

## Multiple Health Behaviors and Psychological Well-being of Chinese Female Undergraduate Students

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### Abstract

*This study examined Chinese female college students' multiple health behaviors, their quality of life, and mental and psychological well-being and compared that with American counterparts. A convenience sample of 293 female undergraduates participated in the study during spring 2010, in Eastern China. A traditional self-report paper-pencil instrument was created and used to collect data. American college students' data collected in spring 2010 is from ACHA-NCHA. Chinese participants were primarily first or second year college students (94.9%). Overall, 22.5% of the Chinese students were classified as underweight. More than 39.0% had zero days of vigorous exercise per week. About 85.0% of students rarely or never used a seat belt when riding in a car driven by other people. Academics pressure was the most difficult thing for both Chinese and American students to handle. Chinese students reported worse general health, more struggles with mental health indicators, and greater personal relationship issues compared to the American cohort. It is concluded that Chinese female students have unique health needs compared to the American cohort. Prevention strategies or interventions should be designed to meet their needs. Health education priority should shift from a focus on one-dimensional physical health to multiple life-style-related health behaviors among this priority population.*

**Keywords:** Chinese, female college students, health behavior, mental health, quality of life

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## Introduction

Mainland China has experienced tremendous socio-economic change over the past 30 years. To respond to the rapid economic growth, the Chinese higher education system has expanded in terms of its college enrollment, tuition fees, and financial aids, and through the emergence of new institutions since the late 1990s.<sup>1,2</sup> The total number of students enrolled, for example, increased from 1.08 million in 1998 to 2.68 million in 2001.<sup>3</sup> Chinese college students must manage not only the transition from high school to college, but also the outcomes of a booming economy and the social changes that China has experienced. Most Chinese universities have been located in urban areas. Therefore, some students may also need to adjust to living in a modern city when they move from small remote rural areas. With the increasing enrollment in colleges, the environment and dynamics of college life are different from 20 years ago. Dorms are not the only living place anymore; more college students are choosing to live outside campus. Also more students have part-time jobs. Consequently, there have been dramatic shifts in lifestyle-related behaviors such as exercise, smoking, eating habits, and how to manage stress. For example, sexual activity is not rare anymore, which contradicts the traditional social norm of no sex prior to marriage. The social and psychological pressure resulting from such changes make stress management increasingly important. The job market is not very promising for young graduates and the pressures of getting a good job after college are palpable. This young Chinese generation not only embraces a lot of opportunities, but faces more challenges as well.

Health education specialists dedicated to working on the health needs of Chinese youth should shift from focusing only on physical health (absence of disease) to promoting healthy lifestyle-related behaviors. For a long time controlling infectious diseases has been the priority for health preventions and interventions in China, but now, these are no longer the prevailing health issues in urban areas. In 2008, the first three causes to death among Chinese people in some cities and counties were cancer, heart disease, and cerebrovascular disease.<sup>4</sup> These are all non-infectious diseases but lifestyle related. A report from the Chinese Center for Disease Control and Prevention reflects this shift.<sup>5</sup> Their investigations focused on Chinese residents' nutrition and health statuses by examining eating habits, smoking, drinking, and physical activity behaviors in 2002. It revealed that only 14.1% of residents were physically active and

most of them were older people. Young adults spent more time doing sedentary activities such as watching TV, and 4.6% of urban young people did not eat breakfast. Smoking is still a public health crisis, with 48.2% of males and 2.6% of females using tobacco. The rate of drinking alcohol has increased significantly, especially among females (73.1%).

However, nationwide, the prevalence of such health behaviors and the health status of Chinese college students are not clear. There have been limited studies targeting the college student population. In the area of exercise, Luo found that college students had spent more leisure time on surfing the internet and dating and less time on physical activities.<sup>6</sup> Especially among female students, the average time for daily exercise was less than 15 minutes.

Regarding sexual behaviors, one study found that 7.3% of 970 participants (undergraduates: freshman to junior) reported having had sexual intercourse.<sup>7</sup> In contrast, several studies of multiple health behaviors of college students have been conducted in Hong Kong. Lee and Yuen Loke studied health-promoting behaviors and psychological well-being of university students.<sup>8</sup> Their results echoed Luo's findings that fewer college students engaged in any form of physical activities, particularly females. But their sample showed positive personal growth in using stress management skills and dealing with interpersonal relationships. When looking at the patterns of drug use behaviors in Hong Kong, Abdullah et al. found that the most commonly used substances among undergraduates were tobacco and alcohol, and that there were gender differences in drug use with higher rates among males than females.<sup>9</sup>

Multiple health behaviors of adolescents and college students have been well studied in the United States. The Youth Risk Behavior Surveillance System (YRBSS) from the Center for Disease Control and Prevention (CDC) and the National College Health Assessment (NCHA) from the American College Health Association (ACHA) have been conducted regularly. Very little is known about health risk and health promoting behaviors in the college student population in mainland China. Therefore, the purpose of this preliminary study was to assess the prevalence of multiple health behaviors and health status among Chinese female undergraduate students and to compare these findings with American college students data collected in spring 2010 from ACHA-NCHA.<sup>10</sup> Given the importance of these behaviors for

health promotion, this research focused on five health behaviors: smoking, physical activity, eating habits, safety, and sexual behavior, and on the students' quality of life, and their mental and psychological well-being.

## Method

### Sample and Procedures

A convenience sample of 293 female undergraduates who were enrolled full time in a university of a municipality in eastern China, participated in this cross-sectional study during spring 2010. The university was a public, four year institution with an enrollment of more than 8,000 undergraduate students, predominantly females. Before participating in this study, students were given an oral consent. Oral consent consisted of verbally informing the students that participation was voluntary and anonymous, and would not affect their academic performance, that answers to survey questions would be confidential, and that access to the study data would be limited only to researchers.

The Chinese College Health Behaviors Survey for Females (CCHBS-F), a traditional self-report paper-pencil instrument, was created and used to collect data. The content of the survey was based on the information gathered from a student focus group. First, ten female undergraduates were recruited to form a focus group in order to help researchers identify existing health behaviors among female college students. Second, the CCHBS-F was created based on the feedback from the focus group. Most survey questions were adopted from previous research in English, and then were translated into Chinese. Finally, students and researchers also worked together to assure that the wording and response options for each question were clear and reflected the reality in China. For example, past findings and the focus group show that illegal drug use is not an issue among Chinese female students, so those related items were not included in the survey. Students were asked to complete the paper-and-pencil survey in the classroom and the teacher and researchers were always available to help if they had any question about the survey.

### Measures

The CCHBS-F containing 60 questions was used to collect data on demographics, multiple health behaviors, quality of life, and mental and psychological wellbeing. All measures except

demographics in this instrument were adopted from previous research carried out by international and U.S. organizations, or the American government, such as the World Health Organizations (WHO), CDC, and American College Health Association (ACHA). The original measures are English and were translated into Chinese by researchers.

*Multiple health behaviors-* Three physical activity questions based on the guidelines for adults recommended by the U.S. Department of Health and Human Services<sup>11</sup> and WHO<sup>12</sup> assessed the number of days of moderate, vigorous, and muscle strengthening physical activities during the past seven days. Students were also asked about their weight goals and whether they had used exercise or dieting to lose weight in the last 30 days. Fruit, vegetable, and soda consumption was assessed in number of times per week. These items were taken from Youth Risk Behavior Surveillance System survey of 2009.<sup>13</sup>

Questions about ever smoking and frequency of smoking were also adopted from the 2009 YRBSS questionnaire.<sup>13</sup> One item measured the frequency of seat belt use when taking a taxi or riding with a driver. The sexual behavior item was based on the instrument from Cleland, Ingham & Stone.<sup>14</sup> All participants were asked whether they have ever had sexual intercourse (vaginal, same sex or hetero sex).

*Health-related quality of life-* Health-related quality of life was measured using five items adopted from the CDC.<sup>15</sup> One item was about general health status, and four items were about the number of days during the past 30 days that physical and mental health was not good, and number of days of having unhealthy symptoms ( $\alpha = .74$ ).

*Mental and psychological well-being-* The mental health measures were taken from the *National college health assessment* published by ACHA.<sup>16</sup> Eight items were used to ask students whether they had ever felt hopeless, overwhelmed by all they had to do, exhausted, very lonely, etc. ( $\alpha = .78$ ). The response options ranged from 1 (Yes, in the last 12 months) to 5 (No, Never). Another 10 questions examined a group of problems that students had difficulties to handle within the last 12 months (academics, family problems, intimate relationships, other social relationships, finance, health problems of a family member, personal appearance, personal health issue, sleep difficulty, and other). One single item assessed the overall level of stress that students had experienced. Ratings were made on a 5-point

Likert scale, ranging from 1 (No stress) to 5 (Tremendous stress).

Psychological wellbeing measures collected for this study included a 10-item Rosenberg global self-esteem measure<sup>17</sup> ( $\alpha = .82$ ) and a 7-item body image/body esteem measure ( $\alpha = .66$ ). The scale of self-esteem consisted of 10 statements, each rated on a scale of 1 to 4, where 1 indicated "strongly agree" and 4 indicated "strongly disagree." The body image/body esteem item was obtained from prior research on adolescent self-images.<sup>18</sup> The response options for this scale ranged from 1 (describes me very well) to 6 (does not describe me at all).

### Data Analysis

The Statistical Package for Social Sciences (SPSS), version 19.0, was used for computing descriptive statistics, chi-square, and reliability coefficients. A total score for self-esteem (10-40) and problems difficult to handle (0-10) and an average score of body image/body esteem were created. Chi-square tests were conducted to compare the results of general health status, smoking, physical activity, and sexual behaviors, stress level, and mental health between the Chinese and American female college students. The ACHA- NCHA II data was collected in spring 2010.

## Results

Table 1 presents a list of sample demographic characteristics in this study. Most participants were first or second year students (94.9%). Chi-square tests were performed to test whether freshmen and sophomores were demographically different. No significant differences were found ( $p > .05$ ). The body mass index (BMI) was calculated from self-reported height and weight. Based on the standards from WHO,<sup>19</sup> a normal range of BMI is between 18.50 and 24.99 kg/m<sup>2</sup>, our data revealed that 22.5% students were underweight (from severe thin to mild thin), and only 1.4% were pre-obese.

### Multiple Health Behaviors

Overall, 16.4% reported 0 days of moderate exercise, 39.2% reported 0 days of vigorous exercise, and 54.3% reported 0 days of muscle strengthening activities. The standards for regular physical activities are engaging in "light-moderate leisure-time physical activity at least five times per week, on average, for at least 30 minutes each time or vigorous leisure-time physical activity at least three times per

week, on average, for at least 20 minutes each time".<sup>20</sup> Almost 83.0% had fewer than five days of moderate exercise and 82.2% had fewer than three days of vigorous physical activities per week. According to the guidelines of at least two days of muscle strengthening exercise per week,<sup>11</sup> 75.4% were below the standard.

Nearly 57.0% of the students had eaten fruits and vegetables five or more times per day during the seven days before the survey. Overall, the prevalence of having consumed soda beverage was low, with 48.5% drinking 0 times and 20.1% drinking only one time. Half of the students described themselves as overweight. When asked about their weight goals, more than 61.0% were planning to lose weight, while only 4.4% were planning to gain weight. Almost 43.0% indicated that they used exercise to lose or keep from gaining weight, and 40.4% had dieted in the past 30 days.

For other health behaviors, about 86.0% had never tried cigarettes, and the majority of students (99.0%) had not smoked in the past 30 days. Only 6.1% reported they had sexual intercourse. Regarding using a seat belt, 85.0% indicated that they rarely or never wore a seat belt when riding in a car driven by someone else.

### Health-Related Quality of Life

Nearly 48.0% described their general health as fair or not good. The average days of not good physical health and mental health were 4.07 days ( $SD = 5.14$  days) and 6.51 days ( $SD = 5.48$  days), respectively. The sum of these two measures forms a new total of overall unhealthy days. Students reported an average of 10.39 unhealthy days ( $SD = 7.64$  days) in the previous month. Regarding days of having unhealthy symptoms, students indicated 5.37 days ( $SD = 5.57$ ) of feeling sad, blue, or depressed and 4.55 days ( $SD = 5.04$ ) of feeling worried, tense or anxious during the previous month.

### Mental and Psychological Health

In the last two weeks, 33.4% of the students had felt overwhelmed by all they had to do, and 28.3 % had felt exhausted (not from physical activity). However, in the past 12 months, feeling that things were hopeless (40.6%), feeling very sad (37.5%), and very lonely (36.2%) were most often reported by students in the study. Out of 10 things possibly difficult for students to handle within the last 12 months, academics (39.9%), other social relationships

(34.2%), and personal health (21.0%) occupied the first three spots. About 17.4% said there had been four or more things difficult for them to deal with within the last year. For the self-evaluated stress level, 27.3% had experienced more than average stress.

A total score for the Rosenberg self-esteem scale was calculated. It ranged from 10 to 40 points. Higher scores represent higher self-esteem. Twenty-five students had scores lower than 25 points. In terms of body image and body esteem, most students (61.8%) were not pleased with their future images, and 53.2% were not proud of their bodies and appearance. Two out of five students (40.3%) seemed to be forced to imitate the people they like. About 32.0% had been worried about their health in the past year and the same percentage of students had often thought they were not at all the person they would like to be. However, only 13.7% did not feel strong and healthy, and 16.4% felt ugly and unattractive.

### **Comparison with American Data**

A total of 95,712 college students were surveyed in spring 2010 by ACHA. The average age of total sample was 22.36 years ( $SD = 6.21$  years) and 62.5% females.

Figure 1 shows multiple comparisons in general health status and several health behaviors between two countries. About 36.5% of Chinese sample reported very good or excellent general health in comparison with 56.6% of the American sample,  $\chi^2(1, N = 62089) = 39.29, p = .00$ . In terms of multiple health behaviors, 86.2% Chinese students never tried cigarettes versus 68.6% of American students, and only 6.1% Chinese students have had vaginal sex versus 70.9% of American students ( $ps < .05$ ). For physical activity behaviors, more American students reported 0 days of moderate exercise (22.8% vs. 16.4%), and three or more days of vigorous exercise (28.8% vs. 17.8%) than the Chinese counterparts ( $ps < .05$ ). The BMI results showed that 22.5% Chinese students were underweight compared with 5.8% of American cohort ( $p < .05$ ). However, none in Chinese sample was obese as opposed to 11.3% of American sample.

As for mental health, 27.3% Chinese sample indicated they had experienced more than average stress compared with 55.7% American sample ( $p < .05$ ). Among ten things been very difficult to handle within the last 12 month, students from both countries agreed that academics pressure was the

biggest difficulty for them to deal with (39.9% Chinese students vs. 47.2% American students). However, other social relationship was the second biggest struggle for Chinese students (34.2%) and finances was for American cohort (37.7%). There were significant differences ( $ps < .05$ ) in eight situations: academics, family problems (14.7% Chinese vs. 31.7% Americans), intimate relationships (15.7% Chinese vs. 34.9% Americans), other social relationships (34.2% Chinese vs. 27.4% Americans), finances (16.4% Chinese vs. 37.7% Americans), personal appearance (19.8% Chinese vs. 26.0% Americans), sleep difficulties (12.6% Chinese vs. 26.8% Americans), and other (18.1% Chinese vs. 10.1% Americans). As for the last 30 days of mental health, Chinese students reported more issues in feeling hopeless (18.8% vs. 9.5%), overwhelmed by all you had to do (24.9% vs. 18.5%), and exhausted not from physical activity (27.6% vs. 18.0%). But both cohorts of students showed similar patterns for other aspects of mental health ( $ps > .05$ ) including felt very lonely (16.7% vs. 13.9%), felt very sad (16.4% vs. 14.9%), felt very depressed (9.2% vs. 6.5%), felt overwhelming anxiety (10.6% vs. 12.4%), and felt overwhelming anger (7.8% vs. 8.9%).

### **Discussion**

This study was one of the first to evaluate multiple health behaviors of young college women in mainland China. As expected, students showed a sedentary lifestyle which is consistent with the findings from other studies.<sup>6,8</sup> Most students (94.9%) were in their first or second year in college, with an average age of 19.79 years. They should be at the age of living an active life and being full of energy. Though physical education is a required course for freshmen and sophomores in China, the striking reality is that students not only failed to participate in moderate, vigorous, and muscle strengthening exercise, but also had an unhealthy perception about their weight. Of students who were underweight or within the normal body mass range, almost 61.0% reported a desire to lose weight and near half described themselves as overweight.

This finding was not a surprise because body image and image sensitivity related to physical appearance in the eyes of others are significant concerns for young females across the world.<sup>21</sup> However, a large percentage (22.5%) of those students were underweight compared to an American college sample of spring 2010, where only 5.8% classified as underweight.<sup>10</sup> In addition, more than half of the surveyed students were not proud of their bodies and

appearance, and about 16.4% felt ugly and unappealing. In Western society, thinness equals attractiveness and a thin ideal body image has been internalized by young women.<sup>22,23</sup> Our findings indicated that it seems this kind of internalization has developed among college-age Chinese women as well. Numerous studies examined the relationships of body dissatisfaction, internalization of the thin-ideal, and the onset of eating disorders. Pursuit of the thin-ideal reinforced body dissatisfaction and contributed to the development of eating disorders.<sup>24-26</sup> Therefore, what kind images young females should have about themselves and how they developed such distorted prototypes are salient issues generated from the study. It is possible that media and peers play huge roles in influencing young people's views of themselves and others, even though the literature lacks adequate empirical evidence regarding that conviction.

Of five health behaviors examined, failure to use seat belt when riding in a car driven by someone else was by far the most commonly reported. Only five students stated that they always used a seat belt. The university is located in a and it is common for people to take a taxi and to sit in the front seat. Moreover, private vehicle ownership has an annual growth rate of 23% in China.<sup>27</sup> This seat belt use data thus raises important questions about the extent to which students or perhaps even the public are aware of the relationship between seat belt use and the risk of injury or death. These findings on low seat belt use also reflect insufficient safety education for the college population and underscore the need for considerable effort, from individual to law enforcement, to enhance the awareness of the importance of seat belt use.

China is the largest cigarettes consumer and producer country in the world. However, by 2002, smoking prevalence among women older than 15 years is still only single digit (3.1%) compared to 66% among men of the same age.<sup>28</sup> Our results also showed a similar pattern, with 99.0% of respondents who said they had not smoked during the previous 30 days. Given the national trend, it would be worthwhile to examine smoking behaviors among college males more thoroughly. Sexual activity is another behavior with single digit prevalence in our sample (6.1%). In contrast, 52.0% American college female students reported having vaginal intercourse during the last 30 days.<sup>10</sup> These results reflected different social norms and cultures regarding sexual behaviors between the two countries. Our results also indicated that the influence of social changes and of western culture on Chinese college female students' sexual behaviors

may be exaggerated by peers or the media. Traditional values are still strong and popular. However, as mentioned before, almost 95% of our sample were first or second year students. It is possible that third or fourth year students are likely to have sex than students in their early years at college.

Surprisingly, almost half of the students described their general health as fair or not good and reported an average of more than 10 unhealthy days (both physical and mental health) during the last month. It is important to note that academics were still the toughest challenge for students, and that almost one-third had experienced more than average stress, which echoed the findings from a previous study.<sup>29</sup> Their health statuses, to some extent, may reflect the academic pressures on them. Students also felt it was difficult to manage other social relationships instead of intimate relationship that was the third biggest challenge for American students to handle following academics and finances. The study from Li and colleagues indicated that worries over inadequate social skills and lack of interpersonal communication skills were personal stressors that hassle Chinese college students.<sup>29</sup> Since the participants were new to college, some students may be struggling with the transition from high school to college, from living with parents at home to living with roommates in a different environment. Traditionally, college students all lived in the dorm and it was not unusual for seven or eight people to share a room. They had daily contact with each other, and most of them had the same class schedule. In addition, when the only-child-in-a-family generation goes to college, handling relationships with other people may be the first obstacle for them to overcome.

As for the comparison with American college sample, Chinese female college students showed different behavioral pattern. Smoking, sexual behavior, and more days of vigorous exercise were not widely accepted by this sample. Ten difficult situations for students to handle within the last twelve months before the survey were ranked based on responding percentages. The orders of them from both samples were very different even though they all ranked academics as the number one difficulty. Chinese students had less financial burden and family problems than American counterparts. But they worried more about their personal health and appearance. Regarding mental health, only responses of last 30 days were compared between two samples. Chinese students showed poorer mental health than American students. The reason that they felt exhausted, hopeless, and overwhelmed by too many things to do may not be just from the academics. The

order of ten situations indicated that worries may come from their concerns about themselves: self-appearance, personal health, and relationships with others.

Although this preliminary study indicated a behavioral pattern and the state of psychological well-being of female Chinese college students, several limitations should be acknowledged. First, the study was based on a convenience sample of a single public university. The participants were all females, and male students were excluded due to the purpose of this study. It is possible that male students would exhibit different behavioral patterns. For example, one study found that more than 60.0% of male college students smoked cigarettes.<sup>6</sup> In contrast, only two female students in our study reported smoking cigarettes within the last 30 days. Most of the participants were first and second year students. Juniors were under-represented and seniors were excluded in this study. Older students may have been more exposed to more risky health behaviors than younger students. In general, the characteristics of our sample may limit the ability to generalize these findings to students attending other colleges. Future studies should compare other Chinese population.

Another limitation is the validity of CCHBS-F. Most survey questions were translated into Chinese from English counterparts. Even though those English surveys have been used by several organizations and other professionals, and researchers and student focus group evaluated the survey questions for wording, format, response options, and clarity before the study, only content validity evidence was provided. Unexpectedly, 18.1% Chinese students mentioned that other situations that were not listed on survey were very difficult for them to handle. It was ranked number six of ten problems (vs. number 10 by American students). The result implies that the survey used in this study does not cover some important situations that are challenging for students in China. To understand which situations that may trouble female college students, a qualitative or mixed method design could be used to identify them. Further validation of CCHBS-F in its Chinese version is needed.

The final limitation is that American sample used for comparison was older and range of age was broader than that of Chinese students. These further present limitations in the comparisons in health behaviors, general health status, and mental health between the groups. Future prospective studies should assess the two groups concurrently.

## Conclusion

The present results have important implications for health education specialists working with college students in China. First, the health education priority should shift from physical health (absence of disease) to life-style-related multiple health behaviors. Second, more effort is needed to develop strategies that encourage and motivate students to be more physically active. For first year and second year students, physical education courses are mandatory in China.<sup>30, 31</sup> These programs are more sports oriented and may represent the only health education related programs available for students in college. Based on the results obtained in this study, it is uncertain whether those programs work well or can motivate students to engage in physical activity inside and outside physical education. Third, female and male students may have different behavioral patterns. Thus, health education strategies should be tailored for females. For female students, health education specialists need to focus on helping students develop healthy self-images and social images and enhance their self-esteem. Fourth, students' psychological well-being cannot be overlooked. They need better skills for coping with relationships with other people. Last, safety education is necessary and important, not only for students' own life but also for other people's health and public safety. Overall, Chinese female college students showed specific behavioral patterns compared with American counterparts, and any prevention efforts or interventions should be designed to meet their specific needs. HIV or AIDS prevention, for example, may be much less urgent than the lack of physical activity for this population of Chinese female college students. However, more comprehensive health education programs with emphasis on mental health and stress management, self-identity and appearance concerns, personal health management, and relationship and communication skills need to be developed and embedded into China's college education system and its curriculum.

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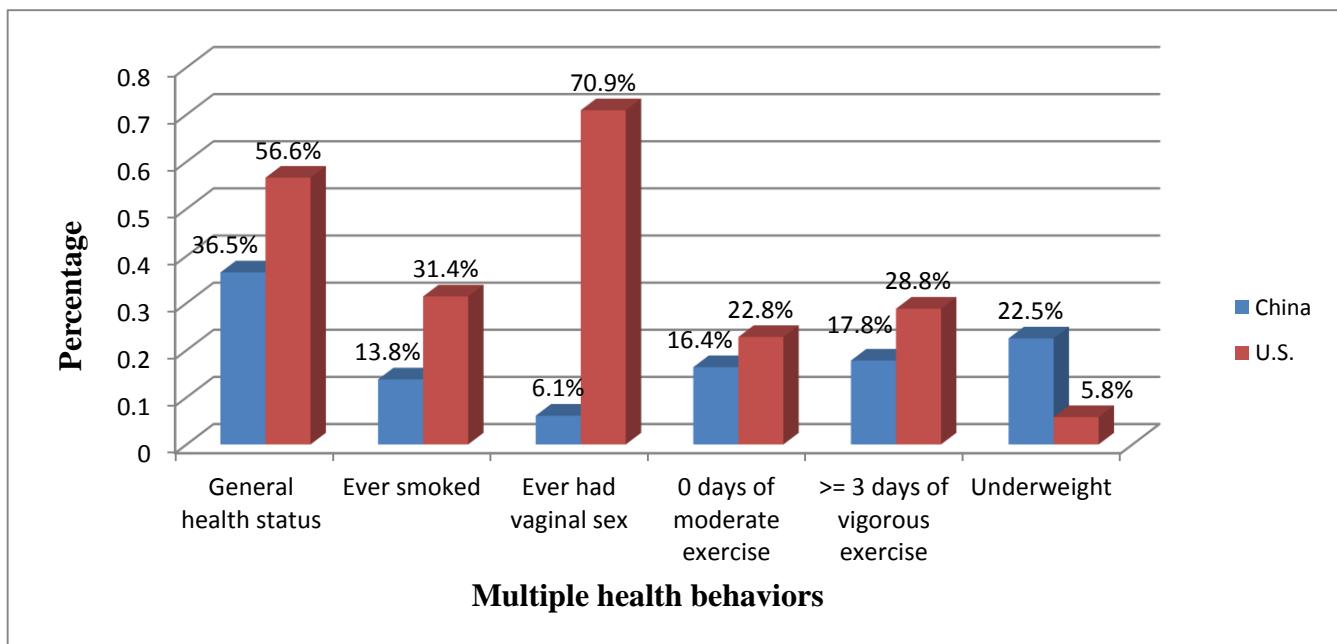
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**Table 1 Sample Demographics**

Characteristics	Frequency	%
Year in school		
First	131	44.7
Second	147	50.2
Third	15	5.1
Age	19.87 years/SD= 1.03	
Mother's education		
Before high school	110	37.7
High school	70	24.0
College or higher	112	38.4
Father's education		
Before high school	79	27.1
High school	64	22.0
College or higher	148	50.9
Mother smoking (yes)	5	1.7
Father smoking (yes)	185	63.1
Part time job (yes)	88	30.1
Home residence		
Urban areas	210	71.7
Rural areas	83	28.3
BMI (kg/m <sup>2</sup> )		
Underweight (<18.50)	66	22.5
Normal (18.50-24.99)	223	76.1
Pre-obese (25.00-29.99)	4	1.4

**Figure 1 Comparisons of multiple health behaviors between Chinese and American students****Figure 2 Comparison of Mental Health between Chinese and American Students**