(RESEARCH ARTICLE)

Factors affecting women's first childbearing age limit (based on Colombo District)

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Abstract

This study explores the determinants influencing the age at which women have their first child in the Colombo district of Sri Lanka. Drawing upon demographic, social, and economic factors, the research employs a mixed-methods approach, including demographic analysis, chi-square analysis, multiple regression analysis, and literature review. Findings reveal that factors such as education level, age at marriage, occupation status, and monthly household income significantly impact the age at first childbirth. Specifically, education emerges as a primary determinant, with higher levels of education associated with delayed childbirth. Additionally, residential location and type of marriage play roles in shaping the timing of the first childbirth. The study underscores the multifaceted nature of these determinants and highlights the importance of understanding the interplay between demographic, social, and economic factors in informing targeted interventions to promote reproductive health and well-being among women in Sri Lanka. Based on the conclusions drawn, recommendations are provided for implementing education initiatives, fostering economic empowerment, strengthening family planning services, supporting love marriages, and advocating for policy interventions. Implementation of these recommendations can address underlying factors influencing the age at which women have their first child, ultimately promoting women's health, empowerment, and well-being in the Colombo district and beyond.

Keywords: First Childbearing; Age Limit; Factors; Multiple Regression Analysis

1. Introduction

As noted by Bogue (1969), fertility holds a pivotal role in the realm of population studies, as it directly influences the survival and biological replenishment of human societies, consequently impacting population growth positively. Defined sociologically, fertility pertains to the number of live births per woman. The onset of a woman's biological ability to bear children typically coincides with adulthood or puberty (Bongaarts, 1982), initiating a reproductive phase that generally spans from around 15 years of age to approximately 49 years of age, with menopause marking the cessation of this capability around the age of 50.

James (1983) emphasizes that in numerous countries, including Sri Lanka, the recognized reproductive age bracket for women falls within the range of 15 to 49 years. Balbo and Mills (2011) underscore the significance of women's timing of first childbearing, highlighting its profound implications for population dynamics. Consistently delaying or forgoing childbirth can precipitate population decline and aging, as elucidated by Balbo and Mills (2011). Furthermore, a woman's age at first delivery plays a critical role in shaping the total fertility rate, which serves as a key determinant of population growth (Bauer, McKinnon & Kerr, 2015). The phenomenon of delayed childbearing observed in many countries has contributed to dwindling fertility rates, ultimately leading to subdued population growth (Bauer, McKinnon & Kerr, 2015). Additionally, delaying the onset of childbearing exacerbates intergenerational gaps (Balbo & Mills, 2011).

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As highlighted by Bumpass, Rindfuss, and Jamosik (1978), various factors such as career achievement, marital stability, and asset accumulation can positively impact a woman's health, as well as influence the spacing between children and the overall size of the household. Socioeconomic status holds a significant bias over the age at which women choose to have their first kid. Variables like educational completion, income level, and employment opportunities play pivotal roles in shaping women's decision-making processes. Typically, higher levels of education and greater economic stability prompt women to postpone childbearing as they prioritize their personal and professional aspirations (Mills, Rindfuss, McDonald & te Velde, 2011).

In both developing and developed nations, social class has emerged as a key determinant of the age at which women embark on motherhood. Balbo and Mills (2011) note that the global trend of increasing educational levels has contributed to declining fertility rates, thereby influencing the timing of marriage and first childbirth. Cultural and societal norms exert significant influence over women's age at first childbearing, with traditional gender roles, social expectations, and cultural values shaping perceptions of the ideal age for starting a family (Rindfuss & St. John, 1983). In some cultures, early childbirth may be encouraged or anticipated due to prevailing cultural norms and expectations.

Furthermore, in societies where gender equality and individual autonomy are prioritized, women may opt to delay childbearing to pursue personal ambitions, as emphasized by Bloom and Reddy (1986). The availability of reproductive health services, including contraceptives and birth control resources, emerges as a analytical element of women's timing of first childbirth. Adequate access to affordable reproductive healthcare licenses women to make informed decisions regarding family planning and the timing of their first child (Balbo & Mills, 2011). Conversely, restricted access to such services may lead to unintended or early pregnancies (Rossier, Hohmann, & Bernardi, 2012).

Therefore, this study aims to delve deeper into understanding the myriad factors influencing the age at which women experience their first childbirth.

2. Literature Review

As per the Sri Lanka Demographic and Health Survey (DHS) of 2016, the middle age at first delivery for Sri Lankan women stands at 25.7 years, showing a notable increase from the recorded median age of 24.7 years in the 2006 DHS report. This marked increase in the median age at first birth is a significant finding from the 2016 survey. Furthermore, the survey reveals variations in the median age at first birth across different districts of Sri Lanka, as well as between rural and urban areas. According to the 2016 DHS report, women residing in urban settings tend to delay their first childbirth, with a median age of 26.5 years, compared to 25.5 years for women in rural areas. Additionally, women in the plantation sector exhibit a median age at first birth of 24.5 years.

2.1. Demographic factors affecting women's age at first delivery

A study conducted in Tanzania revealed that the median age for women's first sexual intercourse was 16, correlating closely with their age at first childbirth. Interestingly, the study also found that three-quarters of mothers began childbearing during their teenage years. Ngalinda (1998) concluded that early initiation of sexual activity often translates to early childbirth and subsequently, higher fertility rates.

Similarly, research conducted by Chandrasekhar (2010) in high-fertility Bangladesh showed that women typically encounter sexual activity before reaching the age of 15. This early initiation into sexual relations consequently leads to premature childbirth and elevated fertility rates.

Furthermore, Menken (1972) highlights the significance of age at marriage as a demographic determinant influencing a woman's timing of first childbirth. Indeed, age at marriage has long been recognized as one of the key adjacent determinants affecting fertility patterns.

2.2. Sociological factors affecting women's age at first birth

According to Rindfuss and St. John (1983), education emerges as a primary determinant influencing the age at which women have their first kid. Increased years of education and accomplishment of academic degrees tend to delay childbearing, thereby reducing years dedicated to childbirth. Women who invest more time in their education are less inclined to marry and start a family at a younger age, as noted by Rabbi and Kabir (2013). Additionally, Kumar and Danabalan (2006) found that women with higher educational attainment tend to experience longer intervals between marriage and first childbirth, highlighting the influence of education on reproductive behaviors.

Moreover, the influence of women's education and literacy on reproductive choices is emphasized by Presser (1971), who identifies them as significant drivers of variations in reproductive behavior.

Lindner, Bary and Murphy (2001) argue that religious affiliation also plays a role in fertility patterns, noting that Muslims often exhibit higher fertility rates compared to non-Muslims. Catholic teachings, which discourage birth control, tend to favor larger families, while early marriage practices among Muslims contribute to larger family sizes, as discussed by Zajonc (1976). Chandrasekhar (2010) further observes that Muslim women are 1.14 times more likely to have their first child at a younger age compared to Hindu women, while Christians and adherents of other religions are less prone to early childbearing.

Furthermore, Thayaparan, Bandara, and Gunathilaka (2022) indicate that rural-dwelling women tend to have higher fertility rates compared to their urban counterparts. This disparity is attributed to potentially better knowledge and access to advanced contraceptives among urban women, as highlighted by Thayaparan, Bandara, and Gunathilaka (2022).

2.3. Economic factors influencing the age at first birth of a woman

Economic factors wield significant influence over the timing of a woman's first childbirth. Bloom and Reddy (1986) suggest that individuals are more inclined to delay marriage and parenthood as they prioritize their careers. In many societies, the financial standing or strength of a family plays a pivotal role in determining the age at which individuals choose to marry and start a family (Bulatao, 1984). Young women from impoverished backgrounds often seek older partners who can provide financial support, leading them to initiate pregnancy at a younger age (Anthony et al., 2000).

Furthermore, Kumar and Danabalan (2006) highlight a correlation between the prevalence of contraception and the age at which women begin childbearing. They observed an increase in contraceptive usage from 9.6 percent in 1975 to 53.6 percent in 2005, coinciding with a trend of younger age at first childbirth. Conversely, the absence of intentional contraception is identified as a driver of population growth.

3. Methods and Design

For this study, a sample of 92 was selected from clusters identified in the 2016 Demographic and Health Survey (DHS) of Sri Lanka. A random sampling approach was employed to select participants from the overall population. The population size was determined according to the dimensions of the Colombo district as documented in the DHS data. The Yamane method was utilized to compute the suitable sample size. Through this sampling technique, a sufficiently representative sample of women of reproductive age in Sri Lanka, particularly within the Colombo district, was obtained.

3.1. Statistical Analysis

3.1.1. Demographic Analysis

The largest proportion of the sample, constituting 37%, falls within the age group of 25-29 years, while 29.3% belong to the 30-34 age group. Conversely, the age bracket with the fewest women is 45-49 years, comprising only 4.3% of the sample. Additionally, 6.5% fall within the 20-24 age range, 16.3% are aged 35-39, 6.5% are aged 40-44, and 4.3% are aged 45-49.

Regarding the age at which women give birth to their first baby, the highest percentage (66%) in the Colombo district falls within the 25-29 age group, followed by 20% in the 20-24 age group. Additionally, 13% are in the 30-34 age group, while only 1% are in the 35-39 age group.

Residential location also appears to influence the age of first childbirth, with 74% of women residing in rural areas and 26% in urban areas. The type of marriage (whether love or arranged) also plays a role, with 63% of marriages resulting from love relationships and 37% from arranged marriages.

Furthermore, contraceptive use varies based on economic status and attitudes, with 89.1% of families reported to use contraceptives while 10.1% do not.

3.1.2. Chi-Square Analysis

Chi-Square analyses were conducted to assess the association of demographical, social and economic factors in determining the age limit at which the first child is born. Table 1 shows the results of the Chi-square test.

Table 1 Chi-square test for the study of determinants of age at first childbearing in women

Hypothesis	df	χ^2	P value	C value
H_{01}: Independence of the effect of educational level on the age at first birth of women.	9	88.849[a]	0.000	0.701
H_{02}: Independence of the effect of age of the marriage of women on the age at first birth.	9	97.790[a]	0.000	0.718
H_{03}: Independence of the effect of religion on the age at first birth of women.	9	12.077[a]	0.003	0.341
H_{04}: Independence of the effect of the type of women married on the age at first birth of women.	3	0.381[a]	0.944	0.064
H_{05}: Independence of the effect of the age of the husband on the age at first birth of women.	33	29.402[a]	0.647	0.492
H_{05}: Independence of the effect of the educational level of the husband on the age at first birth of women.	18	24.107[a]	0.152	0.455
H_{06}: Independence of women's use of birth control methods to determine the age at first birth of women.	3	3.009[a]	0.390	0.177
H_{07}: Independence of women's being employed to determine the age at first birth of women.	3	16.110[a]	0.001	0.386
H_{06}: Independence of monthly salary of the household to determine the age at first birth of women.	12	38.544[a]	0.000	0.543

Source: Survey data, 2023

When examining the independence of the variables on the influence of the factors affecting the determination of the age at the first baby of women, it can be concluded that the age of marriage has a greater effect on the purpose of the age of women at birth (χ^2= 97.790, P = 0.000). There is a strong relationship between these two variables (C = 0.718).

Then it can be demonstrated that education level has the greatest effect (χ^2= 88.849, P = 0.000). There is a strong relationship between these two variables (C = 0.718). It can be observed that the monthly income of the family affects determining the age at the birth of the first child (χ^2= 38.544, P = 0.000). It can also be observed that the employment status of women has influenced the determination of the age at the birth of the first child (χ^2= 16.110, P = 0.000). On the other hand, it can be concluded that the type of marriage has no effect on women's age at first birth (χ^2= 0.381, P = 0.944).

3.1.3. Multiple Regression Analysis

All variables must be categorized and entered into the model by grouping dummy variables. The covariance analysis model, with the first category as the reference group, can be expressed as follows:

$$Y = \beta 0 + \beta 1D1 + \beta 2D2 + \beta 3D3 + \beta 4D4 + \beta 5D5 + \beta 6D6 + \beta 7D7 + \beta 8D8 + \beta 9D9 + \beta 10D1 0 + \beta 11D11 + \beta 12D12 + \beta 13D13 + \beta 14D14 + U$$

The model was estimated with the baseline categories as follows: if the age of marriage falls within the range of 20-24, if the education level ranges from 1 to 10 grades, if the religion is Buddhist, if the individual is employed, and if the monthly income is less than 20,000. Table 2 shows the coefficients of the estimated model.

Table 2 Coefficients of the estimated model

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	23.046	1.159		19.027	0.000
D1	1.883	0.538	0.050	0.526	0.001
D2	3.367	1.057	0.121	1.293	0.000
D3	-3.894	1.606	-0.203	-2.424	0.068
D4	4.266	0.860	0.640	4.958	0.000
D5	4.710	0.784	0.841	6.011	0.000
D6	6.968	0.838	0.945	8.311	0.000
D7	-1.532	0.776	-0.185	-1.974	0.052
D8	0.055	0.889	0.006	0.061	0.951
D9	0.248	1.637	0.013	0.152	0.880
D10	0.651	0.589	0.116	1.106	0.272
D11	0.139	1.252	0.015	0.111	0.912
D12	-0.553	1.094	-0.082	-0.506	0.615
D13	0.279	1.164	0.049	0.240	0.811
D14	0.102	1.210	0.014	0.084	0.933
a. Dependent Variable: age at first birth					

Accordingly, the estimated model:

$$Y = 23.046 + 1.883D_1 + 3.367D_2 + 4.266D_4 + 4.710D_5 + 6.968D_6$$

$$(19.027) \quad (0.526) \quad (1.293) \quad (4.958) \quad (6.011) \quad (8.311)$$

$$(0.000) \quad (0.001) \quad (0.000) \quad (0.000) \quad (0.000) \quad (0.000)$$

After estimating a model, the goodness of fit of the parameter estimates must be checked before it can be used for forecasting or policy making. The coefficient of determination can be used for this test. The coefficient of determination is represented in table 3.

Table 3 Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.726[a]	0.637	0.611	2.102
a. Predictors: (Constant), D14, D9, D3, D6, D2, D8, D11, D7, D1, D4, D12, D10, D5, D13				

Source: Survey data, 2023

The R^2 value of the study has been 63.7%. A constructed regression model is a suitable model for making interpretations. Adjusted R^2 value is 61.1%. And since R^2 value and adjusted R^2 value are almost equal, the constructed multiple regression model is an ideal model for interpretation.

Table 4 Analysis of Variance (ANOVA)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	378.754	14	27.054	6.123	0.000[b]
	Residual	340.203	77	4.418		
	Total	718.957	91			
a. Dependent Variable: age at first birth						
b. Predictors: (Constant), D14, D9, D3, D6, D2, D8, D11, D7, D1, D4, D12, D10, D5, D13						

Source: Survey data, 2023

An analysis of variance (ANOVA) is used to test the overall variance of the estimated model. Here, the goodness of fit is considered. That is, the sig value determines whether the fitted model is statistically significant. The model is statistically reliable overall when the sig value is less than 0.05 under the 95% confidence level. As shown in Table 5, the sig value is 0.000 which means that the model is statistically reliable overall at a 95% confidence level.

Table 5 Testing Multicollinearity

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	23.046	1.159		19.027	0.000		
	D1	1.883	0.538	0.050	0.526	0.001	0.691	1.447
	D2	3.367	1.057	0.121	1.293	0.000	0.705	1.418
	D3	-3.894	1.606	-0.203	-2.424	0.068	0.875	1.142
	D4	4.266	0.860	0.640	4.958	0.000	0.368	2.715
	D5	4.710	0.784	0.841	6.011	0.000	0.314	3.183
	D6	6.968	0.838	0.945	8.311	0.000	0.476	2.102
	D7	-1.532	0.776	-0.185	-1.974	0.052	0.703	1.423
	D8	0.055	0.889	0.006	0.061	0.951	0.627	1.596
	D9	0.248	1.637	0.013	0.152	0.880	0.843	1.186
	D10	0.651	0.589	0.116	1.106	0.272	0.558	1.793
	D11	0.139	1.252	0.015	0.111	0.912	0.316	3.163
	D12	-0.553	1.094	-0.082	-0.506	0.615	0.236	4.242
	D13	0.279	1.164	0.049	0.240	0.811	0.145	6.886
	D14	0.102	1.210	0.014	0.084	0.933	0.208	4.797
a. Dependent Variable: age at first birth								

Source: Survey data, 2023

Before conducting multiple regression analyses based on the dependent variable and the independent variable, multicollinearity was tested between each independent variable. In this study, multicollinearity among the independent variables was assessed using the variance inflation factor (VIF) or tolerance (TOL) value. If the VIF value is greater than 10 and the TOL value is less than 0.1, the model has multicollinearity. Accordingly, in relation to the study, the VIF value of all the dependent variables is fewer than 10 and the TOL value is more than 0.1, so it can be concluded that there is no multicollinearity between all the independent variables.

4. Conclusion

Based on the conducted analyses, several key findings emerge regarding the determinants of the age at which women have their first kid in the Colombo district of Sri Lanka.

Firstly, demographic analysis reveals that the largest proportion of women falls within the age group of 25-29 years, both within the sample and among those giving birth to their first child. Moreover, residential location and type of marriage also seem to affect the age of first childbirth, with many women residing in rural areas and a significant portion entering into marriages based on love relationships. Secondly, the chi-square analysis highlights significant associations between various demographic, social, and economic factors and the age at first childbirth. Notably, factors such as education level, age at marriage, employment status, and monthly household income demonstrate strong relationships with the age at which women have their first child.

Finally, the multiple regression analysis further elucidates the impact of these factors, revealing that education level, age at marriage, employment status, and monthly household income are significant predictors of the age at first childbirth. The adjusted R-squared value of 61.1% indicates a good fit of the model, suggesting that these variables collectively explain a substantial portion of the variance in the age at first childbirth among women in the Colombo district.

In conclusion, the findings underscore the multifaceted nature of the determinants influencing the age at which women have their first child, emphasizing the interplay between demographic, social, and economic factors. Understanding these dynamics is crucial for informing targeted interventions aimed at promoting reproductive health and well-being among women in Sri Lanka.

Recommendation

Based on the conclusion drawn from the analyses, several recommendations can be made to address the factors influencing the age at which women have their first child in the Colombo district of Sri Lanka:

- Education Initiatives: Implement programs to enhance access to quality education, particularly for women, aiming to increase educational attainment levels. This could include initiatives such as scholarships, vocational training, and awareness campaigns to emphasize the importance of education in delaying childbirth and empowering women to make informed decisions about their reproductive health.
- Economic Empowerment: Foster economic opportunities for women, especially in rural areas, through skill development programs, microfinance initiatives, and entrepreneurship training. By improving financial stability and income levels, women may be better equipped to delay childbirth and pursue educational and career goals before starting a family.
- Family Planning Services: Strengthen family planning services and access to contraceptives, particularly in rural areas where access may be limited. Providing comprehensive reproductive health education and services can empower women to make informed choices about contraception and family planning, ultimately allowing them to delay childbirth until they are ready.
- Support for Love Marriages: Recognize and support love marriages by providing counseling and support services to couples. Addressing societal stigma and promoting acceptance of love marriages can contribute to healthier and more fulfilling relationships, potentially leading to more deliberate family planning decisions and delayed childbirth.
- Policy Interventions: Advocate for policies that support women's rights, gender equality, and reproductive health. This may include policies promoting gender-sensitive education, workplace accommodations for working mothers, and initiatives to reduce early marriage and teenage pregnancy rates.

By implementing these recommendations, stakeholders can work towards addressing the underlying factors influencing the age at which women have their first child in the Colombo district, ultimately promoting women's health, empowerment, and well-being.

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