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The Development of a Website Providing Contraceptive Information  
to Female College Students in Beijing, China:

A Special Studies Project

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By

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Bachelor of Science in Kinesiology

The College of William and Mary

2016

Thesis Committee Chair: Kate Winskell, Ph.D.

An abstract of

a thesis submitted to the Faculty of the

Rollins School of Public Health of Emory University

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## **Abstract**

The Development of a Website that Provide Contraceptive Information  
to Female College Students in Beijing, China:  
A Special Studies Project

by Guanjin Chen

Despite attitudes towards sexuality having become more open than in the past, knowledge about and use of contraception among Chinese college students is not adequate. This special studies project seeks to develop a website that provides contraceptive information to female college students in Beijing, China, with the goal of improving their knowledge about contraception and potentially their use of contraception. Prior to the website development, focus group discussions were conducted with thirty participants to assess needs among the population. Focus group discussions were conducted again after development of the website for evaluation purposes. Participants were recruited through convenience and snowball sampling; transcripts were analyzed using MAXQDA.

Results from formative research showed that detailed explanations of the safety and effectiveness of each contraceptive method were needed by the target population, in particular relating to IUDs and oral birth control pills, about which participants expressed a high level of confusion. Participants also wanted to see resources about where could they get those products. Website evaluation FGDs showed that this website addressed most of the study participants' needs and expectations. They also pointed to possible directions for future improvements of this website, such as including online quizzes to assess users' change in knowledge and including more interactive sections.

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## **Chapter 1 Introduction**

### *Rationale*

As social and economic conditions continue to improve in China, attitudes towards sexuality are more open than before, especially among young unmarried college students. Various kinds of contraceptive methods are also available for college students who need them. However, young unmarried Chinese women are still experiencing high rates of unintended pregnancy, abortion, and side effects from unsafe sex such as sexually transmitted infections (STIs). Information about family planning and safer sex are available but inadequate, which influences the reproductive wellbeing of young Chinese women and increases their chances of suffering from negative effects caused by unsafe sexual practices. Every year, there are about 13 million abortions in China, around half of which are among women under the age of 25, most of whom are college students. Statistics have also shown that sexually active females between the ages of 20 and 29 account for 62% of all induced abortions each year in China (Deng, 2010). Studies conducted among unmarried female college students in China's cities showed that among those who are sexually active, only about 30% use contraception consistently (Long et al., 2016; Wang et al., 2015). Additionally, female students have inaccurate and inadequate knowledge about contraception. A study conducted among female students in 49 major universities in China showed that only about 20% of the target group understood the effects of intrauterine devices (IUDs) (Wang et al., 2015). These numbers show a severe lack of accurate and adequate contraceptive knowledge among this population, thus, our study will seek to improve the knowledge of contraception among unmarried Chinese female college students.

To address this problem of low knowledge and low uptake of contraception and to improve the reproductive wellbeing of Chinese female college students, this special studies

project will produce a website with information on different kinds of contraceptive methods and their effectiveness and usage, as well as information on safer sex behaviors based on participants' needs. Focus group discussions will be conducted among study participants before website development to assess population needs and after the website is introduced to participants to evaluate the website for future improvements.

### *Purpose Statement*

This special studies project seeks to develop and optimize a website that provides contraception information to female college students in Beijing, China, with a view to improving their reproductive health knowledge and contraceptive uptake.

## **Chapter 2 Comprehensive Review of Literature**

### 2.1 Use of Internet in Health Communication Among College Students around the Globe

The internet has become an increasingly popular source for people seeking health information, especially for college students. Many studies have found that a majority of college students now use the internet to search for health information. According to a recent 2018 Pew Research fact sheet on internet use, 98% of people in the United States who had at least some college education reported using the internet, the education level with the largest proportion of internet users (Pew, 2018). A cross-sectional study conducted by researchers from the Rollins School of Public Health at Emory University among students at two southeastern US universities showed that almost every student (98% of the study participants) reported use of the internet, of which 74% reported getting health information from the internet (Escoffery et al., 2005). Another qualitative study conducted among urban community colleges in the US also found that

young adults aged 18-29 turn to the internet more often than to any other source for health information. Students also reported that the internet is their most often consulted source of health information, and that they felt the internet empowered their healthcare decision-making (Rennis, McNamara, Seidel, & Shneyderman, 2015).

In addition to the fact that the majority of college students use the internet for health information, many researchers have found that online health information searching tends to be a gender-specific behavior. A study in Taiwan found that 70% of female participants reported using the internet to search for health information, compared with 58.6% of male internet users (Koo, Lu, & Lin, 2016). Female internet users were also significantly more likely to change their health behavior as a result of internet research. Another interesting finding in this study was that among female participants, urban residence, higher educational level (college and above), and younger age (between 20-45) were three factors significantly associated with seeking health information on the internet (Koo et al., 2016).

Since the internet has become an important tool for young people to search for health-related information, many studies have started to look at the internet as a source of reproductive health-related information. Findings from such studies also had important implications for the development of this special studies project. A study assessing internet use among HIV-positive women in New York found that among those who used the internet to look up health-related information, about a third chose to read others' health experiences online, and over half chose to watch online videos. Most internet users were passively engaged when using the internet to seek health information, such as reading information or watching videos (Blackstock et al., 2015). Those findings have implications for the development of the website in this special studies

project, suggesting that the researcher should consider including sections that allow people to share and read others' experiences and comments, and add video sources if possible.

Another study in Canada assessed internet use among sexual minority women through focus group discussions. Some motivations identified for using the internet to search for sexual health information included safety (which included privacy, anonymity, and the ability to avoid social stigma), lack of offline resources, and high accessibility (Flanders, Pragg, Dobinson, & Logie, 2017). Their participants indicated that online resources could provide a safe space to talk about sexual health issues. Additionally, some participants reported that they choose to use online sources because these are more informative than their offline service providers and have better interconnectivity. For example, participants reported that they were able to access many other resources through links on the one resource they were currently using. This study also found that besides seeking factual information online, participants also tended to look at other people's shared experiences, and learned from those experiences (Flanders et al., 2017). The implications of those findings are important for the development of the planned website in terms of making sure the website protects users' privacy, making the website informative, and linking users to available real life resources and service providers.

## 2.2 Internet as a Reproductive Health Communication Tool in China

### *2.2.1 Reproductive Health in China*

While sex education materials exist and resources are available both online and offline, reproductive health in China is still quite a concern. This is reflected in two areas: the abortion rate and use of family planning. According to the Chinese Health Statistics Yearbook, there are over 6.5 million cases of abortion each year, half of which happen among those under 25 years old. About one third of unmarried female college students have experienced unintended

pregnancy (Wang et al., 2015). A study conducted among 49 universities in Chinese urban cities found that among sexually active female college students that enrolled in their study, the prevalence of unintended pregnancy was 31.8%. Among students who had a pregnancy, astonishingly, over half (53.5%) had experienced two or more pregnancies. In addition, 83.9% of students with an unintended pregnancy chose abortion (Wang et al., 2015). A study assessing the relationship between school-based sex education and sexual behaviors among Chinese college students also found that the repeated induced abortion rate was as high as 55.9% among Chinese female college students and unintended pregnancy for the same group was highly associated with lack of family planning knowledge (Li et al., 2017).

Although Chinese college students have access to a variety of online and offline resources, they still have a low rate of contraception usage. A study assessing the effectiveness of a social media-delivered sexual health education tool among students in Hong Kong found that only 49.7% of sexually active college students used condoms (Sun, Wong, & Wong, 2017). A study assessing reproductive health knowledge among unmarried female college students in China's cities also found that among sexually active female college students, only about 30% used contraception consistently. Young college students were significantly less likely to use contraception than older students because they had a lower level of reproductive health knowledge, and were less likely to discuss such issues with their peers and parents (Long et al., 2016). Additionally, female college students had inadequate knowledge about contraception. A study conducted among female college students in 49 major universities in China found that over 60% believed oral contraceptive pills (not emergency contraception pills) would negatively affect their fertility, and only about 20% of the participants understood the effect of an IUD (Wang et al., 2015). Among students who were using or had used contraceptive methods, 33%-

40% were still experiencing unintended pregnancy, which could be an indicator of inaccurate use of contraception (Wang et al., 2015).

### *2.2.2 Internet Use in China*

According to the 41<sup>st</sup> China Internet Development Report produced by the China Internet Network Information Center (CNNIC), as of December 2017 China had 772 million internet users (CNNIC, 2018). Young people aged 18-24 numbered as many as 227 million in China (Li et al., 2017). This group is also the largest internet user group. According to the 33rd Statistical Report on Internet Development in China issued by the Chinese government, people aged 20-29 make up the largest internet user group. Among them, female users account for about 45% of all users. As internet use becomes more and more common among Chinese college students, it provides a unique opportunity for reproductive health communication due to its accessibility and confidentiality (Sun et al., 2017).

### *2.2.3 Sex Education in China*

Sex education in China dates back to the 1980s when the Chinese government noted the importance of sex education in schools and started including it in school curricula (Lou, Zhao, Gao, & Shah, 2006). Nowadays, even though sex education classes exist in secondary schools and colleges, they are often largely ignored because of cultural norms which prevent discussion about sexual matters and because sex education is not one of the key subjects that make students competitive during their college or graduate school admission (Burki, 2016). A study found that the contents of current sex education were often superficial and did not fully meet students' needs. They also failed to catch students' interests and attention, such that students began switching to modern communication platforms, such as social media and the internet, to look for

the reproductive health information they needed (Lou et al., 2006). According to a study that traced the development of Chinese sex education over the last century, sex education in China mainly focuses on HIV/AIDS and teenage pregnancy, and tends to put emphasis on the effectiveness of abstinence in preventing these issues (Aresu, 2009). This study also found that although China has the goal of introducing sexual and reproductive health education classes into every middle school of the country, it had not yet been achieved. Additionally, many young people in China became dissatisfied with the sex education provided in schools so they went to look for information elsewhere (Aresu, 2009).

#### *2.2.4 Current Reproductive Health Communication Tool on the Internet*

A study in Shanghai tested the effectiveness of an internet-based education intervention. This study used the website Youthhood ([www.youthhood.com.cn](http://www.youthhood.com.cn)) as the sex education tool. The website contained sexual and reproductive health information, such as reproduction and contraception, STIs, HIV/AIDS, abortion, and sexual harassment. It also contained a discussion section allowing counseling and discussion among students in the intervention group. The study chose two high schools and four colleges in Shanghai as study sites. It sorted the study population into case and control groups and only the intervention group could access this website. Students from the intervention group could browse this website using their assigned username and passwords in order to ensure privacy, and the website was available to them for 6 months (Lou et al., 2006). Results of this study were measured by changes in students' sexual and reproductive health knowledge tested from pre and post surveys. Among the 1300 participants in the intervention group 90% browsed the website. About half of those who browsed the website spent 10 to 20 minutes on it at each time. 67.8% of those who had access to the website liked this way of obtaining sexual health education from the internet (Lou et al.,

2006). Among the intervention group, more than 80% of the subjects reported that they benefited from the website and about half of them reported that exposure to the website resulted in them paying more attention to reproductive health knowledge from other sources. Females appeared to benefit more than males: 88% of female participants said they received some or great benefit from the website, compared to 80% of males. Also, 56.7% females reported that this website encouraged them to pay attention to reproductive health from other resources as well, while only 50.8% of males said so. Participants' reproductive health knowledge level was assessed using a questionnaire during pre and post surveys. The study found that its intervention group had an increase from 50% to 63.4% in their post survey score, while the control group only increased from 50% to 55.1%. Logistic regression analysis of the survey scores also indicated that students who had browsed the website increased their reproductive health knowledge significantly compared to those who did not browse the website at all (Lou et al., 2006)

The author also concluded that the website had minor influences on participants' attitudes towards reproductive health related issues; for example, both the intervention group and the control group had 50% of their subjects disagree with the statement "providing contraception to young people means encouraging them to have sex" before the intervention. At endline the percentage of people disagreeing with this same statement in the intervention group increased to 64%, while it only increased to 54% in the control group (Lou et al., 2006).

### 2.3 Implications from previous studies

The internet health communication intervention discussed in the previous section had useful implications for this special studies project. Compared with traditional health education methods, conducting reproductive education through the internet has multiple advantages. For example, it allows the user to choose any time and place for learning; users can learn at their own



speed; and this format increases privacy. Based on these advantages and college students' high rate of access to the internet, it is feasible to provide reproductive health information through the internet. Websites as resources for contraception information are expected to reach a wide population and have positive effect on people's knowledge about contraception, especially for female college students, as this population has been shown to use the internet more often and benefit more than males. Also, a website could be used to change people's attitudes toward contraception if there is social stigma affecting their uptake of contraception.

Research has suggested that future interventions should allow a longer intervention period in order to observe any change in behavior. Future websites should also take care to be credible, engaging, and suitable for the taste of the target audiences (Lou et al., 2006). Another study also pointed out that websites with health information for college students should be assessed by five criteria: accuracy of information, currency (having the latest information), credibility, clarity, and understandability of the health content (Escoffery et al., 2005). In addition to those criteria, researchers are also encouraged to improve connection to the community both for themselves and for their target audience. A study assessing the implications of internet resources on HIV education among Chinese college students suggested that since current sex education efforts in China rely largely on peer education and media campaigns, internet-based sex education with appropriate guidance can be a useful complement (Hong, Li, Mao, & Stanton, 2007). A study from Hong Kong assessing the effectiveness of social media as a source of health information among college students also suggested that health materials should be appealing to the target population, and should have the ability to reach young people through various channels. Contents should be comprehensive, and researchers should pay special attention to the balance between exposure and privacy of participants (Sun et al., 2017).

Based on the implications from those previous studies, this special studies project will start by conducting formative research in the form of focus group discussions to assess current needs about contraception among Chinese female college students in Beijing. Based on data obtained from this formative research, a website will be produced and will be sent to study participants for evaluation. The website evaluation will be conducted with the same focus group participants.

## **Chapter 3 Methods**

### **3.1 Needs Assessment**

There is currently a low rate of contraceptive usage and a high rate of abortion among Chinese college females, mainly due to inadequate reproductive health education and information currently available to college students. Not getting adequate information from school, most college students nowadays switch to modern communication platforms such as using the internet or social media to obtain reproductive health information. Recognizing this trend, this special studies project will develop a website to provide information about contraception to Chinese female college students in Beijing, China; and will start assessing this population's needs on contraceptive information through formative research.

### **3.2 Population and Sample**

The study participants were Chinese female college students of reproductive age in Beijing, China. The study population included 30 females between the ages of 19 to 25 who are currently attending universities in Beijing, China. Participants were from non-medical

universities or non-medical majors, and they were recruited through convenience and snowball sampling. The reason for excluding medicine-related major students was to avoid selection bias because students with a medical background would have better knowledge about reproductive health than those who do not have a medical background. Beijing was chosen as the study site because, as the capital of China, it is one of the most diverse cities that contains people with different backgrounds. The researcher reached out to know individuals who were eligible for this study and asked them to recruit people they knew. A brief study description including its purpose and procedures, as well as informed consents, was sent out to potential participants via WeChat, an online chatting app. Those willing to participate in the discussions provided their informed consents to the researcher. They were then divided into five different focus groups.

### 3.3 Description of Formative Research Focus Group Discussions

All five focus group discussions were conducted in Chinese in the form of real-time online chatting using an app named WeChat. The reason for choosing to do online focus group discussions was because all participants were based in China, and the researcher was based in the United States. Online communication between these two groups was deemed more feasible than face-to-face focus group discussions in terms of time and budget. Focus group discussions were conducted in Chinese because this was the native language of participants and the only language they speak.

WeChat was used for those discussions because it is the most popular chatting app currently used in China and it includes various important functions for the study such as group chatting, and sending voice messages, photos, and video. Participants were all familiar with all the functions of WeChat at the time of the focus group discussions. They were able to talk with each other and with the researcher in real time using text and voice messages. To ensure

confidentiality, all participants used usernames of their choice instead of real names throughout the discussion. Only their age, major, and username were visible to other participants.

Participants could choose to quit the discussion at any time by leaving the group chat; they could also recall any text or voice message within one minute of sending. Transcripts were downloaded from the app, then translated into English by the researcher for data analysis using MAXQDA software (VERBI Software, 1989-2018). Focus group discussion transcripts and MAXQDA files were kept in a password protected laptop and only accessible to the researcher.

All five focus groups used the same discussion guide. To help participants think about what information they currently had and what information they needed to see on the website, there were eight questions focusing on three topics: current resources for contraceptive information and services, existing methods and knowledge, and unmet needs among the study population. Under section one, participants were asked about the sources they had used or were using for contraceptive information and their perception of those sources. Section two asked about some of the currently used contraceptive methods among college female students like those focus group participants. The last section in the focus group discussion guide asked about needs and expectations for the website. For example, participants were asked what they wanted to see on the website if there were one that provided female college students contraceptive information; and they were asked what type of language they preferred seeing on that website.

### 3.4 Data Analysis

Themes were identified after careful reading of the focus group discussion transcripts and the researcher used MAXQDA to develop a codebook. The researcher used focus group discussion questions as guidance to develop themes; the data analysis was carried out in MaXQDA in two stages. In the first stage, transcripts were analyzed for overall length of time

spent for each discussion, and the proportion of texting by the facilitator and participants to assess level of engagement of focus groups. In stage two, the researcher further analyzed transcripts using thematic coding. The codebook consisted of themes identified via the discussion guide (deductive) and additional themes which emerged during actual discussions (inductive). Detailed, smaller themes were merged into large themes; for example, themes like “opinions about condoms” and “opinions about contraceptive pills” were merged into “opinions about contraceptive methods”. Across focus groups, some good quotes and misunderstandings about certain contraceptive methods were also coded. All focus group transcripts were originally in Chinese and quotes presented in the result section were translated into English.

### 3.5 Plans for Website Revisions and Pilot Testing

After analysis of the transcripts was completed, the draft website was revised according to the findings, in particular relating to the information and website sections participants had suggested, as well as the type of language used on the site.

The revised website was then sent out to each discussion group via WeChat. New focus group discussion guides aimed at evaluating the website were developed. Discussions were conducted with each group after everyone had taken the chance to look at the website. Questions in the evaluation discussion guides asked participants about what they liked and disliked about the website, their opinion about the language/wording used on the website, how appealing the website was, and whether they would recommend it to other people. The researcher then used MAXQDA again to analyze those focus group discussions for future improvement of the website.

### 3.6 Ethical Considerations

This special studies project was determined by the Emory University Institutional Review Board to be exempt from review. A project description consisting of study goals and information about the process was provided electronically to each study participant and informed consent was obtained from each participant. Focus groups were conducted using an online chatting app, where each participant used a pseudonym. The only demographic information collected was participants' age and academic major. All other personal information such as real name, home address, phone number, email was not visible to anyone.

## Chapter 4 Results

### 4.1 Formative Research

The mean age of the study participants was 21 years old. They majored in arts, physical education, journalism, math, law, and early education. A total of five FGDs were held, with six participants in each group (Table 1).

***Table 1 Study Participants Demographic***

	Number of Participants	Mean Age	Major
Focus Group 1	6	20.4	Physical Education
Focus Group 2	6	20.3	Art, Calligraphy
Focus Group 3	6	20.7	Applied Math, Statistics
Focus Group 4	6	21.2	Law, Journalism
Focus Group 5	6	21.2	Early Education

Focus group discussions ranged from 50 minutes to one hour. Throughout all the focus group discussions in the formative research phase, no one withdrew and all participants appeared excited to talk about this topic. All focus group discussions were in the form of text messages; although participants could send both text and voice messages in WeChat, none of the 30 participants sent voice messages. A lot of questions regarding intrauterine devices (IUDs) emerged during the discussion across all focus groups and people appeared to have limited or no understanding of what an IUD was.

A total of four themes emerged from the five focus groups, focusing on currently used resources for contraception information, commonly used contraceptives among the target population, common questions participants had or had heard of from people like them regarding contraceptives, and expectation or needs for the website.

*Theme one: Current resources for contraception information.*

All focus groups were asked what kind of resources they and female college students like them usually use for contraceptive information, how they filtered information and chose from multiple sources, and what their opinions about those sources were. All focus groups reported that their most commonly used source was baidu.com, which is the most used search engine in China and has over 73% of the Chinese population as its users (Statcounter, 2018). Participants in three focus groups reported asking friends who had used contraceptives before, and people in two focus groups reported seeing advertisements about emergency contraceptive pills and condoms on television. Other than those common methods of getting contraception-related information, popular culture was another resource. In one focus group participants reported getting information (albeit incorrect) from movies: *“I also remember that I’ve seen a movie*

*played by Fanbingbing and Hangeng, in which vigorous exercise can also prevent pregnancy” (Focus Group 1).* Those who used baidu.com as a source of information were further asked how they filtered the large number of search results. Among them, all focus groups had participants who reported randomly choosing whatever appeared on the first or second page, or results that received the most “likes”, and some who did not know how to filter information; participants in three focus groups reported asking friends who had used contraception or were majoring in medical subjects to double check information online. Participants in one focus group reported used their pre-existing knowledge to filter information.

*Theme two: Currently used contraceptive methods.*

Under this theme, questions focused on commonly used contraceptive methods and perceptions about those methods among female college students like the participants. The most used contraceptive reported across all focus groups was the condom. The next most common method was “the pill”; about half of the participants in each focus group mentioned this method. “The shot” was mentioned by one or two participants in each focus group, and “the ring” was mentioned in two focus groups.

Comments about condoms focused largely on their effectiveness, and most participants asked questions like whether condoms could fail. When asked why they thought people chose to use condoms more than all other contraceptive methods, participants in three focus groups thought it was because condoms are safer for women’s health (posing a lesser risk to fertility) compared to other methods. One focus group reported using condoms could prevent the transmission of HIV/AIDS (*Focus Group 1*). Others said they chose this method because they had friends or classmates who had used it before.



The next most commonly mentioned method was “the pill”. Surprisingly, those who mentioned this method said taking pills would be harmful to fertility in the long term. Since in Chinese the term “pill” could refer to combination pills, progesterone-only pills, or emergency contraceptive pills, participants in each focus group were asked to specify which kinds of pill they were referring to. Among those who mentioned pills as a contraceptive method, three focus groups did not clearly differentiate between different types of pills and needed more explanation; two focus groups were clear that the pill they mentioned was “*the one that you just eat one time after sex, because if you take too much, it will be harmful to your health*” (Focus Group 5) (i.e. emergency contraception).

In two focus groups people mentioned “the ring” as one of the contraceptive methods they had heard of. Since “the ring” in Chinese could refer to the Nuvaring or copper IUD or hormonal IUD, participants were again asked to specify which type they were referring to. This time those who mentioned “the ring” did not know what they were referring to, because they had only heard this expression of having a “ring” to prevent pregnancy. Additionally, they were unable to distinguish between a copper IUD and a hormonal IUD. In fact, in the other three focus groups when people were asked their opinions about IUDs since they did not bring this method up, they did not link IUDs with “the ring”. Discussion of this method was very animated within those focus groups. Misconceptions included the perception that IUDs were only for older women, and that it is a permanent method to prevent pregnancy. In one focus group participants raised many questions about IUDs, such as whether this method was harmful to a woman’s health, where and how people put IUDs in their bodies, and how IUDs worked. One participant expressed this confusion and concern by saying: “*where do you put that (the IUD)? Down there*

*(the uterus)? OMG! That doesn't sound safe!" (Focus Group 1), and another participant asked "Is (IUD) there to lock up uterus?" (Focus Group 1).*

Across all focus groups a few participants mentioned the "shot" (Depo-Provera) as one method. Besides that, one participant mentioned using the menstrual cycle as one way to prevent pregnancy by calculating "safe days". When asked about their opinion on abortion, most focus groups said it was common in college but very harmful to a woman's health especially when she undergoes abortion multiple times *"You will be infertile if you have too many abortions" (Focus Group 4).*

### *Theme 3: Needs and expectation for the website.*

The five focus groups were asked about what questions they had or had heard most about contraception, and what they wanted to see on the website. All focus groups expressed concerns about the safety of various contraception methods; for example they asked about possible side effects of contraception on fertility, and which kinds of methods were least harmful to one's health. Besides safety concerns, the other main question was about the effectiveness of different methods of contraception. Four focus groups reported that the most common question they had or they had heard of was "will condoms fail?" and "how well do condoms work?" Besides questions about contraception, two focus groups asked about reproductive health and wanted to see information about human reproduction on the website: *"I want information about why we can't get pregnant every time we have sex" (Focus Group 4).*

When focus groups were asked what information they would want to see on a website about contraception, some said they wanted to see an introduction and the possible side effects of each method. Most participants in all five focus groups said they wanted to see product

recommendations on the website, such as where they could get the products mentioned on the website and what resources were available for them to get additional recommendations. In four focus groups most participants reported wanting information to be short and easy to understand because they did not have the patience to read a long paragraph. When asked about what sections they wanted to see on the website, participants provided a variety of answers. In all focus groups, most participants wanted a question-and-answer section, so that they could find questions that were similar to those they had and find answers easily. While a few people in all focus groups preferred to talk to a trained advisor online so that they could have their questions answered right away.

When focus groups were asked about the type of wording they preferred to see on the website, four focus groups had a majority of participants reporting wanting simple language “*no no, no professional language! I want plain language, otherwise I won’t be able to understand*” (Focus Group 4). The rest said they wanted to see professional language because that would sound reliable “*I want professional language on the website, and want information that has credibility*” (Focus Group 3).

#### 4.2 Website Development

After reviewing results from the five focus groups, the researcher decided to include three sections on the website (<http://chjdaisy3118.wixsite.com/contraceptionscl>): an introduction to the website’s purpose, a detailed introduction of each available contraceptive method currently in the Chinese market, and a Q&A section. Each contraceptive method had an individual page that contains information on its effectiveness, safety, directions on how to use that method, and where people could get this method (Figure 1).

Figure 1 Screenshot of the contraception section (for oral contraceptive pills)

HOME
简述
种类
Q&A

## Introduction Types of Contraception

### Oral Contraceptive Pills

## 口服避孕药 – 短效避孕药

### Effectiveness

**有效率** 91% (未严格按照说明使用) ~ 99.7% (严格按照说明使用) 避孕药使用的规范与否非常影响其有效率，虽然严格按照说明使用有效率非常高，但是大部分人做不到每天同一时间服药，或者忘记服药，这些都会导致避孕药的有效率下降。

### Advantages

**优点**  
短效避孕药并非外界传说的对身体有极大危害，相反有许多好处。一些人服用短效避孕药后会发现痘痘减少，痛经减轻等变

### How to Use

**用法**：目前市面上常见的短效避孕药都是21片装也有28片装。在月经第一天（出血第一天）吃第一片，以后的每天都要在同一时间吃一片，连续21天。建议手机设置提醒。  
28片装的每盒中有7片是无效药片，连续服用21天后，停药7天，在这7天中可以服用无效药片以保持服药习惯，或者直接停药7天，7天后开始新的服药周期。无效药片对身体没有任何副作用。

### Where to get

**常用的短效避孕药**：目前市面上常见的短效口服避孕药品牌有：复方炔诺酮，复方甲地孕酮，复方左炔诺孕酮片，妈富隆，优思明，达英，敏定偶，特乐居（资料来源：科学松鼠会，[Juneo 2012]）。

The Q&A section contained questions participants in the five focus groups had brought up and provided answers to each of the questions. The language used on the website is a mix of both professional and informal language: when describing the effectiveness and safety information about each method, the researcher overwhelmingly used professional language, while the Q&A section used mainly informal language to make answers simple and easy to understand (Figure 2).

**Figure 2 Screenshot of the Q&A section**



### 4.3 Website Evaluation

Focus group discussion guides for the evaluation of the website focused on participants' opinions about the website content, the language used on the website, what they liked and disliked most about the website, how helpful the website would be in making informed decisions about and improving access to contraception, and recommendations to further improve the website. Three priority themes, namely focus groups' opinions about the website, helpfulness of the website and future recommendations, were identified after carefully reading and analyzing responses from each focus group discussion using MAXQDA.

#### *Theme 1 Opinions about the Website*

This theme includes participants' opinions about the website in general, the language used, what they liked and disliked the most, and what additional information they would want. A majority of participants reported that the website was very useful because it contained detailed information about each contraceptive method, which was helpful to people who have no previous knowledge about contraception. Most focus groups reported that the language used on the website, a mix of informal and professional language, was very simple and easy to understand in general. Most people in four focus groups reported liking this style of language, while one focus group reported that it was strange to have informal language mixed with professional language.

When asked what they liked the most about the website, most focus groups pointed to the fact that the website provided detailed information about different contraceptive methods available on the market. When the researcher asked focus groups to elaborate on their responses, some people said they liked that the website had percentages to show the effectiveness of each

contraceptive method because that was very simple and straightforward. Other common appealing aspects of the website included the use of pictures of each contraceptive method and information about where people could get products. When asked about information not yet addressed on the website, most of the focus groups reported they would love to see more information about women's reproductive health such as how menstrual cycles happen, how that affects pregnancy, and safe sex tips. Two focus groups had participants suggest that instead of currently having equal focus on all possible methods, the website could put more emphasis on methods that are currently more popular and more available in China.

### *Theme 2 Helpfulness of the website*

This theme contains questions asking participants how helpful they thought the website was in helping them make informed decisions and improving contraceptive usage. Most focus groups reported that they would definitely use this website as a resource: *“For me, I would like to use it and look over it when I need the information”* (Focus Group 3). However, one or two people in two focus groups said that the information on the website was suitable only for some people: *“This is useful for me because I have very little knowledge about contraception, but for people who already know a lot, they would not use the website that often”* (Focus Group 5).

### *Theme 3 Recommendations*

Under this theme, participants gave advice on further improving the website and discussed whether they would recommend the website to others. Two focus groups suggested that since currently the website has a large amount of text, they would like to see more charts and tables to compare methods because that would provide them a clearer understanding of their

relative effectiveness and safety. Also, as mentioned under theme one, some focus groups wanted a comparison between contraception available in China and in the US. Since the contraceptive methods mentioned on this website are what is available in both China and US, participants wanted to see a clearer description of which kinds of contraceptive methods are more available in China, and what methods are used in the US regularly but are perceived by the general population in China to be not safe. For example, IUDs are used by women in all age groups in the US not only for birth control but also as treatment for heavy period and anemia (hormonal IUDs) (Planned Parenthood, 2017), while in China IUDs are less used by the young female population and generate many negative perceptions among this study participants. In this case, information about IUDs should focus more on addressing this negative perception and focus on its safety, instead of putting equal focus on its usage, effectiveness, safety and resources.

Two focus groups suggested the website could have more different sections. Currently, in response to findings from the first round of FGDs, the website only has sections that introduce each method, a Q&A section, and available resources to get contraception. Participants reported that they wanted more interactive sections such as an online quiz that they could take to determine which methods best fit their needs.

When asked whether they would recommend this website to others, all focus groups said they would, but they disagreed on the best ways of recommending the website. Some focus groups said they would post the link of this website on their social media accounts so that everyone who followed them would be able to see and click the link. When asked why they chose this mode of communication, participants in two focus groups said: *“it is kind of weird to recommend this to a friend...I might post it in my friend circle (social media), but I will not sent*



*the link directly to my friends” (Focus Group 3). On the other hand, some participants said they would directly send the link to friends instead of posting the link on social media, because they view this as a private issue: “I will just tell my friends about this website, but will not post the link in my friend circle...it’s strange to share this kind of thing publicly” (Focus Group 1).*

## **Chapter 5 Discussion**

### **5.1 Website Development and Evaluation**

Formative research to inform the further development of the draft website helped to explore the needs of the study population. As suggested by Aresu’s 2009 work, although all participants previously received sex education in school, they still had some knowledge gaps about contraception and expressed many needs related to contraception (Aresu, 2009). IUDs were a topic that most focus groups were not familiar with and focus groups all wanted more information on that topic. This is similar to what Wang et al. found in their work where only about one in five of their study participants understood the effectiveness of an IUD (Wang et al., 2015). Besides the needs for more information on IUDs, focus groups also expressed their desire to see information about each contraceptive method and sources where they could purchase those products or get counseling services. While Hong et al.’s work also suggested expanding the connection between online resources and other sources in local communities, the researcher addressed this need by adding a “where can I purchase it?” section for each contraceptive method, and putting website links for local family planning product distribution centers in the Q&A section, enabling website users to easily find the nearest distribution center (Hong et al., 2007).

During formative research, focus groups also expressed that they wanted information on the website to be credible and reliable, in line with previous findings suggesting that the future development of websites as online health education tools should be credible and suit the taste of the target population (Lou et al., 2006). Addressing this need, the researcher developed an introduction to each contraceptive method, including details of its safety and effectiveness using credible sources from the Centers for Disease Control and Prevention (CDC) in the US and in China; and Bedsider ([www.bedsider.com](http://www.bedsider.com)). Bedsider is an online birth control support network for women aged 18-29 operated by Power to Decide, a campaign that aims at preventing unplanned pregnancy. Contents of bedside.com are reliable because they were developed with the guidance and advice by the Power to Decide's Healthcare Advisory Committee that includes health care professionals from the medical and public health fields (Bedsider). A Q&A section was developed in response to focus groups' expressed preferences, and questions in the Q&A section drew from questions focus groups had during formative research. In order to make sure the website aligned with the tastes of the target population, the researcher also assessed what kinds of format, language, and page design participants had suggested during formative research and made the website according to those needs. For example, focus groups had mixed recommendations around using casual language or professional language on the website, so the researcher combined their needs and used professional language for information about each contraceptive (the effectiveness, safety, and usage), and more casual language in the Q&A section and resource sections.

The researcher then conducted website evaluation with the five focus groups after showing the website to them. Focus groups reported that they liked the level of information provided on the website because it was very detailed and was helpful to those who do not have

previous knowledge about contraception. In terms of language used on the website, the mixture of both casual and professional language fit most people's needs although some felt a little uncomfortable having casual language mixed with professional language. All focus groups liked the connection with real life product and services providers, showing that the website had successfully found a way to link users to services providers. Flanders et al. suggested that future research on developing online resources should focus on the connection with service providers (Flanders et al., 2017), a recommendation supported by the findings of this study.

In terms of types of user interaction with the website, in line with Blackstock's work, most participants engaged with the website passively (Blackstock et al., 2015), and when it came to website recommendation, about half of focus groups recommended passive methods such as adding more pictures and tables to make contents easier to understand and change the background color of the website so that it was visually more appealing. Focus groups did not express the needs for a place where they could discuss contraception among peers, and only a few people expressed the desire to talk to an online advisor so that their questions could be answered right away. Also, most people in all five focus groups seemed satisfied with the current format of the website and the way its information is displayed. When asked about how they would recommend this website to others, about half of the focus groups chose to recommend it by posting the link on their social media, instead of directly sending the link to their friends. This behavior could reflect the attitudes about contraception among the target population and could point to underlying factors that influence the uptake of contraception among the target population, for example stigma around contraception. The study conducted by Blackstock et al. in 2015 also found that a third of participants read others' health experiences online (Blackstock et al., 2015), a finding that was not consistent with the population in this special studies project.

Although focus groups reported that they would seek information about contraception from friends who had experiences, they did not express the need for a “case study” of other people’s experiences of using contraception on the website.

## 5.2 Additional Findings

As shown in previous literature, although female college students in China have access to various methods of contraception and have received sex education, the rate of contraception uptake is still low and rates of negative outcomes of unprotected sex are still high. According to a research report by China Family Planning Association, 70% of young unmarried people reportedly engage in premarital sex in most provinces in China, and 62% of all abortions in China every year involve young, unmarried women (Will, 2012).

The first possible factor that influences the uptake of contraception among participants emerged during formative research. Participants in almost every focus group had many questions when the researcher mentioned IUDs and Nuvaring. They either did not know much about these contraceptive methods, or could not distinguish between different types of contraceptive rings, so they asked the researcher to provide more information about these. In some of the focus groups the participants discussed among themselves when the researcher asked their opinion on abortion or their knowledge about IUDs. In order to make sure the discussions covered all the topics, the researcher invited those who had further questions to reach out and talk one-on-one with the researcher after the discussion. However, no one among all five discussion groups reached out. This suggested a possible constraint when talking about reproductive health issues among this population. Although people were very active and engaged in a group discussion setting, they were less willing to talk about this matter in a private setting. Possible explanations may be that people felt they were in a safe space when talking in a group setting because the researcher had

assured them that every response was anonymous and would not be linked to their identity. Additionally, questions asked in focus groups all focus on the general population, not on participants themselves. This also ensured that participants' privacy was protected during the discussion, and they might have been afraid that during the one-on-one conversation with the researcher they would be asked to talk about their personal experiences with contraception. On the other hand, when talking one-on-one with the researcher, even though their real name would not be displayed on the app, people may still have felt uncomfortable asking questions that came from themselves on such private issues as contraception.

A similar issue emerged during the website evaluation. A question for focus groups was "will you recommend this website to your friends? Why or why not"? As shown in the result section, there were focus group participants that chose to post the link of website on social media and there were focus group participants that chose to send the link directly to a friend. Although these seem to be two completely different choices, the underlying reason for them is the same: people reported that it is either "not appropriate" to publicly post information about contraception or "it's weird" to recommend such information to a friend.

The above situations suggest an underlying social stigma surrounding the topic of contraception or reproductive health in general among this population. Although participants had access to contraception resources and were eager to learn more about this topic, they were still hesitant to show other people that they were actively learning about contraception. This could be one of the underlying factors that leads to the low rate of contraceptive uptake, because if people are hesitant to reach out to others for help and are not willing to show that they are involved in this topic, it is very unlikely that they can express their needs clearly and it is hard for them to get the type of contraception that fits their needs. This indicates a possible direction for the future

improvement of this website that researcher could further investigate, namely possible causes for this social stigma around contraception, and strategies to change people's current perception about contraception.

### 5.3 Strengths

There were several strengths to this project. Firstly, the innovative use of online focus group discussions to collect data was very effective given the different geographic regions of the researcher and participants. It fostered a safe space where participants from across the world felt free to talk about sensitive topics like contraception. The app used for focus group discussions (WeChat) is a popular chatting app that all participants used on a daily basis, therefore this platform provided a familiar discussion environment, which can help them feel more comfortable during the discussion. This stimulated discussion and interaction within focus groups, which led to the production of many unanticipated new ideas and themes. Also, compared with traditional in-person focus groups, online focus groups have advantages when researching sensitive topic like contraception because online focus groups offer anonymity and thus stimulate self-disclosure among participants. Participants felt comfortable talking in a safe space and it is to be expected that this would allow them to speak more than in-person focus group discussions where people gather face-to-face in an unfamiliar setting to talk about sensitive issues (Schneider, Kerwin, Frechtling, & Vivari, 2002). It is also possible that online focus groups can elicit richer quotes from participants than in-person focus groups because participants are able to post well thought out written responses (Schneider et al., 2002; Tates et al., 2009).

Another strength is that the website contained resources for people to go and get services they needed. Hospitals and clinics that provide contraceptive counseling and products were listed

in the website, and people could follow the direction to get services they wanted. This connects online resources with behavioral practices and serves as a motivator for behavioral changes in that target population. People are not only reading and learning information about contraception, they could also have a place to go to if they want to take an action.

#### 5.4 Limitations

Despite the strengths of this project, there were also some limitations. Firstly, the recruitment method used in this project was convenience and snowball sampling. This could lead to potential bias because participants tend to find people that are in their friends' circle, people from the same major, or those who live in the same dormitory. Therefore, this sample might not be representative of the female college population in Beijing as a whole.

Another limitation could happen in the data collection process. The use of online focus group discussions instead of in-person focus groups also has some disadvantages. While anonymous online focus group discussions could provide a safe space for participants and stimulate them to share and discuss their ideas freely, this form of discussion cannot identify non-verbal communications from participants such as body language, facial expressions or tone of voice. Also, while in-person focus groups may incorporate different forms of group interaction such as small activities or interactive exercises, online focus groups have only one form of communication. This can sometimes be difficult when researcher want to quickly build rapport with participants and stimulate more responses.

### **Chapter 6 Recommendations and Conclusion**

The following recommendations are aimed at improving the effectiveness of the website as an online contraception resource.

**Formative Research Process.** As formative research is a process that serves as the basis for developing a website that fits participants' needs, it is critical for future studies to put more focus on this process. Future formative research for the same population could focus more on exploring the connection between the population and local resources, such as school-related healthcare resources, local hospitals and clinic, and why participants could not get the information they wanted through off-line resources. Since this project focused specifically on female students as a population, future studies could include males as study participants and ask about their ideas and needs around contraception.

**Implications for Website.** It appears that the use of websites to present contraceptive information is acceptable and favorable to female college students in Beijing, China. When asked about their most used sources of contraceptive information, a majority of participants reported using online sources. Compared to randomly searching and filtering information online, participants preferred the use of a website where they could easily navigate reliable information for each contraceptive method according to their needs. Participants also mentioned that they would like to see information beyond just contraception, and that could be one of the focuses further improvement of this website.

Furthermore, the website evaluation shows that participants prefer a more engaging way of displaying information. Many people reported that they would like to see more pictures of contraceptive methods, and tables comparing different methods. Blackstock et al.'s work (2015) also found that over half of their participants chose to watch health-related videos. These point to the possibility of further developing the website to make the content more engaging by creating multi-media resources such as informative pictures, tables, and videos. Another possible website extension could include interactive quizzes, since some people mentioned that they would like a



small quiz on the website to help them easily determine which type of contraception best fit their needs. In order to assess change in attitudes and behavior among website users, a quiz assessing their attitudes, motivations for behavior change, and actual behavior change could be made available to them after a certain period of time using this website.

## **Conclusions**

The development of a website that provides contraceptive information for female college students in Beijing, China required careful formative research to explore the true needs of the target population. This was critical to the process and contributed significantly to the development of website content, ensuring it met the needs and preferences of its target audience. The evaluation phase of the website was also very important in assessing how the website fit population needs, what information was not covered and was needed from the participants, and what type of contents would be most favorable to participants. Most importantly, the evaluation allowed the researcher to learn from participants how this website could help them in making informed decisions about contraception. Since female college students in Beijing, China are using online sources more than before to get contraceptive information, this website has the potential to serve as an important source of information about contraception and to motivate their behavior change in the future.

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