Original Article

Determinants of Iranian youths' marriage age: A parametric survival analysis approach

Mahsa Saadati[1], Arezoo Bagheri[2*]

[1] Biostatistics Assistant Professor of National Population Studies and Comprehensive Management Institute, Tehran, Iran

[2] Applied Statistics Assistant Professor of National Population Studies and Comprehensive Management Institute, Tehran, Iran

Corresponding author and reprints: Arezoo Bagheri. No. 5, 2nd Alley, Pakistan st, Shahid Beheshti Av, Tehran, Iran.

Email: arezoo.bagheri@psri.ac.ir

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Abstract

Background: Early and delayed marriage has their own effects on mothers and their children's health and social dimensions. Nowadays, Iran experiences delayed marriage due to several factors; thus, the present study was concocted to investigate the factors affecting youths' marriage age, and to compare these factors between males and females.

Methods: To study demographic, socio-economical, and some atitudinal behavior factors affecting the age of marriage, in the current cross-sectional study, 12741 Iranian pre-married youths including 6381 males and 6360 females from all provinces were selected using multi-stage stratified method and the data was collected using a structured questionnaire in 2014. The questionnaire included demographic, socio-economical, and some atitudinal behavior questions about childbearing. Kaplan-Meier, Log-Rank test, and parametric survival analysis were applied in IBM SPSS Statistics for Windows, Version 22.0., and SAS 9.3 software.

Results: Gamma and Log Logistic parametric models were the best fitted models for females' and males' marriage age, respectively. Females and males who lived in provinces with TFR<2 were married α=0.03 (95%CI=0.02_-0.05) and α=0.05 (95%CI=0.04_0.06) times later than those who lived in provinces with TFR≥2, respectively. Rural females and males married α=-0.06 (95%CI=-0.08_-0.03) and -0.02 (95%CI=-0.06_-0.03) times sooner than urban ones, respectively. As educational level, the number of siblings, and income increased, the youths' marriage age increased (P<0.05). Employed youths also married later compared with unemployed ones.

Conclusion: Young females and males had the same factors influencing their marriage age.

Keywords: Faculty; Iran; Universities

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Introduction

Marriage is an important issue both for individuals and the society. For them, it is a significant and memorable event in their life cycle, and also the most important fundament in the process of family formation. Although after marriage individuals have still relationship with their parents, this event is the beginning of an individual's separation from the parental unit. In the society, marriage is interpreted as a phenomenon that joins two individuals from different families and makes a production and consumption unit, which has different requirements (1, 2).

Marriage is a very important subject in demographic studies that is not only because it is the main root of childbearing but also one of the most important determinants of fertility. Since fertility is affected by the age at the first marriage, it is the most important factor in population dynamics compared with other factors such as mortality and migration. Studying variations in the age of the first marriage, such as delayed or early marriage, can describe differences of fertility patterns across populations and in an individual (3,4). Therefore, age at the first marriage has a direct effect on fertility behavior.

On average, early marriage can lead to a longer period of exposure to the risk of women's pregnancy and often it results in higher completed fertility. It is associated with early childbearing that results in substantial health risks for both mother and her child; young mothers are more likely to experience complications of pregnancy and have less ability to deal with it, which often leads to maternal death. On the other hand, children born to young mothers are usually exposed to higher risks of morbidity and mortality (4). Although, early marriage is related to higher fertility, it also causes reduction in women's participation in the community and can lead to higher rates of divorce.

Delayed age at marriage directly affects completed fertility by reducing the number of years available for childbearing. Nowadays, major social-structural changes such as improving the educational level, urbanization, and the increase in single women's participation in the society have led to delayed marriages. Historically, societies with higher age for the first marriage have lower fertility rates compared to traditional populations in Asia and Africa, where marriages occur in younger ages which results in high level of fertility (2, 5). The previous studies shown that an increase in marriage age leads to dating, premarital sex, unwanted pregnancy, abortion, Sexually Transmitted Disease (STDs), and HIV/AIDS (6). Increase in premarital sex in the absence of contraception use leads to unwanted pregnancies and a rise in adolescent fertility (7). On the other hand, later marriage creates opportunities for women to complete their education, and build labor force skills. These opportunities may, in turn, motivate women to limit their family size and/or widen the space for their children so as to ensure health condition both for themselves and their children (8).

According to the importance of marriage in an individual's life history and its role in the fertility and mortality transitions, many studies all over the world analyzed marriage patterns and their determinants (9-11). During the recent years, conducting research on marriage age has increased by demographer in Iran (12-15); these studies have indicated that youths' marriage age has increased. Considering the importance of studying factors affecting delayed marriage in the recent years among the youths in Iran, the present study was conducted to analyze the impact of factors on females' and males' marriage age by parametric survival methods, separately.

Methods

In the present cross-sectional study, the structured questionnaire was reviewed by 12741 pre-married youths including 6381 males and 6360 females in 31 provinces in Iran, in 2014. This questionnaire included 38 demographic, socio-economic items and some item on participants' attitudes toward childbearing. Income was categorized in 3 categories low: <1, moderate:1-2.5, and high income: ≥3million Iranian Toman. The validity of the questionnaire was confirmed by 10 demographers and its reliability was calculated to be a minimum of 0.82 for each sub items based on Cronbach's alpha. The number of samples was calculated using Cochran formula to gain 95% of confidence so as to analyze the data. The sample was selected using multi-stage stratified random sampling from among those who were referred to public health centers for doing pre-marriage tests,

in all provinces, in Iran. In the first stage, 31 provinces were selected, and then, as the second stage, three cities in each province were selected based on the size and distribution of population using probability proportional to size sampling method. The minimum (n=180) and maximum (n=1556) number of samples were collected from Kohkiloye and Boyerahmad and Tehran provinces, respectively. Male and female individuals were randomly selected within each center and filled out a self-report questionnaire with careful monitoring system (16).

If the age at the first marriage is interpreted as survival time from a single state to married state, survival analysis should be used to analyze this time. In the current study, to do univariate analysis, Kaplan-Meier (KM) estimator was used to describe marriage age between provinces, places of residence, educational levels, job statuses, number of siblings, and income for both males and females, separately, and to compare marriage age among these covariates, Log-Rank test was used.

Usually, proportional hazard Cox regression is applied for modeling event times in studying demographic processes, such as marriage age (17-19). Kaplan-Meier, Log-Rank test, and parametric survival analysis were applied in IBM SPSS Statistics for Windows, Version 22.0., and SAS 9.3 software.

Results

The mean (SD) for marriage age of females and males were 22.2 (0.09) and 26.8 (0.06) years, respectively. In the current article, both females' and males' province, place of residence, educational level, job status, number of siblings, and income were considered as covariates, which can affect the youths' marriage age. Table 1 shows the frequency of the distribution of covariates for both groups

KM survival estimates and Log-Rank test for marriage age by covariates are shown in Table (2). These indicators help us to understand the average of marriage age among various categories of covariates, for both groups. As this table shows, the pattern of KM estimators, except for educational level between covariates, is the same for two groups.

Table 1. Frequency and percentage of studied covariates

Variable		Female N (%)	Male N (%)
Province	TFR<2	5115 (80.4)	5047 (79.1)
	TFR≥2	1245 (19.6)	1334 (20.9)
Place of residence	Urban	5556 (87.4)	5654 (88.6)
	Rural	727 (11.4)	727 (11.4)
Educational level	Illiterate	48 (.8)	64 (1)
	Primary and Middle School	961 (15.1)	1116 (17.5)
	High School and Diploma	2470 (38.8)	2479 (38.9)
	Associate and BA/BS	2470 (38.8)	2201(34.5)
	MA/MS and PhD	403 (6.3)	489 (7.7)
	Religious Studies	8 (0.1)	32 (0.4)
Job Status	Employed	1529 (24)	5497 (86.1)
	Unemployed	4831 (76)	884 (13.9)
Number of Siblings	No Sibling	149 (2.3)	110 (1.7)
	1-2	2443 (38.4)	1859 (29.1)
	3-4	2037 (32.0)	2104 (33.0)
	5 and more	1731(27.2)	2308 (36.2)
Income	Low	3636 (57.2)	3894 (61.0)
	Moderate	2599 (40.9)	2388 (37.4)
	High	125 (2.0)	99 (1.6)

Also, the mean of marriage age for females and males who lived in provinces with TFR<2 and urban area, employed, having more siblings, and having more income were greater than those for other categories in each covariate. The mean of marriage age for "primary and middle school" educated females was 17.6 years, which is the least marriage age mean compared with other females' educational level. Males with "Religious Studies" education had the least mean of marriage age, i.e. 23.8 year, compared with other educational levels of males. Youths with "MA/MS and PhD" educational level had the highest marriage age (more than 28 years).

Marriage age was significantly different between and within groups (Table 2).

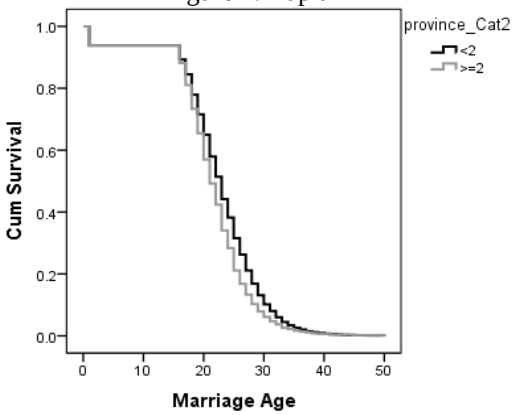
Table 2. Kaplan-Meier estimates and Log-Rank test for marriage age by covariate

Variable		Female		Male		
		Mean (SD)	P^{*}	Mean (SD)	P^{*}	P^{**}
Province	TFR<2	22.396 (0.10)	<0.001	27.148 (0.07)	<0.001	
	TFR≥2	21.239 (0.20)		25.690 (0.12)		<0.001
Place of residence	Urban	22.169 (0.09)	<0.001	27.040 (0.06)	<0.001	
	Rural	18.900 (0.30)		25.309 (0.18)		<0.001
Educational level	Illiterate	23.604 (1.36)	<0.001	26.391 (0.86)	<0.001	
	Primary and Middle School	17.649 (0.36)		26.297 (0.17)		
	High School/Diploma	20.072 (0.13)		26.169 (0.10)		
	Associate and BA/BS	24.989 (0.08)		27.351 (0.09)		<0.001
	MA/MS and PhD	28.337 (0.18)		29.479 (0.21)		
	Religious Studies	22.375 (1.46)		23.750 (0.52)		
Job status	Employed	26.602 (0.14)	<0.001	27.207 (0.06)	<0.001	
	Unemployed	20.766 (0.10)		24.579 (0.14)		<0.001
Number of siblings	No Sibling	18.805 (0.63)	<0.001	25.682 (0.52)	<0.001	
	1-2	20.694 (0.14)		26.124 (0.11)		
	3-4	22.442 (0.16)		26.848 (0.10)		<0.001
	5 and more	24.219 (0.16)		27.473 (0.11)		
Income	Low	21.261 (0.12)	<0.001	25.993 (0.07)	<0.001	
	Moderate	23.205 (0.13)		28.039 (0.10)		<0.001
	High	27.024 (0.59)		31.424 (0.65)		

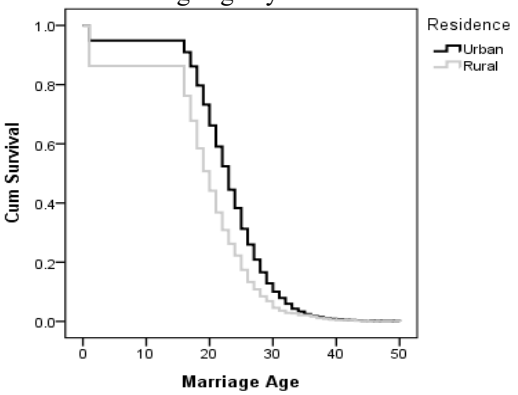
*Log-Rank test, **Mantel-Cox

Figure 1 shows the survival curves of females' marriage age for each covariate. Since patterns of survival curves were almost the same for females and males, only females' curves are shown.

Figure 1. Kaplan-Meier survival curve of females' marriage age by covariates



P<0.001



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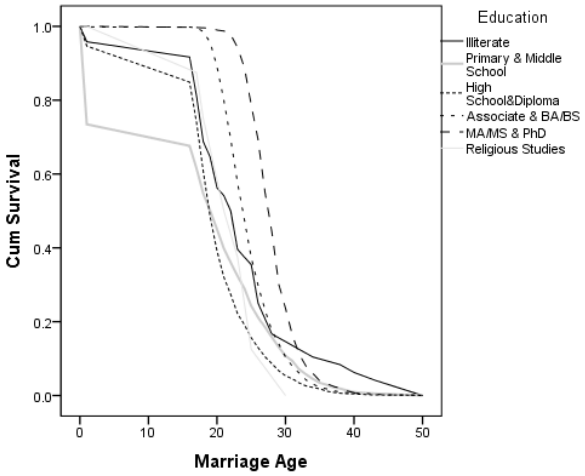

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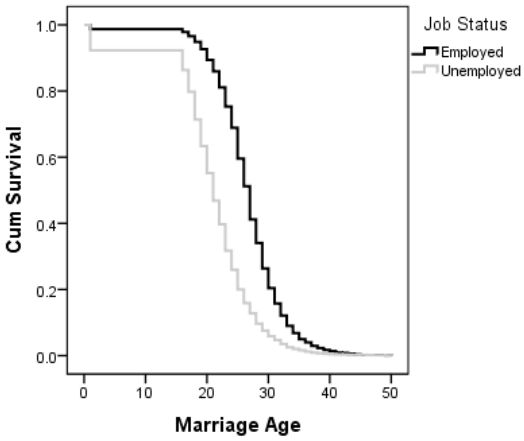

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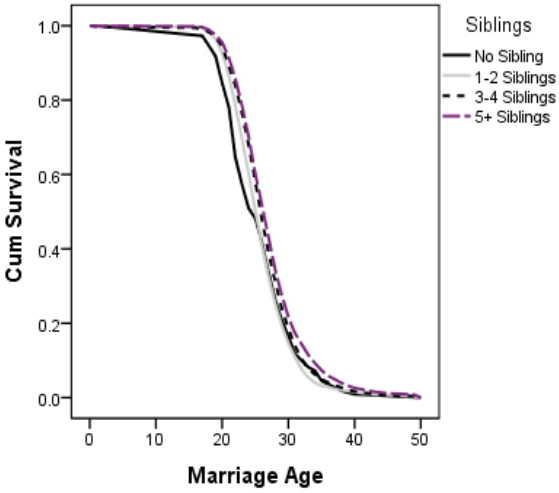
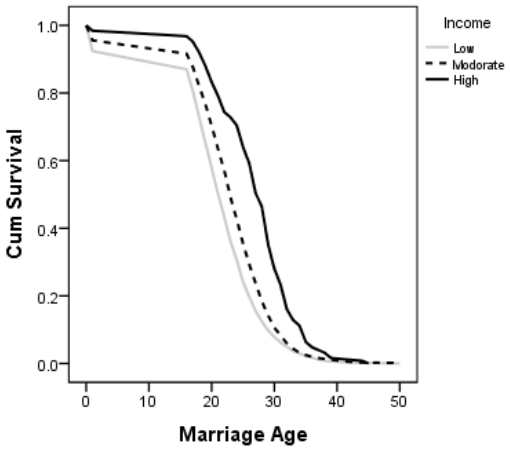


P<0.001



P<0.001

To investigate the effects of all covariates on both females' and males' marriage age simultaneously, parametric survival model was used. To select the best model among Exponential, Weibul, Log Logistic, Log Normal, and Gamma models, all were fitted to data and based on Akaike index (AIC), the best one was selected. AIC of all models for females and males are presented in Table 3. As this table shows, Gamma and Log Logistic models were the best models for females' and males' marriage age, respectively, and thus they were selected as the final models.

Table 4 presents the results of fitted parametric models by gender. As this table shows, all covariates including, province, place of residence, educational level, job status, number of siblings, and income have significant effects on females' and males' marriage age.

Table 3. AIC index for parametric models

Model	Female	Male
Exponential	14509.2	54749.5
Weibul	7086.3	39566.4
LogLogistic	9570.6	37135.8*
LogNormal	13416.1	39364.3
Gamma	6224.6*	38277.8

*Minimum value

Table 4. Parametric models for marriage age by gender

Variable		Female (Gamma)					Male (Log Logistic)				
		a	*SE*	95%CI	χ^2	*P*	*a*	*SE*	95%CI	χ^2	*P*
Intercept		2.94	0.10	(2.75, 3.155)	819.36	<.0001**	3.05	.03	(2.99, 3.11)	9376.87	<.0001**
Province	TFR<2	.03	0.01	(0.02, 0.05)	12.72	.0004**	.05	.01	(0.04, 0.06)	93.13	<.0001**
	TFR≥2 (ref)			.					.		
Place of residence	Rural	-.06	0.01	(-0.08,-0.03)	25.61	<.0001**	-.05	.01	(-0.06,-0.03)	48.19	<.0001**
	Urban (ref)										
Educational level	Illiterate	.18	.11	(-0.04, 0.39)	2.59	.1073	-.025	.03	(-0.09, 0.05)	.36	.5511
	Primary and Middle School	-.03	.10	(-0.08, 0.32)	.07	.7956	-.00	.03	(0.09, 0.20)	.01	.9144
	High School and Diploma	-.06	.10	(-0.17, 0.23)	.33	.5651	.003	.03	(-0.06, 0.05)	.01	.9111
	Associate and BA/BS	.052	.10	(-0.02, 0.13).	.26	.0410*	.07	.03	.	6.57	.0104*
	MA/MS and PhD	.12	.10	(-0.08, -0.03)	1.46	.0278*	.15	.03	(-0.06, -0.03)	28.63	<.0001**
	Religious Studies (ref)			.					.		
Job Status	Employed	.13	.01	(0.12, 0.15)	241.97	<.0001**	.10	.01	(0.09, 0.11)	302.29	<.0001**
	Unemployed (ref)			.					.		
Number of Siblings	No Sibling (ref)										
	1-2	.06	.024	(0.01, 0.10)	5.54	0.0185*	.010	.017	(-0.02, 0.04)	0.38	.5369
	3-4	.16	.02	(0.11, 0.21)	44.09	<.0001**	.06	.017	(0.03, 0.09)	12.56	.0004**
	5 and more	.22	.02	(0.17, 0.27)	82.05	<.0001**	.10	.017	(0.06, 0.13) .	31.80	<.0001**
Income	Low	-.02	.03	(0.032, 0.15)	3.032	.0398*	-.011	.04	(-0.01, 0.03)	3.477	.0310*
	High	.03	.01	(0.00, 0.12)	6.484	.0113*	.00	.02	(-0.04, 0.01)	10.498	.0185*
	Moderate (ref)			.					.		
Scale		.28	.00	(0.28, 0.29)			.09	.00	(0.091, 0.09)		
Shape		1.56	.02	(1.51, 1.60)					(2.99, 3.11)		

* Significant at .05 level, ** Significant at .01 level

Based on coefficient values (*a* column), females and males who lived in provinces with TFR<2 were married in later ages compared with those who lived in provinces with TFR≥2. In other words, the risk of early marriage decreased for females (0.03) and males (0.05) who lived in provinces with TFR<2 compared to TFR≥2. The effect of province on males' marriage age is greater than that on females' marriage age. Youths who lived in rural areas got married sooner than those who lived in urban areas. The effect of place of residence on marriage age for females (-0.06) is greater than that on males (-0.05). University educated females and males were married later than religious educated ones; the risk of early marriage of males decreased for those with "associate and BA/BS" (0.07) and "MA/MS and PhD" (0.15) educational levels compared to participants with religious studies level. As a result, by increasing educational levels of youths, their marriage age also increased. Job status had almost the same effect on marriage age for both groups: employed youths were married later compared with the unemployed ones. The risk of early marriage decreased as the number of siblings increased. The latest marriage time for both females and males accrued for those who had 5 or more siblings. The effect of the number of siblings on marriage age for females was almost two times that of males. The richer youths were married latter compared with others.

Discussion

During the recent years, considering the increase in the number of late marriage in Iran, many studies investigate the influential factors on delayed marriage (12-15, 21). Kazemipour et al. showed that there was a significant relationship between literacy, educational level, ethnicity, place of residence, and socio-economical statues and marriage age (13). Kanani et al. indicated that there was an extreme effect of modernization (which depends on education) and delayed marriage (14). In another survey under the title of "studying social effective factors on delayed marriage in Iran", job statues, job type, educational level, marriage and dowry expenditure, having older brother and sister, house ownership, and the lack of government support were derived as important factors affecting delayed marriage (15).

According to the importance of delayed marriage, in the present study, the influential factors affecting delayed marriage were considered and were then compared between males and females, which is the strength of the study, because many previous investigations studied age at marriage only in one of these groups (i.e. males or females). Considering 'province' as a covariate was another positive point of the present study. Since different provinces have different levels of socio-economic development and miscellaneous culture, this may have led to various marriage age. We classified provinces by TFR (TFR<2 and TFR≥2) (22, 23). The reason for considering TFR to divide provinces was because studies showed that provinces with low fertility have upper modernization level. The results showed that province had significant effect on marriage age for both females and males; individuals who lived in provinces with TFR<2, were married later than those who lived in provinces with TFR≥2. This finding is in line with several previous studies (10, 18, 24-26).

Place of residence was another factor which had significant effect on marriage age. Females and males who lived in rural areas married earlier than those who lived in urban areas, a result which was also confirmed by previous studies (6-7, 16-24). Youths with higher educational levels married in later ages. The relationship between education and marriage age was previously well-established in other studies (10, 15, 18, 21, 26-27). Females with higher educational level have more opportunity to find suitable job and so they try to work similar to males and because of economic independence they marry later than lower educated females.

Also, entering business market happens later for educated males than those with lower education, so by increasing educational level, age at marriage increased for both males and females. Based on analyzing 51 DHS studies all around the world, education is reported as the single factor most strongly related to the postponement of marriage, among other factors such as place of residence, religion, and ethnicity (9).

Employed females and males get married in later ages compared with unemployed ones. Also, economic independence of women had a significant effect on the age at which women marry. Some scholars stated that increasing economic independence of women is largely responsible for the delay in the time they marry and lack of independence accelerates the transition to marriage (25).

In the present study, the number of siblings also was a significant factor determining delayed marriage in that as the number of siblings increased, marriage age increased, as well. This effect was higher for females than for males, probably because of cultural factors: younger girls could not marry before their older sisters. This finding was also confirmed by Moghadas Jaafari et al. (15).

Females with higher income married later than those with lower income due to their economic independence. This finding was previously reported in many studies, as well (25). Hamilton et al. also showed that increasing socio-economic positions of individuals could lead to increase of marriage demand (11).

According to the results of the present study, young females and males have the same factors influencing their marriage age. So, policy makers are advised to examine the same programs and facilities for them in order to decrease youths' marriage age. Since job status is one of the important factor affecting age at marriage and it can change by policy makers, governments should provide job opportunities for youths so as to reduce age at marriage.

Conflict of interest

Authors declare no conflict of interests.

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