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ORIGINAL ARTICLE

Intention of having a second child among infertile and fertile women attending outpatient gynecology clinics in three major cities in China: a cross-sectional study

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STUDY QUESTION: What is the intention to have a second child among women attending outpatient gynecology clinics in three major cities in China?

SUMMARY ANSWER: In total, 69.3% of the participants expressed the intention to have a second child and this was related to infertility status, pronatalist attitudes, and sociodemographic factors.

WHAT IS KNOWN ALREADY: In 2016, the new universal two-child policy was introduced in China enabling all Chinese couples to have a second child. A government-led national survey revealed that the majority of women included under the policy would be 35 years old and older and thus would be at higher risk of infertility. Previous studies found that fertility intention differs by infertility status.

STUDY DESIGN, SIZE, DURATION: A cross-sectional survey was performed to examine the intention of having a second child and its associated factors among infertile and fertile women attending gynecology outpatient clinics in three major cities in China. Clinical nurses approached eligible women in person while waiting for their consultations. Recruitment and data collection were conducted from April to August 2016.

PARTICIPANTS/MATERIALS, SETTING, METHODS: The survey involved four gynecology outpatient clinics in Beijing, Shenzhen, and Hohhot. Married women aged 20–45 years who were seeking outpatient gynecology care for non-malignant problems were invited to participate.

MAIN RESULTS AND THE ROLE OF CHANCE: Data from 974 women were included in the analysis. A total of 69.3% of the women expressed the intention to have a second child, and infertile women were more likely to want a second child compared to fertile women (76.6% vs 61.9%, respectively; $P < 0.001$). Greater ideal parity facilitated the intention for a second child in both groups, while pronatalist attitudes (meaning that they preferred to have their first childbirth at a younger age and attached greater significance to traditional childbearing beliefs), unexplained infertility, presence of a living child and religious affiliation were associated with greater intention among infertile women. In contrast, in the fertile group, older age, full-time work and lower confidence in achieving parity goals diminished the intention for a second

child. Although infertile women displayed greater agreement with pronatalist attitudes and desired a higher ideal parity, they had less confidence in achieving their parity goals than their fertile counterparts.

LIMITATIONS REASONS FOR CAUTION: In addition to self-report and self-selection bias, our participants were recruited from urbanized areas and were more educated than the general population. Owing to the extremely busy environment in the clinics, difficulties were encountered in keeping track of the number of women whom the nurses approached, and the response rate was therefore unavailable.

WIDER IMPLICATIONS OF THE FINDINGS: With the introduction of the universal two-child policy, there is a need to enhance fertility awareness and to encourage reproductive life planning, as well as to lower the cost of childcare, in order to increase the birth rate in China. Effort is required to make childbearing more compatible with current employment, career and educational development, the burdens of family care (e.g. for elderly parents), social environments and cultural expectations. This is particularly relevant for families who already have a child, as our findings show that their hesitation toward a second child was largely related to difficulties with extra childcare within the woman's current work and family life.

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WHAT DOES THIS MEAN FOR PATIENTS?

Since its introduction in 2016, questions remain as to whether China's universal two-child policy will be able to improve birth rates. A government-led national survey revealed that the majority of women included under the policy would be 35 years old and older and thus would be at higher risk of infertility. Because couples' fertility intentions are major determinants of actual behaviors, this study examined the intention for having a second child among Chinese women attending gynecology outpatient clinics.

The study showed that infertile women seemed to express a stronger desire for a second child compared to fertile women. Importantly, the reasons behind these fertility intentions seemed to differ according to fertility status. A higher ideal number of children was a key motivator of childbirth for infertile and fertile women alike. However, infertile women tended to be more pronatalist—meaning that they preferred to have their first childbirth at a younger age and attached greater significance to traditional childbearing beliefs—despite also being less confident in achieving their fertility goals. In contrast, fertile women tended to consider their age, work status and the cost of childcare as major barriers preventing them from wanting a second child. Only in infertile women did already having a child relate to a greater desire for a second child.

Our results indicate that women's intentions for a second child depend on a complex set of sociocultural and personal factors. Notably, infertile women face particular challenges given their strong preference for a second child, especially those who already have a first child. In order to encourage uptake of the universal two-child policy, efforts should be made to address the specific needs of Chinese women, whether infertile or fertile, by lowering the cost of childcare, improving reproductive life planning and enhancing fertility awareness.

Introduction

The one-child policy was enacted in the 1970s in the hope to deliver China out of severe poverty through population containment, and it has brought China's total fertility from about 2.9 births per woman in 1979 to 1.6 in 2015 (The World Bank, 2017). Since 2016, all Chinese couples are entitled to a second child under the new universal two-child policy. At the advent of the policy, it was expected that 90 million couples would be eligible for a second child (NHFPC, 2015). Since its implementation, there has been a 7.9% increase in births in China, which is the highest growth since 2000 (Shan, 2017).

However, issues regarding the uptake of the policy and the required changes to the healthcare system to support the increase in pregnancies are largely unresolved. Before the introduction of the universal two-child policy, the uptake of the selective versions (e.g. couples were eligible only if one or both spouses were an only child) was below expectations in both rural areas (e.g. Yunnan Province) and urban areas (e.g. Nanjing and Shanghai), with many more government approvals acquired than actual childbirths (Basten and Jiang, 2015). Xu *et al.* (2016) reported that 1 year after the introduction of the policy, only one in four pregnancies in their sample of 2345 women was a second pregnancy.

Fertility intentions have long been regarded as predictors of fertility behaviors (Schoen *et al.*, 1999; Ajzen and Klobas, 2013; Luo and Mao, 2014; Jiang *et al.*, 2016), and understanding the factors facilitating or hindering the intentions of women for having a second child are essential for developing strategies to enhance the uptake of the new policy. Previous studies found a repertoire of demographic (e.g. education, occupation, and parity), attitudinal and well-being factors (Ajzen and Klobas, 2013; McAllister *et al.*, 2016) that might influence fertility

intentions. Some factors directly reveal personal preferences and subjective norms toward family building (e.g. ideal parity and perceived importance of childbearing to oneself and one's family), whereas others are indicative of the availability of physical resources (e.g. the couple's age) and psychosocial resources (e.g. socioeconomic status, marital relationships and mental health problems such as depression) that enable childbearing and rearing. Specific to the case of second-child intention, childlessness can also be a key factor, and the urge of having offspring might be satiated in couples with a child whereas such a need remains unfulfilled in childless couples. The decision to have a second child might be colored by the positive experiences (e.g. joy of having children) and negative experiences (e.g. lack of childrearing resources) with the first child.

The estimated prevalence of infertility in China is about 15.5% among women of reproductive age and up to 25% among those who are actively trying to get pregnant (Zhou *et al.*, 2017). In 2015, The National Health and Family Planning Commission (NHFPC) estimated that 60% of couples would be 35 years old or above (NHFPC, 2015). In other words, many couples could be facing infertility because of their advanced age at the time they decide to have a second child (Cheng and Duan, 2016). Despite the prevalence and public health implications of infertility (Boivin *et al.*, 2007; Mascarenhas *et al.*, 2012), research on fertility intentions according to infertility status remains limited (Shreffler *et al.*, 2016). Some studies have found that acceptance of multiple pregnancies as an outcome of ART treatment increases with age and duration of infertility among infertile patients (Gleicher *et al.*, 1995; Child *et al.*, 2004). Likewise, a recent survey in the USA found that women who suffered from infertility based on the World Health Organization (WHO) definition, and/or who self-identified as a person with infertility, expressed a greater desire to have a baby and had higher ideal parity than their fertile counterparts (Shreffler *et al.*, 2016). In light of this previous research, the present study contrasted the second-child intention among women who were experiencing infertility with those who were not, and examined whether different sets of factors influenced second-child intention among these two groups of women.

We conducted the study in gynecology outpatient clinics in three major cities in China. These clinics are visited by women having gynecological conditions such as vaginal discharge, irregular vaginal bleeding, abdominal pain, etc., and these clinics are easily accessed by the public without any referral. While findings from studies conducted in the general public and general practice settings might reflect the public's interest in the policy, our study provides an estimate based on women who possess risk factors for infertility or who have elevated concerns for fertility because participants in our study were seeking gynecological care. Compared to studies conducted in the general public or general medical practice, we expected ours to reveal a higher estimate of second-child intention. Our findings will thus provide information on the demand for services related to second pregnancies among women presenting for gynecological care.

Materials and Methods

Settings and participants

Married women aged 20 to 45 years old attending outpatient gynecology clinics for non-malignant gynecological problems were approached. Exclusion criteria included being ethnically non-Han Chinese, inability to read Chinese and receiving psychiatric treatment for severe psychiatric disorders (e.g. psychosis or schizophrenia).

Recruitment was conducted in four major outpatient clinics of hospitals in Beijing, Shenzhen and Hohhot (in Inner Mongolia). The study engaged a large number of clinical nurses for approaching eligible women in person while they were waiting for their consultations. Due to the extremely busy environment in the clinics, we encountered enormous difficulties in keeping track of the number of women whom the nurses approached. The response rate was therefore unavailable. Out of 1125 women who responded to the questionnaire, 151 of them were excluded from the current analysis because they had two or more living children or had not answered the item about their intention for a second child. Data from 974 participants were included in the analysis.

Design and procedure

This was a cross-sectional study. The questionnaire was developed and face-validated by a multidisciplinary team of gynecologists, experts in ART and social workers specializing in reproductive counseling in Hong Kong and in the participating clinics in China. The clinic nurses approached eligible women, who were introduced to the study and given a written cover letter and an informed consent form. Those who agreed to participate were asked to complete the questionnaire while waiting for their consultations. Recruitment and data collection for the study was conducted from April to August 2016. The authors had no access to information that could be used to identify individual participants during or after the data collection.

Ethics approval

This study was approved by the Institutional Review Boards or the Ethics Committees of the participating hospitals (University of Hong Kong-Shenzhen Hospital: [2016]12; Peking University Third Hospital; Inner Mongolia Medical University Affiliated Hospital (2016;001); Military General Hospital of Beijing PLA (S2016-011-02)). All participants provided their written informed consent.

Measurement

Self-reported infertility

Infertility was assessed by the response to an item constructed based on the WHO medical definition of not having a clinical pregnancy within the past 12 months despite regular unprotected heterosexual intercourse (Zegers-Hochschild *et al.*, 2017).

Second-child intention

Women were asked whether they intended to have a second child under the universal two-child policy, and if they answered yes they were asked about the sex preference for the second child and the desired duration between the first and the second childbirth. If the women reported no intention for a second child, they were asked to give a yes/no response to whether advanced age, heavy workload, high cost of childcare, lack of a person to assist with childcare and/or satisfaction with the current situation were reasons for not wanting a second child.

Demographic factors

Age of the women, age of their husbands and duration of marriage were recorded. Education level was recorded as none, primary, secondary, tertiary or other, and for the analysis this was dichotomized into having received tertiary education or not. Any religious affiliation was also documented. Occupation was recorded as part-time, full-time, unemployed, or

none and others, and for the analysis this was dichotomized into full-time employment or not.

Parity

Participants were asked whether they had a living child. Those who answered yes were asked to provide the sex and age of their child.

Childbearing attitudes

The importance of childbearing was assessed with four items (In general, childbearing is important to (i) me, (ii) my spouse, (iii) my marriage and (iv) my family) on a 10-point Likert scale from 1 (very unimportant) to 10 (very important). Traditional childbearing beliefs were evaluated with 10 items (e.g. 'A family is only complete with children' and 'With no children, I feel that I have not fulfilled the responsibility of a daughter') on a 10-point Likert scale from 1 (totally disagree) to 10 (totally agree). Both scales demonstrated satisfactory reliability (importance of childbearing: $\alpha = 0.91$; traditional childbearing beliefs: $\alpha = 0.94$). Ideal age at the time of birth of the first child, sex preference of the first child and the ideal number of children (i.e. ideal parity), including the number of sons and daughters, were recorded. The women also rated how much confidence they had in achieving their ideal parity by their desired age on a five-point Likert scale ranging from 1 (not confident at all) to 5 (very confident). The questions were answered and coded in the same way among nulliparous and parous women in order to compare their attitudes regarding childbearing.

Well-being

Well-being was indicated by the level of depression and marital satisfaction. Severity of depression was measured by the Patient Health Questionnaire (PHQ-9; Kroenke *et al.*, 2001). Participants answered the nine items of the PHQ-9 on a four-point scale ranging from 0 (not at all) to 3 (nearly every day). The scale demonstrated satisfactory reliability ($\alpha = 0.88$), and a score of 10 or above indicated moderate to severe levels of depression. The three-item Kansas Marital Satisfaction Scale, which is answered on a seven-point Likert scale ranging from 1 (extremely dissatisfied) to 7 (extremely satisfied), was used to measure marital satisfaction (Schumm *et al.*, 1986). Scores below 18 indicate marital stress (Crane *et al.*, 2000). The scale demonstrated good reliability ($\alpha = 0.93$).

Infertility factors

Infertile women were asked how many years they had been trying to conceive (infertility years); whether female, male, mixed,or unknown factors for infertility were present; whether they had been tested for the cause of their infertility; the duration of ART treatment and whether they wished to pursue further ART treatment.

Statistical analysis

Post hoc analysis with G*Power (3.1) showed that the sample size yielded a statistical power of 99.7% assuming an alpha of 0.05 and a two-tailed effect size of 0.15. Demographic factors, parity, childbearing attitudes, well-being, and the women's second-child intentions and associated attitudes (i.e. gender preference, gap between first and second childbirth, and reasons for non-intention for a second child) were compared between infertile and fertile women as well as between women with and without a child using chi-squared tests for categorical parameters and Mann–Whitney *U*-tests for continuous parameters. The associations between infertility and childlessness with the intention for a second child (yes/no) were tested with factors that were significantly different between groups and controlled for using adjusted binary logistic regression. Associations between the intention for a second child and demographic factors, childbearing attitudes, well-being and infertility factors were tested with binary logistic regressions with 'no intention' as the reference category. The analyses were repeated according to infertility status (infertile vs fertile) and childlessness (presence vs absence of a living child). Because this study was exploratory in nature, we did not correct for multiple testing. List-wise deletion was used to handle missing data because the current cross-sectional design did not allow for multiple imputation based on the previous response of an individual. Statistical significance was indicated by a *P*-value <0.05, and all analyses were conducted with SPSS (25.0) (IBM Corp, Armonk, NY, USA).

Results

Sample characteristics

Table I illustrates the characteristics of the study participants. The mean age of the women was 32.0 years, while that of their husbands was 34.1 years. Most women had received tertiary education and had a full-time occupation. About one-third had a living child, and the mean age was about 7 years. Slightly fewer than half of women had a son.

Regarding their childbearing attitudes, the ideal age of the first birth was 27.5 years. The average ideal parity was around two, with one son and one daughter. Preferences for a son (51.6%) or a daughter (48.4%) as the first child were comparable. The average level of agreement with traditional childbearing beliefs was moderate, with a score of around 6 on a scale from 1 to 10. However, childbearing was considered important to the women, their husbands, their marriages and their families (8.5 ± 2.0 points on a scale of 1–10). Confidence in achieving ideal parity by the desired age was moderate (3.3 ± 1.2 points on a scale of 1–5).

One in 10 women (9.9%) had depression of at least a moderate level. For marital satisfaction, slightly more than a quarter (27.8%) were experiencing marital stress. Depression and marital satisfaction were mildly correlated (Spearman's rho = −0.17, $P < 0.001$).

Fifty-four percent (499 out of 924) of the participants reported being infertile, and on average they had been trying to conceive for 2.8 years. Female-factor, male-factor and mixed-factor infertility were responsible for 34.5, 8.7 and 16.9% of cases, respectively. The cause of infertility was unexplained in about one-third of the cases, and 7.1% had never been tested for the cause of infertility. For those who were receiving ART treatment, the average duration of treatment was 1.3 years, and most of these participants wished to pursue further ART treatment at the time of data collection.

Infertile participants tended to be older than fertile participants (32.4 ± 4.7 years vs 31.6 ± 5.0 years, respectively; $P = 0.014$) and were less likely to have received tertiary education (78.5% vs 87.3%, respectively; $P < 0.001$), to have a full-time occupation (66.7% vs 73.7%, respectively; $P = 0.002$) or to have a living child (17.4% vs 52.5%; $P < 0.001$). Among those who had a living child, the children of the infertile group tended to be older than those of the fertile group (9.2 ± 5.6 years vs 6.6 ± 4.9 years; $P < 0.001$). Infertile women also expressed a higher ideal age at first childbirth (27.9 ± 3.0 years vs 27.2 ± 2.6 years; $P = 0.002$) and were in greater agreement with traditional childbearing beliefs (6.2 ± 2.7 points vs 5.6 ± 2.5 points; $P = 0.001$). They also reported a slightly higher ideal parity (2.0 ± 0.6 children vs 1.9 ± 0.4 children; $P = 0.008$) but had less confidence in achieving their ideal parity by

Table I Characteristics of participants attending outpatient gynecology clinics in three major cities (Shenzhen, Beijing and Hohhot) of China.

	All	
	n (%)/mean (SD)	Total
Demographic factors		
Age of the woman (years)	*32.0 (4.9)*	974
Age of the husband (years)	*34.1 (5.5)*	935
Years of marriage	*5.9 (4.8)*	926
With tertiary education	794 (82.8)	959
With a religious affiliation	127 (13.5)	938
With a full-time occupation	660 (69.3)	953
Parity		
With a living child	332 (34.1)	974
With a son	153 (46.2)	331
Age of the child (years)	*7.4 (5.4)*	*345*
Childbearing attitudes		
Ideal age of first childbirth (years)	*27.5 (2.9)*	936
Importance of childbearing[a]	*8.5 (2.0)*	964
Traditional childbearing beliefs[a]	*5.9 (2.7)*	957
Confidence in achieving ideal parity by desired age[a]	*3.3 (1.2)*	857
Ideal parity	*1.9 (0.5)*	944
Ideal number of sons	*1.0 (0.3)*	801
Ideal number of daughters	*1.1 (0.3)*	852
Well-being		
PHQ-9 scores (depression)	*4.4 (5.0)*	941
KMS scores (marital satisfaction)	*17.7 (3.1)*	928
Infertility factors[b]		
Women with infertility	499 (54.0)	*924*
Subfertility years[b]	*2.8 (2.1)*	*323*
Presence of female factors of infertility[b]	131 (34.5)	380
Presence of male factors of infertility[b]	33 (8.7)	378
Presence of mixed factors[b]	64 (16.9)	379
Presence of unknown cause of infertility[b]	132 (34.8)	379
Never tested for cause of infertility[b]	27 (7.1)	379
Duration of ART treatment in years[b]	*1.3 (1.9)*	*322*
Wish to pursue further ART treatment[b]	411 (84.9)	484

PHQ-9, Patient Health Questionnaire-9; KMS, Kansas Marital Satisfaction Scale. The italicized text in Table I refers to mean (SD), rather than n (%).
[a]The importance of childbearing was assessed with four items (In general, childbearing is important to (i) me, (ii) my spouse, (iii) my marriage and (iv) my family) on a 10-point Likert scale from 1 (very unimportant) to 10 (very important). Traditional childbearing beliefs were evaluated with 10 items on a 10-point Likert scale from 1 (totally disagree) to 10 (totally agree). Confidence in achieving ideal parity by desired age was rated on a five-point Likert scale ranging from 1 (not confident at all) to 5 (very confident).
[b]Answered only by participants who were reported to be infertile.

the desired age (3.1 ± 1.3 points vs 3.4 ± 1.2 points; $P = 0.005$). The infertile group had significantly higher PHQ-9 scores than their fertile counterparts (4.7 ± 4.0 points vs 4.0 ± 3.9 points; $P = 0.005$).

Table II Second-child intention and attitudes reported by women in the study.

	All participants	
	n (%)/mean (SD)	Total
With the two-child policy, do you wish to have a second child?		974
Yes	675 (69.3)	
No	299 (30.7)	
If you wish to have a second child, what is your preference for the sex of the second child?		650
Male	275 (42.3)	
Female	375 (57.7)	
If you wish to have a second child, what will be the desired duration between the first and the second childbirth (in years)?	*3.2 (1.5)*	583
For women who did not intend to have a second child, the following were queried as potential barriers for not wanting a second child	***n* (%)**	**Total[a]**
Advanced age	106 (37.1)	286
Heavy workload	67 (23.4)	286
High cost of childcare	106 (37.1)	286
No one to assist with childcare	73 (25.5)	286
Satisfaction with the current situation	65 (22.7)	286

[a]13 participants did not answer this question.

Compared to childless couples, couples with a living child tended to be older (wives: 34.5 ± 4.8 years vs 30.8 ± 4.4 years, respectively; $P < 0.001$, husbands: 36.5 ± 5.2 years vs 32.8 ± 5.3 years, respectively; $P < 0.001$) and had been married for a longer period of time (9.0 ± 5.3 years vs 4.2 ± 3.6 years, respectively; $P < 0.001$). Women with a living child also tended to report a lower ideal age at first childbirth (26.2 ± 2.5 years vs 28.2 ± 2.8 years, respectively; $P < 0.001$), placed greater importance on childbearing (8.6 ± 2.0 points vs 8.4 ± 1.9 points; $P = 0.033$) and had greater confidence in achieving their ideal parity by their desired age (3.5 ± 1.2 points vs 3.2 ± 1.2 points, respectively; $P < 0.001$), but they showed less agreement with traditional childbearing beliefs (5.7 ± 2.5 points vs 6.1 ± 2.7 points, respectively; $P = 0.039$). These women also preferred a greater ideal number of children compared to childless women (2.0 ± 0.5 children vs 1.9 ± 0.6 children, respectively; $P = 0.013$). Marital satisfaction was also higher among childless women (18.0 ± 2.9 points vs 17.3 ± 3.4 points, respectively; $P = 0.003$).

Second-child intentions and attitudes

Second-child intentions and attitudes are presented in Table II. A total of 69.3% of our participants wished to have a second child under the new policy. Participants from Shenzhen were the most interested in the new policy (81.0%), followed by those in Beijing (68.1%) and those in Hohhot (Inner Mongolia) (57.4%) ($P < 0.001$). Among those who intended to have a second child, 57.7% wanted to have a daughter. Although childlessness was not associated with second-child intention

($P = 0.236$), participants with a living child tended to want the opposite sex for their second child ($P < 0.001$). The same effect was found for the preferred sex of the first and the second child among childless women ($P < 0.001$). The desired average gap between the first and the second childbirth was 3.2 years, with those who had a living child indicating a larger gap compared to childless women (3.9 ± 1.7 years vs 2.8 ± 1.3 years, respectively; $P < 0.001$). However, the difference was no longer significant after controlling for the age of their child ($P = 0.254$). Infertile women were more likely to want a second child than fertile women (76.6% vs 61.9%, respectively; $P < 0.001$). Infertile women also preferred a shorter period of time between the first and the second childbirth compared to fertile women (3.0 ± 1.5 years vs 3.4 ± 1.5 years, respectively; $P < 0.001$).

Among participants who did not intend to have a second child, advanced age and the high cost of childcare were the key reasons, followed by having no one to help with childcare. Infertile women were more likely to be of advanced age compared to fertile women (46.8% vs 29.1%, respectively; $P = 0.003$) and were less likely to report a heavy workload (12.8% vs 31.0% respectively; $P = 0.001$) and the lack of a person to assist with childcare (13.8% vs 34.8%, respectively; $P < 0.001$) as their reasons for not intending to have a second child. Women with a living child were more likely than childless women to report a heavy workload (33.7% vs 17.6%, respectively; $P = 0.002$) and having no one to assist with childcare (42.3% vs 15.9%, respectively; $P < 0.001$) as their reasons.

Factors related to second-child intentions

In the full sample, older age of the women (odds ratio (OR) = 0.95 [95%CI = 0.93–0.98]; $P = 0.001$) and their husbands (OR = 0.97 [95% CI = 0.94–0.99]; $P = 0.010$), longer marriage (OR = 0.97 [95% CI = 0.95–1.00]; $P = 0.045$) and having a full-time occupation (OR = 0.64 [95% CI = 0.47–0.87]; $P = 0.04$) tended to diminish the intention of having a second child, while higher importance of childbearing (OR = 1.08 [95% CI = 1.01–1.16]; $P = 0.030$), greater agreement with traditional childbearing beliefs (OR = 1.07 [95% CI = 1.01–1.13]; $P = 0.015$), higher ideal parity (OR = 22.56 [95% CI = 13.70–37.14]; $P < 0.001$) and greater confidence in achieving ideal parity by the desired age (OR = 1.13 [95% CI = 1.00–1.27]; $P = 0.043$) were associated with greater second-child intention. A greater ideal number of sons (OR = 6.71 [95% CI = 2.15–21.00]; $P < 0.001$), but not daughters, was associated with second-child intention.

After controlling for the factors that were found to be significantly different between the infertile and fertile groups, infertility status remained a significant factor for intention to have a second child (OR = 2.43 [95% CI = 1.56–3.78]; $P < 0.001$). In subgroup analyses among fertile women, higher age of the women (OR = 0.93 [95% CI = 0.90–0.97]; $P = 0.001$) and husbands (OR = 0.94 [95% CI = 0.90–0.98]; $P = 0.001$) and the presence of a full-time occupation (OR = 0.53 [95% CI = 0.33–0.86]; $P = 0.010$) were related to diminished second-child intention. Second-child intention was positively associated with ideal parity (OR = 20.20 [95% CI = 9.37–43.53]; $P < 0.001$) and with confidence in achieving ideal parity by the desired age (OR = 1.22 [95% CI = 1.02–1.45]; $P = 0.028$). For infertile women, having a religious affiliation (OR = 2.29 [95% CI = 1.06–4.96]; $P = 0.036$), unknown cause of infertility (OR = 1.08 [95% CI = 1.06–3.06]; $P = 0.029$), lower ideal age at first childbirth (OR = 0.89 [95% CI = 0.84–0.96]; $P = 0.001$), higher importance of childbearing (OR = 1.11 [95% CI = 1.01–1.23]; $P = 0.038$), greater agreement with traditional childbearing beliefs (OR = 1.10 [95% CI = 1.01–1.18]; $P = 0.021$), higher ideal parity (OR = 21.98 [95% CI = 11.16–43.27]; $P < 0.001$) and having a living child (OR = 3.08 [95% CI = 1.49–6.35]; $P = 0.002$) were associated with increased intention to have a second child. Duration of marriage and the ideal number of sons were no longer significant in the subgroup analyses.

After controlling for the factors that were significantly different between women with and without a child, childlessness remained a non-significant factor for second-child intention (OR = 0.76 [95% CI = 0.45–1.27]; $P = 0.296$). Among women with a child, full-time occupation appeared to hamper second-child intention (OR = 0.48 [95% CI = 0.28–0.81]; $P = 0.006$), while higher ideal parity (OR = 11.38 [95% CI = 5.16–25.05]) was related to wanting to have a second child. Among childless women, second-child intention was related to lower age of the women (OR = 0.95 [95% CI = 0.91–0.99]; $P = 0.006$) and their husbands (OR = 0.97 [95% CI = 0.94–1.00]; $P = 0.043$), lower ideal age at first childbirth (OR = 0.92 [95% CI = 0.87–0.99]; $P = 0.015$), greater importance of childbearing (OR = 1.17 [95% CI = 1.07–1.27]; $P < 0.001$), greater agreement with traditional childbearing beliefs (OR = 1.12 [95% CI = 1.05–1.19], $P = 0.001$), higher confidence in achieving their parity goals (OR = 1.19 [95% CI = 1.03–1.37]; $P = 0.018$) and ideal parity (OR = 33.95 [95% CI = 17.88–64.48]; $P < 0.001$), especially ideal parity toward boys (OR = 19.90 [95% CI = 2.40–164.88]; $P = 0.006$). Being infertile was related to wanting a second child among both women with a living child (OR = 6.09 [95% CI = 2.91–12.75]; $P < 0.001$) and those without (OR = 1.49 [95% CI = 1.04–2.15]; $P = 0.031$). The interaction effect between infertility status and childlessness was significant (OR = 4.08 [95% CI = 1.79–9.30]; $P < 0.001$) even after controlling for the main effects such that infertile women who had a living child reported the highest intention to have a second child.

Discussion

Although actual family sizes often deviate from desired family sizes, as shown in most studies, research on fertility intentions has been useful in extending our understanding of what enhances or impedes such intentions and subsequent fertility behaviors (Ajzen and Klobas, 2013). Surveys in different parts of the world have often found a preference for two or even three children over one (Lampic *et al.*, 2005; Daniluk *et al.*, 2012; Chan *et al.*, 2014; Vassard *et al.*, 2016). While sociocultural factors—including female labor market participation and social norms about the division of household labor (Mills *et al.*, 2008; Sullivan *et al.*, 2014), and family policies (Billingsley and Ferrarini, 2014)—impact on fertility intentions at the society-level and at the individual-level fertility intentions are related to a repertoire of attitudinal, demographic and well-being factors (Ajzen and Klobas, 2013; McAllister *et al.*, 2016).

The decision to have a second child in China has been found to be determined by factors such as education, urban residency, income, employment, benefits for the first child and love of children (Luo and Mao, 2014; Xiu *et al.*, 2016; Xu *et al.*, 2016, 2017). In our study, around two-thirds of the women were interested in having a second child under the new policy, with infertile women having a living child reporting the highest intention. A possible explanation for this might be that infertile women are more aware of their diminished fecundity and related health problems because they were planning for a second child. As expected,

this study, which was conducted in gynecology outpatient clinics, reveals a much higher percentage of participants wanting a second child than previous studies conducted in the general public or in general medical practice (Ding and Hesketh, 2006; Xu *et al.*, 2017). Thus, healthcare professionals should be aware of the increased demand for services associated with second pregnancies from this women who are seeking gynecologic care (Cheng and Duan, 2016).

We found that distinct sets of factors were associated with the second-child intention of both infertile and fertile women. While ideal parity was behind the elevated interest in pursuing a second child for both groups, for infertile women factors that imply greater uncertainty in their diminished reproductive potential (i.e. unexplained infertility and having a living child) were associated with greater intention to have a second child in addition to their pronatalist attitudes (i.e. lower ideal age at first childbirth, greater importance of childbearing and greater agreement with traditional childbearing beliefs). Likewise, infertile women who did not want a second child were more inclined to report advanced age as their key reason compared to their fertile counterparts. In other words, their perceived reproductive potential seems to be a key factor for considering a second child.

Further, although the infertile group reported higher ideal parity and greater agreement with traditional childbearing beliefs, they were less confident in achieving their parity goals and they experienced greater emotional distress. Notably, second-child intention was less contingent upon confidence in achieving parity goals among the infertile group than their fertile counterparts. In accordance with the theory of planned behavior, factors other than perceived control (Ajzen and Klobas, 2013), such as subjective norms and pronatalist attitudes, might be more predictive of second-child intention in this group of infertile women.

For women who did not report infertility, their intention for a second child was influenced by demographic characteristics, including age and full-time occupation. Among those who preferred not to have a second child, heavy workload and having no one to assist with childcare were more common reasons than among their infertile counterparts. These couples thus might be more concerned about whether their life and current career is amenable to having a second child.

The traditional preference for sons appears to be giving way to a more balanced sex preference in many Asian countries (Poston, 2002; Jayaraman *et al.*, 2009). Although a higher ideal number of sons but not daughters was associated with elevated second-child intention, the presence of a son did not diminish the second-child intention. In fact, those who had or preferred a son as the first child more often wanted a daughter as their second child. This echoes the findings of Xu *et al.* (2017) who showed that only 2.5% of their participants entered a second pregnancy because of gender preference. Most barriers to childbearing were related to socioeconomic factors. In women who already had a first child, the lack of a full-time occupation increased their second-child intention, whereas those who rejected the idea of a second child reported a heavy workload and lack of childcare help as the primary reasons. These barriers were congruent with those revealed in the NHFPC (2015) survey and the study by Basten and Jiang (2015). Under the one-child policy, a '4:2:1' family structure (four grandparents, two parents and one child) encouraged giving all childcare resources to the only child, including the best possible education, best possible care and all the parental (and grand-parental) attention. Such support, care and opportunities might not be as affordable when two children, instead of one, are in a couple's plan. In fact, a recent study showed that firstborns' unsupportive attitude toward further reproduction of their mother only weakens with the firstborn's increasing age and with greater family income (Liu *et al.*, 2017).

Practical and research implications

The depression scores among infertile women were higher than those of their fertile counterparts. The reproductive journey might be particularly stressful for Chinese couples in a child-oriented culture (Yao *et al.*, 2018), and thus establishing culturally sensitive and evidence-based practice through the development and validation of fertility counseling programs in the Chinese context will be imperative. Programs utilizing body–mind–spirit interventions and couple-based counseling have been found to be effective in enhancing the psychosocial well-being of infertile Chinese couples undergoing ART treatments (Chan *et al.*, 2006, 2012; Loke *et al.*, 2018).

In the long run, enhancing individuals' fertility awareness might be effective in reducing delays in childbearing and increasing the chances of fulfilling parity goals (Hvidman *et al.*, 2014; Petersen, 2016). The current study found that age, unknown cause of infertility and higher parity goals were associated with second-child intention, and thus efforts to reduce delays in childbearing might start by focusing on young adults before their fertility starts to decline. Tools such as reproductive life planning might help individuals clarify their reproductive goals and adopt suitable strategies to achieve them (e.g. contraception against unwanted pregnancies and lifestyle changes) (Stern *et al.*, 2013). Our findings also underscore the need to foster the uptake of the new policy through creative means to lower the cost of childbearing and childcare (Basten and Jiang, 2015). The government should undertake a wholesale effort to make childbearing more compatible with current employment, career and educational development, family caregiving burdens (e.g. care for elderly parents), social environments and cultural expectations. This is particularly relevant for families who already have a first living child. Our findings show that their hesitation toward a second child was largely related to difficulties with fitting extra childcare within the woman's current work and family life. Several Asian countries (e.g. Japan, Singapore, Taiwan, and Korea) have initiated pronatalist policies in the past two decades, but the effectiveness of these policies has been difficult to gauge and it might take more than a generation to achieve the goals of such policies (Frejka *et al.*, 2010).

Strengths and limitations

This study was conducted shortly after the introduction of the two-child policy in China. The timing of the study was optimal because the public had just started to familiarize themselves with the policy and to deliberate on whether the policy would be relevant to them. The multisite recruitment in Southern (Shenzhen), Eastern (Beijing) and Northern (Hohhot) parts of China, as well as in cities of different average income and living costs, enhances the generalizability of our findings to women presenting to outpatient gynecology care in other urban areas in the country. The cross-sectional design, however, precluded inferences about the direction of causality. Also, because the sample was recruited from urbanized areas and was more educated, the results are not readily applicable to individuals in rural areas with lower education levels. Other issues that might have confounded the validity of the findings include self-selection and recall bias as well as

the lack of information about the medical diagnoses among the women. We also met enormous difficulties in tracking the number of women who were approached about responding to our survey, thus leading to the inability to calculate the response rate. Infertility status was identified by self-report to an item that was designed based on the WHO medical definition, and subjective experience of infertility was not assessed. Experienced infertility and self-identified infertility might be discordant and might influence fertility intentions differently (Shreffler *et al.*, 2016). We also did not provide any open-ended options for participants to suggest other factors influencing their fertility intentions.

Conclusions

The current study shows that around two-thirds of women recruited from gynecology outpatient clinics were interested in having a second child under the new universal two-child policy. Despite the high perceived importance of childbearing, we found that socioeconomic factors, childbearing attitudes, age and perceived reproductive potential might impact Chinese women's intention to have a second child.

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Authors' roles

E.H.Y.N. and C.H.Y.C. conceived the study. R.H., K.W., L.S., R.L., S.M., H.P., Y.W., X.C., E.H.Y.N. and C.H.Y.C. participated in the concept and design of the study. R.H., K.W., L.S., R.L., S.M., H.P., Y.W. and X.C. were responsible for data collection in the four clinics. B.H.P.L. conducted the data analysis and drafted the manuscript. All authors contributed to data interpretation, draft revision and final approval of the manuscript.

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Conflict of interest

None declared. No conflicts of interest were associated with this study or its publication.

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