

Predictors of Stigma Among Women with Infertility: A Cross-Sectional Study in Shenzhen, China

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Purpose: The issue of infertility is a worldwide challenge, estimated to affect approximately 50 million couples. Infertility is a stressful event for women and may result in stigma. This study aimed to investigate stigma and its predictors in Chinese women with infertility.

Patients and methods: A cross-sectional study was conducted in Shenzhen, China, from November 2022 to April 2023. Two hundred seventy-five women with infertility completed the Mandarin version of the Infertility Stigma Scale (ISS), the Mandarin version of the Fertility Problem Inventory (M-FPI), and a socialdemographic data sheet. Descriptive statistics were used for demographic and infertility-related characteristics and study variables. The predictors of stigma were subjected to univariate and multivariate analyses.

Results: Although the women with infertility had an average mild level of stigma (54.00 [38.00, 68.00]), 26.9% (n = 74) and 4.7% (n = 13) of the women had a moderate and severe level of stigma, respectively. The women had an average moderate level of infertility-related stress (143.00 [122.00, 157.00]), with 7.3% (n = 20) of women having severe infertility-related stress. The predictors of stigma in women with infertility were the dimensions of social concern, relationship concern, and need for parenthood of infertility-related stress.

Conclusion: This study found that stigma and infertility-related stress were prevalent in Chinese women with infertility. Psychosocial strategies aimed at reducing infertility-related stress may help mitigate perceived stigma in this population.

Keywords: infertility, stigma, infertility-related stress, influencing factors, Chinese

Introduction

Infertility is defined as the failure to achieve pregnancy after 12 months or more of regular unprotected intercourse for couples with a desire to conceive.¹ Currently, infertility rates are alarmingly high across the globe, presenting formidable medical and sociological hurdles for human development.

Stigma refers to a negative feeling that is socially different from others. The development of stigma constitutes a cognitive behavioural process. Previous studies have shown that stigma is prevalent and present at high levels in women with infertility.^{2,3} Stigma can cause negative emotions such as anxiety and depression, lower self-esteem and self-efficacy, affect family stability and marital harmony, and lead to social withdrawal and avoidance behaviours.⁴

Stigma in women with infertility may be related to infertility-related stress. Studies have shown that the higher the infertility-related stress women have, the greater the level of stigma.^{2,3} Infertility-related stress refers to the psychological stress caused by infertility due to factors related to society and family.⁵ The role of a parent is an essential way to realise the value of life. Having children is a crucial way to achieve a fulfilling life and is necessary for marriage and family development. Because women represent the main body of fertility, people usually attribute the responsibility of infertility

to women; thus, women with infertility generally experience infertility-related stress. In addition, assisted reproductive technology requires large amounts of time, energy, and money, which can also lead to stress.⁶ Infertility-related stress is widespread in many countries and regions worldwide, especially in some developing countries in Asia and Africa.

Chinese women with infertility may experience more severe infertility-related stress because of traditional Chinese culture. In Chinese tradition, the family occupies a valued position, and a lack of descendants is considered the greatest tragedy.⁷ This cultural heritage remains strong in modern mainland China, placing enormous pressure on families to have offspring to continue the family name. This pressure is particularly acute on women, as there is a societal tendency to believe that childlessness is always the woman's fault.

In recent years, the fertility rate has been very low in mainland China.⁸ Shenzhen is the fourth-largest metropolitan area in mainland China. The couples in Shenzhen usually have tremendous economic pressure and the influence of Western values, which may impact their stigma and infertility-related stress. However, few studies have explored stigma and infertility-related stress in women with infertility in Shenzhen, China. Therefore, this study aims to examine this issue and provide a foundation for the psychological care of women with infertility.

Methods

Study Design, Setting, and Participants

This was a cross-sectional study. We reported this study following the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) Statement.⁹ Women with infertility were recruited consecutively from November 2022 to April 2023 at the Department of Obstetrics and Gynaecology and Reproductive Medicine Centre of a tertiary hospital in Shenzhen, China. The study hospital has approximately 1500 women with infertility visiting monthly.

Inclusion criteria were: (a) the women being diagnosed with infertility due to female factors based on World Health Organisation (WHO) diagnostic criteria;¹⁰ (b) with a desire to conceive. Women with infertility were excluded if they had (a) severe diseases, including hepatitis B, tuberculosis, acquired immune deficiency syndrome (AIDS), and cancer; or (b) a history of mental illness.

The sample size was calculated using the method of events per variable (EPV) with a factor of 5–10 to ensure stability and prevent overfitting.¹¹ The required sample size was at least 240 cases, with an additional 5% allowance for unqualified samples, leading to an estimated sample size of 253 cases.

Measurements

The Mandarin version of the Infertility Stigma Scale (ISS) was used to measure the stigma in Chinese women with infertility. The ISS has been developed in Mandarin and validated in Chinese women with good reliability and validity.⁷ The reported Cronbach's α , split-half coefficient, and test–retest correlation coefficient for the whole scale were 0.94, 0.90, and 0.91, respectively; and the reported Content Validity Index (CVI) was 0.92.⁷ The ISS has four dimensions: self-devaluation, social withdrawal, public stigma, and family stigma. The ISS has 27 items. All items are scored on a five-point Likert scale from 'strongly disagree' to 'strongly agree'. The total score ranges from 27 to 135 points, with scores categorised into mild (27–63), moderate (64–100), and severe (101–135) stigma levels.¹² The Cronbach's α coefficient in this study was 0.97.

Infertility-related stress was measured using the Mandarin version of the Fertility Problem Inventory (M-FPI). The original M-FPI was in English and was translated and validated in the Chinese population by Peng et al.¹³ The M-FPI has five dimensions, which were dimensions of social concern, sexual concern, relationship concern, need for parenthood, and rejection of childless lifestyle. The M-FPI has 46 items. Each item is rated on a six-point Likert scale ranging from 1 (strongly disagree) to 6 (strongly agree). Among these 46 items, 18 items are reverse-scored. The total scores range from 46 to 276 points, with scores categorised into mild (0–92), moderate (93–184), and severe (185–276) stigma levels.¹⁴ The scale has good reliability and validity for assessing infertility-related stress levels in Chinese couples.¹³ The Cronbach's α coefficient in this study was 0.83.

Socio-demographic and infertility-related characteristics were collected, including age, education, occupation, residence, monthly household income, whether being the only child in the original family, infertility etiology, duration of infertility diagnosis, method of medical expense payment, prognosis evaluation, and barriers to seeking medical treatment.

Ethical Considerations and Procedure

This study was approved by the Institutional Review Board of the Seventh Affiliated Hospital of Sun Yat-sen University (Approval No. KY AF/FC-08/03.0). This study adhered to the Declaration of Helsinki's Code of Ethics.¹⁵ The questionnaire omitted the scale name to avoid harming patients.

To ensure the accuracy and consistency of the data collection process, three research assistants (RAs) received training, and ten participants participated in a pilot study. The trained three RAs invited eligible women to participate in the study at the outpatient clinic. Women with infertility who had provided informed written consent were asked to complete the questionnaires in a quiet room of the clinic. The RAs remained nearby to answer any questions and receive the returned questionnaires.

Data Analysis

The data were analysed using SPSS version 25.0 (IBM Corporation, Armonk, NY, USA). Descriptive statistics were used to present sociodemographic and infertility-related characteristics and the study variables. The Shapiro–Wilk test was used to test the normality of the scores of the ISS and M-FPI. The scores of the ISS and M-FPI were non-normally distributed ($P < 0.001$, $P = 0.008$, respectively). Thus, the median (M; P25, P75) was used to describe and analyze the total scores of stigma and the four dimensions of stigma, the total score of infertility-related stress and its five dimensions. In this study, stigma was the dependent variable and was divided into two categories: mild level (ISS scores < 64) and moderate to severe level (ISS scores ≥ 64). Infertility-related stress was the independent variable. Spearman correlation was used to analyze the correlation between infertility-related stress and stigma in women with infertility. The chi-squared test or the Mann–Whitney U -test was used to compare the differences in the rate of moderate to severe level of stigma among groups with different socio-demographic and infertility-related characteristics. Variables with $P < 0.1$ in the above tests were input into the multivariable logistic regression model to determine the predictors of the stigma. Odds ratio (OR), adjusted odds ratio (AOR), and 95% confidence interval (95% CI) were calculated. Statistical significance was set at $P < 0.05$.

Results

The Characteristics of the Women with Infertility

Table 1 shows the demographic characteristics of the women with infertility. The average age of the women was 32.4 ± 4.75 years. Most women had a high school education or above (72%, $n = 198$), were employed (82.9%, $n = 228$), and lived in urban areas (82.5%, $n = 227$). The majority lived with their spouses (73.1%, $n = 201$), had a monthly household income above 5000¥ (89.5%, $n = 246$), and were covered by medical insurance (64.4%, $n = 177$). Table 2 shows the infertility-related characteristics of women with infertility. The duration of infertility diagnosis was within 2 years for 57.1% ($n = 157$) of women, and the duration of treatment was within 2 years for 70.5% ($n = 194$). The most reported etiology contributing to infertility was ovarian factors (23.3%, $n = 64$) and tubal factors (20%, $n = 55$).

Table 1 Sociodemographic Characteristics of the Women with Infertility (N = 275)

Characteristics	All women (n = 275)	Mild stigma (n = 188)	Moderate/Severe stigma (n = 87)	χ^2/Z	P
Age (years)				-0.983	0.326
≤ 25	16 (5.8)	8 (50.0)	8 (50.0)		
≤ 30	75 (27.3)	55 (73.3)	20 (26.7)		
31–35	117 (42.5)	86 (73.5)	31 (26.5)		
≥ 36	67 (24.4)	39 (58.2)	28 (41.8)		
Education Level				-4.733	<0.001
Junior high school or below	53 (19.3)	22 (41.5)	31 (58.5)		
High school/vocational	24 (8.7)	15 (62.5)	9 (27.5)		
College or above	198 (72.0)	151 (76.3)	47 (23.7)		

(Continued)

Table 1 (Continued).

Characteristics	All women (n = 275)	Mild stigma (n = 188)	Moderate/Severe stigma (n = 87)	χ^2/Z	P
Employment Status				26.266	<0.001
Unemployed	47 (17.1)	30 (63.8)	17 (36.2)		
Worker	36 (13.1)	15 (41.7)	21 (58.3)		
Self-employed	24 (8.7)	11 (45.8)	13 (54.2)		
Employee	96 (34.9)	74 (77.1)	22 (22.9)		
Freelancer	72 (26.2)	58 (80.6)	14 (19.4)		
Place of Residence				2.705	0.100
Rural	48 (17.5)	28 (58.3)	20 (41.7)		
Urban	227 (82.5)	160 (70.5)	67 (29.5)		
Type of Co-residence				4.389	0.222
Living with spouse only	201 (73.1)	144 (71.6)	57 (28.4)		
Living with parents-in-law	48 (17.5)	27 (56.3)	79 (43.8)		
Living with one's own parents	11 (4.0)	7 (63.6)	4 (36.4)		
Living with others	15 (5.5)	10 (68.4)	5 (31.6)		
Monthly household Income				-4.777	<0.001
< ¥5000	29 (10.5)	11 (37.9)	18 (62.1)		
¥5000–9999	94 (34.2)	56 (59.6)	38 (40.4)		
¥10,000–19,999	88 (32.0)	68 (77.3)	20 (22.7)		
≥ ¥20,000	64 (23.3)	53 (82.8)	11 (17.2)		
Has children				0.576	0.750
None	214 (77.8)	148 (69.2)	66 (30.8)		
Has boy	29 (10.5)	20 (69.0)	9 (31.0)		
Has girl	32 (11.6)	20 (62.5)	12 (37.5)		
Payment Method				5.933	0.015
Medical insurance	177 (64.4)	130 (73.4)	47 (26.6)		
Self-payment	98 (35.6)	58 (59.2)	40 (40.8)		
Is the only child				2.847	0.092
Yes	36 (13.1)	29 (80.6)	7 (19.4)		
No	239 (86.9)	159 (66.5)	80 (33.5)		
Is the husband the only child				1.648	0.199
Yes	50 (18.2)	38 (76.0)	12 (24.0)		
No	225 (81.8)	150 (66.7)	75 (33.3)		

Note: Statistical significance was set at $P < 0.1$.

Table 2 Infertility-Related Characteristics of the Women with Infertility (N = 275)

Characteristics	All Women (n = 275)	Mild Stigma (n = 188)	Moderate/Severe Stigma (n = 87)	χ^2/Z	P
Duration of being diagnosed with infertility (Years)				-3.689	<0.001
≤2	157 (57.1)	119 (75.8)	38 (24.2)		
3–5	86 (31.3)	57 (66.3)	29 (33.7)		
≥6	32 (11.6)	12 (37.5)	20 (62.5)		
Duration of infertility treatment (Years)				-3.561	<0.001
≤2	194 (70.5)	145 (74.7)	49 (25.3)		
3–5	66 (24.0)	36 (54.5)	30 (45.5)		
≥6	15 (5.5)	7 (46.7)	8 (53.3)		

(Continued)

Table 2 (Continued).

Characteristics	All Women (n = 275)	Mild Stigma (n = 188)	Moderate/Severe Stigma (n = 87)	χ^2/Z	P
Ever been pregnant				0.338	0.561
Yes	132 (48.0)	88 (66.7)	44 (33.3)		
No	143 (52.0)	100 (69.9)	43 (30.1)		
Infertility factors				4.443	0.349
Ovarian factors	64 (23.3)	40 (62.5)	24 (37.5)		
Tubal factors	55 (20.0)	37 (67.3)	18 (32.7)		
Uterine factors	12 (4.4)	6 (50.0)	6 (50.0)		
Chromosomal or immune factors	16 (5.8)	11 (68.8)	5 (31.3)		
Unknown reasons	128 (46.5)	94 (73.4)	34 (26.6)		
Is her husband healthy in terms of reproduction				0.004	0.953
Yes	208 (75.6)	142 (68.3)	66 (31.7)		
No	67 (24.4)	46 (68.7)	21 (31.3)		
Undergoing IVF treatment				3.849	0.050
Yes	144 (52.4)	82 (62.6)	49 (37.4)		
No	131 (47.6)	106 (73.6)	38 (26.4)		
Having hope for the treatment				6.308	0.043
Yes	199 (72.4)	143 (71.9)	56 (28.1)		
Uncertain	60 (21.8)	38 (63.3)	22 (36.7)		
No hope	16 (5.8)	7 (43.8)	9 (56.3)		
Will continue treatment given the current prognosis				4.160	0.041
Yes	256 (93.1)	179 (69.9)	77 (30.1)		
No	19 (6.9)	9 (47.4)	10 (52.6)		
Factors hindering medical treatment				8.479	0.076
No time	44 (16.0)	30 (68.2)	14 (31.8)		
No improvement in treatment	66 (24.0)	46 (69.7)	20 (30.3)		
Expense	40 (14.5)	22 (55.0)	18 (45.0)		
Inconvenient transportation	6 (2.2)	2 (33.3)	4 (66.7)		
Unclear	119 (43.3)	88 (73.9)	31 (26.1)		

Note: Statistical significance was set at $P < 0.1$.

Abbreviation: IVF, in vitro fertilization.

Stigma and Infertility-Related Stress

Table 3 presents the descriptive statistics of the study variables. In this study, the ISS score for women with infertility was 54.00 (38.00, 68.00), indicating a mild level. A total of 68.4% ($n = 188$) of women reported experiencing mild stigma (ISS scores < 63), whereas 26.9% ($n = 74$) had moderate stigma (ISS scores ranging from 64 to 100 points), and 4.7% ($n = 13$) experienced severe stigma (ISS scores ≥ 101). The social withdrawal dimension of stigma had the highest item median score, followed by the family stigma dimension, the self-devaluation dimension, and the public stigma dimension (Table 3).

The M-FPI score for the women with infertility was 143.00 (122.00, 157.00), at the moderate level. 3.6% ($n = 10$), 89.1% ($n = 245$), and 7.3% ($n = 20$) of the women had a mild, moderate, and severe level of infertility-related stress, respectively. The scores for each dimension of infertility-related stress, from high to low, were the need for parenthood dimension, rejection of childless lifestyle dimension, social concern dimension, relationship concern dimension, and sexual concern dimension.

The Correlations Between Stigma and Infertility-Related Stress

Table 4 shows the results of Spearman analysis. The results showed that the total stigma score positively correlated with the total score of fertility stress and five dimensions.

Table 3 Scores and Ranking of Stigma and Infertility-Related Stress in Women with Infertility (N = 275)

Scale Scores	Total Scores Median (P25, P75)	Item Score Median (P25, P75)	Ranking by Item Score
ISS total score	54.00 (38.00, 68.00)	2.00 (1.41, 2.52)	
Self-devaluation	14.00 (7.00, 17.00)	2.00 (1.00, 2.43)	2
Social Withdrawal	13.00 (10.00, 17.00)	2.60 (2.00, 3.40)	1
Public stigma	17.00 (9.00, 21.00)	1.89 (1.00, 2.33)	4
Family stigma	12.00 (6.00, 17.00)	2.00 (1.00, 2.83)	2
M-FPI total score	143.00 (122.00, 157.00)	3.10 (2.65, 3.41)	
Social concern	30.00 (25.00, 34.00)	3.00 (2.50, 3.40)	3
Relationship concern	27.00 (20.00, 33.00)	2.70 (2.00, 3.30)	4
Sexual concern	21.00 (15.00, 25.00)	2.63 (1.88, 3.13)	5
Need for parenthood	36.00 (30.00, 42.00)	3.60 (3.00, 4.20)	1
Rejection of childless lifestyle	28.00 (24.00, 33.00)	3.50 (3.00, 4.13)	2

Table 4 Correlation Between ISS and M-FPI Scores (N = 275)

Variables	Total Scores of M-FPI	Social Concern	Relationship Concern	Sexual Concern	Need for Parenthood	Rejection of Childless Lifestyle
Stigma	0.70*	0.64*	0.52*	0.56*	0.51*	0.18*

Note: *Statistical significance was set at $P < 0.05$.

Abbreviation: M-FPI, the Mandarin version of the Fertility Problem Inventory.

Table 5 Predictors of the Stigma in Women with Infertility (N = 275)

Variable	B	SE	Wald χ^2	P	Adjust OR (95% CI)
Constant	-12.13	2.51	23.32	<0.001	< 0.001
Social concern dimension of Infertility Stress	0.18	0.04	17.07	<0.001	1.19 (1.10–1.30)
Relationship concern dimension of Infertility Stress	0.90	0.03	7.59	0.006	1.09 (1.03–1.16)
Need for parenthood dimension of Infertility Stress	0.16	0.03	27.81	<0.001	1.171 (1.10–1.24)

Predictors of Stigma Among Chinese Women with Infertility

Table 1 and Table 2 demonstrate the results of the univariate analysis. The variables that had significant associations with stigma included education, employment status, monthly household income, medical payment method, duration of infertility, duration of infertility treatment, history of IVF treatment, self-assessment of treatment prospects, and willingness to continue treatment.

Variables significantly correlated with stigma were retained in the multivariable logistic regression model. The education, employment, monthly household income, payment method for medical expenses, duration of being diagnosed with infertility, duration of infertility treatment, whether receiving IVF treatment, having confidence in treatment, and whether to continue treatment in the future were adjusted in the model. The best-fit regression model revealed that the scores of the social concern dimension (odds ratio [OR] = 1.19, 95% confidence interval [CI] = 1.10–1.30, $P < 0.001$), relationship concern dimension (OR = 1.09, 95% CI = 1.03–1.16, $P = 0.006$), and need for parenthood dimension (OR = 1.17, 95% CI = 1.10–1.24, $P < 0.001$) of the infertility-related stress were predictors of stigma in women with infertility (Table 5).

Discussion

Shenzhen is in southeastern China and is near Hong Kong, China. Since 1980, Shenzhen has developed from a small fishing village into a modern metropolis. Shenzhen residents are among the Chinese who are most influenced by Western

ideas. According to our knowledge, this is the first study to explore the stigma and its predictors among women with infertility in Shenzhen, China. The present study found that although the women with infertility had an average level of mild stigma, 31.6% of women had moderate to severe levels of stigma. The results suggested that stigma was still prevalent in women with infertility in Shenzhen, China.

We have compared the results of our study to those of other studies. The median stigma score in the present study was lower than that in another study conducted in Zhengjiang Province, China.¹⁶ Zhang et al¹⁶ had surveyed in Zhejiang Province, China, in 2011 and found that the ISS score was 66.39 ± 21.96 , indicating that women with infertility had a moderate level of stigma. Possible reasons for these differences may be due to economic development and changing perspectives on infertility in recent years in China. In recent years, Chinese people's demand for fertility has decreased, and an increasing number of people accept infertility, as indicated by the decline in the national fertility rate. We also compare our results with those of other countries. Kaya and Oskay reported¹⁷ that the stigma level of women with infertility in Iran was mild. Yilmaz and Kavak reported¹⁸ that the stigma of women with infertility in Turkey was at a moderate level. These differences in different countries or regions may be due to regional, economic, and cultural factors.

Among the four dimensions of stigma in women with infertility, social withdrawal ranked first, family stigma and self-devaluation dimensions ranked second, and public stigma ranked fourth, which was consistent with the previous study.¹⁶ It may be related to the fact that Chinese women with infertility in Shenzhen are still impacted by traditional Chinese culture, which holds that having no children is considered the greatest tragedy; thus, they were sensitive to their condition, afraid of suspicion and inquiry from the outside world, and deliberately reduced communication with the outside world. Moreover, in current mainland China, some young couples still live with their parents-in-law. The older generations usually have greater expectations for the birth of their offspring; therefore, the dimension of family stigma ranked second. Since the founding of the People's Republic of China, significant social changes have occurred, and women's status has significantly improved. However, the change in the concept of fertility has lagged behind the development of the economy. The traditional family concept and the concepts of marriage and childbearing are deeply rooted in Chinese culture. Women with infertility usually have low self-esteem; as a result, the score on the self-devaluation dimension is relatively high.¹⁶ The score on the public stigma dimension ranked last, possibly because the public's acceptance of infertility has increased with the development of the economy. At the same time, because of the rapid pace of life in metropolitan areas, the surrounding population has paid less and less attention to whether others have children. This is more significant in cities such as Shenzhen, which have large floating populations in mainland China.

The present study also found that the women with infertility had a moderate level of infertility-related stress, which was consistent with a previous study conducted in central China in 2019.¹⁹ This result may suggest that although China's fertility concept has undergone significant changes, the traditional culture of having a child is still prevalent in Chinese families. Although the stigma experienced by Chinese women with infertility in Shenzhen may be decreased, their infertility-related stress level has not changed significantly, suggesting that the infertility-related stress in women with infertility still cannot be ignored.

We also compared our results to those of other countries. A survey conducted by Donkor in Ghana in 2007 indicated that the infertility-related stress score of women with infertility was 172.5 ± 34.2 ;² a study in Tanzania in 2021 also demonstrated that the infertility-related stress score of women with infertility was 158.57 ± 36.29 .⁸ A survey conducted by Slade et al³ in the UK in 2007 showed that the infertility-related stress score of women with infertility was 143.69 ± 33.8 . The present study's results were close to the results of Slade's survey in the United Kingdom and lower than those of Donkor and Groene in Ghana and Tanzania, respectively. These differences in infertility-related stress may be related to the various economic developments and the accessibility of medical resources in different countries.

In our study, the levels of stigma experienced by women with infertility were significantly positively correlated with infertility-related stress, which was consistent with the study results of Donker and Slade.^{2,3} Women with high levels of infertility-related stress may suffer from greater economic pressure or interpersonal pressure, which can result in psychological disorders, decreased self-esteem, and increased self-deprecation, leading to social withdrawal and higher levels of stigma.

Through a multi-factor analysis of stigma, we found that the social concern dimension, the relationship concern dimension, and the need for parenthood dimension of the infertility-related stress were predictors of stigma. The social concern dimension had a positive predictive effect on the stigma score. The treatment of assisted pregnancy is

complicated and lengthy, which leads to a decrease in social interaction and the disconnection of one's life from others among women with infertility. At the same time, some women with infertility will also deliberately reduce their social behaviour. While avoiding society, they also miss some types of social support; this reduction in social support is not conducive to reducing stigma.²⁰ In contrast, for women who choose not to have a confidential attitude towards infertility, they can obtain more social support and help, with the result that the degree of stigma is relatively low.

The relationship concern dimension of infertility-related stress had a positive predictive effect on the stigma score. Women with infertility worry that infertility will lead to a bad relationship with their husbands and could even lead to divorce or affect their future spouse selection.²¹ Women with a good husband–wife relationship can experience more care and understanding from their husbands. Husbands can provide practical and psychological support and can face problems and bear the results with their wives, thus significantly reducing their wives' concerns and anxiety during infertility treatment.

The need for parenthood dimension had a positive predictive effect on the stigma. Mother is a unique role for women, and many people still regard fertility as a realisation of the meaning of life. Influenced by Chinese traditional culture, women with infertility will still label themselves as “infertile”.²² The stronger the idea of “becoming a parent” is, the more self-doubt and anxiety can result. The degree of stigma will also increase accordingly.

In our study, the score of the rejection of the childless lifestyle dimension of infertility-related stress ranked high; however, the rejection of the childless lifestyle dimension was not the predictor of stigma. In 2019, a study by Qian et al²³ in Anhui Province, China, showed that the rejection of childless lifestyle dimension in the fertility stress questionnaire was an essential factor in predicting the level of stigma, which was inconsistent with the results of this study. This difference may be due to the different regions assessed and changes in fertility concepts. Therefore, whether the score for rejecting the childless lifestyle dimension has a crucial predictive effect on stigma remains to be verified in further research.

The findings of the present study have important implications. The high level of infertility-related stress and the high prevalence of moderate to severe levels of stigma in women with infertility indicated the necessity of intervention. Community education programs on rational infertility knowledge and targeted nursing interventions could be applied. Considering that many women with infertility come to the hospitals to get treatment, integrating psychosocial support into fertility clinics or developing culturally sensitive counseling tools may help reduce their infertility-related stress and stigma.

This study has some limitations. Firstly, although infertility occurs in couples that include women and men, the present study only included women. Moreover, the women with infertility in the present study were from a top-tier hospital in Shenzhen, China. It may not represent rural areas or populations from less economically developed regions. Moreover, in the sociodemographic and infertility-related information data sheet, the women's religious beliefs, medical history, abortion history, and other related information were not investigated, which may have overlooked some influencing factors. Future research could explore the experiences of men with infertility and include a broader geographic sample to enhance the representativeness of the findings.

Conclusion

Although the generalizability of this study is limited, the findings of the present study showed that women with infertility experienced mild stigma and moderate infertility-related stress. As the level of infertility-related stress increased in women with infertility, the level of stigma also increased. Psychosocial strategies aimed at reducing infertility-related stress may help mitigate perceived stigma in this population. Healthcare providers should address psychological factors alongside medical treatment to support the mental health of women with infertility.

Data Sharing Statement

The data supporting this study's findings are available from the corresponding author, Lingling Gao, upon reasonable request.

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Author Contributions

All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis and interpretation, or all these areas; took part in drafting, revising or critically reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

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The authors have declared no conflicts of interest in this work.

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