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Determinants of Contraceptive Use in Sri Lanka with Special Reference to Women's Education

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Abstract

This study examines the determinants of contraceptive use in Sri Lanka with special reference to women's education using data on Demographic and Health survey conducted in 2016 by the Department of Census and Statistics. Data analyses were performed at bivariate and multivariate levels. At the bivariate level relationships between contraceptive use and women's level of education as well as other socioeconomic and demographic variables were identified. A logistic regression model was used to find whether there is a significant impact of women's education on contraceptive use. Chi-square test was used to measure the strengths of the independent variables. The results show that women's level of education has significantly influenced to determine contraceptive use. Additionally, women's age, number of living children, years since marriage, ethnicity, sector, and partner's occupation have also been identified as decisive factors in determining contraceptive use. The findings of this study lead towards important policy implications and suggest future research directions.

Keywords:
contraceptive use, relationship, significant, women's education

Introduction

Over the past five decades, substantial changes have been occurred in fertility, mortality, family planning, and contraceptive use in Sri Lanka. Fertility was considerably higher in early 20th century. During the periods of 1900 and 1960, the Crude Birth Rate (CBR) was around 40 per 1,000 persons. The Crude Death Rate (CDR) during that period was also high and was fluctuating around 20-40 per 1,000 persons. Although fertility was high in the early four decades of the 20th century, population growth was considerably lower because of the influence of high mortality. After mid 1940s, CDR started to decline significantly until 1960s while CBR continued to remain around 35-40. CDR which was 20.2 in 1946 had dropped to 14.3 in 1947, and it continuously declined up to 8.0 in 1960. While mortality was declining, fertility remained stable; consequently, population growth has accelerated. Before starting mortality decline, the population growth rate was less than 1.5 percent. Thereafter, population growth increased to 2.8 in 1953 (Department of Census and Statistics (DCS), 1974). In such a situation, in the 1950s, the Sri Lankan government realized the need of reducing fertility to control population growth and to increase child nutrition. Therefore, in the 1960s, the government took many policy decisions by declaring the importance of contraceptive use to accelerate fertility decline and control population growth. Since then, contraceptive use has become a decisive factor in reducing childbearing and increasing the gap between children.

Overview of women's education and contraceptive use in Sri Lanka

Contraceptive use has played a major role in reducing fertility all over the world since the mid-20th century. Although contraceptive use has been introduced in the early 20th century, it has influenced to decline fertility dramatically after introducing the pills as a family planning method in the 1950s. In parallel to some developed countries, Sri Lanka has also introduced family planning through several policies and programmes (Abeykoon, 2006; DCS, 2009). As a result of these policies and programmes, a network of nurses and public health midwives were deployed in rural and remote areas, oral contraceptives were made available from pharmacies without a prescription, and free family planning services were made available in the health clinics and hospitals. Because of these important steps, Contraceptive Prevalence Rate* has increased to 70 percent in 2000 (DCS, 2002). Figure 1 shows Contraceptive Prevalence Rate from 1975 to 2016. In 1975, only one third of currently married women used contraception. The use of contraceptives then increased significantly until 2000, but since then it has shown a slight decline.

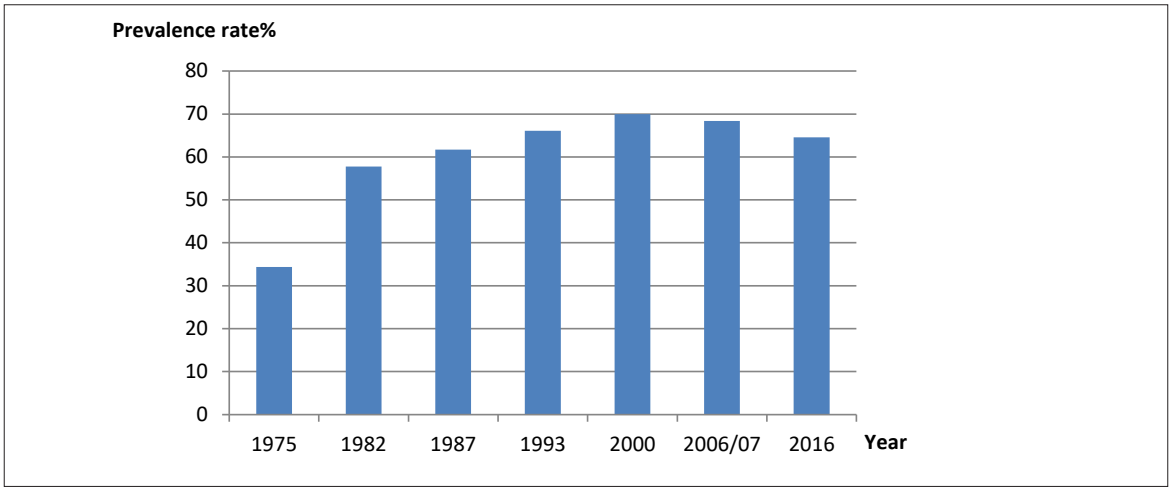

Figure 1 : Contraceptive prevalence rate 1975 – 2016
Source: Department of Census and Statistics

Figure 2 shows literacy rates of Sri Lanka for males and females from 1881 to 2012. It clearly shows the rapid increase of female education from the 1940s. As women achieved higher education levels, their empowerment has become an interesting and important factor in enhancing women's decision-making power.

Although the government of Sri Lanka has contributed in many ways to promote contraceptives, several socioeconomics and demographic factors have also influenced to make decisions on contraceptive use (Radhakrishna and Susan, 1984). Level of education, residential sector, wealth status of the family, employment status, and number of living children have been identified as some of the important determinants of contraceptive use. Among them, level of education of women is considered as an important factor to determine contraceptive use (Moreno, 1993; Gubhaju, 2009; Bbaale and Mpuga, 2011).

*Contraceptive prevalence is the percentage of women who are currently using, or whose sexual partner is currently using, at least one method of contraception, regardless of the method used. It is usually reported for married or in-union women aged 15 to 49 (WHO, 2013).

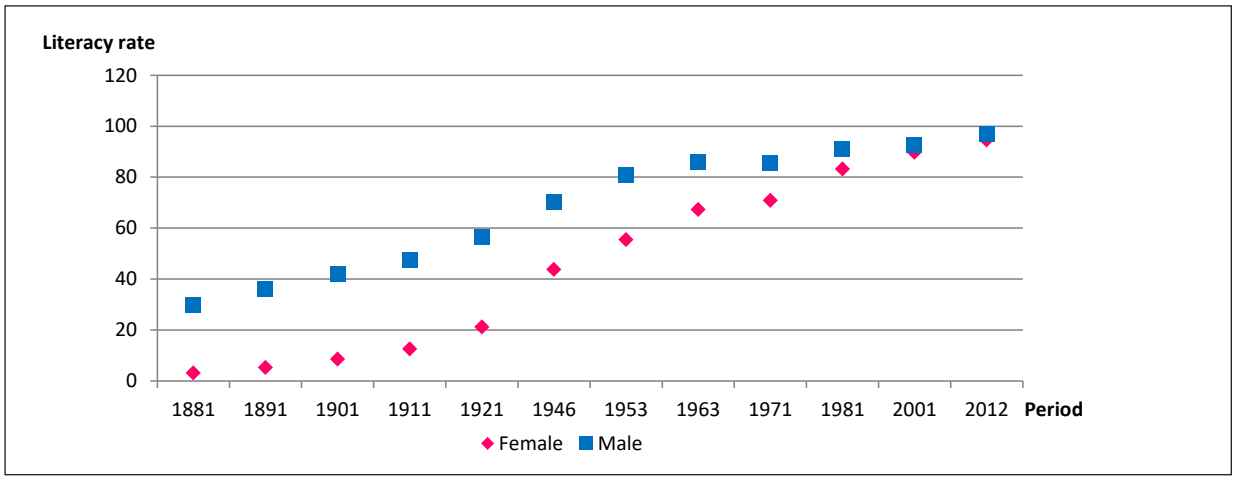

Figure 2: Literacy rates in Sri Lanka by sex - 1881-2012
Source: Department of Census and Statistics

According to the Demographic and Health Surveys (SLDHSs) conducted by the Department of Census and statistics, considerable relationships were observed between contraceptive use and women's level of education (Figure 3). In 1993, the lowest contraceptive prevalence rate was observed among women with no education. Women with a primary level of education showed the highest level of contraceptive use; however, contraceptive use slightly decreased when the education level increased. In 2000, women in each education level showed higher contraceptive prevalence rates than in the respective education levels in 1993. Until 2006/07, the highest contraceptive prevalence rate was reported from the women with the primary level of education, but in 2016, highest contraceptive usage was reported for women in the no schooling category. Except for 1993, the lowest contraceptive use was reported from women who have achieved higher education levels. The highest differences in contraceptive use among different education levels were found in 2006/07.

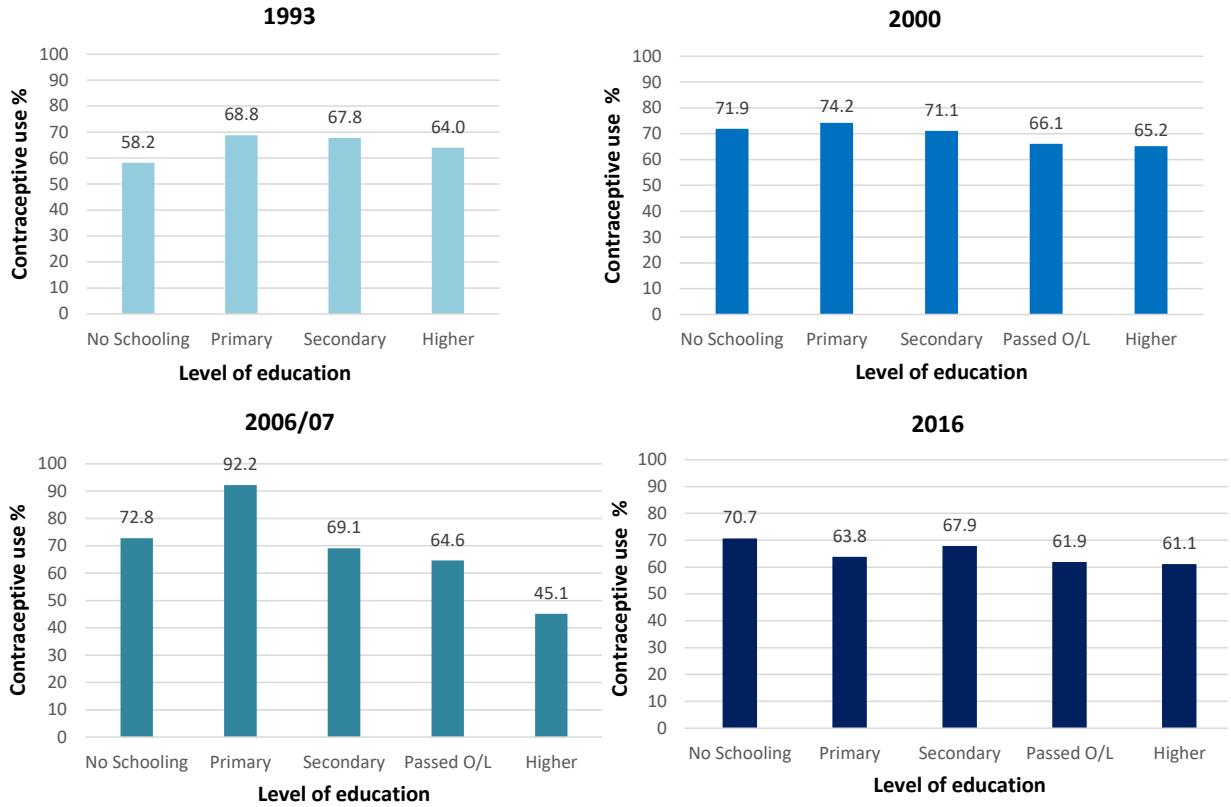

Figure 3: Contraceptive use by women's level of education 1993, 2000, 2006/07, 2016
Source: Department of Census and Statistics

The above graphs clearly identify considerable relationships between women's level of education and contraceptive use. Therefore this study attempts to reveal whether there is a statistically significant influence of women's education to determine contraceptive use.

Objective of the study

The main objective of this study is to examine the influence of women's education on contraceptive use in Sri Lanka. As explained above, in the early stages of contraceptive use, the level of education and contraceptive use have increased, but, in recent experience, contraceptive use shows a declining trend when a women's level of education increases. Therefore, it is interesting to study the relationship between women's level of education and contraceptive use and to identify any other factors that have influenced to determine contraceptive use. Accordingly, a specific objective of the study is to identify the other socioeconomics and demographic variables that determine contraceptive use in Sri Lanka.

Literature review

Although contraceptive use is a couple's decision, more contraceptive methods are used by women. Therefore their level of education considerably influences in determining contraceptive use (Lam and Duryea, 1999; Orji and Onwudiegwu, 2002). Bbaale and Mpuga (2011) found that female education, especially the secondary level and post-secondary level of education increase the likelihood of contraceptive use. Adanu et. al., (2009) found that the education status of women was the most significant variable in determining contraceptive use in Ghana. Ahmed (1987) stated that the wife's education has significantly influenced to determine current use of contraceptives in Bangladesh. He further stated that when the level of education increases, contraceptive use also increases. Shapiro and Tambashe (1994) found that employment and women's education are strongly associated with contraceptive use.

There is a common acceptance that education leads to autonomy, and it helps women to stand up to their husbands. It also provides the opportunity for women to have a discussion to learn about fertility control and make effective use of the health care system (Riyami et. al., 2004). Educated women have more contact with the outside world, so they have a wider worldview. Education strengthens women's decision making power, and it will lead to empowering them, so women's empowerment has considerably influenced on contraceptive use (Do and Kurimoto, 2012).

Community effect is one of the important factors in determining contraceptive use. Irrespective of women's own education levels, the average education level of the women in a community would influence for decision making on contraceptive use. As an example, if some women in an area have a lower level of education but majority has a higher level of education, attitudes and behavior of women with higher education levels may influence women with lower education levels because women always get together and discuss common things. Moursund and Kravdal (2003) found that the average educational level of other women in the community has influenced on contraceptive use above and beyond that of an individual's education.

In analyzing literature, it can be concluded that women's education has influenced to determine contraceptive use in many ways. Literature reveals that individual education, community level education as well as women's autonomy gained through education have influenced to take decisions on contraceptive use.

Methodology

Data

This study is based on the Sri Lanka Demographic and Health Survey (SLDHS) conducted by the Department of Census and Statistics (DCS) in 2016. SLDHS collects detailed information on the history of contraceptive use including knowledge of contraceptives, contraceptive use, and contraceptive method choice from ever married women aged 15-49. The sample size of the SLDHS 2016 was 2,500 clusters (enumeration areas). It covered 28,800 housing units and detailed information was collected from 18,302 ever married women aged 15- 49 years. Computer Assisted Personal Interviews (CAPI) technology was used for data collection of the survey.

This study selects a sub set from the individual data file (ever married women age 15-49) to analyze determinants of contraceptive use giving special reference to women's level of education. Accordingly, there are 17,170 interview completed women whose current marital status is reported as married or living together, but this study excluded 857 women who were pregnant at the time of the survey and 1,954 women whose husbands were living away from home and hence some characteristics of them were not recorded in the data file. Finally, there were 1,840 missing cases for the variable "using something to delay or avoid pregnancy; therefore, those records were also excluded. Accordingly, the data file used for the final analysis comprises 12,519 ever married women aged 15-49 years.

Study design

The study proposes bivariate and multivariate analyses to find the impact of women's education on contraceptive use. The following conceptual framework (Figure 4) provides the structure and content of the study, and it describes the dependent variable and all the independent variables used for the analyses. The dependent variable is "contraceptive use" and it is a dichotomous variable categorized as 1 for current contraceptive users and 0 for current contraceptive non-users. Contraceptive use depends on several demographic, socioeconomic, and environmental variables. However, this study identifies three categories of factors namely education variables, other socioeconomic variables, and demographic variables which describe contraceptive use. Although several variables have been identified by previous literature, variables that are available in the SLDHS 2016 are used for this study and are presented in this conceptual framework. All the independent variables presented here are considered as categorical variables with three or more categories.

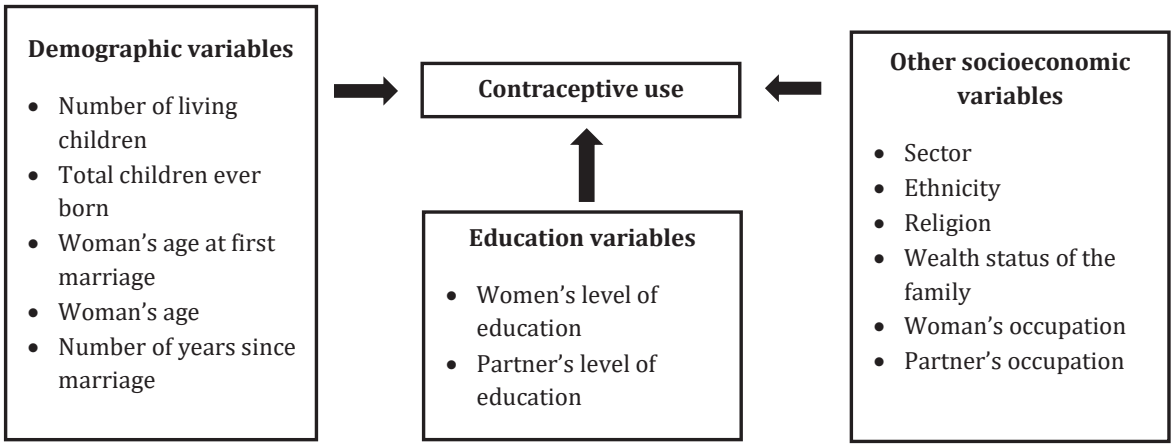

Figure 4: Conceptual framework

Method of analysis

At the bivariate level, relationships between contraceptive use and other background variables were analyzed, and at the multivariate level, a binary logistic regression model was used to find whether there is a significant impact of women's education on contraceptive use. Chi-square test was used to measure the strengths of the independent variables. If the chi-square test statistics was significant at least 95% confidence interval, those variables were selected to the binary logistic regression model (Adanu et.al.2009, Ghubaju. 2009).

This study uses SPSS software for data analysis.

Chi square test

The chi square test was used to determine whether there was a significant difference between the expected frequencies and the observed frequencies in one or more categories of data using hypothesis tests or constructing confidence intervals.

Chi-square test statistics are given as follows.

$$X^2 = \sum_{i=1}^{n} \frac{(O_i - E_i)^2}{E_i}$$

E_i – Expected frequency, O_i – Observed frequency, N – The number of cells in the data table

For fitting the model of independence, the chi square test statistics is;

$$X^2 = \sum_{i=1}^{r} \sum_{i=1}^{c} \frac{(O_{ij} - E_{ij})^2}{E_{ij}}$$

The degrees of freedom identify as n-1, the number in the group minus restrictions. The distribution of the statistics with "j" number of rows and "k" number of columns is approximated by the chi-square distribution with (k-1) (j-1) degrees of freedom.

The study uses a binary logistic regression model to analyze whether there is a significant influence of women's level of education on contraceptive use.

Binary logistic regression model

Logistic regression measures the relationship between a categorical dependent variable and one or more independent variables using probability scores as the predicted values of the dependent variable. Binary logistic regression deals with situations in which the observed outcome for a dependent variable can have only two possible types. The binary logistic regression model is presented as follows;

$$\ln (P/1—P) = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \ldots . \beta_n + X_n$$

Where;

P is the probability of a woman's contraceptive use at the time of the survey. β_1 to β_n are regression co-coefficients, and X_1 X_n are independent variables.

Results

Bivariate analysis

At the bivariate level, this study attempts to identify whether there is a relationship between woman's level of education and contraceptive use, and relationships between contraceptive use and other variables. Table 1 presents the contraceptive prevalence rates by education variables.

Considering women's level of education, table 1 shows that more than two-half of women in the no schooling category use any contraceptive method. However, after that contraceptive prevalence shows decreasing trend when women's level of education increases. Only 60 percent of women with higher education qualifications, degree and above use contraceptives. These statistics clearly show an inverse relationship between contraceptive use and women's level of education. As contraceptive use might be a couple's decision, their partners' education level may also influence to make decisions on contraceptive use. Table 1 shows when the partner's level of education increases, contraceptive use slightly decreases. Accordingly, a clear inverse relationship is observed between partner's level of education and contraceptive use.

Table 1: Contraceptive prevalence rate by education variables

Education variable	Contraceptive prevalence rate	Number of women*
Woman's level of education		
No schooling	70.7	235
Passed Grade 1-5	63.8	1,099
Passed Grade 6-10	67.9	7,629
Passed G.C.E. (O/L) or equivalent	61.9	3,842
Passed G.C.E. (A/L) or equivalent	61.4	3,611
Degree and above	59.9	841
Partner's level of education		
No schooling	73.0	171
Passed Grade 1-5	71.1	1,596
Passed Grade 6-10	70.2	7,211
Passed G.C.E. (O/L) or equivalent	63.6	3,231
Passed G.C.E. (A/L) or equivalent	64.6	2,361
Degree and above	62.0	588

**Weighted by sampling factor*
Source: Author's calculations

Other than the education variables, contraceptive prevalence is described by some other socioeconomics variables and demographic variables. Table 2 presents the relationship between other socioeconomic variables and contraceptive prevalence rates.

Table 2 depicts women in the rural sector have higher contraceptive prevalence than the other two sectors. When comparing the contraceptive use by ethnic groups, the lowest contraceptive prevalence reported by Sri Lanka Tamils showing 45.6%, and it is followed by Sri Lanka Moors showing 47.5%.

The highest rate, 69.8%, was reported from the Sinhalese. According to the religion, Buddhist women show the highest contraceptive prevalence (69.9%) while Islam women show the lowest contraceptive prevalence (46.5%). Considerable differences in contraceptive use among the wealth quintiles were not observed. It is interesting to see that the lowest contraceptive prevalence was reported from Clerks and clerical support workers for both women's and their partners' occupation categories.

Table 2: Contraceptive prevalence rate by other socioeconomic variables

Other socioeconomic variable	Contraceptive prevalence rate	Number of women*
Sector		
Urban	56.8	2,682
Rural	66.4	13,906
Estate	58.9	669
Ethnicity		
Sinhala	69.8	13,220
Sri Lanka Tamil	45.6	2,064
Indian Tamil	57.7	358
Sri Lanka Moor /Muslim	47.5	1,561
Other	62.6	54
Religion		
Buddhist	69.9	12,339
Hindu	48.1	1,898
Islam	46.5	1,670
Roman Catholic	62.1	1,118
Other	60.9	232
Wealth status of the family		
Lowest	64.5	3,065
Second	66.5	3,458
Middle	65.1	3,623
Fourth	63.8	3,658
Highest	63.0	3,453
Women's occupation		
Managers, senior officials and legislators	62.2	172
Professionals	64.3	1,060

Technicians and associate professionals	62.3	211
Clerks and clerical support workers	50.2	446
Service and sales workers	68.9	921
Skilled agricultural, forestry and fishery workers	79.5	230
Craft and related trades workers	67.1	471
Plant and machine operators and assemblers	59.2	111
Elementary occupations	69.0	1,779
Not working	63.9	11,854
Partner's occupation		
Armed Forces and workers not classified by occupations	70.8	829
Managers, senior officials and legislators	65.3	572
Professionals	69.2	2,022
Technicians and associate professionals	66.8	882
Clerks and clerical support workers	59.8	449
Service and sales workers	68.0	2,685
Skilled agricultural, forestry and fishery workers	67.9	932
Craft and related trades workers	72.4	1,163
Plant and machine operators and assemblers	70.2	317
Elementary occupations	67.5	4,841
Not working	44.5	2,565

**Weighted by sampling factor*
Source: Author's calculations

Table 3 presents the relationship between demographic variables and contraceptive use. Contraceptive use among women with no children was considerably lower than women with at least one child. Almost three forth of women who have two living children used contraceptives while more than 80% of women who have three living children used contraceptives.

The relationship observed between total children ever born and contraceptive use was almost same as the relationship identified between number of living children and contraceptive use. When women's age at marriage increases contraceptive use considerably decreases. Seventy percent of women who got married less than 20 years of age used contraceptives while 11% of women who got married 40 years of age or more used contraceptives.

A considerable positive relationship was found between contraceptive use and women's age; however, a significant drop was reported from the last age group. Number of years since marriage also describes contraceptive use. When the number of years since marriage increases, contraceptive use also increases. It is interesting to present that 28% of women whose years since marriage were less than 2 years also used contraceptives.

Table 3: Contraceptive prevalence rate by demographic variables

Demographic variable	Contraceptive prevalence rate	Number of women*
Number of living children		
No living children	15.8	1,761
1	54.6	4,290
2	73.8	6,531
3	81.0	3,572
4	74.9	777
5+	70.9	325
Total children ever born		
No children	15.7	1,739
1	54.5	4,184
2	73.6	6,438
3	80.3	3,647
4	75.2	865
5+	71.7	385
Woman's age at first marriage		
10-14	71.0	262
15-19	70.4	5,068
20-24	66.6	6,369
25-29	59.6	4,165
30-34	53.4	1,099
35-39	33.5	230
40+	11.5	64
Woman's age		
15-19	43.8	227
20-24	56.0	1,372
25-29	58.5	2,559
30-34	63.6	3,483
35-39	71.1	3,736
40-44	72.0	3,030
45-49	60.6	2,850
Number of years since marriage		
0-1	28.5	869
2-4	55.1	1,980
5-9	60.8	3,601
10-14	67.8	3,589
15-19	74.0	3,243
20+	70.2	3,974

**Weighted by sampling factor*
Source: Author's calculations

Multivariate analysis

At the multivariate level, a binary logistic regression model was used to identify the significant relationships between contraceptive use and all independent variables. Among the variables described in the conceptual framework, significant variables were selected to the multivariate model after considering the significance of chi-square test statistics. (Appendix 1 presents chi-square test statistics). Accordingly, only the variable of partner's level of education was not significant at 0.05 level, hence it was not selected for the model and all other variables were selected.

Accordingly women's education, number of living children, total children ever born, woman's age at first marriage, woman's age, number of years since marriage, sector, ethnicity, religion, wealth status of the family, woman's occupation, partner's occupation, were selected as independent variables to the logistic regression model. As mentioned earlier all these variables were used as categorical variables and the first category of all variables was identified as reference level and all other categories were used as dummy variables.

In the logistic regression model, the overall percent of cases that are correctly predicted by the model is 79.4%. This percentage has increased from 78.6 for the null model to 79.4 for the full model. Nagelkerke's R^2 is 14.7% (table 4) and it means that the model explains approximately 15% of the variation of the outcome. Hosmer and Lameshow Test suggests the model is good to fit the data at an acceptable level because the test is significant at 0.327 (table 5) level ($p>0.05$). It means that there is no difference between the observed values and the model predicted values.

Table 4: Model summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	11751.933	0.095	0.147

Source: Author's calculations

Table 5: Hosmer and Lemeshow test

Step	Chi-square	df	Sig.
1	9.182	8	0.327

Source: Author's calculations

The following table explains the parameter estimates for the best binary logistics regression model. Only the variables which significantly influence to determine contraceptive use are presented in this table.

Table 6: Parameter estimate of the best logistic regression model

Parameter and level	Factor level	β value	df	Standard error	Wald statistics	P-value	Odd ratio
Intercept		**0.806**	**1**	**0.380**	**4.501**	**0.034**	**2.239**
Woman's level of education							
No schooling	RL		5		21.752	0.001	
Passed Grade 1-5	1	-0.809	1	0.218	13.721	0.000	0.445
Passed Grade 6-10	2	-0.665	1	0.212	9.868	0.002	0.515
Passed G.C.E. (O/L)	3	-0.786	1	0.217	13.135	0.000	0.456
Passed G.C.E. (A/L)	4	-0.656	1	0.222	8.749	0.003	0.519

Degree and above*	5	-0.445	1	0.252	3.115	0.078	0.641
Ethnicity							
Sinhala	RL		4		74.704	0.000	
Sri Lanka Tamil	1	-1.226	1	0.147	69.292	0.000	0.293
Indian Tamil	2	-1.212	1	0.219	30.692	0.000	0.298
Sri Lanka Moor*	3	-0.341	1	0.297	1.321	0.250	0.711
Other*	4	-0.063	1	0.454	0.019	0.890	0.939
Sector							
Urban	RL		2		10.441	0.005	
Rural*	1	0.117	1	0.067	3.051	0.081	1.124
Estate	2	0.451	1	0.141	10.181	0.001	1.570
Partner's occupation							
Not working	RL		10		24.696	0.006	
Armed Forces and workers not classified by occupations	1	0.375	1	0.160	5.494	0.019	1.455
Managers, senior officials and legislators	2	0.534	1	0.180	8.808	0.003	1.707
Professionals	3	0.606	1	0.138	19.204	0.000	1.834
Technicians and associate professionals	4	0.510	1	0.158	10.361	0.001	1.666
Clerks and clerical support workers	5	0.384	1	0.183	4.383	0.036	1.468
Service and sales workers	6	0.528	1	0.134	15.595	0.000	1.696
Skilled agricultural, forestry and fishery workers	7	0.380	1	0.147	6.688	0.010	1.463
Craft and related trades workers	8	0.505	1	0.150	11.377	0.001	1.657
Plant and machine operators and assemblers	9	0.540	1	0.203	7.039	0.008	1.715
Elementary occupations	10	0.392	1	0.126	9.651	0.002	1.480
Years since marriage							
0-1	RL		5		79.692	0.000	
2-4	1	-0.839	1	0.190	19.431	0.000	0.432
5-9	2	-1.447	1	0.205	49.911	0.000	0.235
10-14	3	-1.634	1	0.224	53.379	0.000	0.195
15-19	4	-1.394	1	0.246	32.242	0.000	0.248
20 and above	5	-1.556	1	0.279	31.076	0.000	0.211
Woman's age							
15-19	RL		6		96.345	0.000	
20-24*	1	0.185	1	0.251	0.540	0.462	1.208

25-29*	2	-0.347	1	0.257	1.827	0.177	0.707
30-34	3	-0.645	1	0.273	5.567	0.018	0.525
35-39	4	-0.621	1	0.295	4.443	0.035	0.537
40-44	5	-0.732	1	0.319	5.264	0.022	0.481
45-49	6	-1.404	1	0.336	17.466	0.000	0.246
Number of living children							
0	RL		5		30.284	0.000	
1*	1	0.980	1	0.665	2.175	0.140	2.665
2	2	1.869	1	0.673	7.701	0.006	6.479
3	3	2.379	1	0.686	12.030	0.001	10.789
4	4	2.216	1	0.714	9.642	0.002	9.168
5 or more	5	2.270	1	0.750	9.168	0.002	9.684

**Not significant at 0.05 level of significance*
RL- Reference Level
Source: Author's calculations

$$\ln\left(\frac{p}{1-p}\right) = 0.806 + \beta_1[\text{Woman's level of education}] + \beta_2[\text{Ethnicity}] + \beta_3[\text{Sector}] + \beta_4[\text{Partner's occupation}] + \beta_5[\text{Years since marriage}] + \beta_6[\text{Woman's age}] + \beta_7[\text{Number of living children}]$$

Binary logistic regression shows that women's level of education is highly significant for contraceptive use, and the overall effect is significant at 0.01 level.The β coefficients for all education levels except level 5 (degree and above) are significant at 1% level and negative relationships are observed for all. The odd ratio explains that women who have passed grade 1-5 or G.C.E. (O/L) were 2.2 (1/0.445, 1/0.456) times less likely to use contraceptives than women with no education (reference level). As well as women who had passed grade 6-10 or G.C.E. (O/L) were 1.9 times less likely to use contraceptives than women with no education.

Among the other socioeconomic variables, ethnicity, sector, and partner's occupation have significantly influenced in determining contraceptive use. Only two factor levels of variable ethnicity have significantly influenced to determine contraceptive use compared with reference level (Sinhala). Both Sri Lankan Tamil and Indian Tamil women were 3.4 times less likely to use contraceptives than Sinhala women. Among the two categories of the variable 'sector', only factor level three (estate sector) has significantly influenced to determine contraceptive use compared with reference level urban sector. Contraceptive use is 1.6 times higher among the women in the estate sector than the women in the urban sector. Partner's occupation was highly significant to the model, and all the levels have significantly influenced to determine contraceptive use. A woman whose partner is in any occupation group was 1.5–1.8 times more likely to use contraceptives than a woman whose partner was in the not working category.

Among the demographic variables, which were selected for the model, years since marriage, women's age, and number of living children have significantly influenced the contraceptive use. The most significant variable to the model was years since marriage, and a significant negative relationship between years since marriage and contraceptive use was observed. If a woman had spent 2-4 years in marriage, their contraceptive use was 2.3 times lower than the reference level (0-1 years since marriage).

A woman who spent 5-9 years after the marriage was 4.3 times less likely to use contraceptives than a woman in the reference level. A woman who spent 10-14 years since the marriage was just more than five times less likely to use contraceptives than the reference level. The other two factor levels (level 4 and 5) also show significant negative relationships with contraceptive use.

After women's age is 30 years, women's age negatively influences to determine contraceptive use. A woman in the age groups 30-34 or 35-39 was almost two times less likely to use contraceptives compared to a woman in the age group 15-19. However, contraceptive use of a woman in the age group 45-49 was slightly more than four times higher than a woman in the age group 15-19. Large variations in the use of contraceptives were observed by number of living children. All the levels of the variables "number of living children" were statistically significant to the model except the level 1 (number of living children = 1) compared with the reference level "no children". A woman with two children was 6.5 times more likely to use contraceptives than a woman without any children. A woman with three children reports the highest use of contraceptives among all significant categories showing almost 11 times higher contraceptive use than the reference level. While a woman with four children reports 9.2 times more likely to use contraceptives, a woman with five or more children reports 9.7 times more likely to use contraceptives than the reference level.

Discussion

This study reveals the patterns of current use of contraceptives among ever married women in Sri Lanka and its determinants. Also, the study provides several insights that can be helpful to identify the perceptions of Sri Lankan women on contraceptive use. Women's education identifies as one of the important factors associated with contraceptive use among females. This study reveals that less educated women were more likely to use contraceptives while more educated women were less likely to use contraceptives. Most of the studies conducted based on the experience of some developing countries have identified significant relationship between contraceptive use and women's education. However, the findings contradicted the current study. Brice (2002) conducted a study using Demographic and Health Survey data with Multiple Indicator Cluster Survey data in Cameron and found that female education was strongly associated with the contraceptive use of women, but women with secondary and post-secondary levels of education were more likely to use both modern and traditional contraceptives than women with lower education levels. Bbaale and Mpuga (2011) conducted a study to find out the relationship of female education, contraceptive use, and fertility rates in Uganda Using Uganda DHS data, and they found that female education, especially at the secondary and post-secondary levels, increases the likelihood of using contraceptives and reduces fertility.

In Sri Lanka, higher contraceptive use among less educated women could be justified as they always follow the instructions provided by community health professionals to avoid maternal related complications hence they use modern methods to limit the births and increase the gap between births. However, educated females get information from many sources, and they usually use traditional methods like abstinence and safe period because they concern about side effects or health issues associated with modern methods. Perera (2014) has also found that fear of the side effects of modern contraceptive methods was one of the important factors influencing the use of traditional contraceptive methods by educated females. Late marriages of the most educated females were also identified as one of the reasons for the decline in the use of contraceptives among educated women. According to SLDHS (2016), 20 percent of women who have a degree or higher level of education got married age at 30 or later. However, lower contraceptive prevalence among educated females in Sri Lanka has to be further investigated.

Although this study mainly focuses on women's level of education, demographic variables have been identified as the most significant in determining contraceptive use. Among the demographic variables, "years since marriage" was identified as the most significant variable. Women's age, especially older ages has significantly influenced to determine contraceptive use in Sri Lanka. Gafar (2020) also revealed that there was a highly significant influence on contraceptive use by women's age conducting a study using data on Demographic and health survey 2017 conducted in Indonesia. It denotes that women aged 35–49 years were less likely to use contraceptives than married women aged 15–24 years. Similarly, Khouangvichit used the Lao Reproductive Health Survey and found that women in the cohort of age groups 25-34 and 35- 44 had a strong significant effect on contraceptive use. According to this study number of living children has also been identified as a highly significant variable to determine contraceptive use among Sri Lankan women. Women who had a higher number of children were more likely to use contraceptives than women who had no children or a lesser number of children. Several studies conducted in many countries provide evidence that is consistent with these results. For example, using data from Demographic and Health Survey Bangladesh, Islam et. Al., (2016) showed that the number of living children was likely to play a significant role in contraceptive use, also it stressed women who had 1-2 children and who had more than two children were more likely to use contraceptives compared with women who had no children.

In addition to women's education level and demographic variables, this study revealed that some socioeconomic variables have also significantly influenced to determine contraceptive use. Ethnicity plays a major role in determining contraceptive use. Among all ethnic groups, Sri Lankan Tamil and Indian Tamil reported significantly lower contraceptive use with respect to Sinhalese. This is evidenced by several studies conducted by many individuals in Sri Lanka. As an example, Murthy and Vos conducted a study using 1975 Sri Lanka fertility survey data and found that majority of Sinhalese had much higher use of contraceptives than either the Sri Lanka Tamils or the Moors. With reference to the urban sector, women in the estate sector reported significantly higher contraceptive prevalence. In general, people in the estate sector have poor educational and social backgrounds, so their exposure to mass media and other sources of information is lower than the other two sectors (urban and rural). Therefore health sector professionals, especially Public Health Midwives usually promote contraceptive use among the women in the estate sector and encourage them to use modern methods. This could be the reason for reporting significantly higher contraceptive use in the estate sector.

Conclusion

The main objective of this study was to find out whether there is an influence of women's education on contraceptive use in Sri Lanka. It was tested at the bivariate and multivariate levels. According to the analyses, it can be said that there is a statistically significant influence of women's education on contraceptive use in Sri Lanka. At the bivariate level, a clear inverse relationship was identified between women's level of education and contraceptive use. The analysis depicts that the percentage of women that use contraceptives decreases when women's level of education increases. In the multivariate analysis, a statistically significant relationship was observed between women's level of education and contraceptive use, and the direction of the relationship was same as the bivariate analysis. Women who have received any education less than the degree level are around 2 times less likely to use contraceptives than women who have not received any education. However, contraceptive use among women with the degree and above education qualifications did not significantly influence to determine contraceptive use.

This study reveals that the women's level of education has become a decisive factor to determine contraceptive use. As well as findings of this study lead towards important policy implications and suggest future research directions. Contraceptive use among the women to higher education levels is lower and their fertility level is also lower compared to women with lower education levels. The Total Fertility Rate of a woman with GCE (O/L) or higher education is 2.1, and it is equal to the replacement level of fertility. Replacement level of fertility means that the level of fertility at which a population exactly replaces itself from one generation to the next generation. If the country's population has become the optimum level, it is better to maintain the replacement level of fertility. Therefore, policies on fertility should be focused on whether contraceptive use is promoted among educated females or contraceptive use is reduced among less or no educated females.

To move to an effective policy, further studies require analyzing the purpose of contraceptive use by women's level of education because some women use contraceptives for limiting births while others use contraceptives for making space between children. Although a significant negative relationship is reported from contraceptive use by women's level of education, different relationships might be observed by studying different contraceptive method choice by women's level of education. Therefore, a future study is required in identifying the relationships among women's level of education and specific contraceptive method choice especially modern permanent methods, modern temporary methods, and traditional methods.

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Appendix 1

Table 1: Chi-square test results

Variable	df	Chi-square value	P value
Number of living children	5	413.62	0.000
Total children ever born	5	393.42	0.000
Woman's age at first marriage	6	50.33	0.000
Woman's age	6	141.22	0.000
Number of years since marriage	10	76.98	0.000
Woman's level of education	5	36.07	0.000
Partner's level of education	5	8.88	0.114*
Sector	2	28.58	0.000
Ethnicity	4	240.27	0.000
Religion	4	199.30	0.000
Wealth status of the family	4	20.23	0.000
Woman's occupation	8	22.74	0.004
Partner's occupation	9	18.71	0.028

**Not significant at 0.05 level of significance*
Source: Author's calculations