

Study on Fertility Intention and Influencing Factors of Single Women of Childbearing Age in Shiyan City

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Abstract: With social transformation and evolving attitudes toward marriage and childbearing, the fertility intentions of single women of childbearing age have become increasingly prominent. This study investigates fertility intentions and influencing factors among single women of childbearing age in Shiyan City, providing insights for strategy development. Through random sampling, 256 single women from five districts were selected as subjects. Data were collected on personal characteristics, social attributes, family circumstances, and fertility intentions, with analysis conducted using multiple logistic regression. Results indicate that age, monthly income, health status, household income coverage capacity, and satisfaction with maternity leave strategies significantly affect fertility intentions (all $P < 0.05$). The analysis reveals that estimated child-rearing costs serve as a protective factor for fertility intentions ($OR = 0.71$). The study highlights that low fertility intentions persist among single women of childbearing age in Shiyan City, with child-rearing expenses being a key determinant influencing their decision-making.

Keywords: Single Pregnant Women; Fertility Intention; Influencing Factors

1. Introduction

With China's social transformation and evolving attitudes toward marriage and childbearing, the fertility intentions of single women of childbearing age have become a prominent focus in demographic studies. A survey by the National Health Commission reveals that the primary cause of declining fertility is the decrease in first-child birth rates, rather than insufficient willingness to have second or third children.^{[1][2]} This phenomenon has prompted researchers to examine fertility intentions among potential childbearing populations, including

single women, aiming to comprehensively understand the complex drivers behind low fertility rates.^{[3][4]} Traditional fertility research has predominantly focused on married women, while paying insufficient attention to single women of childbearing age, creating a research gap. This study analyzes the fertility intentions and influencing factors of single women of childbearing age in Shiyan City, providing new insights for improving local fertility support systems and offering reference for refining fertility strategies.

2. Data and Methods

2.1 Data Sources

The data sources were single women of childbearing age with household registration or permanent residence in Shiyan City. Five districts in Shiyan City were selected by random sampling, and online questionnaires and offline interviews were conducted to investigate and collect data of single women of childbearing age in Shiyan City.

2.2 Method

2.2.1 Sample size determination

Based on Kendall et al.'s sample estimation method, the sample size for multivariate analysis should be 10-20 times the number of independent variables. In this study, with 11 independent variables, the maximum sample size calculated as $20 \times 11 = 220$ cases was used as the standard. Considering regional factors, a total of 256 valid questionnaires were ultimately collected.

2.2.2 Research tools

The survey questionnaire was independently designed by researchers based on extensive literature review, covering the following aspects: Personal characteristics: age, education level, monthly income, health status, etc.; Social characteristics: occupational type, etc.; Family characteristics: household income coverage for

post-childbearing expenses, parental childcare support, estimated costs for raising children to adulthood, satisfaction with maternity leave strategies, and satisfaction with local childcare services.

2.2.3 Research methods

In this study, the ideal number of children for single women of childbearing age is used as the dependent variable, which belongs to an ordered categorical type and is specifically divided into: 0 children, 1 child, 2 children, 3 or more children. Given the characteristics of this variable, a multiple ordered logistic regression model was employed to analyze data related to factors influencing fertility intentions among single women of childbearing age in Shiyen City. The hypothesis is that the ideal number of children for single women of childbearing age is a linear function of factors, expressed as:

$$Y_i = \sum_{k=1}^k \beta_k + X_{ik} + \varepsilon_i = Z_i + \varepsilon_i \quad [5]$$

Here, represents coefficients related to variables ($k=1, \dots, k$), and ε_i is the error term. If $k > 0$, an increase in the $-th$ factor value leads to a decrease in fertility intention; conversely, if $k < 0$, it results in an increase in fertility intention.

2.3 Statistical Analysis

The collected data were processed using SPSS27.0 statistical software. The analysis commenced with a chi-square test, followed by preliminary screening of selected independent variables based on test results and subsequent analysis of the screening outcomes. Subsequently, multiple logistic regression was employed to analyze fertility intentions among single women of childbearing age, constructing a multivariate logistic regression model. Independent variables were further screened according to model significance. Notably, $P < 0.05$ indicates statistically significant differences.

3. Results

3.1 Single Maternal of Childbearing Age Women's Fertility Intention

Single-factor analysis of fertility intention was

conducted on 256 valid samples, with ideal child counts of 1.0, 2.0, 3.0, and 4.0 accounting for 8.59% (22 cases), 49.61% (127 cases), 35.55% (91 cases), and 6.25% (16 cases) respectively. The analysis revealed significant correlations between fertility intention and age, education level, monthly income, health status, family income coverage ability, satisfaction with maternity leave strategies, and estimated child-rearing costs (all $P < 0.05$). Women aged 26-30 demonstrated the strongest fertility intention (48.82%), while those with higher incomes (monthly income 5,000 yuan) showed stronger willingness to have children. Notably, higher estimated child-rearing costs significantly reduced fertility intention. Additionally, 43.96% of women with "very good" health status chose to have three children, and 71.43% of those satisfied with maternity leave strategies preferred having more children (71.43% chose three), as detailed in Table 1.

3.2 Multivariate Logistic Regression Analysis of Reproductive Intentions among Single Women of Childbearing Age

Using reproductive intention (ideal number of children) (1.0=0, 2.0=1, 3.0=2, 4.0=3+), age (20-25=1 to 41-45=5). The multivariate logistic regression analysis revealed that household income coverage capacity (OR=2.59, 95% CI: 1.97-3.40) and individual monthly income (OR=1.68, 95%CI:1.33-2.13) are significant positive predictors of fertility intention, with their impact intensifying as economic levels rise. For each additional age group, fertility intention increases by 46% (OR=1.46, 95%CI: 1.21-1.77). Conversely, every tier increase in estimated child-rearing costs reduces fertility intention by 29% (OR=0.71, 95%CI: 0.59-0.85). The model demonstrates overall significance ($\chi^2=183.72$, $P < 0.001$), explaining 38% of fertility intention variation (Nagelkerke $R^2=0.38$). These findings indicate that economic security and advancing age are core drivers of fertility intention among single women of childbearing age, while high child-rearing costs act as key inhibitors. Specific variable coefficients are detailed in Table 2, with full analysis presented in Table 3.

Table 1. Single Factor Analysis of Fertility Intention of Single Women of Childbearing Age

Variable	Classify	Ideal number of children (%)				χ^2/F	P price
		1.0(n=22)	2.0(n=127)	3.0(n=91)	4.0(n=16)		
Age (years)	20-25	8(36.36)	22(17.32)	9(9.89)	0(0.00)	63.525	<0.001***
	26-30	5(22.73)	62(48.82)	27(29.67)	5(31.25)		
	31-35	6(27.27)	36(28.35)	21(23.08)	1(6.25)		

	36-40	3(13.64)	5(3.94)	20(21.98)	5(31.25)		
	41-45	0(0.00)	2(1.57)	14(15.38)	5(31.25)		
Record of formal schooling	High school and below	6(27.27)	15(11.81)	13(14.29)	0(0.00)	17.773	0.038*
	Junior college education	9(40.91)	52(40.94)	28(30.77)	8(50.00)		
	Undergraduate course	7(31.82)	52(40.94)	40(43.96)	4(25.00)		
	Master degree or above	0(0.00)	8(6.30)	10(10.99)	4(25.00)		
Vocational type	In system	3(13.64)	26(20.47)	26(28.57)	1(6.25)	37.640	<0.001***
	Enterprise	9(40.91)	72(56.69)	37(40.66)	8(50.00)		
	Liberal professions	9(40.91)	19(14.96)	7(7.69)	1(6.25)		
	Privately or individually-owned business	1(4.55)	10(7.87)	21(23.08)	6(37.50)		
Personal monthly income	Under 3000 yuan	9(40.91)	4(3.15)	0(0.00)	0(0.00)	257.286	<0.001***
	3000-5000 yuan	10(45.45)	85(66.93)	10(10.99)	0(0.00)		
	5000-10000 yuan	3(13.64)	35(27.56)	67(73.63)	3(18.75)		
	10,000-20,000 yuan	0(0.00)	3(2.36)	14(15.38)	8(50.00)		
	20,000 yuan or above	0(0.00)	0(0.00)	0(0.00)	5(31.25)		
Health condition	Beyond compare	0(0.00)	19(14.96)	40(43.96)	11(68.75)	226.167	<0.001***
	Preferably	1(4.55)	61(48.03)	50(54.95)	3(18.75)		
	Same as	5(22.73)	46(36.22)	1(1.10)	0(0.00)		
	The comparison is poor	10(45.45)	1(0.79)	0(0.00)	2(12.50)		
	Very bad	6(27.27)	0(0.00)	0(0.00)	0(0.00)		
Family income coverage capacity	Absolutely	0(0.00)	20(15.75)	53(58.24)	15(93.75)	212.625	<0.001***
	Pay one's way	3(13.64)	98(77.17)	38(41.76)	1(6.25)		
	There are difficulties	16(72.73)	9(7.09)	0(0.00)	0(0.00)		
Loan situation	Housing loan	5(22.73)	23(18.11)	30(32.97)	5(31.25)	14.911	0.246
	Auto loan	9(40.91)	50(39.37)	27(29.67)	5(31.25)		
	Mortgage and car loans	5(22.73)	29(22.83)	26(28.57)	2(12.50)		
	Other	1(4.55)	16(12.60)	5(5.49)	3(18.75)		
Influence of traditional ideas	Exert a tremendous influence	0(0.00)	0(0.00)	5(5.49)	0(0.00)	22.466	0.033*
	The impact is significant	2(9.09)	3(2.36)	4(4.40)	2(12.50)		
	Same as	5(22.73)	23(18.11)	15(16.48)	2(12.50)		
	The impact is small	7(31.82)	42(33.07)	15(16.48)	5(31.25)		
	Make no difference	8(36.36)	59(46.46)	52(57.14)	7(43.75)		
Maternity leave satisfaction	Very dissatisfied	8(36.36)	7(5.51)	3(3.30)	0(0.00)	90.250	<0.001***
	Discontent	6(27.27)	46(36.22)	3(3.30)	0(0.00)		
	Satisfied	2(9.09)	56(44.09)	65(71.43)	7(43.75)		
	Very satisfied	6(27.27)	18(14.17)	20(21.98)	9(56.25)		
Estimated maintenance costs	Under 500,000 yuan	13(59.09)	17(13.39)	0(0.00)	0(0.00)	76.544	<0.001***
	500,000 to 1 million	7(31.82)	54(42.52)	35(38.46)	6(37.50)		
	\$1 million to \$2 million	2(9.09)	55(43.31)	46(50.55)	8(50.00)		
	More than \$2 million	0(0.00)	1(0.79)	10(10.99)	2(12.50)		
Childcare service satisfaction	Very dissatisfied	4(18.18)	8(6.30)	0(0.00)	0(0.00)	68.709	<0.001***
	Discontent	7(31.82)	25(19.69)	2(2.20)	0(0.00)		
	Same as	10(45.45)	40(31.50)	19(20.88)	1(6.25)		
	Satisfied	1(4.55)	43(33.86)	56(61.54)	11(68.75)		
	Very satisfied	0(0.00)	11(8.66)	14(15.38)	4(25.00)		

* $P < 0.05$, ** $P < 0.01$, *** $P < 0.001$

Table 2. Variable Assignment Description

Classify	Variable	Variable name	Assignment explanation	Type of variable
Fertility desire	Ideal number of children to have	Y	1.0=1, 2.0=2, 3.0=3, 4.0=4	The dependent variable, the continuous variable

Personal characteristics	Age (years)	X1	20-25=1, 26-30=2, 31-35=3, 36-40=4, 41-45=5	continuous variable
	record of formal schooling	X2	High school and below = 1, college = 2, undergraduate = 3, master's degree or above =4	continuous variable
	Personal monthly income	X3	3000 yuan below = 1, 3000-5000 yuan = 2, 5000-10000 yuan = 3, 10000-20000 yuan = 4, 20000 yuan and above =5	continuous variable
	health condition	X5	Very bad = 1, relatively bad = 2, average = 3, good = 4, very good =5	Continuous variable (reverse)
Social characteristics	vocational type	X4	Institutional = 1, enterprise = 2, freelance = 3, self-employed =4	classified variable
Family characteristics	Household income covers post-fertility expenses	X6	Complete inability = 0, difficulty = 1, barely able to maintain = 2, completely able =3	continuous variable
	Elderly parenting support	X7	Pay required = 0, no support = 1, occasional help = 2, full support =3	continuous variable
	Estimate the cost of raising a child to adulthood	X8	Less than 500,000 yuan = 1, 500,000-1,000,000 = 2, 1,000,000-2,000,000 = 3, 2,000,000 + =4	continuous variable
	Maternity leave satisfaction	X9	Very dissatisfied = 1, dissatisfied = 2, satisfied = 3, very satisfied =4	continuous variable
	Citywide satisfaction with childcare services	X10	Very satisfied =1, dissatisfied =2, average =3, satisfied =4, very satisfied =5	continuous variable
Classify	variable	variable name	Assignment explanation	type of variable

Table 3. Results of Multiple Logistic Regression Analysis (Dependent Variable: Fertility Intention 2.0 vs. <2.0)

Variable	Coefficient	Standard error	Dominance ratio OR	95% confidence interval	P price
Age (years)	0.38	0.10	1.46	[1.21, 1.77]	<0.001***
Record of formal schooling	0.29	0.08	1.34	[1.14, 1.57]	<0.001***
Personal monthly income	0.52	0.12	1.68	[1.33, 2.13]	<0.001***
Health condition	0.21	0.07	1.23	[1.07, 1.42]	0.003**
Family income coverage capacity	0.95	0.14	2.59	[1.97, 3.40]	<0.001***
Maternity leave satisfaction	0.17	0.06	1.19	[1.06, 1.34]	0.004**
Estimated maintenance costs	-0.34	0.09	0.71	[0.59, 0.85]	<0.001***
Constant	-2.87	0.42	0.06	-	<0.001***

* $P < 0.05$, ** $P < 0.01$, *** $P < 0.001$

4. Discussion

Since the implementation of China's three-child strategy, the national birth rate has continued its downward trend, with the natural population growth rate in 2021 declining by 1.11^[6] compared to 2020. As the aging population accelerates, China will face the challenge of demographic imbalance for a considerable period in the future, which will exert pressure on economic development.

According to the seventh national population

census in Shiyan City, the city's permanent resident population stands at 3,209,004. The demographic breakdown shows: 599,932 (18.70%) aged 0-14; 1,998,483 (62.28%) aged 15-59; and 610,589 (19.03%) aged 60 and above (including 451,977 aged 65 and above, accounting for 14.08%). Compared with the sixth national census in 2010, the proportion of 0-14-year-olds increased by 3.63 percentage points, while that of 15-59-year-olds decreased by 9.28 percentage points. Notably, the proportions of both 60+ and 65+ populations

rose by 5.65 and 5.54 percentage points respectively^[7] (data from Shiyang Municipal Bureau of Statistics). This trend underscores accelerating population aging. In modernization processes, fertility decisions among single women of childbearing age are influenced by multiple factors including traditional family values and contemporary social norms.

The fertility intention of single women of childbearing age in Shiyang City is influenced by multiple factors. Economic pressure, as the primary constraint, significantly affects their fertility decisions. Under limited time, energy and material conditions, people pay more attention to the quality of children's growth than the number of children^[8].

The high cost of child-rearing, housing pressures, and uncertainties about future economic prospects have made many single women cautious about having children. Meanwhile, single women pursuing career development often face the conflict between childbirth and professional advancement. Childbearing may lead to career interruptions, which could affect income levels and career prospects. This has prompted many women to delay or even abandon having children. Research indicates that establishing a family fertility support system requires dual approaches. First, creating economic subsidy mechanisms and refining maternity leave strategies to ensure full implementation of legally mandated parental leave entitlements including maternity, paternity, and childcare leave while advocating for gender equality and encouraging shared parenting responsibilities. Second, enhancing childcare infrastructure: OECD countries have boosted fertility rates by building childcare facilities and promoting private childcare services. This involves developing inclusive childcare systems that support private providers offering full-day, half-day, or temporary care options, while strengthening quality oversight. Resources should be consolidated to provide comprehensive parenting support for families in need, fostering inter-family, community, and institutional collaboration. Establishing professional certification mechanisms for childcare workers with clear career progression pathways will elevate industry recognition. Additionally, government subsidies and assistance programs should be strengthened, providing financial aid to economically

disadvantaged families and creating emergency relief channels for those facing exceptional hardships.

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