Health promotion sciences
https://healthpromotionjournal.ir
ISSN on-line: 3115-7564
https://doi.org/10.1000/q364p268
Article Type: Original Article
Heshmati, H (2026).Reported Age at Marriage and Its Sociodemographic Correlates among Married Women in Torbat Heydarieh County, Northeastern Iran. *Health promotion sciences*, *2*(1), 47-55.

Reported Age at Marriage and Its Sociodemographic Correlates among Married Women in Torbat Heydarieh County, Northeastern Iran: A Cross-Sectional Study

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ABSTRACT. The timing of marriage is a critical demographic and life-course transition linked to family formation and reproductive trajectories. Its correlates vary significantly across different social and cultural settings. To describe the reported age at marriage and examine its unadjusted associations with educational level, occupational status, and number of children among married women in Torbat Heydarieh County, northeastern Iran.In this cross-sectional study conducted in 2026, 405 married women aged 15–49 years were recruited through multistage random sampling. Sociodemographic data was collected using a researcher-developed questionnaire, and the reported age at marriage was recorded via an open-ended question. Data were analyzed in IBM SPSS Statistics (Version 20) using descriptive statistics, one-way analysis of variance (ANOVA) with Fisher's LSD post hoc tests, and Pearson's correlation. No multivariable adjustment was performed. Valid data on the reported age at marriage were available for 391 participants (96.5%). The mean reported age at marriage was 21.93 years (SD=5.18; median = 21). It differed significantly by educational level (F=20.18,p<.001) and occupational status (F=10.22, p<.001). Women with a university education reported a higher mean age at marriage (23.36±4.29 years) compared to those with less than a high school education (19.47±4.67) or a diploma (20.78±6.09). Women employed outside the home reported a higher mean age at marriage than housewives (23.22±4.02 vs. 20.90±5.77years; p<.001). The mean also differed across categories of the number of children (F=13.75, p<.001), ranging from 24.39±4.24years among women with no children to 19.13±3.66among those with three or more. The reported age at marriage was negatively correlated with the number of children (r=-.301, p<.001; n=389). In this single-county sample, the reported age at marriage varied significantly across educational and occupational groups and was inversely correlated with the number of children. Given the cross-sectional design and the absence of multivariable adjustment, these findings describe unadjusted associations and do not imply causal relationships.

Keywords: age at marriage; women; education; employment; sociodemographic factors; Iran.

Received on February 07, 2026
Accepted on April 29, 2026
ePublished: May 01, 2025

1. Introduction

Marriage is a major life-course transition and a central component of family formation. Its timing matters for demographic change because it marks the formation of a union and, in many settings, the onset of childbearing. Marriage is a major life-course transition and a central component of family formation. Its timing is demographically significant as it often marks the formation of a union and, in many settings, the onset of childbearing.

Cross-national evidence indicates substantial variation in the timing of marriage across countries and regions, as well as shifts across birth cohorts. The United Nations World Marriage Data provides indicators of marital status and mean age at marriage for 232 countries, compiled from heterogeneous census and survey sources (United Nations, 2019).

Studies in developing countries have documented persistent, albeit declining, rates of early marriage, with marked regional disparities.

Analyses of Demographic and Health Surveys demonstrate that educational attainment is associated with the timing of marriage, although the magnitude and pattern of this association differ across settings (Jensen & Thornton, 2003; Singh & Samara, 1996). More recent comparative research indicates that educational expansion is accompanied by changes in marriage timing, particularly among women (Bongaarts et al., 2017; Wu & Pesando, 2025).

Iran has undergone substantial changes in marriage patterns, though these shifts have not been uniform across cohorts, regions, or social groups. Studies based on Iranian demographic and census data have documented marriage postponement, spatial and ethnic differences in the transition to first marriage, and the critical role of women's education and the broader socioeconomic context (Mahdaviazad et al., 2019; Torabi & Baschieri, 2010; Torabi et al., 2013).

Education may be linked to later marriage through several pathways, including prolonged participation in schooling, shifting role priorities, and changing expectations about family formation. For instance, a study based on Iran's Urban Time Use Survey suggested that education shapes women's transition to marriage through time allocation and the prioritization of roles beyond marriage (Torabi & Abbasi-Shavazi, 2016). Evidence from other settings, including Turkey and South Asia, similarly links higher educational attainment to later first marriage, though this relationship remains context-dependent (Caldwell, 2005; Bongaarts et al., 2017).

The association between employment and the timing of marriage is less straightforward. Employment measured at the time of a survey may not reflect a woman's labor-force participation prior to marriage, and marriage itself may subsequently affect employment. Cross-national evidence suggests that current employment differences by age at marriage can be weak in some settings, underscoring the need to avoid causal interpretations when the temporal order is unknown (Blossfeld, 2009). Furthermore, economic conditions and marriage-market institutions may shape the timing of marriage in context-specific ways (Corno et al., 2020).

The timing of marriage is also intrinsically related to reproductive trajectories. Later marriage may coincide with later entry into parenthood where childbearing is closely tied to marriage; however, the relationship with completed parity is not necessarily linear and may depend on fertility preferences, age, union duration, and social context (Compernolle & Axinn, 2019; Nitsche & Hayford, 2020). While research on child marriage has documented associations with educational disadvantage and early childbearing, findings on child marriage should not be conflated with the full distribution of ages at marriage among adult women (Arthur et al., 2018; Malhotra & Elnakib, 2021; Parsons et al., 2015; Plesons et al., 2021).

Although national and provincial studies have examined the timing of marriage in Iran, local evidence remains valuable because social and demographic patterns can vary across geographical settings. Measurement also matters: a reported age at marriage cannot be interpreted as the age at first marriage unless the questionnaire explicitly establishes that distinction.

This study, therefore, describes the reported age at marriage without reclassifying it as the age at first marriage, and examines its unadjusted associations with educational level, occupational status, and number of children among married women aged 15–49 years in Torbat Heydarieh County, northeastern Iran.

2. Methods

2.1. Study Design and Setting

This cross-sectional study was conducted in 2026 among married women aged 15–49 years residing in Torbat Heydarieh County, northeastern Iran.

2.2. Participants and Sampling

A total of 405 women were recruited through multistage random sampling. In the first stage, five comprehensive health centers were selected via simple random sampling. In the second stage, the sample was allocated to these centers using stratified sampling. In the third stage, participants

within each center were selected by simple random sampling. Eligible women were married, aged 15–49 years, willing to participate, without a history of mental illness, not taking antidepressant medication, and in adequate mental health to complete the questionnaire. Questionnaires with incomplete responses were excluded only from the specific analyses requiring the missing information.

2.3. Measures

Data were collected using a researcher-developed questionnaire. The sociodemographic section covered the reported age at marriage, educational level, and occupational status.

The reported age at marriage was recorded through an open-ended question. Because the questionnaire did not distinguish between the age at first marriage and the age at the current marriage, this variable is consistently referred to as the "reported age at marriage" throughout the manuscript.

Educational level was categorized as less than high school, diploma, or university. Occupational status, recorded at the time of the survey, was classified as housewife, employed outside the home, or home-based self-employed. The number of children was recorded via an open-ended question and categorized as 0, 1, 2, or 3 or more.

Content validity of the questionnaire was assessed by a panel of public health experts; however, formal reliability testing (Cronbach's alpha) was not conducted, which is acknowledged as a methodological limitation.

2.4. Statistical Analysis

Data were analyzed using IBM SPSS Statistics (Version 20). Descriptive statistics summarized the study variables.

One-way ANOVA was used to compare the mean reported age at marriage across educational, occupational, and number-of-children categories. Fisher's LSD post hoc comparisons were performed following statistically significant overall ANOVA results. Pearson's correlation coefficient was used to examine the relationship between the reported age at marriage and the number of children. The significance level was set at $p <$,05. Each analysis utilized available observations, resulting in varying sample sizes due to missing data. No multivariable analysis was performed; all reported associations are unadjusted.

2.5. Ethical Considerations

Participation was voluntary, and the questionnaires were anonymous. Informed consent was obtained from all participants prior to data collection, and confidentiality was strictly maintained. The study was approved by the Ethics Committee of Torbat Heydariyeh University of Medical Sciences (Ethics Code: IR.THUMS.REC.1403.014).

3. Results

3.1. Distribution of Reported Age at Marriage

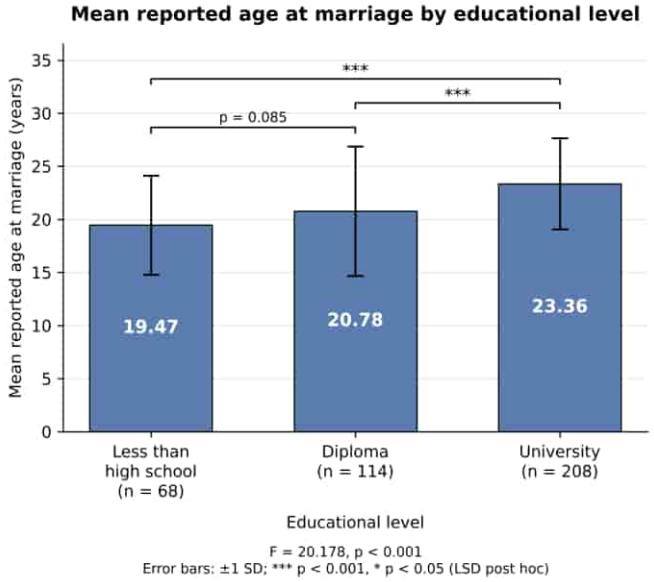
Of the 405 participants, 391 (96.5%) provided valid data on the reported age at marriage, while 14 (3.5%) had missing data. The mean reported age at marriage was 21.93 years (SD = 5,18), and both the median and mode were 21 years (Table 1). The minimum reported value of 10 years is addressed in Section 4.4.

Table 1. Distributional characteristics of the reported age at marriage among married women in Torbat Heydarieh County (N=405)

Statistic	Value
Total sample	405
Valid observations, *n*(%)	391 (96.5%)
Missing observations, *n*(%)	14 (3.5%)
Mean, years	21.93
Standard deviation, years	5.18
Median, years	21
Mode, years	21

3.2. Reported Age at Marriage by Educational Level

The mean reported age at marriage differed significantly across educational groups ($F = 20{,}18. p <$,001). It was $19{,}47 \pm 4{,}67$years among women with less than a high school education, $20{,}78 \pm 6{,}09$among those with a diploma, and $23{,}36 \pm 4{,}29$among those with a university education. LSD post hoc comparisons revealed that the university group differed significantly from both lower-education groups (both $p <$,001), whereas the difference between the less-than-high-school and diploma groups was not statistically significant ($p =$,085) (Table 2, Figure 1).



Note:*** p < 0.001 (LSD post hoc); the difference between less than high school and diploma was not significant (p = 0.085) Bars show means and error bars show ±1 SD (Table 2).

Figure 1. Mean reported age at marriage by educational level

3.3. Reported Age at Marriage by Occupational Status

The mean reported age at marriage differed significantly across occupational groups ($F = 10{,}22. p <$,001). Women employed outside the home reported a higher mean age at marriage ($23{,}22 \pm 4{,}02$ years) than housewives ($20{,}90 \pm 5{,}77$ years; $p <$,001). The mean among home-based self-employed women was $20{,}62 \pm 5{,}62$years. Other pairwise comparisons between occupational groups were not statistically significant (Table 2, Figure 2).



Note: Bars show means and error bars show ±1 SD (Table 2). *** p < 0.001 (LSD post hoc); other pairwise comparisons were not significant.

Figure 2. Mean reported age at marriage by occupational status

3.4. Reported Age at Marriage by Number of Children

The mean reported age at marriage differed significantly across categories of the number of children ($F = 13{,}75. p < {,}001$). The mean was highest among women with no children ($24{,}39 \pm 4{,}24$ years) and lowest among women with three or more children ($19{,}13 \pm 3{,}66$ years). LSD comparisons were significant for 0 versus 1, 2, and 3 or more children; for 1 versus 3 or more; and for 2 versus 3 or more. The difference between 1 and 2 children was not significant ($p = {,}106$) (Table 2, Figure 3).

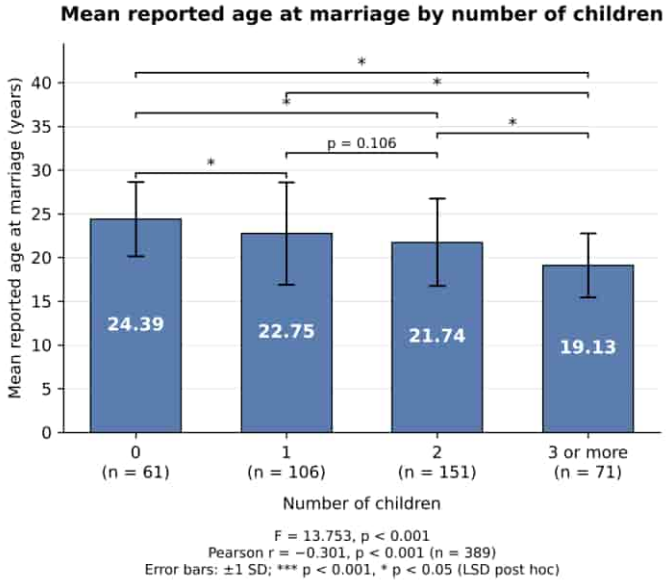
Table 2. One-way analysis of variance comparing the mean reported age at marriage across sociodemographic groups.

Characteristic	Category	n	Mean ± SD (years)	ANOVA
Education	Less than high school	68	19.47 ± 4.67	F = 20.178, p < 0.001
	Diploma	114	20.78 ± 6.09	
	University	208	23.36 ± 4.29	
Occupation	Housewife	205	20.90 ± 5.77	F = 10.215, p < 0.001
	Employed outside the home	171	23.22 ± 4.02	
	Home-based self-employed	13	20.62 ± 5.62	
Number of children	0	61	24.39 ± 4.24	F = 13.753, p < 0.001
	1	106	22.75 ± 5.87	
	2	151	21.74 ± 5.00	
	3 or more	71	19.13 ± 3.66	

ANOVA, one-way analysis of variance; SD, standard deviation. Group sizes differ between analyses because of missing data. LSD post hoc results are given in the text.

3.5. Correlation between the reported age at marriage and the number of children

Pearson's correlation showed a statistically significant negative association between the reported age at marriage and the number of children (r = −0.301, p < 0.001; n = 389) (Table 3).



Note: Bars show means and error bars show ±1 SD (Table 2). * p < 0.05 (LSD post hoc); the difference between 1 and 2 children was not significant (p = 0.106). Pearson's correlation between the reported age at marriage and the number of children: r = −0.301, p < 0.001 (n = 389).

Figure 3. Mean reported age at marriage by number of children

3.6. Correlation Between the Reported Age at Marriage and the Number of Children

Pearson's correlation revealed a statistically significant negative association between the reported age at marriage and the number of children ($r = -{,}301. p < {,}001; n = 389$) (Table 3).

Table 3. Pearson's correlation between the reported age at marriage and the number of children among women with complete data.

Variables	n	Pearson r	p-value
Reported age at marriage and number of children	389	−0.301	< 0.001

4. Discussion

This study examined the reported age at marriage and its unadjusted associations with educational level, occupational status, and number of children among married women in Torbat Heydarieh County. The mean reported age at marriage was 21.93 years. Significant differences were observed across educational and occupational groups, alongside a negative association with the number of children. All findings represent unadjusted, cross-sectional associations.

Women with a university education reported a higher mean age at marriage than women with lower educational attainment. This pattern aligns with Iranian studies documenting later first marriage among highly educated women and research linking educational expansion to marriage postponement (Mahdaviazad et al., 2019; Torabi & Baschieri, 2010; Torabi et al., 2013). Torabi and Abbasi-Shavazi (2016) suggested that education may influence marriage timing partly through time allocation and shifting role priorities, a pathway highly relevant to the Iranian context. International comparative studies similarly show that higher educational attainment is often associated with later marriage, though the magnitude of this association varies globally (Bongaarts et al., 2017; Caldwell, 2005; Wu & Pesando, 2025). In the present data, the primary difference lay between university-educated women and the other two groups, as the less-than-high-school and diploma groups did not differ significantly. Because the analysis was unadjusted and cross-sectional, these educational differences should be interpreted as group comparisons rather than evidence of a causal effect. Education may have been completed before or after the reported marriage, and the questionnaire did not establish this temporal sequence.

Women employed outside the home at the time of the survey reported a higher mean age at marriage than housewives. This finding may reflect differences in educational pathways, socioeconomic circumstances, or life-course priorities. However, occupational status was measured at the survey date, not necessarily at the time of marriage. Marriage may also influence subsequent employment, and international evidence suggests that the association between current employment and age at marriage is not uniformly strong across settings (Blossfeld, 2009). Therefore, reverse causation and confounding cannot be ruled out. Additionally, the small sample size of the home-based self-employed group limits the statistical power of comparisons involving this category.

The reported age at marriage was negatively correlated with the number of children, with the mean being lower among women with three or more children compared to those with none. A plausible explanation is that earlier marriage allows for a longer reproductive window in which childbearing can occur; however, the present data cannot test this hypothesis. Studies in other populations have linked marriage timing to entry into parenthood and achieved fertility, though these relationships are mediated by social norms, fertility preferences, age, and whether childbearing occurs primarily within marriage (Compernolle & Axinn, 2019; Nitsche & Hayford, 2020).

This correlation must not be interpreted as a causal effect of marriage age on family size. Current age, birth cohort, duration of marriage, fertility intentions, contraceptive use, infertility, socioeconomic conditions, and marital history may all influence the number of children, and none of these confounders were controlled in this analysis.

The minimum reported age at marriage was 10 years. Such a value may represent a genuine report, a misunderstanding of the question, or a data-entry error. Like any value below 18 years, it must be

interpreted with extreme caution. Research on child marriage in Iran indicates that early marriage varies by gender, ethnicity, parental literacy, and place of residence (Torabi & Bagi, 2024). While international reviews describe associations between child marriage and educational disadvantage or early childbearing, these findings pertain to a specific subgroup and should not be generalized to the entire present sample (Arthur et al., 2018; Malhotra & Elnakib, 2021; Parsons et al., 2015; Plesons et al., 2021).

Strengths and Limitations

The strengths of this study include recruitment through five comprehensive health centers using multistage random sampling and the examination of the reported age at marriage in relation to several key sociodemographic characteristics.

However, several limitations must be acknowledged. First, the cross-sectional design precludes temporal and causal inference. Second, the study was restricted to one county and recruited women through health centers, limiting generalizability to broader populations. Third, no multivariable adjustment was performed, meaning residual confounding (e.g., by current age or socioeconomic status) is highly likely. Fourth, occupational status was measured at the survey date, not at the time of marriage. Fifth, the questionnaire did not distinguish between the age at first marriage and the age at the current marriage, limiting direct comparison with studies that explicitly measured first marriage. Sixth, the reported age at marriage was self-reported and subject to recall bias; the minimum reported value of 10 years requires verification against source records. Finally, missing observations resulted in varying sample sizes across analyses, and one occupational group was notably small. Furthermore, formal reliability testing of the researcher-developed questionnaire was not conducted, which is a methodological constraint.

5. Conclusion

Among married women aged 15–49 years in Torbat Heydarieh County, the reported age at marriage differed significantly by educational level and occupational status and was negatively correlated with the number of children. These unadjusted, cross-sectional findings indicate that the reported age at marriage varies across sociodemographic groups in this local population, but they do not establish causal relationships. Future studies should employ an explicitly defined measure of age at first marriage, collect comprehensive socioeconomic and life-course data, ensure instrument reliability, and apply multivariable analyses to control for confounding factors.

Declarations

Acknowledgments

The author sincerely thanks all participants for their valuable contributions to this Data Authors' **contributions**

The author contributed to all stages of the research and the preparation of the manuscript. study.

Availability of Data and Materials

Datasets generated and analyzed during this study are available from the corresponding author upon reasonable request.

Conflict of Interest

The author declares no conflicts of interest.

Consent for Publication

Not applicable.

Ethics approval and consent to participate

Ethical approval was granted by the Ethics Committee of Torbat Heydariyeh University of Medical Sciences (Code: IR.THUMS.REC.1403.014). Informed consent was obtained from all participants.

Funding

This study was supported by Torbat Heydariyeh University of Medical Sciences.

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Declaration of AI Use

Python was used for figure generation, and AI tools were utilized for language editing and formatting refinement in this paper.

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How to cite this article: Heshmati, H (2026).Reported Age at Marriage and Its Sociodemographic Correlates among Married Women in Torbat Heydarieh County, Northeastern Iran. Health promotion sciences, 2(1), 47-55.