BMJ Open

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Journal:	*BMJ Open*
Manuscript ID	bmjopen-2017-017621
Article Type:	Research
Date Submitted by the Author:	09-May-2017
Complete List of Authors:	qing, Wu ning, Yu; Guizhou Provincial Center of Disease control and Prevention yan, Li
Primary Subject Heading:	Public health
Secondary Subject Heading:	Epidemiology, Public health
Keywords:	PUBLIC HEALTH, EPIDEMIOLOGY, reproductive health

The Effects of Family Planning Factors on the Awareness of Sexual and Reproductive Health Care Rights Among Married Women of Reproductive Age in China: A Cross-sectional Study

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Abstract

Objectives: to explore the effects of family planning factors on the awareness of SRHCRs among married women of reproductive age in China.

Setting: As the primary units, 4 areas were selected in north, southwest, south and central China respectively. In the 4 areas, two counties were selected as the secondary units respectively.

Participants: A total of 2504 married, reproductively aged women were recruited.

Primary outcomes: The effects of family planning factors on the awareness of SRHCRs among married women of reproductive age

Secondary outcome measures: The average response rate of awareness on SRHCRs

Results: There were a total of 10843 (≤6×2504) responses on SRHCRs administered to participants. The average response rate of awareness on SRHCRs was 72.17% (10843/15024) among participants. Right 3 had the highest response rate (90.64%), followed by Right 5 (86.11%) and Right 1 (84.47%). Only 43.39% of participants gave responses to Right 4. The participants without children showed more interest in Right 1, 2, and 4. Those who utilized fetal sex tests paid more attention to Rights 2 and 4. The women who accepted informed choice were more likely to be aware of all 6 Rights except for Rights 3 and 6. Those individuals who were satisfied or very satisfied with comprehensive sexual and reproductive health counseling services were more likely to show interest in all 6 Rights.

Conclusions: The awareness of SRHCRs among reproductive women in China is still inadequate. Family planning service providers should strengthen reproductive awareness according to the different needs of women.

Keywords: *family planning services, sexual and reproductive health care rights (SRHCRs), married women of reproductive age, informed choice, generalized*

estimation equation (GEE)

Article summary:

1. Strength

1.1 A multi-center study;

1.2 A multiple-response set (SRHCRs) was analysed by GEE.

2. Limitations

2.1 Causal inferences could not be established with certainty as ours was a cross-sectional study.

2.2 Our findings might entail selection bias.

2.3 This study was limited only to the awareness of SRHCRs. Therefore, behavioral modification toward realizing these rights was not included.

The Effects of Family Planning on The Awareness of Sexual and Reproductive Health Care Rights Among Married Women of Reproductive Age in China: A Cross-sectional Study

Background

Family planning is an imperative and historical choice under the specific status of population and social development in China. Since the International Conference on Population and Development was held in Cairo in 1994, the concepts of sexual and

reproductive health and rights (SRHRs), which the international society emphasized, have been accepted by the Chinese government. Therefore, both the range and the content of family planning services have been shifted from simple population control to a combination of population control and SRHRs.

SRHRs have been constructed gradually, both in knowledge and practice by the family planning system, and its inherent activities and mechanisms have been changed from simple administrative management to a combination of high-quality services and scientific management. The perception toward women-centered reproductive health has been gradually bolstered in reproductive health fields since the Fourth World Women Conference in 1995. This conference was considered to provide protection for and to be respectful of women's reproductive health rights, and, as a result, more relevant research and clinical trials are now being conducted in reproductive health fields worldwide. However, the aims of striving for and maintaining human reproductive health rights are still in progress; and the issues require much more research and discussion.

A support environment for promoting women's sexual and reproductive health care rights (SRHCRs) has been established. These rights are based on the International Planned Parenthood Federation (IPPF) and are regarded as providing important roles for both SRHRs and family planning. They also rely on a series of rules and

regulations within the laws of the People's Republic of Population and Family Planning. SRHCRs embody the women-centered principles of not only family planning services, but women's empowerment. In addition, informed choice helps women of reproductive age express their own sexual and reproductive goals with safety and dignity as another important element in family planning services. It also improves the quality of family planning reproductive services and furthers women's empowerment in China. However, severe challenges still exist in terms of fully realizing women's family planning and reproductive health rights: on the one hand, there are some contradictions between individual rights and national policies, as well as between current interests and long-term interests. With the continual development of society, a woman's desire for equality and empowerment is more urgent than ever before. Conversely, the level of family planning service is rather low, and the service concept is still imperfect. From the perspective of family-planning service providers, no attention is paid to women's rights. Providers also cannot understand women's rights due to the lack of awareness of these rights, and the lack of appropriate skill sets required by family planning services. Simultaneously, women of reproductive age cannot actively participate in services and maintain their rights if they possess insufficient knowledge of basic reproductive rights. Therefore, we urgently need to re-examine family planning and reproductive health services with respect to realizing

women's SRHCRs in family planning.

A substantial number of studies have focused on young women and induced abortions, STDs/HIV, or contraceptive methods. However, very few studies have been attentive to SRHCRs, which are important in providing useful insights into women's rights and health. We hypothesized herein that 6 SRHCRs would correlate with some factors of demographic characters, marriage, contraceptive history, and family planning. This study was therefore primarily designed to explore the awareness of 6 SRHCRs among married women in China, and to analyse the influencing factors of family planning on these rights.

Data and Methods

A cross-sectional study was conducted. The study employed a three-stage stratified and random sampling method for the overall sampling scheme and an onsite sampling scheme based on permanent population registration system. The sampling design had four features. First, it was to draw a random sample. Second, to be representative, the scope of selected PSUs (survey sites) should contain provinces, autonomous regions and municipalities respectively. Third, the selected areas should established better family planning managerial and service network. Besides, it is essential to gain strong support derived from family planning services and community workers. Fourth, all things being equal, cost minimization was chosen.

Overall sampling scheme

The primary sampling units (PSUs) included 22 provinces, 5 autonomous regions and 4 municipalities (Table 1 and Appendix I).

The first stage of sampling involved selecting PSUs by PPS, and the second stage was to select counties from the chosen PSUs in the same way. Residential communities/subdistricts were then selected from the chosen counties of the previous stages by systematic sampling.

Table 1. Administrative divisions in China

Provinces (N=23)	Autonomous regions (N=5)	Municipality (N=4)
Hebei	Inner Mongolia	Beijing
Shangxi	Guangxi	Tianjin
Liaoning	Xinjiang	Shanghai
Jilin	Ningxia	Chongqing
Heilongjiang	Tibet	
Jiangsu		
Zhejiang		
Anhui		
Fujian		
Jiangxi		

Provinces (N=23)	Autonomous regions (N=5)	Municipality (N=4)
Shandong		
Henan		
Hubei		
Hunan		
Guangdong		
Hainan		
Sichuan		
Guizhou		
Yunnan		
Shaanxi		
Gansu		
Qinghai		

In practice, 4 divisions were selected: Guangdong, Chongqing, Inner Mongolia and Henan; and 2 counties were selected for each city (Fig.1 and Appendix I).

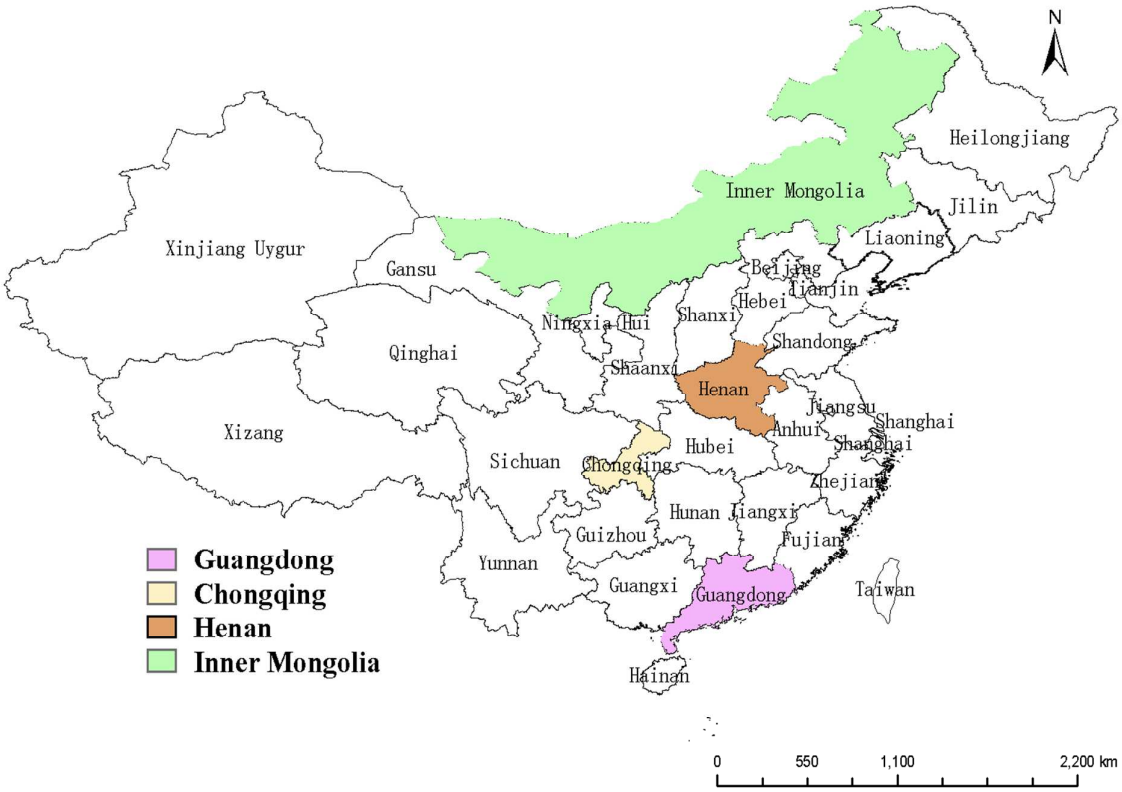

Figure 1. China's administrative units: provinces, autonomous regions, and municipalities (sourced from National Atlas of Administrative Province, Area and County (City), Ministry of Land And Resources of the People's Republic of China).

Sample size

A sample size was calculated according to the following formula, resulting in a minimal sample size of 866 reproductively aged women. Therefore, in 4 survey sites, the total sample size was 3465 (866×4). Inclusion criteria for eligible participants were as follows (1) aged 20-49 years; (2) married; (3) local permanent residents; (4) exhibited regular sexual behaviors; and (5) participated in this study voluntarily.

$$N=deff\times u^2\times p\times(1-p)/\delta^2,$$

Where N is the parameter to be calculated and is the sample size in terms of the number of reproductively aged women to be selected. *Deff* is the sample design effect, assumed to be 2.0 (default value).*u* is the statistic that defines the level of confidence desired, using a 95% confidence interval. p is an estimate of a key indicator to be measured by the study; here p equals 47%. δ is the margin of error to be attained, using 10%.

Measures

The questionnaire for this study was self-designed, primarily according to the "Law of Population and Family Planning of P. R. China," "The Protection of Women's Rights of P. R. China," "Program of China's Women Development," and the IPPF Charter on Sexual and Reproductive Rights." The questionnaire contained 5 main areas: demographic characteristics; marital and contraceptive history; informed choice; comprehensive sexual and reproductive health (SRH) counseling; and sexual and reproductive health rights (SRHRs). Prior to the formal survey, a pilot study was conducted to collect the information on the questionnaire from several group discussions with reproductively aged women. We made revisions to the questionnaire in accordance with feedback from these group discussions until it fully reached the goal of gathering the required valid information.

Independent variables

We included 5 variables of socio-demographics characteristics, 3 reproductive history variables, and 3 family planning service variables (Table 2).

Table 2. Assignment and coding of independent variables

Variable	Assignment and coding
Socio-demographics characteristics	
Age (years)	<25=1, 25-34=2, 35-44=3 and 45-49=5
Educational attainment	elementary school or lower=1, junior high school=2, high school=3, junior college or higher=4
Household registration	rural=1, urban=2
Occupation	laborer/commercial/service worker=1, peasant=2, employer in public institution=3, others=4
Family annual income *per capita* (dollars)	<160.78=1, 160.78-321.57=2, 321.58-482.35=3, 482.36-643.14=4, ≥643.15=5
Reproductive history	
Number of children	0=0, 1=1, 2=2, ≥3=3

Variable	Assignment and coding
Used fetal sex tests	yes=1, no=0
Use of contraception	yes=1, no=0
Family planning service	
Accepted informed choice	yes=1, no=2
Satisfaction with comprehensive SRH counseling services offered by FPWs	very satisfied=1, satisfied=2, dissatisfied=3
Institutes that were optimal for family planning services	hospital=1, maternal and child care center=2, family planning center=3, community health center=4

Dependent variables

The dependent variable to be tested in this study, "Are you aware of the SRHCRs," was a multiple-response set, embracing 6 options (Rights) (Table 3).

Table 3. A multiple-response set of SRHCRs

Variable	Assignment and coding	Definition
Information (Right1)	yes=1, no=0	To know the benefits and availability of sexual and reproductive health services, and whether women

Variable	Assignment and coding	Definition
		knew their Rights in this regard
Access (Right 2)		To obtain services regardless of race, sex, or sexual orientation, marital status, age, religious or political beliefs, ethnicity, or disability
Choice (Right 3)		To decide freely on whether and how to control their fertility and which method to use
Safety (Right 4)		To be able to protect themselves from unwanted pregnancy, disease, and violence
Privacy (Right 5)		To have a private environment during counseling and services
Dignity (Right 6)		To be treated with respect, empathy, courtesy, consideration, and attentiveness

Interviews

The interviewers were properly trained to fully understand the questionnaire's content, showed appropriate interview skills, and assisted the participants in completing the questionnaires. Eligible individuals were invited to sit in a quiet place without a third party, and same-gender investigators were responsible for completing the

questionnaires in face-to-face interviews. The project managers evaluated the completeness and logic of the questionnaires, returning feedback on errors to the investigators when unqualified questionnaires were found. The interviewers then modified these questionnaires with the interviewees in a timely manner.

Data analysis

Data on all the questionnaires were entered twice by different professionals using EpiData 3.1 to enable a comparison between data. Data cleaning included consistency verification for all variables. Missing data were fixed during the interviewing. The analysis was performed with SAS version 9.3 (SAS Inc. Cary, NC, USA). Descriptive statistics included frequencies and proportions. A GEE was employed to explore the effects of influencing factors on SRHCRs (Appendix II).

Ethical Considerations

The study protocol was approved by the Research Ethics Committee of the Shanghai Institute of Planned Parenthood Research (code: PJ2014-20) prior to the implementation of the research. The aims of the present study were interpreted and clarified to all of the eligible participants. In addition, verbal and written informed consent was obtained for the purposes of information security and protection of privacy. Consent was obtained from all participants before data collection was initiated.

Results

Characteristics of participants

In this study survey, 961 respondents were excluded from further analysis due to negative answers given regarding whether they "knew of SRHRs." There were 2047 of 2504 respondents aged 25 to 44 years, accounting for 81.74% of the total. Over 40% of the participants obtained a junior high school education, more than half (58.83%) were rural-to-urban migrants, and 42.69% of the respondents were peasants. Nearly one-third of the families had an annual income of 643.15 dollars or above. Of the respondents, over half had one child, but very few had more. Among those who were ever pregnant, 97.41% did not avail themselves of fetal sex tests, and the majority of the participants (92.45%) reported that they used contraceptives (Table 4).

Table 4. Demographic characteristics and reproductive history among study participants.

Variable	N=2504	%
Age		
<25	269	10.74
25-34	1027	41.01
35-44	1020	40.73
45-49	188	7.51
Educational attainment		
Elementary school or lower	179	7.15
Junior high school	1035	41.33
High school	699	27.92
Junior college or higher	591	23.60
Household registration		

Rural	1473	58.83
Urban	1031	41.17
Occupation		
Laborer/commercial/service worker	370	14.78
Peasant	1069	42.69
Employer in public institution	309	12.34
Others	756	30.19
Family annual income *per capita* (dollars)		
<160.78	304	12.14
160.78-321.57	353	14.10
321.58-482.35	567	22.64
482.36-643.14	514	20.53
≥643.15	766	30.59
Number of children		
0	814	32.51
1	1391	55.55
2	291	11.62
≥3	8	0.32
Used fetal sex tests		
Yes	65	2.60
No	2439	97.40
Use of contraception		
Yes	2315	92.45
No	189	7.55

SRHCR awareness among interviewees

There were a total of 10843 (≤6×2504) responses on SRHCRs among participants, and the average response rate regarding awareness of SRHCRs was 72.17% (10843/15024). Right 3 had the highest response rate (90.64%), followed by Right 5 (86.11%) and Right 1 (84.47%). Only 43.39% of participants gave responses to Right

4 (Table 5).

Table 5. Distribution of SRHCR awareness based upon multiple responses among interviewees (N=2504).

Rights	Number of responses	%
Information	2013	84.47
Access	1804	75.70
Choice	2160	90.64
Safety	1034	43.39
Privacy	2052	86.11
Dignity	1780	74.70

Generalized estimation equation (**GEE) for awareness of SRHCRs**

In the GEE model, the 6 constant estimates depicted the 6 log values of the baseline response probability/reference, respectively. Thus, the response probabilities for baseline awareness of SRHCRs were calculated as 27.05%, 18.24%, 36.02%, 5.42%, 28.70% and 17.51%, respectively, according to the formula $P=\frac{e^{\beta_0}}{1+e^{\beta_0}}$. The response probabilities for baseline/reference awareness of SRHCRs indicated the responses regarding the references of the variables, respectively, in the model; *e.g.*, with respect to age, the group aged 45-49 was the reference and the response represented this reference for 45-49 years of age. Although the response probabilities were not of practical significance, the estimates showed a consistent trend for the proportions in Table 5.

Awareness of SRHCRs was correlated with region, age, educational attainment, annual family income per person, number of children, whether or not the couple used fetal sex tests, or whether or not they accepted informed choice and were satisfied with the comprehensive SRH counseling offered by FPWs. Participants without children were correlated with higher odds of responses on SRHCRs in comparison with those who had three or more children; the odds of being aware of SRHCRs among participants who used fetal sex tests *versus* those without fetal sex tests were higher; the odds of being aware of SRHCRs for those who accepted informed choice were 3-fold greater compared with those who did not (OR=3.35; 95% CI, 2.74-4.09); and participants who were very satisfied or satisfied with comprehensive SRH counseling offered by FPWs were significantly more likely to be aware of SRHCRs. (Table 6).

In further analysis, we assigned the 6 separate options (constants) to factors that significantly influenced family planning in Table 6. Compared with participants with 2 or more children, those without children were more likely to be interested in Rights 1, 2 and 4. Participants who used fetal sex tests were more likely to focus on Right 2 and Right 4 than those who never used such tests. Women who accepted informed choice were more likely to respond to all 6 Rights except for Right 3 and 6 compared to those who never accepted informed choice. The participants who were satisfied or

very satisfied with comprehensive SRH counseling offered by FPWs *versus* those who were dissatisfied with such counseling were more likely to show interest in all 6 Rights (Table 7).

Table 6. GEE for the correlation between the factors and SRHCRs in the married women

Parameter	Estimate	Standard error	*p-value*	OR	(95% *CI*)
Int1	-1.00	0.37	0.0071		
Int2	-1.50	0.37	<0.0001		
Int3	-0.57	0.37	0.1278		
Int4	-2.86	0.38	<0.0001		
Int5	-0.91	0.38	0.0149		
Int6	-1.55	0.37	<0.0001		
Region					
Inner Mongolia	-0.51	0.09	<0.0001	0.60	(0.50, 0.71)
Guang Zhou	-0.37	0.10	<0.0001	0.69	(0.57, 0.83)
He Nan	Ref.			1	
Age					
<25	0.66	0.14	<0.0001	1.94	(1.47, 2.57)
25-34	0.25	0.11	0.0221	1.28	(1.04, 1.58)
45-49	Ref.			1	
Educational attainment					
Elementary school or lower	-0.56	0.15	0.0001	0.57	(0.43, 0.76)
Junior high school	-0.57	0.11	<0.0001	0.57	(0.46, 0.70)
High school	-0.39	0.10	0.0001	0.68	(0.55, 0.82)
Junior college or higher	Ref.			1	
Annual family income *per capita* (dollars)					
<160.78	0.44	0.10	<0.0001	1.56	(1.27, 1.89)
≥643.15	Ref.			1	
Number of children					
0	0.23	0.10	0.0251	1.26	(1.03, 1.55)
2	Ref.			1	
Used fetal sex tests					

Yes	0.57	0.20	0.0046	1.78	(1.20, 2.65)
No	Ref.			1	
Accepted informed choice					
Yes	1.21	0.10	<0.0001	3.35	(2.74, 4.09)
No	Ref.			1	
Satisfaction with comprehensive SRH counseling offered by FPWs					
Very satisfied	1.03	0.18	<0.0001	2.82	(1.98, 4.01)
Satisfied	0.81	0.18	<0.0001	2.26	(1.58, 3.24)
Dissatisfied	Ref.			1	

Table 7. Effects of predominant influencing factors on awareness of SRHCRs.

Parameter		**Estimate**	**Estimate error**	***p value***	**OR**	**(95%*CI*)**
Used fetal sex tests						
Yes *vs*. No at	Right 2	1.32	0.42	0.0017	3.75	(1.64, 8.58)
	Right 4	0.56	0.26	0.0328	1.76	(1.05, 2.95)
Number of children						
0 *vs*. 2 at	Right 1	-0.46	0.13	0.0004	0.63	(0.49, 0.81)
	Right 2	-0.49	0.13	0.0002	0.61	(0.47, 0.79)
	Right 4	0.96	0.13	<0.0001	2.62	(2.04, 3.38)
Accepted informed choice						
Yes *vs*. No at	Right 1	4.55	0.25	<0.0001	94.75	(58.32, 153.92)
	Right 2	0.80	0.15	<0.0001	2.22	(1.66, 2.98)
	Right 4	-0.75	0.15	<0.0001	0.47	(0.35, 0.63)
	Right 5	0.91	0.16	<0.0001	2.49	(1.81, 3.41)
Satisfaction with comprehensive SRH counseling offered by FPWs						
Very Satisfied *Vs*. Dissatisfied	Right 1	0.81	0.27	0.0028	2.25	(1.32, 3.84)
	Right 2	0.56	0.27	0.0382	1.76	(1.03, 3.00)
	Right 3	0.89	0.32	0.0049	2.43	(1.31, 4.51)
	Right 4	1.68	0.34	<0.0001	5.34	(2.74, 10.41)
	Right 5	0.92	0.29	0.0014	2.52	(1.43, 4.43)
	Right 6	0.89	0.28	0.0017	2.42	(1.40, 4.21)
Satisfied *vs*.	Right 1	0.68	0.28	0.0168	1.97	(1.13, 3.45)

Dissatisfied	Right 2	0.61	0.28	0.0308	1.84	(1.06, 3.21)
	Right 3	0.94	0.34	0.0049	2.57	(1.33, 4.95)
	Right 4	1.24	0.35	0.0004	3.46	(1.75, 6.84)
	Right 5	1.25	0.31	<0.0001	3.50	(1.92, 6.38)
	Right 6	0.72	0.29	0.0142	2.05	(1.15, 3.62)

Note: The non-significant constants and variables were herein omitted. The analysis controlled for region, age, household registration, educational attainment, occupation, annual family income *per capita*, contraceptive status, experience with fetal sex tests, acceptance of informed choice, satisfaction with comprehensive SRH counseling offered by FPWs, and which institutes were optimal for family planning services.

Discussion

Awareness of SRHCRs in China

Generally, the level of awareness of SRHCRs was relatively low, averaging a 72.17% response percentage among married women of reproductive age in China. On the one hand, previous research on the extent of awareness regarding general health rights in China was still sparse [1,2], and there exist variations in awareness of SRHCRs among women generally [3]. Women manifested various levels of awareness of SRHCRs due to factors such as age, income, education, geographic location, *etc*. [4-6]; and this was also the case in our study. Although the subjective cognizance of rights among Chinese has certainly improved, the long-term impacts derived from feudal and cultural contexts cannot be completely eliminated, as these still affect people's thinking and behavior. Conversely, family planning services have revealed a weakness

of health-related medical information and knowledge of family planning/reproductive health rights. In such cases, women seem vulnerable when service providers neglect women's autonomy. Even if they sensed inappropriateness or dissatisfaction, women were likely to be passively compliant in response to the advice or requests of service providers [4]. Additionally, a crisis in trust due to the asymmetry of right-related knowledge between service providers and clients could occur [5]; and such indifference could be further worsened with regard to the desire for communication by both women and service providers. Women tended to emphasize informed compliance but then overlook rights, pursuant to their own interests [6]; and this could lead the two sides to conflict.

Family-planning-related factors and awareness of SRHCRs

The Chinese still currently focus on the number of children that they deliver. Participants who had no children fell into two groups: those who used temporary contraception, and those who were either infertile or unwilling to have children. The first group comprised sexually active individuals capable of giving birth; and according to some studies, the desire for offspring was still strong among these women [7-8]. Hence, they seriously considered their rights with respect to choice, access, information, and any other element that could affect their future fertility plans. However, these women were interested in SRHCRs only when policies were sound.

Since the 1990s, China has ranked as a low-birth-rate country because of the implementation of the previous family planning policy. However, in the 2000s, China underwent an inevitable aging of the population. In 2015, China's 35-year-old one-child policy was abolished to allow couples to give birth to a second child. This new policy mainly included revoking the birth approval system, "social maintenance fees," and fines paid by violators in accordance with the previous family planning policy; so as to ensure a return of voluntary reproductive rights to women. Policies like these favored women who were preparing to give birth, and allowed them to generate enthusiasm toward pursuing SRHCRs and enjoying them. The second group was keen to seek treatment, and expected people's understanding and respect. Because couples seeking recourse to medically assisted reproduction (MAR) are unable to conceive naturally, they may claim a reproductive health disability; and the inviolable human right is not to suffer discrimination on such a basis. A reproductively disabled couple may claim that any burdens imposed upon their use of MAR—such as satisfying criteria applied to selecting adoptive parents—amounts to discrimination, and violates human rights since married couples are not subject to public monitoring or regulation in their natural conception of children. Publicly funded health care may therefore entitle all women to routine gynecologic examinations and preventive infertility care, and women in reproductively impaired marriages will be entitled to

this same right [10]. As a result, the present study suggests that married women of reproductive age show a willing awareness of those rights related to reproductive technologies, access, and health.

Informed choice includes the rights of men and women to be informed and to have access to safe, effective, affordable, and acceptable methods of family planning of their choice [11]. In 1995, informed choice was introduced to China and implemented in pilot counties that carried out high-quality care with respect to family planning [12]. Informed choice was included in the "Law of Population and Family Planning of P. R. China," enacted in 2001, which illustrates the right of sexual equality in child bearing and the right of information on family planning, reproductive health, and education. When folding women's reproductive rights into a new era of family planning, informed choice reflects the practice of women's empowerment in reproductive health programs [13]. In our study, informed choice provided an impetus toward improving 3 rights (Rights 1, 2, and 5), and an impediment to Right 4. This indicated that reproductively aged women in China were aware of the collection of information on sexual and reproductive health services, access to these services, and protecting their privacy *via* informed choice. However, women of reproductive age were still passive as far as selecting effective, safe, and acceptable contraceptive methods [14]. This implies that it is essential to strengthen the self-determined right of contraceptive

methods when implementing informed choice in SRHCRs.

The comprehensive SRH counseling services support clients' informed and voluntary decisions as well as assist them in making a feasible scheme in reproductive care and related health services [15]. This can improve contraceptive methods for clients, prevent STD/HIV infections, and provide support for treatment of future sexual dysfunction [16-23]; suggesting that women's SRHCRs are being heeded. With the passing of time, people will require access to integrated SRH services more than ever before [24]. The core concept of comprehensive SRH counseling services is "client-oriented." Therefore, not only is client satisfaction to these services a key measurement of quality, but it also affects the utilization of services and SRHCRs. The full practice of SRHCRs depends to a large extent upon active acceptance by clients, and simultaneously, such acceptance relies on satisfaction with comprehensive SRH counseling services [25]. Even when health services were readily available and affordable, women were still not willing to use them if they were of poor quality [26]. This finding also agrees with a Chinese study where the higher the satisfaction with reproductive health services, the stronger the acceptance of reproductive health-related knowledge [27].

There is an old Chinese proverb regarding "Bring[ing] up … sons [to care for] for parents [in their] old age." In the context of family-planning transitioning *vs.*

traditional concepts in China, Chinese married women still face a decision on whether to have boys or girls when they are ready for child bearing. Though the use of fetal sex diagnosis is illegal in China, the current situation is still problematic: sexual selection will be prejudicial against the birth of girls, and thus violate the right to non-discrimination of gender. However, modern human rights also react against forcing women to maintain their pregnancies against their free will. Reinforcing women's rights to select for pregnancy continuation or termination are the same inalienable rights to creat families of their choice, to information, and, for instance, to the benefits of scientific progress [10]. This is of paramount importance with respect to the current family planning policy, especially to those women who have had one child or want a boy as the first child. Therefore, to be aware of such rights of access will meet their reproductive demands, and ensure their reproductive health in a way that allows women to gain dignity; however, gaining social acceptance or family position is another issue entirely.

Our study exhibits several limitations. First, causal inferences could not be established with certainty as ours was a cross-sectional study. Second, our findings might entail selection bias. Third, this study was limited only to the awareness of SRHCRs. Therefore, behavioral modification toward realizing these rights was not included. Further studies, therefore, need to be implemented to achieve the latter goal.

Conclusions

To our knowledge, this is the first study to focus on SRHCRs of married reproductively aged women nationwide in China. In our study, PPS techniques ensured sample representativeness. Our analysis not only described awareness of 6 SRHCRs among participants, but also identified possible effects of family planning factors on SRHCRs using the GEE. Furthermore, our study provided more detailed guidelines to follow regarding effects between the factors and the 6 rights. According to our results, The awareness of SRHCRs among reproductive women in China is still inadequate. Family planning service providers should strengthen reproductive awareness according to the different needs of women.

Acknowledgments

We are grateful to other investigators for contributions to our research project, including interviewers and study participants who, with understanding and patience, cooperated with the study team. This project was funded by the National 12th Five-Year Plan (No. 2012BAI32B08).

Abbreviations

Variable	Abbr.

Sexual and Reproductive Health Care Rights	SRHCRs
Sexual and Reproductive Health & Rights	SRHRs
International Planned Parenthood Federation	IPPF
Probability Proportion to Size	PPS
Primary Sampling Units	PSUs
Sexual and Reproductive Health	SRH
Medically Assisted Reproduction	MAR
Family Planning Workers	FPWs

Competing interests

The authors declare that they have no conflicts of interest.

Authors' contributions

WJQ conceived of the study, participated in the design of the study, interpreted the results, and translated them into policy suggestions. YCN performed the statistical analysis, participated in interpretation of the results, and drafted the manuscript. LYY took part in the discussion of the paper and approved the final manuscript.

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Appendix I

This study employed the method of two-stage probability proportion to size (PPS) for the overall sampling scheme, and an onsite sampling scheme based upon a permanent

population registration system.

Sampling Strategies

Stage I: PPS for selecting provinces

PPS is a sampling technique that uses an "auxiliary variable" to select a unit by a probability proportionate in measure to its size.

After repeating the procedure using random simulation for 2500 iterations, all 4 sites, Guangdong, Chongqing, Inner Mongolia and Henan, were selected (Table 1).

Table 1. PPS for survey site sampling

Survey sites	Female population	Selection probability	Sampling weight
Inner Mongolia	1965431	0.06864	14.57
Chongqing	2582818	0.09020	11.00
Henan	6056991	0.21154	4.73
Guangdong	10813256	0.37765	2.64

Stage II: Sampling of counties

In each survey site, 2 counties were selected using PPS. The residential communities/subdistricts are listed and ordered clockwise in terms of eastern, western, southern, northern and central directions; and then 2 of them were selected systematically.

Onsite sampling scheme

Subjects were sampled in the 2 residential communities/subdistricts per county based upon randomly generated ID numbers from permanent population registration

systems.

Appendix II

Methodology for the analysis of a multiple-response set

A multiple-response set is a categorical variable in substance; however, the options available to it account for one response at different levels. The options have two features: (1) because a correlation exists for different options, taking these options as an independent option respectively is inappropriate when blocking out the correlation between them artificially; (2) options in a multiple-response set are not generally interchangeable as different statuses; they are rather chosen from the first, second, and other options in consecutive order.

Each option is a measurement to this response such that *n* options compose *n* measurements to the response. Hence, the issue can be taken as a multivariate logistic regression model with repeated measurements (generalized estimation equation, GEE). In a typical repeated-measurements model, one constant can be set on the condition of the basically equal probability of baseline/reference response in terms of each measurement. In a multiple-response set, the emphasis for each option is different, resulting in different probabilities regarding baseline/reference responses. It is appropriate to create multiple constants to these options.

STROBE Statement—Checklist of items that should be included in reports of ***cross-sectional studies***

	Item No	Page number
Title and abstract	1	(*a*) 1
		(*b*) 1
Introduction		
Background/rationale	2	3-6
Objectives	3	6
Methods		
Study design	4	6
Setting	5	7-9
Participants	6	(*a*) 9-10
Variables	7	10-13
Data sources/ measurement	8*	13-14
Bias	9	3
Study size	10	9-10
Quantitative variables	11	14
Statistical methods	12	(*a*) 14
		(*b*) 14
		(*c*) 14
Results		
Participants	13*	(a)15
		(b) 15
Descriptive data	14*	15
Outcome data	15*	(*a*)16-17
Main results	16	(*a*) 17-21
Other analyses	17	18-21
Discussion		
Key results	18	21-26
Limitations	19	26
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence
Generalisability	21	Discuss the generalisability (external validity) of the study results
Other information		
Funding	22	27

*Give information separately for exposed and unexposed groups.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at www.strobe-statement.org.

BMJ Open

The Effects of Family Planning on the Awareness of Sexual and Reproductive Health Care Rights Among Married Women of Reproductive Age in China: A Cross-sectional Study

Journal:	*BMJ Open*
Manuscript ID	bmjopen-2017-017621.R1
Article Type:	Research
Date Submitted by the Author:	01-Aug-2017
Complete List of Authors:	qing, Wu ning, Yu; Guizhou Provincial Center of Disease control and Prevention yan, Li
Primary Subject Heading:	Sexual health
Secondary Subject Heading:	Epidemiology, Public health
Keywords:	PUBLIC HEALTH, EPIDEMIOLOGY, reproductive health, family planning services, sexual and reproductive health care rights (SRHCRs), married women of reproductive age, informed choic

The Effects of Family Planning Factors on the Awareness of Sexual and Reproductive Health Care Rights Among Married Women of Reproductive Age in China: A Cross-sectional Study

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Abstract

Objectives: Family planning has switched gradually since the International Conference on Population and Development was held in Cairo in 1994. There are few studies about family planning and women reproductive rights. The main objective is to examine the status of the awareness of sexual and reproductive health care rights (SRHCRs) and how the factors related to family planning influenced the awareness of

SRHCRs among married women of reproductive age in China.

Methods and Participants: Proportionate to probability sampling (PPS) was used. Inner Mongolia, Chongqing, Guangdong and Henan were selected. Total 2504 married reproductive-aged women were recruited. A self-administered, anonymous questionnaire was applied to collect information on SRHCRs.

Results: There were a total of 10843 (≤6×2504) responses on SRHCRs administered to participants. The average response rate of awareness on SRHCRs was 72.17% (10843/15024) among participants. Choice (Right 3) had the highest response rate (90.64%), followed by Privacy (Right 5) (86.11%) and Information (Right 1) (84.47%). Only 43.39% of participants gave responses to Safety (Right 4). The participants without children showed more interest in Right 1, Access (Right 2) and Right 4. Those who utilized fetal sex tests paid more attention to Rights 2 and Right 4. The women who accepted informed choice were more likely to be aware of all six Rights except for Rights 3 and Dignity (Right 6). Those individuals who were satisfied or very satisfied with comprehensive sexual and reproductive health counseling services were more likely to show interest in all six Rights.

Conclusions: The awareness of SRHCRs among reproductive women in China is still inadequate. Family planning service providers should strengthen reproductive awareness according to the different needs of women.

Keywords: *family planning services, sexual and reproductive health care rights (SRHCRs), married women of reproductive age, informed choice, generalized estimation equation (GEE)*

Article summary:

- This is one of the first studies to examine the effects of factors related to family planning to the awareness of SRHCRs among married women of reproductive age;
- A multiple-response set (SRHCRs) was analysed by GEE.
- Causal inferences could not be established with certainty as ours was a cross-sectional study.
- This study was limited only to the awareness of SRHCRs. Therefore, behavioral modification toward realizing these rights was not included.

The Effects of Family Planning on The Awareness of Sexual and Reproductive Health Care Rights Among Married Women of Reproductive Age in China: A Cross-sectional Study

Background

Family planning is an imperative and historical choice under the specific status of population and social development in China. It has four stages [1]. The first stage: the

moderate policy in the early 1970s. China launched a targeted family planning campaign nationwide to promote late marriage, childbearing, birth spacing and limited fertility. At that time, contraception was introduced as the predominant method to reduce the fertility rate. Consequently, for married couples, they had rights to select contraceptive methods and decided birth-spacing period freely. The second stage: the harshest policy in the world. Since the inception of the reform of socialist market economy, rapid population growth in China had to be concerned about. In 1979, the central government enacted the mandatory one-child policy. From 1980 to 1983, the mandatory long-term contraceptive policy was further strengthened [2], which was so called one child-IUD, two children-sterilization (yi huan er zha). According to the policy, the individual rights for more births, selection of contraceptive methods were severely restricted. Induced abortions were also highly focused on. The third stage: relatively mitigatory policy from the middle of 1990s to 2014. Since the International Conference on Population and Development was held in Cairo in 1994, the concepts of sexual and reproductive health and rights (SRHRs), which the international society emphasized, have been accepted by the Chinese government. Therefore, both the range and the content of family planning services have been shifted from simple population control to a combination of population control and SRHRs. The fourth stage: full liberalization of the second child policy from 2015 to the present. In 2015,

the central government dismantle the remnants of the one-child policy against aging of population and economic recession. During this period, women's reproductive rights have been consolidated.

A supportive environment for promoting women's sexual and reproductive health care rights (SRHCRs) has been established. These rights are based on the International Planned Parenthood Federation (IPPF) and are regarded as providing important roles for both SRHRs and family planning. They also rely on a series of rules and regulations within the laws of the People's Republic of Population and Family Planning. SRHCRs embody the women-centered principles of not only family planning services, but women's empowerment. In addition, informed choice helps women of reproductive age express their own sexual and reproductive goals with safety and dignity as another important element in family planning services. It also improves the quality of family planning reproductive services and furthers women's empowerment in China. However, severe challenges still exist in terms of fully realizing women's family planning and reproductive health rights: on the one hand, there are some contradictions between individual rights and national policies, for example, with the continual development of society, a woman's desire for equality and empowerment is more urgent than ever before. Conversely, the level of family planning service is rather low, and the service concept is still imperfect. From the

perspective of family-planning service providers, no attention is paid to women's rights. Providers also cannot understand women's rights due to the lack of awareness of these rights, and the lack of appropriate skill sets required by family planning services. Simultaneously, women of reproductive age cannot actively participate in services and maintain their rights if they possess insufficient knowledge of basic reproductive rights. Therefore, we urgently need to re-examine family planning and reproductive health services with respect to realizing women's SRHCRs in family planning.

A substantial number of studies have focused on young women and induced abortions, STDs/HIV, or contraceptive methods [3,4,5]. However, very few studies have been attentive to SRHCRs, which are important in providing useful insights into women's rights and health. We hypothesized herein that six SRHCRs would correlate with some factors of family planning. This study was therefore primarily designed to explore the awareness of six SRHCRs among married women in China, and to analyse the factors of family planning on these rights.

Data and Methods

A cross-sectional study was conducted between August 2013 and August 2014 with a three-stage stratified and random sampling method for the overall sampling scheme and an onsite sampling scheme based on permanent population registration system.

The sampling design had four features. First, it was to draw a random sample. Second, to be representative, the scope of selected PSUs (survey sites) should contain provinces, autonomous regions and municipalities respectively. Third, the selected areas should established better family planning managerial and service network. Besides, it is essential to gain strong support derived from family planning services and community workers. Fourth, all things being equal, cost minimization was chosen.

Overall sampling scheme

The primary sampling units (PSUs) included 22 provinces, five autonomous regions and 4 municipalities (Table 1 and Appendix I).

The first stage of sampling involved selecting PSUs by PPS, and the second stage was to select counties from the chosen PSUs in the same way. The third stage was the subject selection from residential communities/subdistricts , by systematic sampling.

Table 1. Administrative divisions in China

Provinces (N=22)	Autonomous regions (N=5)	Municipality (N=4)
Hebei	Inner Mongolia	Beijing
Shangxi	Guangxi	Tianjin
Liaoning	Xinjiang	Shanghai
Jilin	Ningxia	Chongqing

Provinces (N=22)	Autonomous regions (N=5)	Municipality (N=4)
Heilongjiang	Tibet	
Jiangsu		
Zhejiang		
Anhui		
Fujian		
Jiangxi		
Shandong		
Henan		
Hubei		
Hunan		
Guangdong		
Hainan		
Sichuan		
Guizhou		
Yunnan		
Shaanxi		
Gansu		
Qinghai		

In practice, 4 divisions were selected: Guangdong, Chongqing, Inner Mongolia and Henan; and 2 counties were selected for each city (Fig.1 and Appendix I).

Sample size

A sample size was calculated according to the following formula, resulting in a minimal sample size of 866 reproductive-aged women. Therefore, in 4 survey sites, the total sample size was 3465 (866×4). Inclusion criteria for eligible participants were as follows (1) aged 20-49 years; (2) married; (3) local permanent residents; (4) exhibited regular sexual behaviors; and (5) participated in this study voluntarily.

$N=deff \times u^2 \times p \times (1-p)/\delta^2$,

Where N is the parameter to be calculated and is the sample size in terms of the number of reproductive-aged women to be selected. *Deff* is the sample design effect, assumed to be 2.0 (default value).*u* is the statistic that defines the level of confidence desired, using a 95% confidence interval. p is an estimate of a key indicator to be measured by the study; here p equals 47%. δ is the margin of error to be attained, using 10%.

Measures

The questionnaire for this study was self-designed, primarily according to the "Law of Population and Family Planning of P. R. China," "The Protection of Women's Rights

of P. R. China," "Program of China's Women Development," and the IPPF Charter on Sexual and Reproductive Rights." The questionnaire contained five main areas: demographic characteristics; marital and contraceptive history; informed choice; comprehensive sexual and reproductive health (SRH) counseling; and sexual and reproductive health rights (SRHRs). Prior to the formal survey, a pilot study was conducted to collect the information on the questionnaire from several group discussions with reproductive-aged women. We made revisions to the questionnaire in accordance with feedback from these group discussions until it fully reached the goal of gathering the required valid information.

Independent variables (Appendix II)

We included five variables of socio-demographics characteristics as the controlled variables, three reproductive history variables and three family planning service variables as the family planning related variables (Table 2).

Table 2. Assignment and coding of independent variables

Variable	Assignment and coding
Socio-demographics characteristics	
Age (years)	<25=1, 25-34=2, 35-44=3 and 45-49=5
Educational attainment	elementary school or lower=1, junior high school=2, high school=3, junior

Variable	Assignment and coding
	college or higher=4
Household registration	rural=1, urban=2
Occupation	laborer/commercial/service worker=1, peasant=2, employer in public institution=3, others=4
Family annual *per capita* income (dollars)	<160.78=1, 160.78-321.57=2, 321.58-482.35=3, 482.36-643.14=4, ≥643.15=5
Reproductive history	
Number of children	0=0, 1=1, 2=2, ≥3=3
Did you use fetal sex tests	yes=1, no=0
Are you using contraceptive methods	yes=1, no=0
Family planning service	
Did you receive informed choice	yes=1, no=2
Satisfaction with comprehensive SRH counseling services offered by FPWs	very satisfied=1, satisfied=2, dissatisfied=3
Institutes that were optimal for family	hospital=1, maternal and child care

Variable	Assignment and coding
planning services	center=2, family planning center=3, community health center=4

Dependent variables (Appendix II)

The dependent variable to be tested in this study was a multiple-response set embracing six rights). The main question of the multiple-response set was "Are you aware of the SRHCRs?" and each right had an independent option- yes and no for interviewees to select (Table 3).

Table 3. A multiple-response set of SRHCRs

Variable	Assignment and coding	Definition
Information (Right1)	yes=1, no=0	To know the benefits and availability of sexual and reproductive health services, and whether women knew their rights in this regard
Access (Right 2)		To obtain services regardless of race, sex, or sexual orientation, marital status, age, religious or political beliefs, ethnicity, or disability
Choice (Right 3)		To decide freely on whether and how to control their fertility and which method to use

Variable	Assignment and coding	Definition
Safety (Right 4)		To be able to protect themselves from unwanted pregnancy, disease, and violence
Privacy (Right 5)		To have a private environment during counseling and services
Dignity (Right 6)		To be treated with respect, empathy, courtesy, consideration, and attentiveness

Data collection The interviewers were service providers and community workers. They had received a standardized training program to fully understand the study, questionnaire's content and showed appropriate interview skills. They put up posters, delivered leaflets and carried out door-to-door informing for one month. In these ways, the participants were recruited. On site, the participants were voluntary to complete the questionnaires in their houses or some designated places in their communities or living quarters. The same-gender interviewers were responsible for completing the questionnaires in face-to-face interviews without a third party. They assisted the participants when encountering difficulties. The project managers evaluated the completeness and logic of the questionnaires, returning feedback on errors to the investigators when unqualified questionnaires were found. The interviewers then

modified these questionnaires with the interviewees in a timely manner.

Data analysis

Data on all the questionnaires were entered twice by different professionals using EpiData 3.1 to enable a comparison between data. Data cleaning included consistency verification for all variables. The analysis was performed with SAS version 9.3 (SAS Inc. Cary, NC, USA). Descriptive statistics included frequencies and proportions. A Generalized Estimating Equations (GEE) was employed to explore the effects of influencing factors on SRHCRs [6,7,8] (Appendix II).

Ethical Considerations

The study protocol was approved by the Research Ethics Committee of the Shanghai Institute of Planned Parenthood Research (code: PJ2014-20) prior to the implementation of the research. The aims of the present study were interpreted and clarified to all of the eligible participants. In addition, verbal and written informed consent was obtained for the purposes of information security and protection of privacy. Consent was obtained from all participants before data collection was initiated. All the questionnaires were fill out anonymously and the investigators signed a confidentiality agreement to protect the privacy and sensitive issues of the interviewees before the interview.

Results

Characteristics of participants

In this study survey, 3891 participants were recruited. Of the total, 135 participants were excluded from the study for the discordance in the inclusion criterion. In total, 3756 participants were included. Because the awareness of SRHCRs (Are you aware of SRHCRs) was nested in the question of "Do you know of the rights for service recipients?", 961 respondents were excluded from further analysis due to negative answers given regarding whether they "knew of the rights for service recipients." (We only needed those who knew of the rights). Therefore, 2504 out of 3756 participants were included into our analysis. There were 2047 of 2504 respondents aged 25 to 44 years, accounting for 81.74% of the total. Over 40% of the participants obtained a junior high school education, more than half (58.83%) were rural-to-urban migrants, and 42.69% of the respondents were peasants. Nearly one-third of the families had an annual income of 643.15 dollars or above. Of the respondents, over half had one child, but very few had more. Among those who were ever pregnant, 97.41% did not avail themselves of fetal sex tests, and the majority of the participants (92.45%) reported that they used contraceptives (Table 4).

Table 4. Demographic characteristics and reproductive history among study participants.

Variable	N=2504	%
Age		
20-25	269	10.74
25-34	1027	41.01
35-44	1020	40.73
45-49	188	7.51
Educational attainment		
Elementary school or lower	179	7.15
Junior high school	1035	41.33
High school	699	27.92
Junior college or higher	591	23.60
Household registration		
Rural	1473	58.83
Urban	1031	41.17
Occupation		
Laborer/commercial/service worker	370	14.78
Peasant	1069	42.69
Employer in public institution	309	12.34
Others	756	30.19
Family annual *per capita* income (dollars)		
<160.78	304	12.14
160.78-321.57	353	14.10
321.58-482.35	567	22.64
482.36-643.14	514	20.53
≥643.15	766	30.59
Number of children		
0	814	32.51
1	1391	55.55
2	291	11.62
≥3	8	0.32
Used fetal sex tests		
Yes	65	2.60
No	2439	97.40
Use of contraception		
Yes	2315	92.45
No	189	7.55

SRHCR awareness among interviewees

There were a total of 10843 (≤6×2504) responses on SRHCRs among participants, and the average response rate regarding awareness of SRHCRs was 72.17% (10843/15024). Right 3 had the highest response rate (90.64%, 95%CI: (89.47, 91.81)), followed by Right 5 (86.11%, 95%CI: (84.72, 87.50)) and Right 1 (84.47%, 95%CI: (83.02, 85.93)). Only 43.39% of participants gave responses to Right 4 (Table 5).

Table 5. Distribution of SRHCR awareness based upon multiple responses among interviewees (N=2504).

Rights	%	95%CI (%)
Information	84.47	(83.02, 85.93)
Access	75.70	(73.98, 77.43)
Choice	90.64	(89.47, 91.81)
Safety	43.39	(41.40, 45.38)
Privacy	86.11	(84.72, 87.50)
Dignity	74.70	(72.95, 76.44)

Generalized estimation equation (**GEE) for awareness of SRHCRs**

In the GEE model, the 6 constant estimates depicted the 6 log values of the baseline response probability/reference, respectively. Thus, the response probabilities for baseline awareness of SRHCRs were calculated as 27.05%, 18.24%, 36.02%,

5.42%, 28.70% and 17.51%, respectively, according to the formula $P=\frac{e^{\beta_0}}{1+e^{\beta_0}}$. The response probabilities for baseline/reference awareness of SRHCRs indicated the responses regarding the references of the variables, respectively, in the model; *e.g.*, with respect to age, the group aged 45-49 was the reference and the response represented this reference for 45-49 years of age. Although the response probabilities were not of practical significance, the estimates showed a consistent trend for the proportions in Table 5.

Awareness of SRHCRs was correlated with region, age, educational attainment, annual family income per person, number of children, whether or not the couple used fetal sex tests, or whether or not they accepted informed choice and were satisfied with the comprehensive SRH counseling offered by FPWs. Participants without children were correlated with higher odds of responses on SRHCRs in comparison with those who had three or more children; the odds of being aware of SRHCRs among participants who used fetal sex tests *versus* those without fetal sex tests were higher; the odds of being aware of SRHCRs for those who accepted informed choice were 3-fold greater compared with those who did not (OR=3.35; 95% CI, 2.74-4.09); and participants who were very satisfied or satisfied with comprehensive SRH counseling offered by FPWs were significantly more likely to be aware of SRHCRs. (Table 6).

In further analysis, we assigned the 6 separate options (constants) to factors that significantly influenced family planning in Table 6. Compared with participants with 2 or more children, those without children were more likely to be interested in Rights 1, 2 and 4. Participants who used fetal sex tests were more likely to focus on Right 2 and Right 4 than those who never used such tests. Women who accepted informed choice were more likely to respond to all 6 Rights except for Right 3 and 6 compared to those who never accepted informed choice. The participants who were satisfied or very satisfied with comprehensive SRH counseling offered by FPWs *versus* those who were dissatisfied with such counseling were more likely to show interest in all 6 Rights (Table 7).

Table 6. GEE for the correlation between the factors and SRHCRs in the married women (N=2504)

Parameter	Estimate	Standard error	*p-value*	OR	(95% *CI*)
Int1	-1.00	0.37	0.0071		
Int2	-1.50	0.37	<0.0001		
Int3	-0.57	0.37	0.1278		
Int4	-2.86	0.38	<0.0001		
Int5	-0.91	0.38	0.0149		
Int6	-1.55	0.37	<0.0001		
Region					
Inner Mongolia	-0.51	0.09	<0.0001	0.60	(0.50, 0.71)
Guang Zhou	-0.37	0.10	<0.0001	0.69	(0.57, 0.83)
He Nan	Ref.			1	
Age					
<25	0.66	0.14	<0.0001	1.94	(1.47, 2.57)

25-34	0.25	0.11	0.0221	1.28	(1.04, 1.58)
45-49	Ref.			1	
Educational attainment					
Elementary school or lower	-0.56	0.15	0.0001	0.57	(0.43, 0.76)
Junior high school	-0.57	0.11	<0.0001	0.57	(0.46, 0.70)
High school	-0.39	0.10	0.0001	0.68	(0.55, 0.82)
Junior college or higher	Ref.			1	
Annual family *per capita* income (dollars)					
<160.78	0.44	0.10	<0.0001	1.56	(1.27, 1.89)
≥643.15	Ref.			1	
Number of children					
0	0.23	0.10	0.0251	1.26	(1.03, 1.55)
2	Ref.			1	
Did you use fetal sex tests					
Yes	0.57	0.20	0.0046	1.78	(1.20, 2.65)
No	Ref.			1	
Did you receive informed choice					
Yes	1.21	0.10	<0.0001	3.35	(2.74, 4.09)
No	Ref.			1	
Satisfaction with comprehensive SRH counseling offered by FPWs					
Very satisfied	1.03	0.18	<0.0001	2.82	(1.98, 4.01)
Satisfied	0.81	0.18	<0.0001	2.26	(1.58, 3.24)
Dissatisfied	Ref.			1	

Note: 1. The non-significant categories in the independent variables were herein omitted.

2. int1-in6 were the six conditions of the probabilities of the six baseline/reference responses (Appendix II).

Table 7. Effects of predominant influencing factors on awareness of SRHCRs (N=2504)

Parameter		**Estimate**	**Estimate error**	***p value***	**OR**	**(95%*CI*)**
Did you use fetal sex tests						
Yes *vs*. No at	Right 2	1.32	0.42	0.0017	3.75	(1.64, 8.58)
	Right 4	0.56	0.26	0.0328	1.76	(1.05, 2.95)
Number of children						
0 *vs.* 2 at	Right 1	-0.46	0.13	0.0004	0.63	(0.49, 0.81)

	Right 2	-0.49	0.13	0.0002	0.61	(0.47, 0.79)
	Right 4	0.96	0.13	<0.0001	2.62	(2.04, 3.38)
Did you receive informed choice						
	Right 1	4.55	0.25	<0.0001	94.75	(58.32, 153.92)
Yes *vs.* No at	Right 2	0.80	0.15	<0.0001	2.22	(1.66, 2.98)
	Right 4	-0.75	0.15	<0.0001	0.47	(0.35, 0.63)
	Right 5	0.91	0.16	<0.0001	2.49	(1.81, 3.41)
Satisfaction with comprehensive SRH counseling offered by FPWs						
	Right 1	0.81	0.27	0.0028	2.25	(1.32, 3.84)
	Right 2	0.56	0.27	0.0382	1.76	(1.03, 3.00)
Very Satisfied	Right 3	0.89	0.32	0.0049	2.43	(1.31, 4.51)
Vs. Dissatisfied	Right 4	1.68	0.34	<0.0001	5.34	(2.74, 10.41)
	Right 5	0.92	0.29	0.0014	2.52	(1.43, 4.43)
	Right 6	0.89	0.28	0.0017	2.42	(1.40, 4.21)
	Right 1	0.68	0.28	0.0168	1.97	(1.13, 3.45)
	Right 2	0.61	0.28	0.0308	1.84	(1.06, 3.21)
Satisfied *vs.*	Right 3	0.94	0.34	0.0049	2.57	(1.33, 4.95)
Dissatisfied	Right 4	1.24	0.35	0.0004	3.46	(1.75, 6.84)
	Right 5	1.25	0.31	<0.0001	3.50	(1.92, 6.38)
	Right 6	0.72	0.29	0.0142	2.05	(1.15, 3.62)

Note: The non-significant constants and variables were herein omitted. The analysis controlled for region, age, household registration, educational attainment, occupation, annual family income *per capita*, contraceptive status, experience with fetal sex tests, acceptance of informed choice, satisfaction with comprehensive SRH counseling offered by FPWs, and which institutes were optimal for family planning services.

Discussion

Awareness of SRHCRs in China

Generally, the level of awareness of SRHCRs was relatively low, averaging a 72.17%

response percentage among married women of reproductive age in China. On the one hand, previous research on the extent of awareness regarding general health rights in China was still sparse [9,10], and there exist variations in awareness of SRHCRs among women generally [11]. Women manifested various levels of awareness of SRHCRs due to factors such as age, income, education, geographic location, *etc*. [12-14]; and this was also the case in our study. Although the subjective cognizance of rights among Chinese has certainly improved, the long-term impacts derived from feudal and cultural contexts cannot be completely eliminated, as these still affect people's thinking and behavior. Conversely, family planning services have revealed a weakness of health-related medical information and knowledge of family planning/reproductive health rights. In such cases, women seem vulnerable when service providers neglect women's autonomy. Even if they sensed inappropriateness or dissatisfaction, women were likely to be passively compliant in response to the advice or requests of service providers [12]. Additionally, a crisis in trust due to the asymmetry of right-related knowledge between service providers and clients could occur [13]; and such indifference could be further worsened with regard to the desire for communication by both women and service providers. Women tended to emphasize informed compliance but then overlook rights, pursuant to their own interests [14]; and this could lead the two sides to conflict.

Family-planning-related factors and awareness of SRHCRs

In China, the policy of "late marriage and late childbirth" has been advocated by the government for years [15]. In our study, the reproductive-age women were mainly at the age from 22 to 44 years old. With the increase of age, the risk of giving birth also increases due to physical changes among these women. In term of childbirth, they could be more concerned about their reproductive health. Some research [16] indicated that 76.67% of the married women were aware of the knowledge of usual genital tract care, genital tract care during a menstrual period and after intercourse. A half of them knew about the symptom of genital tract infection. Only 16.25% of the participants payed attention to the access and information on contraception and reproductive technology. In our study, the participants who had no children had a positive effect on their reproductive health (safety right), but negative effect on information and access rights, which was similar to these studies.

Informed choice includes the rights of men and women to be informed and to have access to safe, effective, affordable, and acceptable methods of family planning of their choice [17]. In 1995, informed choice was introduced to China and implemented in pilot counties that carried out high-quality care with respect to family planning [18]. Informed choice was included in the "Law of Population and Family Planning of P. R.

China," enacted in 2001, which illustrates the right of sexual equality in child bearing and the right of information on family planning, reproductive health, and education. When folding women's reproductive rights into a new era of family planning, informed choice reflects the practice of women's empowerment in reproductive health programs [19]. In our study, informed choice provided an impetus toward improving three rights (Rights 1, 2, and 5), and an impediment to Right 4. This indicated that reproductive-aged women in China were aware of the collection of information on sexual and reproductive health services, access to these services, and protecting their privacy *via* informed choice. However, women of reproductive age were still passive as far as selecting effective, safe, and acceptable contraceptive methods [20]. This implies that it is essential to strengthen the self-determined right of contraceptive methods when implementing informed choice in SRHCRs.

The comprehensive SRH counseling services support clients' informed and voluntary decisions as well as assist them in making a feasible scheme in reproductive care and related health services [21]. This can improve contraceptive methods for clients, prevent STD/HIV infections, and provide support for treatment of future sexual dysfunction [22-29]; suggesting that women's SRHCRs are being heeded. With the passing of time, people will require access to integrated SRH services more than ever before [30]. The core concept of comprehensive SRH counseling services is

"client-oriented." Therefore, not only is client satisfaction to these services a key measurement of quality, but it also affects the utilization of services and SRHCRs. The full practice of SRHCRs depends to a large extent upon active acceptance by clients, and simultaneously, such acceptance relies on satisfaction with comprehensive SRH counseling services [31]. Even when health services were readily available and affordable, women were still not willing to use them if they were of poor quality [32]. This finding also agrees with a Chinese study where the higher the satisfaction with reproductive health services, the stronger the acceptance of reproductive health-related knowledge [33].

There is an old Chinese proverb regarding "Bring[ing] up … sons [to care for] for parents [in their] old age." In the context of family-planning transitioning *vs.* traditional concepts in China, Chinese married women still face a decision on whether to have boys or girls when they are ready for child bearing. Though the use of fetal sex diagnosis is illegal in China, the current situation is still problematic: sexual selection will be prejudicial against the birth of girls, and thus violate the right to non-discrimination of gender. However, modern human rights also react against forcing women to maintain their pregnancies against their free will. Reinforcing women's rights to select for pregnancy continuation or termination are the same inalienable rights to create families of their choice, to information, and, for instance,

to the benefits of scientific progress [34]. This is of paramount importance with respect to the current family planning policy, especially to those women who have had one child or want a boy as the first child. Therefore, to be aware of such rights of access will meet their reproductive demands, and ensure their reproductive health in a way that allows women to gain dignity; however, gaining social acceptance or family position is another issue entirely.

Our study exhibits several limitations. First, causal inferences could not be established with certainty as ours was a cross-sectional study. Second, our findings might entail a selection bias. However, it was estimated by a Heckman selection model, the rho (the correlation coefficient between latent model and selection model) was not significant ($p>0.05$). Therefore, the selection bias in our study could be considered as inexistence. Third, this study was limited only to the awareness of SRHCRs. Therefore, behavioral modification toward realizing these rights was not included. Further studies, therefore, need to be implemented to achieve the latter goal.

Conclusions

reproductive-aged women According to our results, The awareness of SRHCRs among reproductive women in China is still inadequate. Family planning service providers might strengthen reproductive awareness according to the different needs of women. With the transition of family planning policy, we found that the related

factors of family planning, number of children, used fetal sex tests, accepted informed choice and satisfaction with comprehensive SRH counseling offered by FPWs had different effects on each of SRHCRs. Especially, at present, as the policy of a second child is available to couples in China, informed choice has a full function and married women can decide to give birth or not. These two factors have significant effects on the awareness of SRHCRs. Satisfaction with comprehensive SRH counseling offered by FPWs had a positive effect on the awareness of SRHCRs. These give us some leads on how to improve the awareness and use of SRHCRs in detail.

Acknowledgments

We are grateful to other investigators for contributions to our research project, including interviewers and study participants who, with understanding and patience, cooperated with the study team. This project was funded by the National 12th Five-Year Plan (No. 2012BAI32B08).

Abbreviations

Variable	Abbr.
Sexual and Reproductive Health Care Rights	SRHCRs
Sexual and Reproductive Health & Rights	SRHRs

International Planned Parenthood Federation	IPPF
Probability Proportion to Size	PPS
Primary Sampling Units	PSUs
Sexual and Reproductive Health	SRH
Medically Assisted Reproduction	MAR
Family Planning Workers	FPWs

Competing interests

The authors declare that they have no conflicts of interest.

Authors' contributions

WJQ conceived of the study, participated in the design of the study, interpreted the results, and translated them into policy suggestions. YCN performed the statistical analysis, participated in interpretation of the results, and drafted the manuscript. LYY took part in the discussion of the paper and approved the final manuscript.

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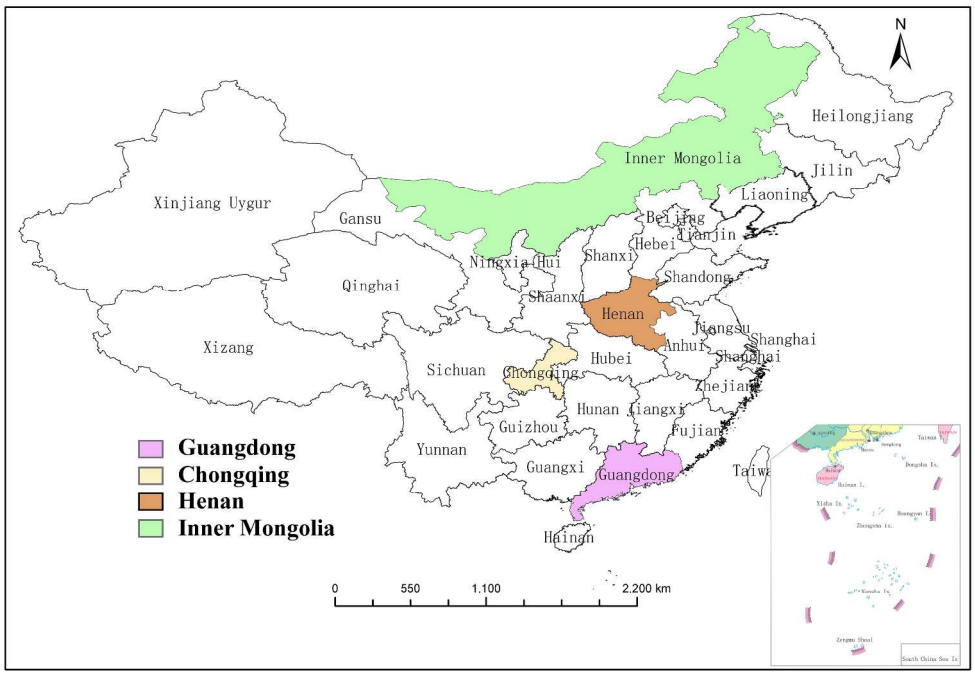
Figure 1. China's administrative units: provinces, autonomous regions, and municipalities (sourced from National Atlas of Administrative Province, Area and County (City), Ministry of Land and Resources of the People's Republic of China).



148x104mm (600 x 600 DPI)

Appendix I

This study employed the method of two-stage probability proportion to size (PPS) for the overall sampling scheme, and an onsite sampling scheme based upon a permanent population registration system.

Sampling Strategies

Stage I: PPS for selecting provinces

PPS is a sampling technique that uses an "auxiliary variable" to select a unit by a probability proportionate in measure to its size.

After repeating the procedure using random simulation for 2500 iterations, all 4 sites, Guangdong, Chongqing, Inner Mongolia and Henan, were selected (Table 1).

Table 1. PPS for survey site sampling

Survey sites	Female population	Selection probability	Sampling weight
Inner Mongolia	1965431	0.06864	14.57
Chongqing	2582818	0.09020	11.00
Henan	6056991	0.21154	4.73
Guangdong	10813256	0.37765	2.64

Stage II: Sampling of counties

In each survey site, 2 counties were selected using PPS. The residential communities/subdistricts are listed and ordered clockwise in terms of eastern, western, southern, northern and central directions; and then 2 of them were selected systematically.

Stage III: Onsite sampling scheme

Subjects were sampled in the 2 residential communities/subdistricts per county based upon randomly generated ID numbers from permanent population registration

systems.

Appendix II

Methodology for the analysis of a multiple-response set

A multiple-response set is a categorical variable in substance; however, the options available to it account for one response at different levels. The options have two features: (1) because a correlation exists for different options, taking these options as an independent option respectively is inappropriate when blocking out the correlation between them artificially; (2) options in a multiple-response set are not generally interchangeable as different statuses; they are rather chosen from the first, second, and other options in consecutive order.

Each option is a measurement to this response such that *n* options compose *n* measurements to the response. Hence, the issue can be taken as a multivariate logistic regression model with repeated measurements (generalized estimation equation, GEE). In a typical repeated-measurements model, one constant can be set on the condition of the basically equal probability of baseline/reference response in terms of each measurement. In a multiple-response set, the emphasis for each option is different, resulting in different probabilities regarding baseline/reference responses. It is appropriate to create multiple constants to these options.

Appendix II

Confidentiality

Code□-□-□□□□

The Effect of Family Planning on Sexual and Reproductive Health and The Rights

A Questionnaire for Married Women of Reproductive age

Instructions:

1. This study is to provide scientific evidence to improve the awareness of sexual and reproductive rights by understanding the effect of family planning on sexual and reproductive health and the rights. The information that you provide is ONLY for this study. Strict security measures have been established.
2. Pleas read the suggested answers following the questions carefully. Give a ○ or √ when the answer fits you, or write down your reply accordint to the notice. **Each question has ONLY ONE optimal suggested answer unless a specific notice is given. In the meantime, please give the corresponding answer based on the jumping prompt.** Please try your best to reminisce what happened in the past and offer the best answer.

Location: □

1Inner Monglia 2 Chongqing 3 Guangdong 4 Henan

National Population and Family Planning Commission
China's Family Planning Reproductive Health Counselling Capacity Building Office

Questionnaire for Reproductive-age women

Code□-□-□□□□

A.Demographic Chraracteristics

Area of coding

A1.Date of birth: _____year_____month	□□□□/□□
A2.Sex：1 Male 2 Female	□
A3.Registered permanant residence (hukou):1 Rural 2 Urban	□
A4. Educational Attainment: 1 Elementary school 2 junior high school 3 high school 5 junior college or higher	□
A5.Occupation: 1 Laborer/commercial/service worker 2 Peasant 3 Employer in public institution 4 other	□
A6. Family annual income *per capita* (dollars) 1. ＜160.78 2 .160.78- 321.57 3. 321.58-482.35 4. 482.36-643.14 5. ≥643.15	□

B、Reproductive history

B1.Number of children？_____（**if 0，jump to B4**）	□□
B2.您（最小）的孩子____（周）岁？	□□
B3.您或您的配偶/性伴共怀孕____次？（**若为 0，跳至 B12**）	□□
B4.您或您的配偶/性伴最近一次的怀孕时是否进行过孕期检查？ 1 是 2 否（**跳至 B12** ）	□
B5.孕期检查的主要地点是（请您选择最主要的 1~3 个）：a__b__c__ 1 计划生育服务站（室） 2 妇幼保健院（所） 3 医院 4 家中 5 村卫生室 6 其他（请注明）_____	□/□/□
B6.孕期检查时，由谁为您或您的配偶/性伴提供该项服务？ 1 计划生育服务人员 2 医务人员 3 其他（请注明）_____ 4 不知道	□
B7.在进行孕期检查时，您对其**服务态度**是否满意？_____ 您对其**检查环境**是否满意？____ 您对其**技术规范**是否满意？_____ 1 非常满意 2 基本满意 3 一般满意 4 基本不满意 5 不满意	□ □ □
B8.您或您的配偶/性伴平均____周进行一次孕期检查？	□□
B9.您或您的配偶/性伴孕期检查时的项目包括(选择最常见的 1~3 个):a__b__c__ 1 B 超 2 心电图 3 尿检 4 血常规 5 肝功能 6 肾功能 7 其他（请注明）_____	□/□/□
B10.您或您的配偶/性伴孕期检查时平均每次花费为_____ 1. 免费 2 ．＜100 3. ＜150 4. ＜500 5. ≥500	□
B11.您当地有无胎儿性别鉴定的情况？ 1 有 2 无（**跳至 B14**） 3 不知道（**跳至 B14**）	□
B12.您知道在哪里能进行胎儿性别鉴定吗？ 1 计划生育门诊 2 医院 3 私人诊所 4 其他 5 不知道	□

B13. Did you Use fetal sex tests? 1 Yes 2 No	☐
B14. Are you using contraceptive methods? 1 Yes（Jump to B16.1） 2 No	☐
B15.您和您的配偶/性伴没有采取避孕的主要原因是什么？（按主次顺序选择最主要的 1~3 个）a__b__c__**（直接跳至 B28）** 1 不了解避孕方法 2 想怀孕 3 得不到想要的避孕方法 4 怕麻烦 5 影响性生活 6 配偶反对 7 不好意思去获取避孕药具 8 其他_____	☐/☐/☐
B16.1 您或您的配偶/性伴目前使用的主要避孕方法是：__ 1 上环 2.1 男用安全套 2.2 女用安全套 3 结扎 4 口服避孕药 5 紧急避孕药 6 安全期避孕 7 体外射精 8 其他 9 不知道 16.2 您目前使用的主要避孕方法是由谁决定：__ 1 自己 2 配偶/性伴 3 双方共同决定 4 计生/卫生服务人员 5 其他 16.3 您对目前使用的主要避孕方法的副作用了解程度？__ 1 非常了解 2 比较了解 3 一般了解 4 不太了解 5 完全不了解 16.4 您对目前使用的主要避孕方法的优点了解程度？__ 1 非常了解 2 比较了解 3 一般了解 4 不太了解 5 完全不了解 16.5.您对目前的避孕方法是否满意？ 1 非常满意 2 基本满意 3 一般 4 不满意（**答 B16.6，其余跳至 B17**） 16.6 您对目前避孕方法不满意的原因：（按主次选择 1~3 个）a__b__c__ 1 质量差 3 不方便 4 避孕效果不好 5 有副作用 6 费用高 7 影响性快感 8 不易获得 9 其他_____**（B16.1 回答“2~9”跳至 B22）**	☐ ☐ ☐ ☐ ☐ ☐/☐/☐
B17.您和您的配偶/性伴所使用的宫内节育器的类型是： 1 宫型 IUD 2 T 铜 220C 3 T 铜 380 4 母体乐铜 375 5 γ 型铜 380 6 O 型 165 环 7 不知道	☐
B18.您或您的配偶是否查过环： 1 是 2 否（**跳至 B21**）	☐
B19.您或您的配偶/性伴多长时间查环一次？ 1）＜0.5 年 2 0.5 年~ 3 ≥1 年	☐
B20.您或您的配偶/性伴主要在哪查环？**（跳至 B22）** 1 医院/妇幼保健院 2 计划生育服务机构 3 私人诊所 4 社区卫生服务中心 5 其他(请注明)___	☐
B21.您或您的配偶/性伴未进行查环的原因是： 1 没必要 2 没时间 3 没有钱 4 检查地点太远 5 其他___	☐
B22.您或您的配偶/性伴在**最近 1 次**的性生活中是否使用了安全套？ 1 是 ，请说明是（可多选）：1.1_男用安全套 1.2_女用安全套 2 否（**跳至 B25**）	☐
B23.您或您的配偶/性伴在**最近 3 次**的性生活中是否均使用了安全套？ 1 是 ，请说明是（可多选）：1.1_男用安全套 1.2_女用安全套 2 否	☐
B24.您或您的配偶/性伴使用安全套的原因是什么？（按主次选择 1~3 个） a__b__c__	☐/☐/☐

1 避孕 2 预防性病 3 预防艾滋病 4 配偶/性伴要求使用 5 使用方便 6 几乎无副作用 7 其他	
B25.您或您的配偶/性伴目前使用的避孕方法主要从哪儿获得？ 1 妇幼保健院 2 医院 3 药店/超市 4 计划生育服务机构 5 私人诊所 6 社区服务中心 7 单位 8 其他	☐
B26.您或您的配偶/性伴目前使用的避孕方法的费用： 1 免费 2 自费 3 不知道	☐
B27.至目前，您认为哪种避孕方法最有效/理想？ 1 上环 2 结扎 3.1 男用安全套 3.2 女用安全套 4 口服避孕药 5 紧急避孕药 6 皮下埋植剂 7 其他_____ 8 不知道	☐
B28.您或您配偶/性伴是否曾经服用过紧急避孕药？ 1 是 2 否（**跳至 B30**）	☐
B29.您或您的配偶/性伴主要用哪种紧急避孕药？ 1 米非司酮（碧韵胶囊、后定诺、弗乃儿） 2 左炔诺孕酮（安婷、惠婷） 3 其他 4 不知道	☐
B30.您认为一个月内最多可以服用多少次紧急避孕药？ 1 1 次 2 2 次 3 ≥3 次 4 无限量 5 不知道	☐
B31.您认为一年内最多可以服用多少次紧急避孕药？ 1 2 次 2 3 次 3 ≥4 次 4 无限量 5 不知道	☐

C Informed Choice

C1.您是否听说过避孕节育知情选择？ 1 是 2 否（**跳至 C4**）(c1)	☐
C2.您是怎么知道避孕知情选择的？（按主次选 1~3 个答案）a_____b_____c_____ 1 电视、广播 2 网络 3 计划生育工作人员 4 座谈会、讨论会、咨询 5 报纸、杂志 6 书籍和手册 7 社区工作人员 8 医务人员 9 其他:_____	☐/☐/☐

C3.以下关于避孕知情选择的说法对么？（划 √）	**1 对**	**2 错**		
a.避孕知情选择是通过宣传、教育，群众根据自身的身体状况，选择适合自身特点的安全有效的避孕方法				☐
b.知情选择的最终目的是控制我国人口数量				☐
c.开展知情选择，应关注群众需求的多样性				☐
d.服务人员只需向群众提供他们所需要的避孕方法				☐
e.避孕知情选择最终由医务人员决定用何种避孕方法				☐
f.知情选择的主体是育龄妇女				☐
g.群众在一系列可供选择的避孕方法中，自己选择				☐
h.育龄群众有权利享受避孕节育知情选择				☐

C4. Did you receive informed chioce? 1 Yes 2 No（**Jump to C6**）	☐
C5.您所在地区开展避孕知情选择的形式有哪些？（按主次选择 1-3 个答案）a__b__c__ 1 开展宣教活动 2 开展技术服务 3 开展咨询服务 4 定期举办讲座	☐/☐/☐

5 其他（请注明）_____	
C6.您对开展知情选择避孕方法的态度是： 1 赞同 2 无所谓 3 反对	☐
C7.您认为您可以自己决定使用何种避孕方法吗？ 1 是 2 否	☐
C8.您认为有必要在本地区开展避孕方法知情选择吗？ 1 有必要 2 无所谓 3 没有必要	☐
C9.您认为实施避孕知情选择后，当地百姓同计划生育服务人员的关系会怎么样? 1 好转 2 无变化 3 恶化 4 其他（请说明）_____	☐
C10.如果实施避孕节育知情选择后，您是否想过更换避孕方法? 1 是（**跳至 C12**） 2 否	☐
C11.如果您不想更换，主要原因是什么？ 1 身体状况不允许 2 不知道哪里可以获得想要的避孕方法 3 经济条件不允许 4 现有的效果较好，没必要更换 5 其他_____	☐
C12.近一年内，您是否接受过面对面的避孕节育相关知识的咨询？ 1 是 2 否 （**跳至 C15**）	☐
C13.1 计划生育工作人员是否告诉您,你可以**自己决定**使用避孕方法? 1 是 2 否 3 记不清	☐
13.2 他们是否向您介绍**三种或三种以上**的避孕方法供您选择？ 1 是 2 否 3 记不清	☐
13.3 他们是否**倾向于**让您使用**某一种**避孕方法？ 1 是 2 否 3 记不清	☐
13.4 他们是否**限定**您使用某一种避孕方法？ 1 是 2 否(**跳至 13.9**) 3 记不清(**跳至 13.9**)	☐
13.5 当限定您使用某一种避孕方法时,他们是否说明理由？ 1 是 2 否	☐
13.6 他们是否问您最想要采取哪种避孕方法？ 1 是 2 否 3 记不清	☐
13.7 他们是否让你自己决定使用某种避孕方法? 1 是 2 否 3 很难说	☐
13.8 他们是否告诉您有关将采取的避孕措施的使用方法？ 1 是 2 否 3 记不清	☐
13.9 他们是否告诉您将采取的避孕措施的副作用？ 1 是 2 否(**跳至 14**) 3 记不清（**跳至 14**）	☐
13.10 他们是否告诉您在出现副作用时，如何处理？ 1 是 2 否 3 记不清	☐
C14. Satisfaction with comprehensive SRH counseling services offered by FPWs 1 Very satisfied 2 Satisfied 3 Dissatified	☐
C15.您是否到过计划生育门诊（医院、妇幼保健院、计划生育站）？ 1 是 2 否（**跳至 D 部分**）	☐
C16.该计划生育门诊是否有**单独的咨询室**？ 1 是 2 否 3 不知道	☐

C17.您对计划生育门诊的**环境**是否最满意？ 1 大部分满意 2 一般 3 不满意	□
C18.您对计划生育门诊的**服务态度**是否满意？ 1 大部分满意 2 有时满意，有时不满意 3 不满意	□
C19.您对计划生育门诊的**设备**是否满意？ 1 大部分满意 2 有时满意，有时不满意 3 不满意	□
C20.您对计划生育门诊的**技术水平**是否满意？ 1 大部分情况满意 2 有时满意，有时不满意 3 不满意	□
C21.您对计划生育门诊的**服务项目**是否满意？ 1 大部分情况满意 2 有时满意，有时不满意 3 不满意	□
C22. Institutes that are optimal for family planning services 1 Hospital 2 Maternal and child care center 3 Family planning center 4 Community health center	□
C23.您首选该处的主要原因：**（按主次选择 1-3 个答案）a__b__c__** 1 环境好 2 服务态度好 3 设备及技术水平高 4 服务项目多 5 习惯 6 不知道别的地方也提供该服务 7 经济原因 8 其他_____	□/□/□

D. 性与生殖健康知识

避孕方法	D1 是否听说 1 听说过 2 从没有听说过	D2 如何使用？ （参照说明）	D3 避孕原理？ （参照说明）	D4 主要优点？ （参照说明）	D5 主要副作用？ （参照说明）
a. 宫内节育器	___□	__□	__□	___□	___□
b. 男扎	___□	__□	__□	___□	___□
c. 女扎	___□	__□	__□	___□	___□
dM. 男用安全套	___□	__□	__□	___□	___□
dF. 女用安全套	___□	__□	__□	___□	___□
e. 口服避孕药	___□	__□	__□	___□	___□
f. 紧急避孕	___□	__□	__□	___□	___□
g. 体外射精	___□	__□	__□	___□	___□
h. 安全期避孕	___□	__□	__□	___□	___□
i. 皮下埋植剂	___□	__□	__□	___□	___□

注：D1 回答“2”，则不用回答相应的 2-5

D2 该避孕方法如何使用？	D3 该方法的避孕原理？	D4 该方法的优点	D5 该方法主要副作用
1. 有月经周期，确认无妊娠，任何时候都可以；哺乳期，6 周后开始；人流后立即。 2. 只要没有禁忌症，任何时候都可以手术 3. 决定不再要孩子；流产或产后立即手术 4. 性生活过程自始至终使用，防止脱落和破裂 5. 月经第 5 天，每天一片连服 22 片 6. 房事后 72 小时内，最好事后即服 7. 精液不射入阴道 8. 避免在排卵期前后同房 9. 月经期第 3 天起至月经干净后 7 天内均可放置，以月经干净后 3～7 天为最佳；人流引产后即时，产时、剖宫产时胎盘娩出后即时 10. 不知道	1. 引起子宫无菌性炎症、局部生化物质变化、释放铜离子加重无菌性炎症抗着床等 2. 采用日历计算，基础体温，宫颈口自我感觉等方法计算排卵期，避免排卵期性生活 3. 射精前将阴茎从阴道抽出，阻止精子进入女性生殖道 4. 起屏障作用，阻止精子进入女性生殖道 5. 抑制排卵，使宫颈黏液变稠，阻止精子穿过 6. 对 50%的月经周期抑止排卵，有排卵者发生黄体不健；使宫颈黏液变稠；改变子宫内膜 7. 阻断输精管，阻止精子进入精液 8. 堵塞或切断输卵管，使精卵不能结合 9. 不知道	1. 是无保护性性交后防止意外妊娠的有效方法，月经周期中任何时间都可以使用 2. 手术简便，永久性避孕 3. 使用方便，一般无副作用，可防止性病 4. 长效安全，不影响性生活，取之可以恢复生育力，不影响泌乳及激素水平 5. 服用方便，不影响性生活，避孕效果好 6. 无副作用，不需任何费用 7. 不知道	1. 神经官能症，局部肿胀，出血，性功能障碍，附睾郁积症 2. 经量增多，经期延长，月经间期点滴出血，经期痉挛疼痛增加；可能脱落导致意外妊娠 3. 腹壁切口感染，盆腔感染，肠粘连等术后并发症 4. 月经改变，头疼，功能性卵巢囊肿，乳房胀痛，埋植剂脱出等 5. 类早孕反应反应，月经周期改变；不能作为常规避孕方法 6. 类早孕反应，长期服用可能引起高血压、高血脂，轻度体重增加 7. 极少人可能发生乳胶过敏症 8. 一般无副作用 9. 不知道

D6.您认为下列哪些避孕方法可以预防艾滋病病毒感染？ **（答案写横线上：1 是　2 否　3 不知道）** a 男用安全套____　b 女用安全套____ c 阴道海绵体、宫颈帽_____　d 体外射精_____ e 输精管结扎（男扎）_____　f 带消炎痛宫内节育器_____	 □ □ □ □ □ □
D7.下列有关男用安全套使用，是否正确？**（答案写横线上：1 是 2 否 3 不知道）** a 可以用吹气的方法检查安全套的完整性____ b 安全套仅需要在射精前带上就可以起到避孕的作用____ c 安全套在使用前要用手指捏紧气囊，排空空气____ d 安全套在射精前带上就可以预防性病和艾滋病____ e 安全套可以重复使用_____ f 安全套取出时，应夹住阴茎根部____ g 安全套破裂，需采取紧急避孕_____ h 过期安全套仍可以继续使用_____	 □ □ □ □ □ □ □ □
D8.您当地的避孕方法的收费情况：（答案写横线上：**1 免费 2 收费 3 不知道**） a 宫内节育器__　b 男用安全套___ c 口服避孕药__　d 紧急避孕药__ e 皮下埋植剂__　f 女用安全套__ g 避孕针剂__　h 人流__ i 结扎__	 □/□ □/□ □/□ □/□ □
D9.性健康包括以下那些内容**(可多选)**？	

1 性满意	2 没有皮癣等皮肤病	□□□
3 避免性传播疾病	4 能成功地妊娠或避孕	□□□
5 没有性虐待、性强迫或性骚扰	6 没有乳腺癌、乳腺增生等疾病	

E 性与生殖健康综合咨询

E1.您是否听说过**性与生殖健康综合咨询**服务？ 1 是　2 否（**跳至 E3**）	□
E2.您是通过何种途径听说过**综合咨询**服务的？（若为多个，请您按主次选择 1~3 个答案）a_____b_____c_____ 1 电视广播　2 网络　3 报刊杂志　4 同事朋友间 5 计划生育机构宣传　6 其他_____	□/□/□

E3.您认为当地开展下列服务的质量如何？（划√）	**1 很好**	**2 好**	**3 一般**	**4 不好**	**5 不知道**	
a 与怀孕有关的服务						□
b.皮肤病的防治						□
c.艾滋病和性病的预防和服务						□
d.计划生育服务						□
e.流产后保健						□
f.育儿服务						□

E4.您认为咨询人员作下列工作的必要性（划√）	**1 很必要**	**2 必要**	**3 无所谓**	**4 没必要**	**5 不知道**	
a 代替群众作出决定						□
b 只需回答群众的问题，其余的不用管						□
c 给群众作出危险评估（性病、感染、意外妊娠等）						□
d 让群众最终自主决定						□
e 给群众详细的信息，必要时帮助作出决定						□
f 帮助对象制定计划						□

E5.您所在社区是否开展了**性与生殖健康综合咨询服务**？ 1 是　2 否（**跳至 E7**）　3 不知道（**跳至 E7**）	□
E6.如果有，该项服务主要由哪个机构来提供？ 1 计划生育机构　2 医院　3 社区服务中心 4 街道或者居委　5 其他___	□
E7.如果开展**性与生殖健康综合咨询服务**，您是否愿意去接受该项服务？ 1 愿意（**跳至 E9**）　2 不愿意　3 无所谓	□
E8.您不愿意接受的主要原因是：（按主次选主要的 1~3 个）a___b___c___ 1 自己知识足够，没有必要　2 害怕受到别人的歧视	□/□/□

3 医务人员的能力不够　4 医务人员不能对隐私保密　　5 其他_____	
E9.您认为**是否有必要**在当地开展**性与生殖健康综合咨询服务**？ 1 有必要　2 没有必要　3 无所谓	□
E10.您**是否希望**获得**性与生殖健康综合咨询服务**？ 1 希望　　2 不希望　3 无所谓（**回答 2、3 跳至 E16**）	□
E11.您最希望在什么场所获得该项服务？（按主次选主要的 1~3 个）a__b__c_ 1 家里　　2 医院　3 专业咨询机构　4 计划生育机构 5 公共场所　6 其他_____	□
E12.您希望以何种形式来获得该项服务：（按主次选择主要的 1~3 个）a__b__c__ 1 讲座　2 面对面咨询　3 热线访问 4 网络交流　5 其他_____	□/□/□
E13.您最希望由谁来提供该项服务？ 1 计生人员　2 医务人员　3 街道或居委干部 4 接受专门培训的咨询人员　　5 其他_____	□
E14.您最希望咨询员提供哪些方面的信息？（按主次选择主要的 1~3）a__b__c__ 1 避孕节育　2 生殖道感染　3 性传播性疾病（包括艾滋病） 4 意外妊娠　　5 计划生育知识　6 性健康　7 其他_____	□/□/□
E15.您建议每次咨询的时间是： 1 ＜30 分钟　　2　30 分钟~45 分钟　3　　45 分钟~1 小时 4　1 小时~　　5　⩾2 小时	□
E16.您**是否接受过**相关的**性与生殖健康综合咨询服务**？ 1 是　　2 否　　3 不知道（**回答 2、3 跳至 E25**）	□
E17.您接受咨询服务的主要地点是：（按主次选择主要的 1~3）a___b___c___ 1 计划生育服务站（所/中心）　2 妇幼保健院　3 医院　4 家中 4 社区卫生中心　　5 单位医务室　6 热线　7 其他_____	□/□/□
E18.您**最近一次**咨询的主要原因是：（按主次选择主要的 1~3）a___b___c___ 1 发生了意外的性行为　　2 意外妊娠　　3 生殖感染 4 人工流产保健问题　　5 一般咨询　　7 其他_____	□□□

E19.请回答以下关于咨询时的一些情况：	**1 是**	**2 否**	
a.咨询室设置隐秘			□
b.医务人员热情礼貌，并能主动介绍了自己			□
c.咨询时，回避周围无关人员			□
d.咨询时，服务人员不对我的情况指指点点			□
e.在遇到隐私问题时，服务人员能够鼓励、开导我			□
f.服务人员详细了解我咨询的原因			□
g.在咨询前，说明对谈话内容保密			□

E20.咨询过程中，医生有没有询问以下问题？	1 是	2 否		
a.性生活史，婚育史，怀孕情况				□
b.艾滋病和性传播疾病史和症状				□
c.对艾滋病和性传播疾病了解情况				□
d.对避孕方法的知识和使用情况				□
e.与配偶/性伴在计划生育、性病艾滋病方面的交流				□

E21.关于本次咨询，服务人员是否做到以下内容？	1 是	2 否		
a.详细回答了要咨询的全部内容				□
b.针对本次来访原因，作了详细的解释，必要时，是否作出危险评估（性病、感染、意外妊娠）				□
c.帮助做出下一步决定				□
d.解释做下一步决定的重要性				□
e.分析各种选择的利与弊				□
f.帮助您制定详细的计划				□
g.告知您执行决定的一些技巧（如和性伴讨论、安全套使用等）				□

E22.您对本次（或最近一次）接受的服务是否满意？ 1 非常满意　2 基本满意　3 一般　4 不满意（**回答 E23，否则跳至 E24**）	□
E23.您不满意的最主要原因是什么？ 1 服务态度差　2 信息提供不足　3 询问的方式　4 没有隐私　5 其他__	□
E24.您对本次咨询服务满意的最主要原因是什么？ 1 服务态度好　2 咨询环境隐私　3 服务人员知识全面 4 服务人员回答问题方法好　5 其他_____	□
E25.您认为是否有必要在服务人员中开展**性与生殖健康的综合咨询**培训？ 1 无所谓　2 有必要　3 很有必要　4 没有必要（跳至 E27）	□
E26.您认为服务人员需要接受哪些方面的培训？（可多选） 1 避孕节育技术　2 交流沟通技巧　3 避孕节育知识　4 性相关知识 5 生殖健康知识　6 其他_____	□□□□ □□
E27.您认为开展**性与生殖健康的综合咨询服务**能否提高避孕节育知情选择？ 1 能　2 不能　3 不知道	□
E28.您认为开展**性与生殖健康的综合咨询服务**对您是否有帮助？ 1 有很大帮助　2 有一些帮助　3 有帮助　4 帮助不大　5 没有帮助	□
E29.您现在的主要需求有哪些？（按主次选择主要的 1~3）a___b___c___ 1 避孕方法知情选择　2 性健康方面的问题　3 孕期保健　4 产后保健 5 意外妊娠问题　6 青春期性健康　7 其他_____	□/□/□
E30.您认为**性与生殖健康的综合咨询服务**能否解决您的上述需求？ 1 能　2 不能　3 不知道	□
E31.您是否听说过中国的**生殖健康咨询师**资格认证？	□

1 听说过　　2 没有听说过	
E32.与一般服务人员相比，您是否更愿意接受具有资格认证的服务人员提供服务？ 1 是　　2 否　　3 无所谓，谁提供都一样	
E33.您认为有必要在中国开展“**生殖健康咨询师**”的资格认证吗？ 1 有必要 （**回答 E34**）　2 没有必要（**回答 E35**）　3 无所谓（**回答 E36**）	□
E34.您认为在中国开展“生殖健康咨询师”的资格认证有必要的原因是：（**多选**） 1 性病患者增多 2 婚外性行为增多 3 性开放 4 意外妊娠率增加 5 人流率增多 6 服务机构逐渐健全 7 领导重视 8 经济水平发达 9 其他_____**(跳至 E36)**	□□□□□ □□□□□
E35. 您认为没必要在中国开展“生殖健康咨询师”的资格认证原因是：（**多选**） 1 政府政策影响 2 服务可及性差 3 服务机构不合理 4 医务人员知识不足 5 文化因素影响 6 服务落实差 7 医疗机构健全 8 计划生育机构健全 9 其他_____ **(跳至 E36)**	□□□□□ □□□□□
E36.请您谈谈对今后开展性与生殖健康综合咨询服务的看法及建议？ _____ _____	

F 计划生育优质服务

F1.您是否听说过计划生育优质服务？ 1 是　　2 否（**跳至 F3**）				□
F2.您是通过何种途径听说过计划生育优质服务的？（若为多个，请您按主次选择 1~3 个答案）a_____b_____c_____ 1 电视广播　2 网络　3 报刊杂志　4 同事朋友间 5 计划生育机构宣传　6 其他_____				□/□/□
F3.您认为计划生育优质服务的重点是什么？ 1 技术服务　2 咨询服务　3 宣传服务　4 教育服务　5 随访服务				□
F4.以下关于计划生育优质服务的说法是否正确？（划√）	1 是	2 否		
a. 坚持以人为本，以提高群众自我保健意识和自我保健能力为重点				□
b. 积极推行避孕节育知情选择				□
c. 以落实各项避孕节育措施作为工作重点				□
d. 完善考评体系和评估办法				□
e. 建立宣传教育、科学管理和综合服务相统一的经常性工作机制。				□
f. 建立科学的管理和服务规范，并把工作规范作为重要标准				□
F5.哪些是计划生育优质服务内容？（划√）	1 是	2 否		

a．创造优质服务的环境和条件；				☐
b．提供优质服务的公共服务；				☐
c．提供优质的技术服务。				☐
d．流产后保健服务				☐
e．育儿服务				☐
F6.您是否听说过计划生育优质服务的六要素？ 1 是　2 否**（跳至 F8）**				☐
F7.以下关于计划生育优质服务六要素的说法，是否正确？（划√）	1 是	2 否		
a．提供指定的避孕方法；				☐
b．介绍指定避孕方法的知识和服务信息				☐
c．提高有用途的技术能力和条件				☐
d．良好的人际关系				☐
e．周密的随访服务				☐
f．多功能的生殖保健服务				☐
F8.您认为性与生殖健康综合咨询服务是否能提高计划生育优质服务的质量？ 1 是　2 否　3 不一定　4 不知道				☐
F9.您所在地是否开展计划生育的优质服务？(f9a) 1 已经开展　2 没有开展　3 不知道**（回答 2，3 结束问卷）**				☐
F10.请您对当地开展计划生育优质服务提出自己的建议和意见？ _____				

G. 性与生殖健康权力服务

G1. 您是否听说过老百姓具有“性与生殖健康权利和人权”？ 1 是 2 否（**跳至 G3**）	☐
G2.您是通过何种途径听说的？（若多个，请您按主次选择 1~3 个答案）a_____b_____c_____ 1 电视广播 2 网络 3 报刊杂志 4 朋友间 5 计划生育机构 6 其他_____	☐

G3.以下哪些是性与生殖健康权力的内容？ （划√）	1 是	2 否		
a. 生存、自由和安全的权利				☐
b. 健康、生殖健康、计划生育的权利				☐
c. 决定生育孩子数量和间隔的权利				☐
d. 婚姻自愿和婚姻平等的权利				☐
e. 隐私权				☐
f. 不受歧视的权利				☐

G4.您是否听说过公民在计划生育方面享有的权利？1 是 2 否 （**跳至 G6**）	☐

G5.以下关于公民在计划生育方面享有的基本权利的说法是否正确？（划√）	1 是	2 否		
a. 依法生育的权利				☐
b. 实行计划生育男女平等的权利				☐
c. 获得计划生育/生殖健康信息和教育的权利				☐
d. 获得避孕节育技术和生殖保健服务的权利				☐
e. 获得知情选择安全、有效、适宜的避孕节育措施服务的权利				☐
f. 获得法律、法规和政府规章规定的奖励、优待、社会保障权利和平等发展的权利				☐
g. 公民实行计划生育，享有其人身、财产权不受侵害的权利				☐
h. 获得法律救济的权利				☐

G6.以下关于性健康的说法是否正确？（划√）	1 是	2 否		
a. 指不仅为了繁殖而性交，而且可以为了性快感而性交				☐
b. 人们具有与性活动有关的健康需求				☐
c. 有负责任的、满意的和安全的性生活				☐
d. 性伴之间要互相尊重				☐
e. 一种没有疾病、损伤、暴力、性无能、不必要的痛苦或死亡危险的性生活				☐
f. 一种没有害怕、害羞、内疚和对性生活有错误信念的性生活				☐
g. 有能力享受和控制自己的性行为和生殖活动				☐

G7. Do you know of the rights for service recipients? 1 Yes 2No（**Jump to G9**）	☐

G8.Are you aware of sexual and reproductive health care rights?（Tick）	1Yes	2No		
a. Information				☐
b. Access				☐
c. Choice				☐
d. Safety				☐
e. Privacy				☐

f. Dignity				□
G9.以下关于“知情自主决策意义”的说法是否正确？（划√）	1 是	2 否		
a．有助于人们行使自己的权力，在健康和生育上做出自主的决策；				□
b．有助于满足服务对象的需求，提高其满意程度				□
c．有助于实现计划生育方案的目标				□
G10.您是否听说过知情自主决策必需的五种基本元素？ 是 2 否（**跳至 G12**）				□
G11.以下关于知情自主决策必需的五种基本元素的说法，是否正确？（划 √）	1 是	2 否		
a．可以选择的服务项目				□
b．决策的过程是自愿的				□
c．能获得适当的信息				□
d．确保服务对象与服务人员间具有包括咨询在内的良好的互动关系				□
e．支持知情自主决定的社会和相关的环境				□

G12.您是否接受过性与生殖健康权利的宣教服务？1 是 2 否（跳至 G16） □

G13.您接受的宣教服务的内容包括哪些？ □□□□

1 性权力 2 生殖健康权 3 性健康权 4 知情自主决策权

G14.您接受的宣教服务是由哪个机构提供的？ □

1 计划生育机构 2 医院 3 社区服务中心 4 街道或者居委 5 其他

G15.您对提供的宣教服务是否满意？ 1 满意 2 不满意 □

G16.您是否需要接受更多性与生殖健康权利相关的宣教服务 1 是 2 否 □

G17.您是否接受过性与生殖健康权利的咨询服务？ □

1 是 2 否（回答 2 结束问卷）

G18.您接受的咨询服务的内容包括哪些？ □□□□

1 性权力 2 生殖健康权 3 性健康权 4 知情自主决策权

G19.您接受的咨询服务是由哪个机构提供的？ □

1 计划生育机构 2 医院 3 社区服务中心 4 街道或者居委 5 其他

G20.您对提供的咨询服务是否满意？1 满意 2 不满意 □

G21.您是否需要接受更多性与生殖健康权利相关的咨询服务服务 1 是 2 否

G22.您认为开展以“群众需求为中心”的性与生殖健康及权利相关的宣传、教育和综合咨询服务对您是否有帮助？ □

1 有很大帮助 2 有一些帮助 3 有帮助 4 帮助不大 5 没有帮助

G23.请您对当地性与生殖健康权利综合咨询提出自己的建议和意见？

_____

问卷结束，谢谢您的参与！

调查日期：_____年_____月_____，调查员签名：_____

复审员签名:_____

STROBE Statement—Checklist of items that should be included in reports of ***cross-sectional studies***

	Item No	Page number
Title and abstract	1	(*a*) 1
		(*b*) 1
Introduction		
Background/rationale	2	3-6
Objectives	3	6
Methods		
Study design	4	6
Setting	5	7-9
Participants	6	(*a*) 9-10
Variables	7	10-13
Data sources/ measurement	8*	13-14
Bias	9	3
Study size	10	9-10
Quantitative variables	11	14
Statistical methods	12	(*a*) 14
		(*b*) 14
		(*c*) 14
Results		
Participants	13*	(a)15
		(b) 15
Descriptive data	14*	15
Outcome data	15*	(*a*)16-17
Main results	16	(*a*) 17-21
Other analyses	17	18-21
Discussion		
Key results	18	21-26
Limitations	19	26
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence
Generalisability	21	Discuss the generalisability (external validity) of the study results
Other information		
Funding	22	27

*Give information separately for exposed and unexposed groups.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at www.strobe-statement.org.

BMJ Open

The Effects of Family Planning Factors on the Awareness of Sexual and Reproductive Health Care Rights Among Married Women of Reproductive Age in China: A Cross-sectional Study

Journal:	*BMJ Open*
Manuscript ID	bmjopen-2017-017621.R2
Article Type:	Research
Date Submitted by the Author:	28-Aug-2017
Complete List of Authors:	qing, Wu ning, Yu; Guizhou Provincial Center of Disease control and Prevention yan, Li
Primary Subject Heading:	Sexual health
Secondary Subject Heading:	Epidemiology, Public health
Keywords:	PUBLIC HEALTH, EPIDEMIOLOGY, reproductive health, family planning services, sexual and reproductive health care rights (SRHCRs), married women of reproductive age, informed choic

The Effects of Family Planning Factors on the Awareness of Sexual and Reproductive Health Care Rights Among Married Women of Reproductive Age in China: A Cross-sectional Study

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Abstract

Objectives: Although family planning in China has changed gradually since 1994, there are few studies about family planning and women's reproductive rights. The main objective of this study was to examine the awareness of sexual and reproductive health care rights (SRHCRs), and learn how factors related to family planning

influence the awareness of SRHCRs among married women of reproductive age in China.

Methods and Participants: Inner Mongolia, Chongqing, Guangdong and Henan were selected for the study, and a total 2,504 married women of reproductive age were recruited. A self-administered, anonymous questionnaire was applied to collect information on participants' awareness of SRHCRs.

Results: There were a total of 10,843 (≤6×2504) responses with a response rate of 72.17% (10,843/15,024) on average among the participants regarding SRHCRs (a multiple response set). The highest response rate was for Choice (Right 3) (90.64%, 95% CI: (89.47%, 91.81%)), followed by Privacy (Right 5) (86.11%, 95% CI: (84.72%, 87.50%)), and Information (Right 1) (84.47%, 95% CI: (83.02%, 85.93%)). Only 43.39%, 95% CI: (41.40%, 45.38%) of the participants gave responses to Safety (Right 4). The participants without children showed more interest in Right 1, in Access (Right 2), and in Right 4. Those who utilized tests for fetal sex determination paid more attention to Rights 2 and 4. The women who accepted informed choice were more likely to be aware of all six rights except for Right 3 and Dignity (Right 6). Those individuals who were satisfied or very satisfied with comprehensive sexual and reproductive health counseling services were more likely to show interest in all six rights.

Conclusions: The awareness of SRHCRs among reproductive-age women in China is still inadequate. Family planning service providers might strengthen the service awareness of sex and reproductive health rights according to the different needs of women.

Keywords: family planning services, sexual and reproductive health care rights (SRHCRs), married women of reproductive age, informed choice, generalized estimating equation (GEE)

Article summary:

- This study is one of the first to examine the effects of factors related to family planning on the awareness of sexual and reproductive health care rights (SRHCRs) among married women of reproductive age in China.
- A multiple-response set regarding SRHCRs was analyzed using GEE.
- For this cross-sectional study, causal inferences could not be established with certainty and recall bias could occur.
- This study was limited only to the awareness of SRHCRs. Therefore, behavioral modification toward realizing these rights was not included.

Introduction

In China, family planning has been an historical as well as an imperative choice

under the specific laws guiding population and social development. The modern history of family planning in China can be viewed as having occurred in four stages [1]. The first stage occurred during the early 1970s when the government of the People's Republic of China launched a targeted family planning campaign nationwide to promote late marriage, childbearing, spacing of births, and limited fertility. At that time, contraception was introduced as the main method for reducing the fertility rate. Consequently, married couples had the right to select contraceptive methods and decide birth-spacing. The second stage was ushered in by the reform of the socialist market economy, along with related concerns about China's rapid population growth. Consequently, in 1979, the central government enacted the harsh mandatory one-child policy. From 1980 to 1983, the mandatory long-term contraceptive policy was further strengthened [2]. The expanded policy severely restricted the right of couples to have an unauthorized number of children and to select a method of contraception. For a family that had one child, the woman was required to be fitted with an intrauterine device (IUD). Couples who had two children were coerced into agreeing to sterilization of one partner (yi huai er zha). Campaigns promoting abortions were also a focus.

From the middle of the 1990s – 2014, the government of the People's Republic of China instituted a third stage in the nation-wide family planning effort. During this

period, they established a mitigated policy that accepted the concepts of sexual and reproductive health rights (SRHRs) emphasized by the International Conference on Population and Development held in Cairo in 1994. In light of the emphasis presented by the international community, the Chinese government shifted both the range and content of family planning services from simple population control to a combination of population control and SRHRs. Currently, the fourth stage of development, from 2015 to the present, has seen full liberalization of the second child policy. In 2015, the central government dismantled the remnants of the one-child policy in view of the aging of population and economic recession. During this period, women's reproductive rights were consolidated.

In this manner, a supportive environment for promoting women's sexual and reproductive health care rights (SRHCRs) was established in China that continues today. These rights are based on guidance from the International Planned Parenthood Federation (IPPF), and play an important role for family planning. This initiative also relies on a series of rules and regulations that fall within the Population and Family Planning Law of the People's Republic of China. SRHCRs embody the women-centered principles of family planning services, as well as women's empowerment. In addition, as another important element in family planning services, informed choice helps women of reproductive age express their own sexual and

reproductive goals with safety and dignity, while improving the quality of family planning reproductive services and furthering women's empowerment in China.

However, there are still major challenges blocking the full realization of women's family planning and reproductive health rights in China. On the one hand, conflicts still exist between individual rights and national policies. For example, with the continual development of society, women's desire for equality and empowerment is more urgent than ever before. However, the level of family planning services is rather low, and the service concept is still imperfect. The policies on improving such services lag behind women's desire. On the other hand, from the perspective of family-planning service providers, little attention is paid to women's rights because providers may not understand women's rights, lack awareness of these rights, or possibly lack the appropriate skills required by family planning services. Clearly, women of reproductive age cannot participate actively in services and maintain their rights if they do not possess sufficient knowledge of basic reproductive rights. Therefore, we urgently need to re-examine family planning and reproductive health services in China with respect to realizing women's SRHCRs in family planning.

A substantial number of studies have focused on young women and induced abortions, STDs/HIV, or contraceptive methods [3, 4, 5]. However, very few studies have been attentive to SRHCRs, which are important for providing useful insights into

women's reproductive health. For our study, we hypothesized that six SRHCRs would correlate with some factors of family planning. Therefore, this study was designed primarily to explore the awareness of these six SRHCRs among married women of reproductive age in China, and to analyze the impact of identified factors of family planning on these rights.

Data and Methods

For this research, we conducted a one-year, cross-sectional study (August, 2013 – August,2014) using a three-stage stratified random sampling method for the overall sampling scheme, along with an onsite sampling scheme based on the permanent population registration system of China. The sampling design had four features. First, it drew a random sample. Second, to be representative, the scope of selected survey sites (primary sampling units or PSUs) included provinces, autonomous regions, and municipalities. Third, the selected areas had established a better family planning managerial and service network, and had gained strong support derived from family planning services and community workers. Fourth, all things being equal, cost minimization for the research group was chosen.

Overall sampling scheme

The PSUs included 22 provinces, five autonomous regions, and four municipalities of China (Table 1 and Appendix I). The first stage of sampling involved

selecting PSUs by Probability Proportionate to Size (PPS). In the second stage, we selected counties from the chosen PSUs in the same way. In the third stage, we selected subjects from residential communities/ sub-districts in the selected counties, using Systematic Sampling.

Table 1. Administrative divisions in China

Provinces (N=22)	Autonomous regions (N=5)	Municipality (N=4)
Hebei	Inner Mongolia	Beijing
Shangxi	Guangxi	Tianjin
Liaoning	Xinjiang	Shanghai
Jilin	Ningxia	Chongqing
Heilongjiang	Tibet	
Jiangsu		
Zhejiang		
Anhui		
Fujian		
Jiangxi		
Shandong		
Henan		
Hubei		

Provinces (N=22)	Autonomous regions (N=5)	Municipality (N=4)
Hunan		
Guangdong		
Hainan		
Sichuan		
Guizhou		
Yunnan		
Shaanxi		
Gansu		
Qinghai		

Based on these standards, four regions were selected for the study: Guangdong, Chongqing, Inner Mongolia, and Henan(Fig.1 and Appendix I). Two counties were selected for each city.

Sample size

For this study, the sample size was calculated using the following formula:

$$N=deff\times u^2\times p\times(1-p)/\delta^2,$$

where N is the parameter to be calculated, i.e., the sample size in terms of the number of reproductive-age married women to be selected. *Deff* is the sample design effect, assumed to be 2.0 (default value); u is the statistic that defines the level of confidence

desired, using a 95% confidence interval; and *p* is an estimate of a key indicator to be measured by the study. Here, *p* equals 47%, and δ is the margin of error to be attained, in this case 10%.

This approach resulted in a sample size of 866 married women of reproductive age. Therefore, across the four survey sites, the total sample size was 3,465 (866×4). Inclusion criteria for eligible participants were as follows: (1) Women age 20 – 49 years; (2) married; (3) local permanent residents; (4) engaged in regular sexual activity; and (5) participated in this study voluntarily.

Measures

We designed the questionnaire for this study based primarily on the Population and Family Planning Law of the People's Republic of China, the Protection of Rights and Interests of Women, and the National Program for Women's Development in China, as well as the IPPF Charter on Sexual and Reproductive Rights. The questionnaire included five main areas of focus: demographic characteristics, marital and contraceptive history, informed choice, comprehensive sexual and reproductive health (SRH) counseling, and sexual and reproductive health rights (SRHRs).

Prior to the formal survey, we conducted a pilot study to collect feedback on the questionnaire from several group discussions with married women of reproductive age. We made modifications to the questionnaire in accordance with the input

gathered from these group discussions, until the questionnaire reached the goal of gathering the required data in a full and valid manner.

Independent variables

We included five socio-demographic characteristics as the controlled variables, with three reproductive history variables and three family planning service variables as the family planning related variables (Table 2).

Table 2. Assignment and coding of independent variables

Variable	Assignment and coding
Socio-demographics characteristics	
Age (years)	<25=1 25-34=2 35-44=3 45-49=5
Educational attainment	Elementary school or lower=1, Junior high school=2, High school=3, Junior college or higher=4
Household registration	Rural=1 Urban=2
Occupation	Laborer/commercial/service worker=1 Agricultural laborer=2 Employee in public institution=3 Others=4
Family annual *per capita* income (dollars)	<160.78=1 160.78-321.57=2

Variable	Assignment and coding
	321.58-482.35=3
	482.36-643.14=4, ≥643
	15=5
Reproductive history	
Number of children	0=0
	1=1
	2=2
	≥3=3
Did you use fetal sex tests	Yes=1
	No=0
Are you using contraceptive methods	Yes=1
	No=0
Family planning service	
Did you receive informed choice	Yes=1
	No=2
Satisfaction with comprehensive sex and reproductive health (SRH) counseling services offered by family planning workers (FPWs)	Very satisfied=1 Satisfied=2 Dissatisfied=3
Institutes that were optimal for family planning services	Hospital=1 Maternal and child care center=2 Family planning center=3 Community health center=4

Dependent variables

The dependent variable to be tested in this study was a multiple-response set that

embraced six rights. The main question for the multiple-response set was, "Are you aware of the role of Sexual and Reproductive Health Care Rights as related to the following rights?" For each right listed, interviewees had the option to select "Yes" or "No" as shown in Table 3.

Table 3. A multiple-response set of SRHCRs

Variable	Assignment and coding	Definition
Information (Right 1)	yes=1, no=0	To know the benefits and availability of sexual and reproductive health services, and to know one's rights to this information.
Access (Right 2)		To obtain services regardless of race, sex, or sexual orientation, marital status, age, religious or political beliefs, ethnicity, or disability
Choice (Right 3)		To decide freely on whether and how to control one's own fertility, and to choose which method to use
Safety (Right 4)		To be able to protect oneself from unwanted pregnancy, disease, and violence
Privacy (Right 5)		To have a private environment during counseling and services

Variable	Assignment and coding	Definition
Dignity (Right 6)		To be treated with respect, empathy, courtesy, consideration, and attentiveness

Data collection

For this study, the interviewers were service providers and community workers. We provided a standardized training program to ensure that they understood the study and the questionnaire's content, and to confirm that they had appropriate interview skills. To recruit participants, the interviewers put up posters, delivered leaflets, and went door-to-door informing the residents that there was an opportunity to participate in the research for one month. The participants were all volunteers who were asked to complete the questionnaires in their houses or at some other designated place in their communities or near their living quarters. The participants filled in the questionnaires themselves without third parties present. The interviewers of the same gender who were responsible for ensuring that the questionnaires were completed assisted the participants to understand the questions if they encountered difficulties. The project managers evaluated the completeness and logic of the questionnaires, returning feedback on errors to the investigators when unqualified questionnaires were found. The interviewers then returned to the interviewees to revise the questionnaires in a timely manner.

Data analysis

Data from the questionnaires were entered twice by different professionals using EpiData 3.1 to enable a comparison between data. Data cleaning was performed using SAS version 9.3 (SAS Inc. Cary, NC, USA) to verify consistency for all variables. Descriptive statistics included frequencies and proportions. A Generalized Estimating Equation (GEE) was employed to explore the effects of influencing factors on SRHCRs [6,7,8] (Appendix II).

Ethical Considerations

The study protocol was approved by the Research Ethics Committee of the Shanghai Institute of Planned Parenthood Research (code: PJ2014-20) prior to the implementation of the research. We presented the aims of the study to all eligible participants, providing interpretation and clarification as needed. Before data collection was initiated, verbal and written informed consent was obtained from all participants for the purposes of information security and privacy protection. All questionnaires were filled out anonymously, and before the interview, the investigators signed a confidentiality agreement to protect the privacy and sensitive information of the interviewees.

Results

Characteristics of participants

In the initial study survey, 3,891 participants were recruited. Of this number, 135 participants were excluded from the study by the inclusion criteria. In total, 3,756 participants were included. As mentioned above, awareness of SRHCRs ("are you aware of SRHCRs") was nested in the question, "Do you know the rights of service recipients?" Because our study was designed to survey only participants who knew of these rights, 961 respondents were excluded from further analysis based on their negative answers regarding their knowledge of the rights for service recipients. Therefore, the final number of participants included in our analysis was 2,504 out of 3,756. Of this group, 2,047 respondents were 25 – 44 years of age, accounting for 81.74% of the total. Over 40% of the participants had a junior high school education, more than half (58.83%) were rural-to-urban migrants, and 42.69% of the respondents were agricultural labourers. Nearly one-third of the families had an annual income of $643.15 or above. Of the respondents, over half had one child, but very few had more. Among those who were ever pregnant (no matter full term or not), 97.41% did not avail themselves of fetal tests to determine the sex of the fetus, and the majority of the participants (92.45%) reported that they used contraceptives (Table 4).

Table 4. Demographic characteristics and reproductive history among study participants.

Variable	N=2504	%
Age		
20-25	269	10.74
25-34	1027	41.01

35-44	1020	40.73
45-49	188	7.51
Educational attainment		
Elementary school or lower	179	7.15
Junior high school	1035	41.33
High school	699	27.92
Junior college or higher	591	23.60
Household registration		
Rural	1473	58.83
Urban	1031	41.17
Occupation		
Laborer/commercial/service Worker	370	14.78
Peasant	1069	42.69
Employer in public institution	309	12.34
Others	756	30.19
Family annual *per capita* income (dollars)		
<160.78	304	12.14
160.78-321.57	353	14.10
321.58-482.35	567	22.64
482.36-643.14	514	20.53
≥643.15	766	30.59
Number of children		
0	814	32.51
1	1391	55.55
2	291	11.62
≥3	8	0.32
Used fetal sex tests		
Yes	65	2.60
No	2439	97.40
Used contraception		
Yes	2315	92.45
No	189	7.55

SRHCR awareness among interviewees

There were a total of 10,843 (≤6×2504) responses regarding SRHCRs among the

participants, and the average response rate regarding awareness of SRHCRs was 72.17% (10,843/15,024). Right 3 had the highest response rate (90.64%, 95% CI: (89.47%, 91.81%)), followed by Right 5 (86.11%, 95% CI: (84.72%, 87.50%)) and Right 1 (84.47%, 95% CI: (83.02%, 85.93%)). Only 43.39%, 95% CI: (41.40%, 45.38%) of participants gave responses to Right 4 (Table 5).

Table 5. Distribution of SRHCR awareness based upon multiple responses among interviewees (N=2504).

Rights	%	95% CI (%)
Information (Right1)	84.47	(83.02, 85.93)
Access (Right2)	75.70	(73.98, 77.43)
Choice (Right3)	90.64	(89.47, 91.81)
Safety (Right4)	43.39	(41.40, 45.38)
Privacy (Right5)	86.11	(84.72, 87.50)
Dignity (Right6)	74.70	(72.95, 76.44)

Generalized estimating equation (GEE) for awareness of SRHCRs

In the GEE model, the 6 constant estimates specify the 6 log values of the baseline response probability/reference, respectively. Thus, the response probabilities for baseline awareness of SRHCRs were calculated as 27.05%, 18.24%, 36.02%, 5.42%, 28.70%, and 17.51%, respectively, according to the formula $P=\frac{e^{\beta_0}}{1+e^{\beta_0}}$. The response probabilities for baseline/reference awareness of SRHCRs indicated the responses regarding the references of the variables in the model, *e.g.*, with respect to age, the group age 45 – 49 was the reference, and the response represented this reference for 45 – 49 years of age. Although the response probabilities were not of practical

significance, the estimates showed a consistent trend for the proportions in Table 5.

Awareness of SRHCRs was correlated with region, age, educational attainment, annual family income per person, number of children, whether the couple used fetal sex prediction tests, and whether they accepted informed choice and were satisfied with the comprehensive SRH counseling offered by FPWs. Participants without children were correlated with higher odds of responses on SRHCRs in comparison with those who had three or more children. The odds of awareness of SRHCRs among participants who used fetal sex prediction tests were higher than among those who did not use fetal sex tests. The odds of awareness of SRHCRs among those who accepted informed choice were 3-fold greater as compared with those who did not (OR=3.35; 95% CI, 2.74-4.09). Participants who were very satisfied or satisfied with comprehensive SRH counseling offered by FPWs were significantly more likely to be aware of SRHCRs. (Table 6).

In further analysis, we assigned the 6 separate options (constants) to factors that significantly influenced family planning (Table 6). Compared with participants who had 2 or more children, those without children were more likely to be interested in Rights 1, 2, and 4. Participants who used fetal sex tests were more likely to focus on Right 2 and Right 4 than those who never used such tests. Women who received informed choice were more likely to respond to all of the rights except for Rights 3

and 6, as compared with those who never accepted informed choice. The participants who were satisfied or very satisfied with comprehensive SRH counseling offered by FPWs *versus* those who were dissatisfied with such counseling were more likely to show interest in all of the rights (Table 7).

Table 6. GEE for the correlation between the factors and SRHCRs in the participants (N=2504)

Parameter	Estimate	Standard error	*p-value*	OR	(95%*CI*)
Int1	-1.00	0.37	0.0071		
Int2	-1.50	0.37	<0.0001		
Int3	-0.57	0.37	0.1278		
Int4	-2.86	0.38	<0.0001		
Int5	-0.91	0.38	0.0149		
Int6	-1.55	0.37	<0.0001		
Region					
Inner Mongolia	-0.51	0.09	<0.0001	0.60	(0.50, 0.71)
Guang Zhou	-0.37	0.10	<0.0001	0.69	(0.57, 0.83)
He Nan	Ref.			1	
Age					
<25	0.66	0.14	<0.0001	1.94	(1.47, 2.57)
25-34	0.25	0.11	0.0221	1.28	(1.04, 1.58)
45-49	Ref.			1	
Educational attainment					
Elementary school or lower	-0.56	0.15	0.0001	0.57	(0.43, 0.76)
Junior high school	-0.57	0.11	<0.0001	0.57	(0.46, 0.70)
High school	-0.39	0.10	0.0001	0.68	(0.55, 0.82)
Junior college or higher	Ref.			1	
Annual family *per capita* income (dollars)					
<160.78	0.44	0.10	<0.0001	1.56	(1.27, 1.89)
≥643.15	Ref.			1	
Number of children					
0	0.23	0.10	0.0251	1.26	(1.03, 1.55)
2	Ref.			1	
Did you use fetal sex tests					

Yes	0.57	0.20	0.0046	1.78	(1.20, 2.65)
No	Ref.			1	
Did you receive informed choice					
Yes	1.21	0.10	<0.0001	3.35	(2.74, 4.09)
No	Ref.			1	
Satisfaction with comprehensive SRH counseling offered by FPWs					
Very satisfied	1.03	0.18	<0.0001	2.82	(1.98, 4.01)
Satisfied	0.81	0.18	<0.0001	2.26	(1.58, 3.24)
Dissatisfied	Ref.			1	

Note: 1. The non-significant categories in the independent variables were omitted.
2. Int1 – In6 were the six conditions of the probabilities of the six baseline/reference responses (Appendix II).

Table 7. Effects of predominant influencing factors on awareness of SRHCRs (N=2504)

Parameter		**Estimate**	**Estimate error**	***p value***	**OR**	**(95% CI)**
Did you use fetal sex tests						
Yes *vs*. No at	Right 2	1.32	0.42	0.0017	3.75	(1.64, 8.58)
	Right 4	0.56	0.26	0.0328	1.76	(1.05, 2.95)
Number of children						
0 *vs*. 2 at	Right 1	-0.46	0.13	0.0004	0.63	(0.49, 0.81)
	Right 2	-0.49	0.13	0.0002	0.61	(0.47, 0.79)
	Right 4	0.96	0.13	<0.0001	2.62	(2.04, 3.38)
Did you receive informed choice						
Yes vs. No at	Right 1	4.55	0.25	<0.0001	94.75	(58.32, 153.92)
	Right 2	0.80	0.15	<0.0001	2.22	(1.66, 2.98)
	Right 4	-0.75	0.15	<0.0001	0.47	(0.35, 0.63)
	Right 5	0.91	0.16	<0.0001	2.49	(1.81, 3.41)
Satisfaction with comprehensive SRH counseling offered by FPWs						
Very Satisfied *Vs*. Dissatisfied	Right 1	0.81	0.27	0.0028	2.25	(1.32, 3.84)
	Right 2	0.56	0.27	0.0382	1.76	(1.03, 3.00)
	Right 3	0.89	0.32	0.0049	2.43	(1.31, 4.51)
	Right 4	1.68	0.34	<0.0001	5.34	(2.74, 10.41)
	Right 5	0.92	0.29	0.0014	2.52	(1.43, 4.43)
	Right 6	0.89	0.28	0.0017	2.42	(1.40, 4.21)
Satisfied *vs.*	Right 1	0.68	0.28	0.0168	1.97	(1.13, 3.45)

Dissatisfied	Right 2	0.61	0.28	0.0308	1.84	(1.06, 3.21)
	Right 3	0.94	0.34	0.0049	2.57	(1.33, 4.95)
	Right 4	1.24	0.35	0.0004	3.46	(1.75, 6.84)
	Right 5	1.25	0.31	<0.0001	3.50	(1.92, 6.38)
	Right 6	0.72	0.29	0.0142	2.05	(1.15, 3.62)

Note: The non-significant constants and variables were omitted. The analysis controlled for region, age, household registration, educational attainment, occupation, annual family income *per capita*, contraceptive status, experience with fetal sex tests, acceptance of informed choice, satisfaction with comprehensive SRH counseling offered by FPWs, and the type of institution that was optimal for delivering family planning services.

Discussion

Awareness of SRHCRs in China

Our research showed that the general level of awareness of SRHCRs was relatively low, averaging a 72.17% response rate among the participants. Previous research on the extent of awareness regarding general health rights in China is still sparse [9,10], and variations in awareness of SRHCRs exist among women generally [11]. Previous research demonstrated that women manifested various levels of awareness of SRHCRs because of factors such as age, income, education, and geographic location [12-14]. A similar result was found by our study as well. Although the subjective awareness of rights among Chinese women has improved, the long-term impact of feudal and cultural contexts has not been eliminated completely, and these influences still affect Chinese thinking and behavior. Moreover, family planning services have shown weakness in delivering health-related medical information and knowledge of family planning/reproductive health rights. In such cases, women are vulnerable when

service providers neglect their autonomy. Even when they sensed inappropriateness or dissatisfaction, women were likely to be passively compliant in response to the advice or requests of service providers [12]. Additionally, a crisis in trust due to the asymmetry of rights-related knowledge between service providers and clients could occur [13], and such differences could be worsened further with regard to the communication of both women and service providers. Women tended to emphasize informed compliance, but then overlooked rights closely related to their own interests [14], which means that women just do what the service providers told them to do, but cannot strive for rights which benefit them.

Family-planning-related factors and awareness of SRHCRs

In China, the policy of "late marriage and late childbirth" has been advocated by the government for years [15]. In our study, women of reproductive age were 22 – 44 years old. As a woman's age increases, the risks of childbirth increase as well, so these women could have increased concerns about their reproductive health.

Prior research [16] indicated that 76.67% of the married women were aware of general genital tract care, as well as genital tract care during menstrual periods and after intercourse. Half of them knew about the symptoms of genital tract infection. Only 16.25% of the participants payed attention to their access to information about contraception and reproductive technology. In our study, the participants who had no

children showed a more positive result in terms of the issue of their reproductive health (right to safety), but a more negative result concerning information and access rights, a finding similar to the results of prior studies.

Informed choice includes the rights of men and women to be informed about reproductive health, and to have access to their choice of safe, effective, affordable, and acceptable methods of family planning [17]. In 1995, informed choice was introduced to China and implemented in pilot counties that provided high-quality care with respect to family planning [18]. Informed choice was included in the Law of Population and Family Planning of the People's Republic of China enacted in 2001, emphasizing the right of sexual equality in childbearing, and the right to information about family planning, reproductive health, and education. When folding women's reproductive rights into a new era of family planning, informed choice reflected the practice of women's empowerment in reproductive health programs [19].

In our study, informed choice provided an impetus toward improving three rights (Rights 1, 2, and 5), but was an impediment to Right 4. This finding indicated that women of reproductive age in China were aware of the information on sexual and reproductive health services, access to these services, and the means for protecting their privacy *via* informed choice. However, women of reproductive age were still passive as far as selecting effective, safe, and acceptable contraceptive methods [20].

This result implied that it is essential to strengthen their willingness to take action based on their right to self-determination regarding contraceptive methods when implementing informed choice.

Comprehensive SRH counseling services support their clients' informed and voluntary decisions, and assist them in making a feasible plan for reproductive care and related health services [21]. This approach can revitalize contraceptive methods for clients, prevent STD/HIV infections, and provide support for treatment of future sexual dysfunction [22-29], suggesting that women's SRHCRs are being heeded. With the passing of time, people will require access to integrated SRH services more than ever before [30]. The core concept of comprehensive SRH counseling services is "client-oriented." Therefore, not only is client satisfaction with these services a key measurement of quality, it also affects the utilization of services and SRHCRs. To a great extent, the full practice of SRHCRs depends on active acceptance by clients.

Simultaneously, such acceptance relies on satisfaction with comprehensive SRH counseling services [31]. Research demonstrated that even when health services were readily available and affordable, women were still not willing to use them if they were of poor quality [32]. Our finding agreed with these previous studies, and also with a Chinese study demonstrating that the higher the satisfaction with reproductive health services, the stronger the acceptance of reproductive health-related knowledge [33].

There is an old Chinese proverb that can be translated as, "Bring up sons to care for parents in their old age." In the transition from traditional concepts to contemporary family planning, Chinese married women still face a decision about whether to have boys or girls when they are ready for child bearing. Although the use of fetal sex prediction tests is illegal in China, the current reality is still problematic. When performed, sexual selection generally is prejudicial against the birth of girls, and thus violates the right to non-discrimination on the basis of gender. However, modern human rights practice also reacts against forcing a woman to maintain a pregnancy against her will. A woman's right to select for pregnancy continuation or termination is among the same inalienable rights that allow her to create a family of her choice, gather information, and benefit from scientific progress [34]. This position is of paramount importance with respect to the current family planning policy in China, especially for those women who have had one child, or who want a boy as the first child. Therefore, increased awareness of such rights of access will be a step toward meeting their reproductive demands, and ensuring their reproductive health in a way that allows women to gain dignity. However, securing social acceptance or family position is another issue entirely.

Our study had several limitations. First, causal inferences could not be established with certainty, as ours was a cross-sectional study. Second, our findings might involve

a selection bias. However, as estimated by a Heckman selection model, the rho (the correlation coefficient between the latent model and selection model) was not significant ($p>0.05$). Therefore, the selection bias in our study could be considered non-existent. However, the recall bias could occur. Third, this study was limited to the awareness of SRHCRs. Therefore, the significance of behavioral modification toward realizing these rights was not included. Further studies need to be implemented to achieve this goal. As such, interpreting and generalizing these results should be conducted scrupulously. However, we used PPS to sample married women in various cities as a representative study population, since the family planning factors and SRHCRs were selected for married women of reproductive age. Therefore, the results could be extrapolated to married reproductive-age women across China to a reasonable extent.

Conclusions

Our study provided a picture of the awareness of SRHCRs among women of reproductive age in China. We explored the effects of selected family planning factors on the awareness of SRHCRs by mining data gathered from our questionnaire. According to our results, the awareness of SRHCRs among reproductive-age women in China is still inadequate. Family planning service providers can strengthen service awareness of reproductive rights according to the different needs of women.

With the transition of family planning policy, we found that the related factors of family planning had different effects on each of the SRHCRs. At present, the policy allowing a second child is available to couples in China, so informed choice has a full function, and married women can decide whether to pursue childbirth. Our research demonstrated that informed choice had significant effects on the awareness of SRHCRs. Satisfaction with comprehensive SRH counseling offered by FPWs had a positive effect on the awareness of all six SRHCRs. These findings provide some important leads for improving the awareness and application of SRHCRs.

Acknowledgments

We are grateful to other investigators for contributions to our research project, including interviewers and study participants who, with understanding and patience, cooperated with the study team. This project was funded by the National 12th Five-Year Plan (No. 2012BAI32B08).

Abbreviations

Variable	Abbr.
Sexual and Reproductive Health Care Rights	SRHCRs
Sexual and Reproductive Health Rights	SRHRs
International Planned Parenthood Federation	IPPF
Probability Proportionate to Size	PPS

Primary Sampling Units	PSUs
Sexual and Reproductive Health	SRH
Family Planning Workers	FPWs

Competing interests

The authors declare that they have no conflicts of interest.

Authors' contributions

WJQ conceived of the study, participated in the design of the study, interpreted the results, and translated them into policy suggestions. YCN performed the statistical analysis, participated in interpretation of the results, and drafted the manuscript. LYY took part in the discussion of the paper and approved the final manuscript.

Data sharing statement

There were no unpublished data from the study.

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Figure 1. China's administrative units: provinces, autonomous regions, and municipalities (sourced from National Atlas of Administrative Province, Area and County (City), Ministry of Land and Resources of the People's Republic of China).

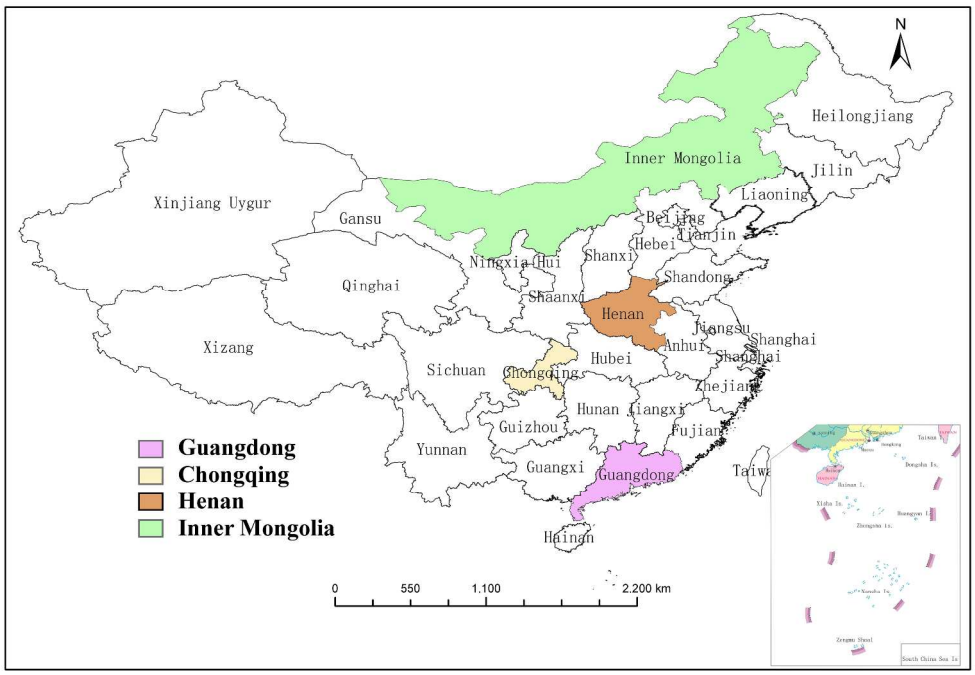

Figure 1. China's administrative units: provinces, autonomous regions, and municipalities (sourced from National Atlas of Administrative Province, Area and County (City), Ministry of Land and Resources of the People's Republic of China).

148x104mm (600 x 600 DPI)

Appendix I

This study employed the method of three-stage probability proportion to size (PPS) for the overall sampling scheme, and an onsite sampling scheme based upon a permanent population registration system.

Sampling Strategies

Stage I: PPS for selecting provinces

PPS is a sampling technique that uses an "auxiliary variable" to select a unit by a probability proportionate in measure to its size.

After repeating the procedure using random simulation for 2500 iterations, all 4 sites, Guangdong, Chongqing, Inner Mongolia and Henan, were selected (Table 1).

Table 1. PPS for survey site sampling

Survey sites	Female population	Selection probability	Sampling weight
Inner Mongolia	1965431	0.06864	14.57
Chongqing	2582818	0.09020	11.00
Henan	6056991	0.21154	4.73
Guangdong	10813256	0.37765	2.64

Stage II: Sampling of counties

In each survey site, two counties were selected using PPS. The residential communities/subdistricts are listed and ordered clockwise in terms of eastern, western, southern, northern and central directions; and then two of them were selected systematically.

Stage III: Onsite sampling scheme

Subjects were sampled in the 2 residential communities/subdistricts per county based upon randomly generated ID numbers from permanent population registration

systems.

Appendix II

Methodology for the analysis of a multiple-response set

A multiple-response set is a categorical variable in substance; however, the options available to it account for one response at different levels. The options have two features: (1) because a correlation exists for different options, taking these options as an independent option respectively is inappropriate when blocking out the correlation between them artificially; (2) options in a multiple-response set are not generally interchangeable as different statuses; they are rather chosen from the first, second, and other options in consecutive order.

Each option is a measurement to this response such that *n* options compose *n* measurements to the response. Hence, the issue can be taken as a multivariate logistic regression model with repeated measurements (generalized estimation equation, GEE). In a typical repeated-measurements model, one constant can be set on the condition of the basically equal probability of baseline/reference response in terms of each measurement. In a multiple-response set, the emphasis for each option is different, resulting in different probabilities regarding baseline/reference responses. It is appropriate to create multiple constants to these options.

STROBE Statement—Checklist of items that should be included in reports of ***cross-sectional studies***

	Item No	Page number
Title and abstract	1	(*a*) 1
		(*b*) 1
Introduction		
Background/rationale	2	4-7
Objectives	3	7
Methods		
Study design	4	7
Setting	5	8-10
Participants	6	(*a*) 10
Variables	7	11-14
Data sources/ measurement	8*	10-11, 15
Bias	9	4
Study size	10	10
Quantitative variables	11	11-14
Statistical methods	12	(*a*) 15
		(*b*) 15
		(*c*) 15
Results		
Participants	13*	(a)16
		(b) 16
Descriptive data	14*	16-18
Outcome data	15*	(*a*)18-19
Main results	16	(*a*) 19-21
Other analyses	17	22
Discussion		
Key results	18	23-24
Limitations	19	27
Interpretation	20	24-27
Generalisability	21	28
Other information		
Funding	22	29

*Give information separately for exposed and unexposed groups.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at www.strobe-statement.org.