and 38.4% (1 944/5 067) students had undertaken "previous reproductive education". Almost all of the students (93.9%, 4 760/5 067) agreed that reproductive education for university/college students was "necessary" or "very necessary". Only 16.3% (825/5 067) of students thought that such education would increase the incidence of sexual activity among university students. "Normal sexual behavior" (60.8%, 3 082/5 067), "Sexual psychological health" (55.5%, 2 811/5 067), and "Contraception" (49.7%, 2 520/5 067) were the three topics that students wanted to understand most. A minority of students wanted to learn about "The structures and functions of genital organs" (26.0%, 1 319/5 067), "Sexual dysfunction" (21.6%, 1 093/5 067) or "Treatments for infertility" (18.2%, 922/5 067). The favorite methods to access reproductive education were through lectures (61.0%, 3 091/5 067) and optional courses (43.7%, 2 212/5 067). With regards to "Who is the most appropriate person to provide sex knowledge", 55.4% (2 808/5 067) chose doctors, 50.3% (2 548/5 067) considered schoolmates or peers preferable, and only 12.8% (648/5 067) chose their parents. Books were the most common source of information on sexual issues (61.1%, 3 098/5 067), followed by schoolmates/peers (49.6%, 2 511/5 067) and the Internet (46.7%, 2 366/5 067). Only 15.1% (765/5 067) described family as their primary source.

Table 1. Responses of Chinese university/college students to questions regarding gathering information about sex. $^{b}P < 0.01$, compared with female students.

	Female students (n = 2 536) No. (%)	Male students (n =2 531) No. (%)	Total (n = 5 067) No. (%)
Do you seek information about sex on your own initiative?			
Yes	597 (23.5)	1 266 (50.0)^{b}	1 863 (36.8)
Sometimes	1 192 (47.0)	909 (35.9)^{b}	2 101 (41.5)
No	729 (28.7)	327 (12.9)^{b}	1 056 (20.8)
Missing	18 (0.7)	29 (1.1)	47 (0.9)
When did you become aware of sex?			
Elementary school	76 (3.0)	282 (11.1)^{b}	358 (7.1)
Junior high school	748 (29.5)	1155 (45.6)^{b}	1 903 (37.6)
Senior high school	1 093 (43.1)	879 (34.7)^{b}	1 972 (38.9)
College	592 (23.3)	190 (7.5)^{b}	782 (15.4)
Missing	27 (1.1)	25 (1.0)	52 (1.0)
Would you like to attend optional courses on sexual health?			
Yes	1 202 (47.4)	1 646 (65.0)^{b}	2 848 (56.2)
No	1 230 (48.5)	798 (31.5)^{b}	2 028 (40.0)
Missing	104 (4.1)	87 (3.4)	191 (3.8)
Is gender-based division necessary for courses on sexual health?			
Necessary	1 103 (43.5)	470 (18.6)^{b}	1 573 (31.0)
Unnecessary	1 327 (52.3)	1 970 (77.8)^{b}	3 297 (65.1)
Missing	106 (4.2)	91 (3.6)	197 (3.9)
Do you think reproductive health education would increase the incidence of university students' sex practices?			
Yes	306 (12.1)	519 (20.5)^{b}	825 (16.3)
No	1 056 (41.7)	947 (37.3)^{b}	2 003 (39.5)
Difficult to judge	1 162 (45.9)	1 050 (41.4)^{b}	2 212 (43.7)
Missing	12 (0.5)	15 (0.6)	27 (0.5)

The different responses to questions regarding acquiring information about sex are shown in Table 1. Male survey participants were more proactive than female counterparts in seeking information about sex.

3.2.2 Attitudes towards sexual issues and experiences of sexual activity

Premarital sexual practices were opposed by 17.7% (895/5 067) of students, accepted by 37.0% (1 876/5 067), and 44.4% (2 250/5 067) thought choosing to engage in premarital sex or not would depend on the situation. To the question "Should university students engage in sexual practices?" 81.4% (4 125/5 067) of students replied "Yes" or "I don't care", whereas only 17.5% (886/5 067) replied "No". The proportions of answers reflecting attitudes towards premarital pregnancy, as "Acceptable" or "Unacceptable", were 36.7% (1 859/5 067) and 22.6% (1 143/5 067), respectively. With regard to the "Management of premarital pregnancy", 28.0% (1 418/5 067) chose artificial abortion. Whereas 74.0% (3 750/5 067) thought it was necessary to have a "premarital physical examination", 3.9% (198/5 067) deemed it unnecessary, and 20.9% (1 058/5 067) students "didn't care".

Table 2 outlines the questions and responses reported above. The viewpoint that premarital sex practices are acceptable was more popular among male than female respondents ($P = 0.000$). The opinion that university students can be sexually active was more popular among male students and non-medical students, compared to female students and medical students, respectively (both P values were 0.000).

The responses to questions regarding sexual experience and sexual health behavior are shown in Table 3. More male than female students have engaged in sexual activities, kissing ($P = 0.685$), caressing ($P = 0.000$), or intercourse ($P = 0.000$), and more non-medical students than medical students have had these experiences (P values were 0.224, 0.003 and 0.086, respectively), although not all the answers were significantly different. The responses displayed significant gender differences but less significant interdisciplinary differences with regard to sexual health behavior.

Table 2. Attitudes of Chinese university/college students towards sexual matters. [b]$P < 0.01$, compared with female students; [e]$P < 0.01$, compared with medical students.

	Gender		Discipline		Total
	Female (n = 2 536) No. (%)	Male (n = 2 531) No. (%)	Medicine (n = 753) No. (%)	Non-medicine (n = 4 314) No. (%)	(n = 5 067) No. (%)
Premarital sex practices					
Acceptable	658 (25.9)	1 218 (48.1)[b]	269 (35.7)	1 607 (37.3)	1 876 (37.0)
Unacceptable	588 (23.2)	307 (12.1)[b]	195 (25.9)	700 (16.2)[e]	985 (17.7)
It depends	1 270 (50.1)	980 (38.7)[b]	279 (37.1)	1 971 (45.7)[e]	2 250 (44.4)
Missing	20 (0.8)	26 (1.0)	10 (1.3)	36 (0.8)	46 (0.9)
University students having sexual practices					
Acceptable	913 (36.0)	1 288 (50.9)[b]	279 (37.1)	1 922 (44.6)[e]	2 201 (43.4)
Unacceptable	626 (24.7)	260 (10.3)[b]	142 (18.9)	744 (17.2)	886 (17.5)
I don't care	970 (38.2)	954 (37.7)	322 (42.8)	1 602 (37.1)[e]	1 924 (38.0)
Missing	27 (1.1)	29 (1.1)	10 (1.3)	46 (1.1)	56 (1.1)
Premarital pregnancy					
Acceptable	955 (37.7)	904 (35.7)	271 (36.0)	1 588 (36.8)	1 859 (36.7)
Unacceptable	558 (22.0)	585 (23.1)	183 (24.3)	960 (22.3)	1 143 (22.6)
It's unavoidable	793 (31.3)	845 (33.4)	234 (31.1)	1 404 (32.5)	1 638 (32.3)
Premarital physical examination					
Necessary	2 050 (80.8)	1 700 (67.2)[b]	549 (72.9)	3 201 (74.2)	3 750 (74.0)
Unnecessary	52 (2.1)	146 (5.8)[b]	24 (3.2)	174 (4.0)	198 (3.9)
I don't care	407 (16.0)	651 (25.7)[b]	170 (22.6)	888 (20.6)	1 058 (20.9)

Table 3. Sexual activities, experiences, and health behavior of Chinese university/college students. [b]$P < 0.01$, compared with female students; [e]$P < 0.01$, [f]$P < 0.05$, compared with medical students.

	Gender		Discipline		Total
	Female (n = 2 536) No. (%)	Male (n = 2 531) No. (%)	Medicine (n = 753) No. (%)	Non-medicine (n = 4 314) No. (%)	(n = 5 067) No. (%)
Have you had any experience with kissing?					
Yes	1 220 (48.1)	1 232 (48.7)	349 (46.3)	2 103 (48.7)	2 452 (48.4)
No	1 288 (50.8)	1 266 (50.0)	392 (52.1)	2 162 (50.1)	2 554 (50.4)
Missing	28 (1.1)	33 (1.3)	12 (1.6)	49 (1.1)	61 (1.2)
Have you had any experience with caressing?					
Yes	570 (22.5)	908 (35.9)[b]	185 (24.6)	1 293 (30.0)[e]	1 478 (29.2)
No	1 939 (76.1)	1 591 (62.9)[b]	558 (74.1)	2 962 (68.7)[e]	3 520 (69.5)
Missing	37 (1.4)	32 (1.2)	10 (1.3)	59 (1.4)	69 (1.3)
Have you ever had sexual intercourse?					
Yes	254 (10.0)	510 (20.2)[b]	98 (13.0)	666 (15.4)	764 (15.1)
No	2 250 (88.7)	1 995 (78.8)[b]	645 (85.7)	3 600 (83.4)	4 245 (83.8)
Missing	32 (1.3)	26 (1.0)	10 (1.3)	48 (1.1)	58 (1.1)
If not, do you expect to be sexual activity while at university/college?					
Yes	669 (26.4)	1 870 (74.0)[b]	366 (48.6)	2 173 (50.4)	2 539 (50.1)
No	1 770 (69.8)	531 (21.0)[b]	356 (47.3)	1 945 (45.1)	2 301 (45.4)
Missing	97 (3.8)	130 (5.0)	31 (4.1)	196 (4.5)	227 (4.5)
Have you ever masturbated?					
Sometimes	284 (11.3)	1 191 (47.1)[b]	198 (26.3)	1277 (29.6)	1 475 (29.1)
Always	48 (1.9)	275 (10.9)[b]	58 (7.7)	265 (6.1)	323 (6.4)
Never	2 001 (78.9)	737 (29.1)[b]	428 (56.8)	2 310 (53.5)	2 738 (54.0)
Not recently	103 (4.1)	244 (9.6)[b]	51 (6.8)	296 (6.9)	347 (6.8)
Missing	100 (3.9)	84 (3.3)	18 (2.4)	166 (3.9)	184 (3.7)
Do you clean your genitalia everyday?					
Yes	2 071 (81.7)	1 182 (46.7)[b]	512 (68.0)	2 741 (63.5)[e]	3 253 (64.2)
No	150 (5.9)	735 (29.0)[b]	107 (14.2)	778 (18.0)[f]	885 (17.5)
Not care	273 (10.8)	576 (22.8)[b]	120 (15.9)	729 (16.9)	849 (16.8)
Missing	42 (1.7)	38 (1.5)	14 (1.9)	66 (1.5)	80 (15.8)
Do you use contraception if you ever have sexual intercourse?					
Yes	2 070 (81.6)	1 966 (77.7)[b]	591 (78.5)	3 445 (79.9)	4 036 (79.7)
No	173 (6.8)	298 (11.8)[b]	97 (12.9)	374 (8.7)[e]	471 (9.3)
Missing	293 (11.6)	267 (10.5)	65 (8.6)	495 (11.4)	560 (11.1)
Would you like to use condoms if you have sex with a casual partner?					
Absolutely	2 257 (89.0)	1 878 (74.2)[b]	595 (79.0)	3 540 (82.1)[e]	4 135 (81.6)
Maybe	131 (5.2)	447 (17.7)[b]	92 (12.2)	486 (11.3)	578 (11.4)
No	41 (1.6)	126 (5.0)[b]	41 (5.4)	126 (2.9)[e]	167 (3.3)
Missing	107 (4.2)	80 (3.1)	25 (3.3)	162 (3.7)	187 (3.7)

3.2.3 Exposure to pornographic material

The survey indicated that 89.5% (2 265/2 531) of male and 56.2% (1 424/5 067) of female students had been exposed to pornographic material. Exposure to such material could lead to "controllable sexual impulse" (for 52.4% of male and 17.8% of female students) and "masturbation" (for 7.3% of male and 1.6% of female students) or "have no influence" (for 30.8% of male and 66.5% of

female students). The most common forms of pornographic material were video disks (32.0%, 1 623/5 067), pornographic novels (26.3%, 1 334/5 067), and websites (16.6%, 842/5 067).

3.2.4 Knowledge on sexual health and STIs

A total of 45.7% (2 318/5 067) of students did not know how to calculate the "safe period" (the time in the menstrual cycle outside of menstruation and ovulation) accurately and 30.8% (1 559/5 067) had no idea of emergent contraception methods. The ovulation period of a female could be identified by 43.6% (1 106/2 536) and 39.3% (995/2 531) of female and male respondents, respectively. The harm of artificial abortion was understood by 48.6% (2 461/5 067) of participants. Only 37.5% (1 898/5 067) could identify all three kinds of sexually transmitted diseases (syphilis, gonorrhea, and condyloma acuminatum) listed in the questionnaire. Although 83.7% (4 243/5 067) knew the modes of transmission of HIV, the proportion of students who knew when to use a condom and the fact that condom use could reduce the risk of HIV infection were only 55.7% (2 821/5 067) and 57.8% (2 927/5 067), respectively.

There were significant gender differences in levels of such knowledge, as shown in Table 4. Most of the questions were answered correctly by more male than female students, except for the questions regarding the calculation of the safe period and how HIV is transmitted. The differences in responses between medical and non-medical students were significant except for the answers to the last two questions (P values were 0.112 and 0.252, respectively). The differences were also significant between students who had or had not accepted prior reproductive education, except for the answers to the following questions: identifying all kinds of STIs listed in questionnaire ($P = 0.179$); calculating the safe period ($P = 0.091$); and whether shaking hands or hugging can transmit HIV ($P = 0.052$).

4 Discussion

4.1 Reproductive health-care services vs. demands of university/college students

Although goals were set at the 1994 International Conference on Population and Development in Cairo to improve human sexual and reproductive health, there are still very few recommendations that focus specifically on the sexual and reproductive health and rights of youth in most countries. China has the largest population of university students in the world. Comprehensive ser-

Table 4. Knowledge of Chinese university/college students on sex health and sexually transmitted infections (STIs)/AIDS (answered correctly). $^{b}P < 0.01$, compared with female students; $^{e}P < 0.01$, compared with medical students; $^{h}P < 0.01$, compared with those had accepted reproductive education.

Gender		Discipline		Had accepted reproductive education		Total
Female	Male	Medicine	Non-medicine	Yes	No	(n = 5 067)
(n = 2 536)	(n = 2 531)	(n = 753)	(n = 4 314)	(n = 1 944)	(n = 3 123)	
No. (%)	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)
Identifying emergency contraception measures						
1 674 (66.1)	1 834 (72.3)^{b}	610 (81.0)	2 898 (67.2)^{e}	1 481 (76.2)	2 027 (64.9)^{h}	3 508 (69.2)
Identifying all of the STIs listed in questionnaire (syphilis, gonorrhea, and condyloma acuminatum)						
779 (30.7)	1 119 (44.2)^{b}	436 (57.9)	1 462 (33.9)^{e}	805 (41.4)	1 093 (35.1)^{h}	1 898 (37.5)
Transmission modes of HIV						
2 168 (85.7)	2 075 (81.8)^{b}	672 (89.2)	3 571 (82.8)^{e}	1 672 (86.0)	2 571 (82.3)^{h}	4 243 (83.7)
When to use a condom properly						
1 038 (40.9)	1 783 (70.3)^{b}	477 (63.3)	2 344 (54.3)^{e}	1 193 (61.4)	1 628 (52.1)^{h}	2 821 (55.7)
Could condom use reduce the risk of HIV infection (yes)						
1 342 (53.0)	1 585 (62.5)^{b}	507 (67.3)	2 420 (56.1)^{e}	1 243 (63.9)	1 684 (53.9)^{h}	2 927 (57.8)
Could shaking hands or hugging transmit HIV (no)						
2 357 (92.9)	2 264 (89.5)^{b}	678 (90.0)	3 943 (91.4)	1 796 (92.4)	2 825 (90.5)	4 621 (91.2)
Calculating the safety period (the time in the menstrual cycle outside of menstruation and ovulation)						
1 265 (49.9)	1 053 (41.6)^{b}	365 (48.5)	1 953 (45.3)	921 (47.4)	1 397 (44.7)	2 318 (45.7)

vices are necessary to help them to form healthy attitudes and behavior towards sex. However, sex is a taboo and private topic in traditional Chinese culture, so sex education has always been ignored. Our study revealed that the majority of students would prefer to communicate with doctors or schoolmates/peers about sexual matters rather than with their parents. It is possible that many parents are uncomfortable talking about sex with their children [2], or because they did not receive reproductive education they are not equipped with enough knowledge or skill to broach this difficult topic with their children [3]. This discomfort over talking about sex with children could be a common problem in many countries [2, 4]. A program called Parents as Primary Sexuality Educators (PAPSE) has been carried out in the USA. It might be an effective way to increase parent–child communication on sexual health [5]. We might learn from such experiences for family reproductive education.

In China, school-based sexual health education has been developed since the late 1980s, but most of the sexual health curriculums focus on physiological development, and few include information on sexual psychological health, contraception, or reproductive health services. There is also an acute shortage of competent health-care educators and providers. These, therefore, restrict the quality of school-based health services. However, as more and more studies suggest, teaching young people about sexual issues will neither hasten their initial sexual contact, nor increase their frequency of intercourse or their number of sexual partners [3]. Our study also provides solid evidence that medical students, although having received professional sex education, did not have more physical sexual experiences than non-medical students. In fact, effective education and health care do not encourage promiscuity. On the contrary, they can prevent risky sexual behavior and unintended pregnancy by helping students to establish a rational understanding of sex and develop healthy sexual behaviors. In the long term, promoting the widespread availability of reproductive health knowledge in high schools as well as universities will be more effective in lowering disease incidence rates than purely investing in research into disease diagnosis and treatment.

Our primary report published in 2005 [1] indicated that 64.1% students were in favor of receiving reproductive health education in school, and this figure increased to 93.9% in our final data. The increase might be due to a greater number of non-medical students being involved in the large-scale survey, most of whom would like to receive sexual health education in school. They wanted to receive more practical knowledge such as normal sexual behavior, sexual mental health, and contraception. These results were similar to that of Li *et al*. [6]. They implied that sex education should meet the needs of students by imparting comprehensive knowledge. However, we should emphasize that plain knowledge alone might not be sufficient to establish safe sexual health behavior. There were no significant differences in responses between medical and non-medical students with regard to some questions about sexual health behaviors. Therefore, far more than just providing a series of lectures, skill-building, problem-solving, communication-based education sessions and clinical services are also essential.

With regard to how the information should be delivered to students, the final result was similar to our primary report [1]. It appears that lectures and optional courses are the most favorable ways of receiving sexual health information. In our investigation, students responded positively to the lectures we held. From their feedback we conclude that lectures by specialists are well received as a way of delivering sexual health information. Some prospective studies also suggest that this method is available [7]. More importantly, accurate information will be presented at lectures or optional courses conducted by specialists. In addition, students also indicated a willingness to discuss sexual issues with schoolmates/peers. Actually, peer education is an excellent supplement to school-based education [8], but it is essential to ratify the competency of peer educators. The lack of confidentiality, impatient service, or a patronizing attitude of service staff, and fear or embarrassment experienced by young people are all barriers to effective service. Perhaps these reasons are why some students do not like attending optional courses and some insist that a gender-based division is necessary. In addition, confidential sexual health services can also be delivered through other accessible ways such as hotlines, counseling, and networks [9]. The appropriate methods of delivering sexual health information would depend on the diverse preferences and needs of specific groups.

4.2 Knowledge vs. attitudes and behavior about reproductive health

Our findings indicate that many students tolerate or even accept premarital sexual practices and pregnancy, with only a minority opposing this view. The corre-

sponding facts are the rising incidence of cohabitation and premarital pregnancy among university/college students. In our survey, approximately half of respondents expected to be sexually active while at university/college and approximately 15% reported having already had such an experience. The results of surveys in other cities of China are similar [10, 11]. Our data do not reflect a dramatic increase in the incidence of sexual activity among Chinese university students [12]. In fact, the figures are much lower than those of the USA, Europe, and Japan [13–15]. This might be due to the constraining Chinese traditional concept of chastity and strict discipline at school. Also, the ban on marriage while in university has only recently been lifted.

However, many university/college students have very limited knowledge about sexual hygiene. Our research showed that many students lacked even the most basic cognition about sexual activity, pregnancy, and contraception. It is possible that students are not thoroughly aware of safe sexual practices, and might not be well-equipped to make decisions surrounding sexual activity. Similarly, students' knowledge on STIs/AIDS was limited. Our data suggested that current sexual education pays a lot of attention to the prevention of AIDS but neglects teaching about other STIs. It is reported that adolescents who received instruction prior to becoming sexually active were less likely to initiate sexual intercourse or be engaged in risky sexual behavior [16, 17]. If we do not provide young people with sufficient knowledge about STIs/AIDS, we could put them at risk of these diseases.

Human sexual behavior is affected by ideas about and attitudes towards sex, and it is now generally acknowledged that a deficiency in the knowledge about STIs/AIDS and risky sexual practices are highly related to STIs/HIV transmission. More than 100 million mostly curable STIs occur each year in young people aged between 15 and 24 years all over the world, and more than half of all new HIV infections happen in young people. In China, the number of cases of STIs has risen steadily in recent years. It is indicated that there have been 650,000 cases of HIV infection in China based on the latest estimation at the end of 2005, and 43.6% of them were infected through sexual contact [18]. This epidemic is now spreading from high-risk groups to the general population. It is predicted that 10 million people in China will be infected by 2010 in the absence of effective prevention strategies [19]. However, Walsh-Childers *et al.* [20] found that a considerable proportion of Chinese university/college students still feel that fate, rather than their own behavior, determined whether an individual was infected with HIV or not.

One would expect university/college students to be more knowledgeable about reproductive health and STIs/AIDS. In fact, despite having more opportunities to access advanced education, the majority of Chinese university/college students are still not knowledgeable enough about STIs/AIDS. The situation in other subgroups of youths might be similar or worse, because not all young people in China can access such education. So we can say that the situation of the average Chinese youth with regard to reproductive health knowledge is not promising.

The present study was based on a survey among university/college students in Shanghai, China. However, there are some limitations to this study. The lack of representation from youths of other regions in the country and the absence of answers to some sensitive questions might have had an impact on our results. We recommend that similar studies be conducted with various groups of young people all over the country.

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