

Relationship between Age of Marriage, Women's Education and Fertility 1954-93: A Study in the West of Iran

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The Islamic Republic of Iran has experienced a sustained fertility decline over the past three decades, with total fertility rates decreasing to below replacement levels. Despite well-documented literature on the relationship between fertility and women's education, no empirical research has compared these trends during the past forty years. The aim of this study was to investigate the relationship between fertility and women's education, in the west of Iran. In an historical longitudinal household survey in 2009, 3443 women who had ever-married were interviewed. This study focused on women's fertility over their lifetime, according to education attainment levels for the period 1954-1993. An inverse relationship was found between age of marriage and the number of children born by 40 years-of-age ($P < 0.01$). Over the last few decades, the number of children born has decreased in all levels of mother's education, furthermore, the highest level of fertility decline was observed among women with an elementary level of education. The results of the study showed declining fertility convergence among the various education levels. Managers and policy makers in addition to encouraging employed women to have more children should also explore the issues for uneducated women and housewives.

Key words: Marriage age, Fertility, Education, Iran

The Islamic Republic of Iran has experienced a rapid and sustained fertility decline over the past three decades. The total fertility rate (TFR) or the number of children per woman in Iran in 1980 was approximately seven; in mid-2011 this had dropped to two children, which is nearly a 70 percent reduction¹. The population growth rate also decreased from 1.6 in 2006 to 1.3 in 2011. At the same time the crude death rate decreased, as a result the reduced growth is mainly due to declines in the birth rate^{2,3}.

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With the continuing fertility decline, many stakeholders, including policy makers, worry about decreasing fertility for a variety of reasons, including; impact on the population age structure, future challenges to economic growth, social life, and adoption policies⁴. It appears likely that in the next 50 years, the fertility rate fall and consequent aging population that will follow, could be the most significant demographic themes in Asia⁵. One of the most important factors in the explanation of fertility decline in each country is the increase in the age of women at marriage⁶⁻⁸. In many Western countries marriage is not a pre-condition to childbearing; however, in Iran as well as in other Muslim countries, it is not accepted either by society or their religion. Thus, postponement of

marriage has a considerable effect on the number of children born. It is widely believed that the expansion of basic education also raises the age of marriage⁹⁻¹¹. Women's education provides better employment opportunities, which helps them to increase their incomes¹². Moreover, the relationship between education and fertility depends on several factors, including; geographical region, cultural factors, level of development, participation of women in the labor force, etc.^{13, 14}.

Despite well-documented literature on the relationship between fertility and women's education, no empirical research has compared women's education and fertility trends during the past forty years in Islamic Republic of Iran. The aim of this study was to investigate the relationship between these two factors, in the city of Kermanshah. Kermanshah with a population of approximately one million people, is the capital of the Kermanshah Province, Iran, and the largest city in the west of Iran. According to 2011 national census data, the fertility rate in this province was below replacement level¹⁵. Taking into consideration that there has been a convergence of fertility behaviors in Iran in recent decades, and an increase in women's demand for higher education levels^{12, 16}, it was expected that the results of the present study would be consistent with fertility trends in Iran.

METHODS

Design

In an historical longitudinal household survey in the west of Iran in 2009, 3443 women who had ever-married, aged 15–55 years, and living in sampled households, were interviewed by trained interviewers. The questionnaire was modified from the 2000 Islamic Republic of Iran Demographic and Health Survey questionnaire. A total of 12 interviewers were trained to administer the questionnaire. In each district selected, the supervisor spent two days training the interviewers, sampling the clusters, re-listing households, and sampling married women respondents.

The sampling method used multistage random sampling. Participants were informed that their participation was voluntary and that their responses would be anonymous. Women born between the years 1954-93, were divided

into eight cohorts based on their date of birth. We also distinguished between three levels of highest education achieved; low included elementary education (<6 years), medium up to upper secondary school (6-12 years), and high captured women with university degrees (>12 years).

Analysis of variance (ANOVA) was used to examine the differences between the means of the number of children, and the women's educational levels.

A correlation coefficient between the women's average educational attainment and fertility was used. The statistical significance level was ≤ 0.05 .

Location

Kermanshah is one of the ten most populous cities in Iran, with a population of around one million according to 2011 census results. This city is the largest city in the central-west area of Iran. The average annual growth in Kermanshah was 0.69 percent during 2006-2011, compared with 1.29 percent in the Islamic Republic of Iran².

Participants

The study participants were 3443 women who had ever-married. They ranged in age from 16 to 55 years, with a mean age of 35.71 years ($SD = 9.76$). More than 95percent of the women were married before the age of 26 years. The childbearing ages of the women were between 13 to 43 years.

RESULTS

Table 1 presents descriptive statistics for the years of education, mean age at first marriage, and the mean number of children per woman classified according to their birth cohort.

The level of formal education has increased strikingly, especially after 1974 (Table 1).

Among the youngest age group (1989-93 birth cohort), the number of women with an academic education was zero. This was due to the fact that the age of these women was below 20 years.

The mean age at marriage was 18.98 ± 3.94 years, while the youngest age at marriage was 12 years, and the highest was 38 years. The mean age at first marriage has increased by more than two years from 1954 to 1983. The low marriage age

Table 1. Mean Age at First Marriage, Birth Intervals, and Mean Number of Children by Birth Cohort

Birth cohort	Sample size (%)	Mean age at first marriage	Birth Intervals		Mean number of children
			First interval	Second interval	
Total	3 443 (100)	18.98 ± 3.94*	2.72 ± 2.66*	3.33 ± 2.18*	2.36 ± 1.69*
1954-58	272 (7.9)	18.52 ± 4.19	3.67 ± 3.89	3.14 ± 2.19	4.43 ± 1.50
1959-63	389 (11.3)	18.80 ± 4.71	3.30 ± 4.54	2.39 ± 1.32	4.03 ± 1.82
1964-68	469 (13.6)	17.83 ± 3.57	2.53 ± 1.89	2.59 ± 1.46	3.42 ± 1.21
1969-73	506 (14.7)	19.15 ± 4.49	3.00 ± 2.53	3.76 ± 1.79	2.49 ± 1.28
1974-78	625 (18.2)	19.23 ± 3.78	2.68 ± 2.05	4.36 ± 2.99	2.23 ± 0.98
1979-83	558 (16.2)	20.79 ± 3.63	2.21 ± 1.36	4.38 ± 1.99	1.19 ± 0.66
1984-88	482 (14.0)	18.59 ± 2.79	2.18 ± 1.40	2.93 ± 1.34	0.70 ± 0.69
1989-93	142 (4.1)	16.55 ± 1.68	1.20 ± .41	1.00 ± .000	0.64 ± 0.77

* Standard Deviation

and other results in the last two groups were due to the low age of married women in these age groups during sampling. However, previously mentioned groups may not have completed their families. The average number of children born per woman was 2.36±1.69 (Table 1). With increasing marriage age, the number of births to women aged 40 years has decreased ($P< 0.05$; $r = -0.51$).

In order to compare fertility trends among the women born in various years, the average number of children per woman at 20, 25, 30, 35, and 40 years-of-age is shown in Table 2. During the past four decades, the average number of children born to women 35 years old showed a persistent decline; from 3.19 children per woman born during

1954-58, to 2.41 children born during 1969-73.

As indicated in Table 2, women born in the years 1954-58, had 1.81 children up to 25 years old, and 4.05 children up to 35 years old. While for women who were born on average fifteen years later, during 1969-73, the average number of children at similar ages was 1.62 and 2.41, respectively. The exception to this declining trend was found in the women born during 1959 to 1968 and to the end of 20-25 years old. The number of children in this group compared to the previous cohort, increased. However, the number of the children born to 35 year old women in this group was less than in the cohort before them.

Table 2. Age-Specific Fertility Rate of Women

Birth cohort	Age at time of data collection	Number of children born to women aged 20	Number of children born to women aged 25	Number of children born to women aged 30	Number of children born to women aged 35	Number of children born to women aged 40
1954-58	51-55	0.48	1.81	3.19	4.05	4.38
1959-63	46-50	0.77	2.17	3.23	3.73	4.00
1964-68	41-45	1.06	2.11	2.83	3.36	3.42
1969-73	36-40	0.56	1.62	2.10	2.41	-
1974-78	31-35	0.62	1.29	1.96	-	-
1979-83	26-30	0.30	0.88	-	-	-
1984-88	21-25	0.49	-	-	-	-

Table 3 shows the average age at marriage, and the average age at childbirth during the birth of the women's first, second, and third birth, based on education level. Among the women with

an academic education, marriage age and age at childbirth were higher than for women with lower education levels ($P<0.05$).

Figure 1 shows the changes in the average

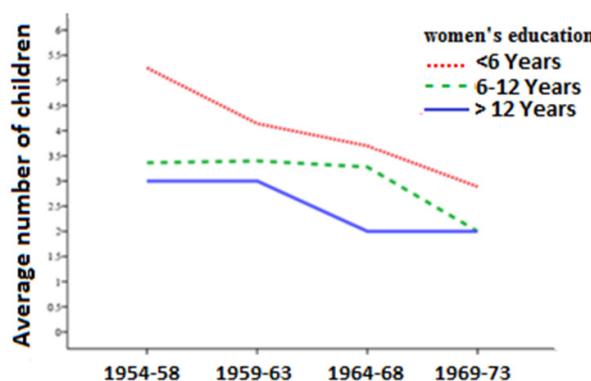
Table 3. Average Age of Marriage and Childbirth, by Education Attained

	Average age at marriage	Average age at childbirth			Average number of children
		First birth	Second birth	Third birth	
Years of education 0-5	18.10 ± 4.50*	21.03 ± 4.90*	23.17 ± 4.80*	25.80 ± 4.50*	3.25 ± 1.90*
Years of education 6-12	18.90 ± 3.40	21.37 ± 3.90	24.30 ± 4.30	27.60 ± 5.08	2.10 ± 1.40
Years of education >12	23.00 ± 3.30	25.78 ± 4.00	29.30 ± 4.60	32.30 ± 5.38	1.06 ± 1.20

* Standard Deviation

number of children born by 35 year old women in four age cohorts based on their education level. Among women born during 1954-1973, the average number of children declined up to the age of 35 years, in all educational levels. Women with elementary education (<6 years) had more children than women with a higher education. It seems that there is a degree of fertility convergence among women with various education levels over time

as the number of children born was 2.5 children for both women with an academic education and uneducated women in the first age cohort. This had reduced to one child in the fourth cohort. The highest reduction in fertility was observed among women with an elementary education, while women with an academic education showed the least change (Figure 1).

**Fig. 1.** Average Number of Children up to Age 35 Years in Four Groups of Education Levels

DISCUSSION

The results of the present study showed that a lower number of children were born during the past few decades in the west of Iran. This study investigated two reasons for such a decline; increases in the marriage age and longer birth spacing between children. Both of these factors were seen primarily in women with an academic education.

From demographic studies, it has been shown that fertility is affected by women's age at first marriage, especially in societies where the transition to parenthood occurs within marriage^{13, 17}. The Islamic Republic of Iran is one of the

countries in which childbearing prior to marriage is extremely rare¹⁸.

As shown by the results, the average age at first marriage increased with later birth cohorts born between the years 1954-1983. The exception in this trend occurred among women born during the 1964-68 period. In fact, women in this birth cohort were about 12 years old or a little older in the early years of the Islamic Revolution in Iran, which occurred in 1979. During those years, the family planning program was suspended and policy makers supported a pro-natalist approach encouraging earlier marriage, and reducing the legal marriage age for girls from 15 to 13 years old^{3,16,18,19}. However, government policy was

changed to an anti-natalist program during the latter years of the 1980s²⁰.

Age of first marriage had a significant reverse effect on the length of the first birth interval. This finding could be due to increases in women's knowledge about the most appropriate age for pregnancy, sub-fecundity in women under twenty years of age, or a combination of both factors. Nonetheless, in the second and third birth intervals, the pattern changed. This means that as the marriage age increased, intervals between births became longer. Therefore, the number of children born decreased as marriage age increased. These findings are in agreement with a number of similar population studies in Asia^{17, 21}.

The decline in the average number of children born may not just be related to an increase in age at marriage, as another important reason is decreasing fertility levels within marriage²². Our findings showed that women with higher education have fewer children, with larger birth intervals. This could be due to higher levels of family planning information and control of marital fertility. Moreover, women with higher education levels have more knowledge, better socioeconomic position, and less pressure to bear child than less educated women²³⁻²⁷.

During 1954-88, the mean number of children born per woman decreased among women of various education levels. However, the speed of this trend was inversely associated with education levels. Following the age cohorts, we observed that women with an academic education had the lowest reduction in the number of children born and their fertility rate was based on two children. The greatest decline in the number of children occurred among women with an elementary education. The substantial decrease in childbirth rates among women with lower and average levels of education has created a pattern of fertility convergence among women of various education levels.

Based on the published data of the national census and additional studies conducted in Iran, there has been increased academic educational attainment rates in women over the past two decades^{2, 28, 29}. Morita *et al.* showed that in developed countries, in which women have higher levels of education, this variable has a lower influence on the number of children⁸.

In order to address rapidly decreasing fertility

rates in Iran, government officials and researchers have attempted to encourage employed women to have more children by increasing the maternity leave period³⁰. However, researchers should first answer the question of why childbirth rates are rapidly declining among uneducated women and housewives.

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