

Contraceptive situation and Influencing Factors in Guangdong Province: A comparative questionnaire study

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Research

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Abstract

Background

The aim of our study is to describe the status of induced abortion and contraceptive use in reproductive women and make clear the correlated factors in Guangdong province.

Method

A self-administered questionnaire survey was conducted separately in 1839 individuals aged 18–49 and 900 health care providers from Guangdong province. The content of questionnaire was based on status of induced abortion and contraceptive use for the former and problems concerning contraceptive services for the latter. Systematic random sampling was used and data were analyzed using SPSS 19.0. Descriptive statistics and binary logistic regression were used in this study.

Results

30.61% of participants experienced the induced abortion. The rate of repeated abortion was 19.96% and it was 20.45% in persons under 20 years old. 18.23% of 1839 individuals chose LARC as the main contraceptive method. The females with college degree (Odds ratio, OR = 1.867; 95% confidence intervals 95%CI: 1.175–2.969), technologists (OR = 2.291; 95%CI: 1.063–4.936) and the persons whose monthly income were of between 3000–5000¥ (OR = 1.920; 95%CI: 1.204–3.065) were more likely to use LARC. The younger females less than 30 years old and never using PAC services had lower odds of using LARC. The rate of post abortion care performance was merely 12.23%. Age, monthly income, occupation, living conditions and obtaining free contraceptives in time were all strongerly influence factors for the use of post-abortion care ($P < 0.01$). The satisfaction rate of free contraceptive services was about 57.44%. Variety uniformity, obtaining inconveniently and worrying about the quality were the main reasons. 66.22% of hospitals set up the department of family planning in our study. Highly work intensity (54.67%) and less leadership (40.22%) influenced health care providers to provide family planning services.

Conclusion

The abortion rate was high especially in young women. There were many problems affecting contraceptive services which damaged women's reproductive health. Increasing government investment for family planning services, strengthening the construction of the family planning department and performing post abortion care and long-acting reversible contraception by taking relevant steps would be useful measures for improving current contraceptive status.

Plain English Summary

The abortion rate of Guangdong province was in the forefront but the contraceptive prevalence rate was low in china. The detailed data in populations with different background were scared. LARCs and PAC services are useful to reduce the unintended pregnancy. Many factors influencing the performance of

LARC and PAC should be done more research. The questionnaire survey contains 50 questions including the basic demographic characteristics, the level of LARC utilization and the intention to use LARC, the situation of PAC performance and barriers to obtain free contraceptive services. In particular, the questionnaire for health care providers was based on health care providers' attitudes to LARC and problems in supplying contraceptive services.

We found that 30.61% of women in reproductive age experienced the induced abortion. The rate of repeated induced abortion was high in unmarried younger women. Older women (> 41 years), having one child at least, obtaining PAC and free contraceptives services in time tended to select LARC. The rate for the use of PAC was low in our survey. Age, job types, living condition, monthly income and obtaining free contraceptives conveniently were the main factors. Free contraceptives were also helpful to promote LARC use while variety uniformity and worrying about the quality were barriers. Workplaces providing PAC services were correlated with correct attitude of regarding IUDs use in health care providers. Improving leadership management and setting up the department of family planning in hospitals may be applicable measures.

Background

Many research indicated that the absolute number of abortions world-wide increased 56.3 million per year in recent years and 27% of abortions happened in unmarried young women. In the developed world, the annual abortion rate declined significantly but it still maintained in 37 abortions per 1000 women in the developing world[1]. The 2018 China Health Statistical Yearbook showed that the number of induced abortions attained 9.74 million in 2018 in china [2]. 55.9% of induced abortion women experience multiple abortion, which was 43.1% in the United States[3, 4]. More and more young people had more than one induced abortion experiences. High risk induced abortion presented an up-trend. Induced abortion seriously threatened the women's health. Women with induced abortion may suffer complications and adverse pregnancy outcome in pregnancies including low birthweight, preterm birth and others[5]. Some researches showed that the induced abortion increased risk of mental disorders especially in unmarried women[6]. Long-acting reversible contraceptives (LARCs) have been proved as the most cost-effective methods to prevent unintended pregnancies especially reduce the rate of repeat abortions during the post abortion period[7]. It has been recommended by the American College of Obstetricians[8]. With the loosened birth policy, contraceptive use condition has changed since 2016. Although the total contraceptive prevalence rates remain around 80% which is the highest in the world, more and more women choose the short-term and self-controlled contraceptive methods. IUD usage decreased from 20.98% in 2014 to 10.73% in 2018. Post-abortion care (PAC) counseling was first proposed in 1991 and many reports showed that it could also induced abortions[9, 10]. Although PAC had been provided in 799 hospitals since 2010, the promotion of PAC in child-bearing age people was not enough (<http://www.yiaijijin.org.cn/html/xinwenzixun/1609.html>). Limited understanding of LARCs and lack of high-quality post-abortion care (PAC) services are the major reasons for the largest number of induced abortion in china.

The contraceptive prevalence rate in Guangdong province was only 71.6% ranking the 27th while the rate of induced abortion was in the second place around the country. The number of internal migrants living was largest in china. Most of the migrant women were in the child-bearing age and lacked contraceptive knowledge and correct attitude. It was not easy for them to obtain the free family planning services. Free PAC services have been provided in 104 hospitals but the understanding of PAC services is not enough depth and thorough in such people of childbearing age. The objective of our study is to evaluate the present situation of contraception and abortion including the knowledge and the offering situation of LARCs and PAC services, the factors that influenced people to obtain free contraceptive services.

Materials And Methods

Study design and setting

We designed the questionnaire using an APP to collect data. Participants with 18–49-year-old who had sexual life in Guangdong province were recruited in our study. This study observed the voluntary participation principle and was approved by Guangzhou Women & Children Medical Center's ethics committee. The questionnaire included questions on: (1)basic demographics; (2)occupation; (3)marriage and fertility status; (4)contraceptive use; (5)history of abortion; (6)contraceptive status; (7) difficulties in receiving free contraceptive and PAC services; and (8) knowledge and acceptance of LARCs and PAC. We also recruited 900 health care providers to reveal problems encountered with in providing the contraceptive services and attitudes towards LARCs and PAC use in abortion or postpartum women. The questions were close-ended. In order to ensure all participants to easily understand the questionnaire, we used simple language and conducted a pre-survey. We excluded cases with incomplete data and reviewed the questionnaire by experienced obstetricians. SPSS 19.0 was utilized to analyze the data. A chi-Square test and logistic regression analysis were performed to analyze factors influencing the status of induced abortion, the choice of contraceptive methods and knowledge of LARCs and PAC. Chi square analysis, descriptive statistics and binary logistic regression were employed in our study. We also chose Odds ratios (ORs) and 95% confidence intervals (CIs) to calculate. A *p*-value of less than 0.05 was regarded as statistically significant.

Results

Socio-demographic characteristics of all participants

93.26% of 1839 participants were of Han ancestry, the average age of which were 33.5 ± 8.17 years. Among them, 69.01% had a college education and approximately half (52.04%) had individual income per month over 5000 RMB. 83.14% of those persons were married. 78.47% had one child at least. 93.2% of those 1839 persons were employed. Table 1 showed all the demographic information for 1839 common participants. All those 900 health care providers came from hospitals(80.33%) or family planning organizations(19.67%). 93.88% of them were obstetrics and gynecology physicians and others were

family planning practitioners. In those obstetrics and gynecology physicians, 21.02% served in the department of family planning in hospitals.

Table 1
Socio-demographic characteristics of participants (n = 1839)

Socio-demographic characteristics		cases	Frequency (%)
Age(years) ^a	≤ 30	666	36.22
	31–40	758	41.22
	≥ 41	415	22.57
Nationality	Han nationality	1715	93.26
	minority nationality	124	6.74
Level of education	Junior high school or below	263	14.30
	Middle special / senior high school	307	16.69
	Junior college	1178	64.06
	Master degree or above	91	4.95
Marital status	Unmarried	256	13.92
	Married	1583	86.08
Number of children	0	396	21.53
	1	708	38.50
	≥ 2	735	39.97
Occupation	Public employees	389	21.15
	Professional and technical personnel	716	38.93
	Self-employed	112	6.09
	Farming	497	27.03
	Unemployed	125	6.80
Account	Country registered residence	890	48.40
	City registered residence	949	51.60
Monthly income	<3000¥	291	15.82
	3000–5000¥	591	32.14
	5000–10000¥	509	27.68
	>100000¥	448	24.36
Living condition	Rural area	552	36.22
	Urban	1085	41.22

Socio-demographic characteristics		cases	Frequency (%)
	Suburb	202	22.57
Number of boys	0	825	14.30
	1	791	16.69
	≥ 2	223	64.06

Status of abortion and Conception Control

30.61%(563/1839) of participants had the history of induced abortion, and 19.96% (367/930) experienced repeated abortion. 28.90% of 256 unmarried women had at least one abortion. Only 45.02% of 1839 participants insisted on adopting contraceptive methods every time during sex. 25.93% (477/1839) chose a LARC as the main contraceptive method.

Performance of PAC and in our study

12.23% of participants applied PAC services. The women with age less than 20-years old or receiving only elementary school education or even lower knowing nothing about PAC services. Comparing to persons beyond 41 years old, the women with age between 20–40 years olds seldom used PAC services(OR:0.301 95%CI: 0.167–0.541 for the group of 20–30 years old and OR:0.474, 95%CI: 0.321–0.701 for the group of 30–40 years old respectively). Participants who lived in urban had a higher prevalence of using PAC services(OR:2.798, 95%CI: 1.419–5.496). Except that, women with technical jobs just like lawyers, teachers or medical staffs more frequently used PAC services(OR:6.971, 95%CI: 1.580–30.76). We pointed out the person with monthly income lower than 10000 ($p < 0.01$) and the person obtaining free contraceptives inconveniently ($p = 0.000$) was main influencing factors for the acceptability of PAC services(Table 2). In our investment for 900 health care providers, 66.11% of their work units provided PAC services. PAC services were carried out mainly in 3-A-grade General Hospitals and maternal and child health institutions The application of PAC services was only 12.4% in primary hospitals. There was significant difference in rates of supplying PAC services between their workplaces with and without the department of family planning.

Table 2
Main factors associated with PAC use among participants: logistic regression.

Variable		Odds ratio (95 CI)	P-Value
Age	21–30	0.301(0.167–0.541)	0.000*
	31–40	0.474(0.321–0.701)	0.000*
	≥ 41	1	
Occupation	Public employees	3.572(0.791–16.121)	0.098
	Professional and technical personnel	6.971(1.580–30.760)	0.010*
	Self-employed	2.963(0.552–15.889)	0.205
	Farming	5.942(0.731–16.246)	0.095
	Unemployed	1	
Monthly income	<3000¥	0.772(0.378–1.827)	0.517
	3000–5000¥	0.452(0.277–0.739)	0.002*
	5000–10000¥	0.612(0.404–0.928)	0.021*
	>100000¥	1	
Living condition	Rural area	1.315(0.564–3.064)	0.553
	Urban	2.798(1.419–5.496)	0.003*
	Suburb	1	
Obtain free contraceptives in time	Not in time	0.269(0.172–0.422)	0.000
	In time	1	

Factors associated with applications of free Contraceptives

In our study, 51.22% (942/1839) of people did not obtain contraceptives free of charge from the government. Worrying about the quality of contraceptives, being unsatisfied with models and types and

feeling embarrassed were main reasons for them to refuse free contraceptives. All those influence factors were described in **Fig. 1**. Family planning departments, self-service terminal for free contraceptives and department of gynecology in public hospitals are main sources of which people at reproductive age to obtain free contraceptives(88.4%). The satisfaction with those approaches was only 57.44%(874/1839). Younger women(20–40 years old) had a lower incidence of using free contraceptives comparing to women being over 40 year-old. The participants' monthly income lower than 3000 or between 3000–5000 had higher odds of using free contraceptives(OR: 2.119, 95%CI:1.125–3.991 and OR: 2.014, 95%CI:1.260–3.221 respectively) The higher income people, the population living in urban and suburb, and the persons being self-employed or without working did not intend to obtain free contraceptives($p < 0.05$)(Table 3). We also analyzed the influence factors for betimes of obtaining free contraceptives. The major factors were also associated with intention to use free contraceptives. Another factor that the women had more than one boy was also strongly associated with timeliness(OR:2.066, 95%CI:1.265–3.374) (Table 4).

Table 3
The strong influence factors associated with intention to use free contraceptives

Variable		Odds ratio (95 CI)	P-Value
Age(years)a	≤ 30	0.335(0.201–0.560)	0.000*
	31–40	0.011(0.423–0.869)	0.011*
	≥ 41	1	
Occupation	Public employees	2.441(1.036–5.754)	0.041*
	Professional and technical personnel	2.336(1.001–5.450)	0.050*
	Self-employed	0.779(0.234–2.590)	0.464
	Farming	2.738(0.819–9.150)	0.102*
	Unemployed	1	
Monthly income	<3000¥	2.119(1.125–3.991)	0.02
	3000–5000¥	2.014(1.260–3.221)	0.003
	5000–10000¥	1.208(0.770–1.895)	0.412
	> 10000¥	1	
Living condition	Rural area	2.059(1.139–3.722)	0.017*
	Urban	0.843(0.506–1.403)	0.511
	Suburb	1	
Obtain free contraceptives in time	Not in time	0.083(0.043–0.160)	0.000*
	In time		

Table 4
The strong influence factors associated with the timeliness of free contraceptives use

Variable		Odds ratio (95 CI)	P-Value
Age(years)a	≤ 30	0.389(0.261–0.580)	0.000*
	31–40	0.436(0.310–0.615)	0.000*
	≥ 41	1	
Level of education	Junior high school or below	0.375(0.112–1.252)	0.111
	Middle special / senior high school	0.340(0.485–1.029)	0.000*
	Junior college	0.706(0.485–1.029)	0.070
	Master degree or above	1	
Occupation	Public employees	1.477(1.096–2.609)	0.042*
	Professional and technical personnel	1.775(1.096–3.061)	0.02*
	Self-employed	0.737(0.412–1.318)	0.303
	Farming	4.601(0.956–22.151)	0.057
	Unemployed	1	
Monthly income	<3000¥	1.780(1.085–2.920)	0.022*
	3000–5000¥	1.974(1.388–2.809)	0.000*
	5000–10000¥	1.680(1.222–2.309)	0.001*
	>100000¥	1	
Living condition	Rural area	1.155(0.731–1.871)	0.559
	Urban	0.536(0.354–0.811)	0.003*
	Suburb	1	
Number of boys	≥ 2	2.066(1.265–3.374)	0.004*
	1	1.354(0.999–1.835)	0.051
	0	1	

Our survey showed that the contraceptives free of charge were provided in 87.22% of the 900 health care providers' work units. Obtaining from self-service terminal for free contraceptives(35.84%) and having prescriptions of free contraceptives after counselling (21.74%) were main approaches. The staff faced many difficulties in promoting contraceptive service provision, which were showed in **Fig. 2**.

Knowledge and performance of LARC and in our study

In this study, only 46.80% of 1839 people know exactly about types of LARC. Few (9.74% had used IUDs, 1.53% had used implants and 6.96% had used vasoligation or female ligation) used LARC. 27.80% participant took regard condom as LARC and 50.49% of them took the condom as the main contraceptive method. 29.8% of the women had the intention to use IUDs or implants during the post abortion period. By using binary logistic regression, the following factors for LARC use were identified as risk factors for age, job, educational level, monthly income, the use of PAC services. (Table 5). We also used binary logistic regression logistic regression to analyze variables that had the significant correlation with a woman's intention to use a LARC after abortion or after childbirth. The result showed that the women who had less than one boy, used PAC services, obtained free contraceptives and were between 30–40 years old were more likely to use a LARC(Table 6).

Table 5
The main factors associated with LARCs use in our study

Variable		Odds ratio (95 CI)	P-Value
Age(years)a	≤ 30	0.483(0.284–0.822)	0.007*
	31–40	0.724(0.494–1.061)	0.097*
	≥ 41	1	
Level of education	Junior high school or below	2.766(0.604–12.688)	0.190
	Middle special / senior high school	1.742(0.870–3.491)	0.117*
	College	1.867(1.175–2.969)	0.008*
	Master degree or above	1	
Occupation	Public employees	0.748(0.380–1.880)	0.681
	Technologists	2.291(1.063–4.936)	0.034*
	Self-employed	1.017(0.413–2.552)	0.955
	Farming	0.614–7.715	0.235
	Unemployed	1	
Monthly income	<3000¥	1.740(0.887–3.412)	0.107
	3000–5000¥	1.920(1.204–3.065)	0.006*
	5000–10000¥	1.043(0.666–1.634)	0.853
	>100000¥	1	
Use of PAC services	No	0.413–0.941	0.025*
	Yes	1	

Table 6
Associations between factors and an intention to use LARCs among women with unintended pregnancy after abortion

Variable		Odds ratio (95 CI)	P-Value
Age(years) ^a	≤ 30	0.718(0.488–1.054)	0.093
	31–40	0.689(0.506–0.940)	0.019*
	≥ 41	1	
Number of children	0	0.344(0.135–0.876)	0.025*
	1	0.733(0.355–1.516)	0.403
	≥ 2	1	
obtain free contraceptives in time	Not in time	0.609(0.459–0.808)	0.001*
	In time	1	
Use of PAC services	No	0.469(0.334–0.659)	0.000*
	Yes	1	

For 900 health care providers, about 60.78% of them have recommended IUDs to women after abortion. The staff worked in 3-A-grade General Hospitals were 3.220 times significantly more likely to recommend IUDs to women after abortion compared to those who worked in Family Planning Service Center(OR = 3.220, 95%CI:1.788–5.797). The situation was also observed in the staff who worked in Women's and children's Hospital comparing to those who worked in Family Planning Service Center (OR = 2.143, 95%CI:1.274–3.603). Health care providers whose workplaces set up the department of family planning(OR = 1.544, CI:1.067–2.233) or supplied PAC services(OR = 1.987, 95%CI:1.412–2.795) were more likely to recommend IUDs to women after abortion. Comparing to the persons working in the department of maternal and child health, gynaecologists especially working in the department of family planning had higher odds to recommend women to use IUD after abortion(OR = 2.234, 95%CI:1.303–3.892) (Table 7). Only 29.78% of them recommend IUDs to unmarried and childless women. The significant predictors described above also influenced health care providers to recommend IUDs after abortion (Table 8).

Table 7

The main factors closely related with the intention to recommend IUDs to women after abortion

Variable		Odds ratio (95 CI)	P-Value
Workplace.	3-A-grade General Hospitals	3.220(1.788–5.797)	0.000
	the basic hospital.	1.236(0.771–1.981)	0.379
	Women's and children's Hospital	2.143(1.274–3.603)	0.004
	Family Planning Service Center	1	
Setting up	Yes	1.544(1.067–2.233)	0.021
the department of family planning	No	1	
Department	Gynecology department	1.990(1.262–3.139)	0.003
	Obstetrics department	1.319(0.799–2.810)	0.279
	the department of family planning	2.234(1.303–3.829)	0.003
	Department of maternal and child health	1	
Supplying PAC services	Yes	1.987(1.412–2.795)	0.000*
	No	1	

Table 8

The main factors closely related with the intention to recommend IUDs to unmarried and childless women

Variable	Odds ratio (95 CI)	P-Value	
Workplace.	3-A-grade General Hospitals	2.485(1.287–4.797)	0.007
	the basic hospital.	2.165(1.165–4.030)	0.015
	Women's and children's Hospital	2.238(1.213–4.128)	0.010
	Family Planning Service Center	1	
Setting up	Yes	1.545(1.089–2.412)	0.05
the department of family planning	No	1	
Department	Gynecology department	2.167 (1.354–3.496)	0.001
	Obstetrics department	0.637(0.488–1.551)	0.637
	the department of family planning	2.737(1.558–4.807)	0.000
	Department of maternal and child health	1	
Supplying PAC services	No	0.419(0.263–0.635)	0.000*
	Yes	1	

Discussion

Guangdong was the most populous province of china. Official data indicated that the induced abortion incidence has maintained more than 50‰ in this province(<http://www.gdhealth.net.cn/html/tongjishuju/tongjiziliao/>). China's a two-child policy has been implemented since 2015. It means that people can have their preferred number of children. IUD was nearly received by all women after the birth of their first child due to the one-child policy[11]. The rate of LARCs use decreased because women could make their own choices. In fact, LARC devices should be first-line contraceptive methods for adolescents[7]. The data showed that the rate of IUD use among married women has reduced in half in Guangdong province since 2015. Problems in contraceptives and influence factors for induced abortion in Guangdong province are still lack of relevant reports.

The abortion rate in our study was close to that reported in three major cities in china[12]. The percentage of married women and unmarried women experiencing one induced abortion was about 32.78% and 17.18% respectively, and 11.72% of unmarried women and 21.28% of married women experienced the repeated induced abortion. A review based on nine studies showed that the average value of abortion rates was about 28%, the range of which was from 11–55% in china [2, 13]. A recent survey showed that the proportion of repeat induced abortion was high and varied different among 30 provinces in china[14]. The abortion rate in Guangdong province was inside this range. The women in the 40–49 age group had a much higher percentage of induced abortion(38.12%) and repeated abortion(28.15%). It was consistent with the findings of other studies due to the experience undergoing the one-child policy during their reproductive age [12, 14, 15]. Although the proportion of induced abortion in women under 20 was lower than that in women over 20-years of age(12.5% vs 30.9%), the proportion of repeated induced abortion was higher in the the former group(25% vs 20.45%). In particular, 66.7% of them were unmarried. It meant that reducing unintended pregnancy in unmarried younger women were grim in Guangdong province.

LARC program has been recommended for adults especially nulliparous and adolescent patients since 2008. It also was identified as a very effective method for adolescents[16–18]. In our study, the rate of IUD use in participants was 14.5%. 75% of women with age less than 20 did not use LARC such as IUD as the common contraceptive methods. The rate of IUD use among unmarried women was only 7.74% in this study. The data were consistent with what were reported in china before[19]. We found that the women with age less than 30 years old or nulliparous women seldom chose IUD as the main contraceptive method due to attempting pregnancy for them. Most of them feared that LARC would cause infertility. Fear of infertility was a major factor for young women's contraceptive decision in the world all along[10, 20, 21]. Our study indicated that the women who had two children often seek LARC. With increase of the education cost and work pressure, many families do not choose to have more children in china. The first consideration for contraception method was efficiency.

Other influential factors included the provision of PAC services and free contraceptive services. PAC services were first proposed since 1994 and described as the effective method to reduce repeat induced abortion[9]. Providing contraceptive services was one of the important parts. Our questionnaire showed that the individual who never used PAC services was significantly less likely to use LARC. It meant that PAC services were very useful to promote LARC use in reproductive age women. In fact, only 14.18% of persons accepted PAC services in our survey. It was much lower in unmarried women(7.03%, 18/256). The correlation between the rate of LARC use and provision of PAC services was seldom described before. Other influence factors for PAC services use including living conditions, occupation and monthly income. People have seldom opportunities to obtain PAC services including living in rural areas, with lower income, being self-employed or without jobs. We should pay more attention to those high-risk groups.

The survey in 900 health care providers showed that PAC services not supplied in the staff' workplaces were correlated with their negative attitudes of regarding IUDs use for unmarried and childless women. Our study also indicated that the staff' age was not the influencing factor. It different from the studies

before[22]. The possibility was that most health care providers were obstetrics and gynecology physicians and having medicine background. We also found that setting up the department of family planning was important to perform LARC use. The reason may be that PAC services have been one part of works in abortion clinics of some public hospitals since 2010[23]. The doctors who work in the department of family planning mainly provide contraceptive services and induced abortion. Comparing to obstetricians or gynecologists in obstetrics and gynecology, they have relatively enough time to obtain the knowledge of PAC services and performance. The questionnaire revealed that the department of family planning was only set up in 66.22% of hospitals. This was a common problem that the leadership did not pay attention to this work.

It's worth noting that people who received free contraceptive in time were easier to choose LARC(OR = 1.609, CI:1.135–2.282). This was the first time to describe the relationship between free contraceptive and LARC use. In china, free contraceptive counselling and reproductive health materials were provided to married women by a government-run Family Planning system in 2004[24]. Free contraceptive use has been identified to be an effective policy in family planning and the reduction of unintended pregnancy[25, 26]. Our study showed that less than half of persons accept contraceptives free of charge and the satisfaction was only 57.1%. We analyzed the influence factors. Variety uniformity, quality and feeling embarrassed were the main reasons. The options for contraceptive pill, intrauterine device and condom free of charge were not plentiful. People who want to obtain free contraceptive services in family planning departments or hospitals will spend spare time. Although they could obtain contraceptives from self-service terminal at any time, the self-service terminal could not be seen everywhere. Most importantly, they could not obtain consulting service from self-service terminal. Interestingly, the lower income people and the people living in rural areas had more chance to obtain free contraceptives. The people living in rural areas accepted free contraceptives easily because the family planning work was part of the village-level leaders' works and it was easily to manage and perform and the leaders pay more attention to those things. Comparing to people with higher income who paid more attention to the quality and types of free contraceptives, low-income groups would consider the price. This result identified that free contraceptive services were apt to some high risk group for PAC services use. Freelance staff or persons without work could also accept free contraceptive services easily. The main reason is that it is difficult to manage and follow up. They could not receive the relevant information from health care providers in time except that they want to know more about those things by themselves. Those people were the concerned objects.

There were some limitations in our study. First, most participants were of Han ancestry and the local residents. Second, we did not study deeply to evaluate how well reproductive aged women master the PAC knowledge and the level of post-abortion care services. Third, we did not distinguish the health care providers based on their education degree. The samples not homogeneously distributing in Guangdong province was also a limitation.

Conclusion

Our findings first gave a detailed account of the current situation of contraception and induced abortion in Guangdong province. The rate of induced abortion was high especially in unmarried women and younger women. LARC use was not widely accepted especially in nulliparous women. Some health care providers had negative attitudes regarding IUDs use for nulliparous women or unmarried women. The attentions paid by leaders and setting up the department of family planning were important to improve providers' accurate knowledge of LARC use. Free contraceptive services provided by the government were very useful but there were some limitations. Finding more channels to supply free contraceptive and PAC services for different populations should be performed.

Abbreviations

LARC: Long-acting Reversible Contraceptives; PAC: Post-abortion Care; OR: Odds Ratio; 95%CI: 95% Confidence Intervals; IUDs: Intra Uterine Device

Declarations

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Availability of data and materials

The data in our study can be acquired from the corresponding author according to research needs.

Authors' contributions

QL contributed the central idea, FJ drafted the manuscript, QX and PL were responsible for questionnaire design. LL and QX contributed to revisions, YH and AZ collected data and coordinated the study. All authors read the manuscript and approved the final manuscript.

Ethics approval and consent to participate

The study was approved by the Ethics Committee of the Guangzhou Women & Children Medical Center and written informed consent was obtained from all subjects.

Competing interests

The authors in our study do not have any conflict of interest, financial or otherwise.

Consent for publication

Not applicable.

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Figures

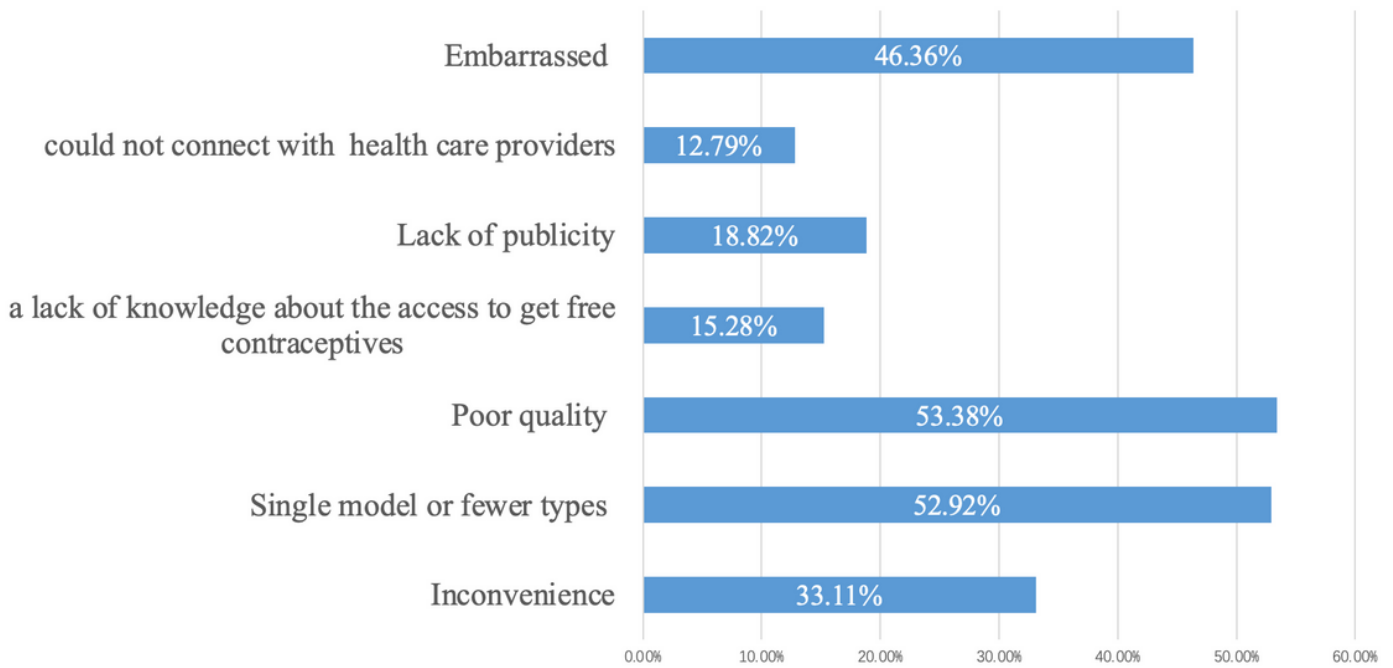


Figure 1

The influence factors for people refusing free contraceptive services

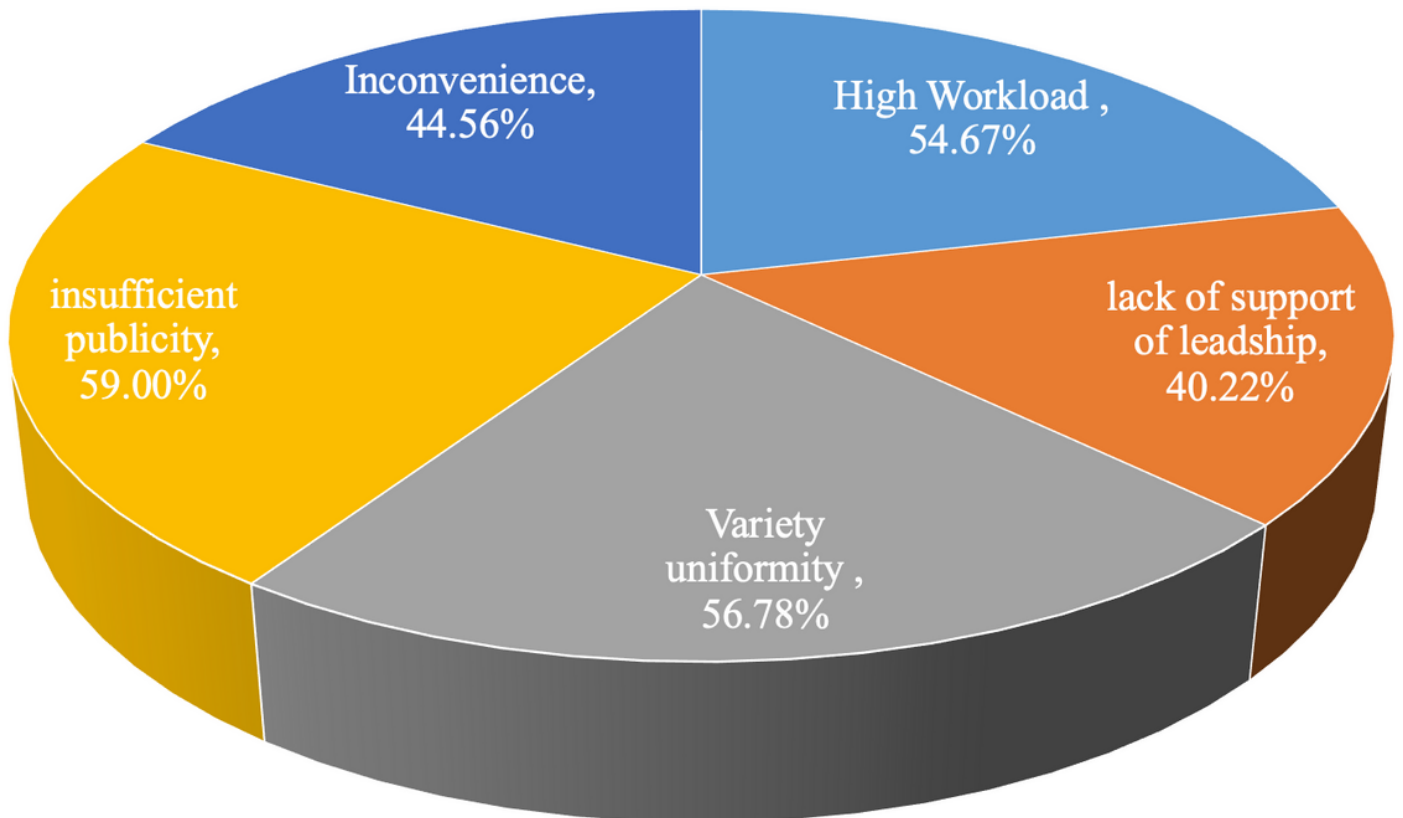


Figure 2

The problems for health care providers to provide free contraceptive services