

Socioeconomic Factors Associated with Attitudes Toward Consanguineous Marriage in Iran

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ABSTRACT

This study aimed to investigate the community attitudes toward consanguineous marriage (CM) and their associated factors. A self-administered questionnaire was distributed through the social media platform Instagram (n = 4733).

The community had a highly positive attitude toward CM (35.4%). The univariate analysis showed that positive attitude was lower among women, residents of Tehran and provincial centers, singles, offspring of biologically related marriages, and participants with high family income. Further, a significant inverse relationship existed between regular book-reading habits and positive attitudes. According to the final model (using the backward elimination method in multivariable logistic regression analysis), positive attitude was lower among participants who studied literary works after adjusting for sex, place of residence, educational level, marital status, and type of parental marriage (adjusted odds ratio = 0.63, 95% confidence interval = 0.52–0.77, $P < 0.001$).

This study was novel in exploring the relationship between book-reading habits and attitudes toward CM. Our findings revealed a strong inverse relationship between studying literary works and positive attitudes.

Keywords: Attitude, consanguinity, cross-section study, Instagram, Iran

INTRODUCTION

Consanguineous marriage (CM) is defined as a marriage between second cousins or between closer biological relatives. Evidence indicates a long history of marriage between biological relatives (1-4). In Greek mythology, gods married their first-degree relatives (i.e., parents with children or sisters with brothers). First-cousin marriages are permitted in Judaism, Buddhism, Zoroastrianism, and Islam. However, marriages between even closer relatives have been documented in ancient Persian, Egyptian, and Japanese societies. Brother-sister marriages were common in many societies throughout ancient history. These types of marriages were especially common in royal families (1).

The prevalence of CM varies worldwide. Despite biblical precedents and evidence showing that CM was quite common in Europe prior to the 20th century, it is currently extremely rare in the United States and European populations (5). However, it is common in many Asian and African countries (6-23). A large number of studies have been conducted to estimate the prevalence of CM in Iran (24-26). The overall prevalence of CM has been

reported to be about 40%, indicating an extremely high prevalence.

Accumulating evidence suggests the adverse effects of consanguinity on the health of offspring. Numerous case-control and ecological studies have shown a higher risk of having offspring with autosomal recessive and multifactorial diseases among consanguineous couples than among nonconsanguineous couples (27-34).

The consanguinity rates show a decreasing trend in many countries, such as European and American countries (35-37). Given modernization and changes in socio-cultural perspectives over the past decades, the younger generation is expected to move away from traditional marriage customs, consequently decreasing the prevalence of CM in Asian and African communities. Despite a decrease in the prevalence of CM in some populations, such as Bahrainis (16), Jordanians (38), Omanis (39), and Palestinians (12, 40), its prevalence remains extremely high in these communities. The CM rates have remained consistently high or, in some cases, increased in some other countries (41, 42). For example, a higher rate of

CM among the current generation compared with their parents has been reported, particularly for first-cousin marriages from Iran (43, 44), the United Arab Emirates (UAE) (6), Algeria (9), Yemen (10), Saudi Arabia (20), and Qatar (45).

A number of studies have shown that the attitudes toward CM are more positive in countries with high levels of CM (39, 46-54). Studies have shown that sex, educational level, and employment status are associated with attitudes toward CM (21, 23, 39, 47, 49, 52). This clearly highlights the importance of exploring the factors predicting positive attitudes, aiming to design appropriate strategies to reduce the prevalence of CM in Iran and other countries. No previous study investigated the relationship between book-reading habits and attitudes toward CM. Therefore, the present study was performed to explore the relationship of some socioeconomic factors, particularly book-reading habits, with attitudes toward CM.

METHODS

Questionnaire and participants

This was a cross-sectional study. A self-administered questionnaire was distributed through the social media platform Instagram. The questionnaire was divided into two parts, comprising 12 questions. The first part assessed the sociodemographic characteristics of the participants: age, sex (male or female), religion (Shia Muslim sect, Sunni Muslim sect, Armenian, Jewish, Assyrian, Chaldean, Zoroastrian, and Mandaean), ethnicity (Persian, Azari, Lur, Arab, Turkmen, Kurd, Baluch, Tajik, Pashtun, Hazara, and Uzbek), place of residence (capital of Iran, provincial center, small cities, and rural areas), family income (middle and lower, or above middle), marital status (single, married, or divorced/widowed), level of education (high school or less, undergraduate, or postgraduate), and type of parental marriages (unrelated, second cousins, first cousins, or double first cousins), through nine close-ended questions. The second part comprised three close-ended questions. The attitude toward CMs was assessed via a question, "Are you a supporter of consanguineous marriages in Iran?" with the answer "yes" or "no." Furthermore, we asked a question about the participants' book-reading habits with the answer "yes" or "no." The last question asked about

the subject studied (literary, political, religious, historical, or other). The questionnaire was written in Persian.

The exclusion criteria were as follows: other nationalities living in Iran, such as Afghanis and Iraqis; participants aged less than 18 years or more than 55 years; and religions other than Muslims, such as Armenians, Jews, Assyrians, Chaldeans, Zoroastrians, and Mandaeans. The reason for excluding these religions was the small number of respondents. The questionnaire was completed by 5140 respondents. Of these, 97, 5, and 305 respondents were excluded from the data analyses due to their age, nationality, and religion, respectively. The final sample comprised 4733 participants.

Statistical analysis

The associations between attitudes toward CM and predictors (sex, marital status, educational level, family income, etc.) were assessed using the Pearson chi-square test. The age of participants with positive and negative attitudes was compared using the independent-samples t test.

The multivariate analysis using a binary logistic regression model was used to identify the factors associated with positive attitudes. The odds ratio (OR) was used to assess the strength of an association. Variables with a P value of 0.15 or less in the univariate analysis were included in the multivariate model as explanatory variables. The outcome variable was the attitude toward CM (negative = 0, positive = 1). A backward elimination procedure was used for model construction, and a two-tailed P value less than 0.05 indicated a significant difference in the final model. Statistical analyses were performed using the Statistical Package for Social Sciences version 22.0 (SPSS Inc., IL, USA).

RESULTS

Of the 4733 respondents, 40.0% were male. The mean age (\pm standard deviation) of the respondents was 28.3 (\pm 6.5) years. A total of 14.8%, 63.4%, 19.1%, and 2.6% of the participants lived in the capital of Iran (Tehran), provincial centers, small cities, and rural areas, respectively. A majority of the participants (93.5%) were Shi'a. In terms of educational level, 16.0%, 58.1%, and 25.9% of the participants belonged to the categories of high school or less, undergraduate, and postgraduate,

respectively, indicating a generally high level of education. As per the reports, 36.6% of the respondents had a family income above the middle level. Finally, a positive attitude toward CM was reported by 35.4% (95% confidence interval (CI) = 34.0%–36.9%) of the respondents.

Table 1 shows the relationships between the aforementioned characteristics and attitude status. The statistical analysis showed that positive attitude was lower among women (compared with men), residents of Tehran and provincial centers (compared with small towns and rural areas), singles (compared with married people), offspring of biologically related marriages (compared with offspring of unrelated marriages), undergraduate and postgraduate participants (compared with high school or less), and participants with high family income (compared with those with medium and less than medium income). The mean age of participants with negative attitudes (28.1 ± 6.4 years) compared with those with positive attitudes (28.6 ± 6.6 years) displayed a small (about 6 months) but statistically significant difference ($t = 2.56$, $df = 4731$, $P = 0.010$). No difference was found between Shi'a and Sunni sects in terms of the prevalence of positive/negative attitudes.

As mentioned in the Introduction section, one of the objectives of the present study was to investigate the relationship between attitude toward CM and the status of book-reading habits of the respondents. A significant relationship was detected between regular book-reading habits and attitude toward CM ($P < 0.001$). The positive attitude was 31.4% and 45.1% among the participants with and without book-reading habits, respectively, with a statistically significant difference (**Table 1**).

Table 2 shows the associations between book-reading habits and selected demographic characteristics. The statistical analysis showed that the frequency of regular book-reading habits was higher among women (compared with men), residents of Tehran and provincial centers (compared with small towns and rural areas), undergraduates and postgraduates (compared with high school or less), and participants with medium and low family income (compared with those with above medium income). The age, religion, and marital status of the participants were similar in the two categories of book-reading habits.

A positive attitude was associated with some of the demographic predictor variables, as well as with a regular book-reading habit, whereas a regular book-reading habit was associated with the same demographic variables. In the next step, multivariate logistic regression analyses were performed to exclude the influence of possible confounders on the association between book-reading habits and attitude toward CM. Variables with $P < 0.150$ in the univariate analysis were used in the multivariate logistic regression analyses, as mentioned in the Methods section. The final model was constructed using the backward elimination method. The variables of age, sex, place of residence, educational level, marital status, family income, type of parental marriages, and study habit status were included in the analysis as predictors. The results of the multivariate analysis are presented in **Table 3**. The multivariate logistic regression analysis revealed an increase in positive attitudes among men (compared with women), residents of small towns and rural areas (compared with residents of Tehran), married persons (compared with single persons), and offspring of biologically related marriages (compared with offspring of unrelated marriages). Positive attitude was lower among educated people (compared with high school or less category) and participants with regular book-reading habits (compared with those who do not read books regularly).

These results indicated that regular book-reading habits and higher educational levels were important factors for negative attitudes. Our further statistical analysis showed that the interaction between these two factors was not significant (data not shown).

Thus, the attitudes of those with regular book-reading habits were more negative than those who do not read books. The responders were categorized according to the context of the books they read, aiming to investigate whether the participants' fields of study were related to attitudes toward CM. **Table 4** shows the relationship between the study fields and attitudes toward CM. The frequency of people with positive attitudes was significantly lower among those who studied literary books (OR = 0.52, 95% CI = 0.43–0.63, $P < 0.001$).

The multivariate logistic regression analysis was performed using age, sex, place of residence, educational level, marital status, family income, type of parental

Table 1 Relationship between selected demographic and socioeconomic characteristics and attitude toward CM

Characteristic	Attitude toward CM		Statistical comparison		
	Negative	Positive	χ^2	df	P
Sex					
Female	2067	773	209.39	1	<0.001
Male	989	904			
Location					
Tehran	483	217	30.70	3	<0.001
Provincial centers	1973	1030			
Small cities	539	367			
Rural	61	63			
Educational level					
High school or less	418	340	39.17	2	<0.001
Undergraduate	1796	953			
Postgraduate	842	384			
Religion					
Shi'a	2864	1559	1.01	1	0.316
Soni	192	118			
Marital status					
Single	1732	809	33.38	2	<0.001
Married	1257	836			
Divorced/Widowed	67	32			
Family income					
Medium and lower	1904	1097	4.51	1	0.034
Above medium	1152	580			
Type of parental marriages					
Unrelated	2047	978	36.60	3	<0.001
Second cousins	343	220			
First cousins	638	457			
Double first cousins	28	22			
Having a book-reading habit					
Negative	756	622	80.04	1	<0.001
Positive	2300	1055			

CM, Consanguineous marriage.

Table 2 Relationship between selected socioeconomic characteristics and book-reading habit

Characteristic	Book-reading habit		Statistical comparison		
	Negative	Positive	χ^2	df	P
Sex					
Female	619	2221	184.3	1	<0.001
Male	759	1134			
Location					
Tehran	138	562	53.49	3	<0.001
Provincial centers	879	2124			
Small cities	306	600			
Rural areas	55	69			
Educational level					
High school or less	331	427	129.1	2	<0.001
Undergraduate	804	1945			
Postgraduate	243	983			
Religion					
Shi'a	1278	3145	1.58	1	0.208
Soni	100	210			
Marital status					
Single	711	1830	5.33	2	0.069
Married	643	1450			
Divorced/Widowed	24	75			
Family income					
Medium and lower	968	2033	39.2	1	<0.001
Above medium	410	1322			

marriage, study literary books, and study history books as predictors of attitudes toward CM. A final model was constructed using backward elimination, and the results are presented in Table 5. According to the final fitted model, the overall results were the same as those presented in Table 3. The positive attitude was lower among the participants who had studied literary works after adjusting for sex, place of residence, educational level, marital status, and type of parental marriages (adjusted OR = 0.63, 95% CI = 0.52–0.77, $P < 0.001$).

DISCUSSION

Previous studies have reported a high prevalence of CMs among the general population in Iran (24–26). In the present study, the overall prevalence of positive attitudes in Iran was also found to be high at 35.4%.

This was consistent with the findings in the region as follows. The prevalence of the positive attitude was 75% (39), 43% (50), 52%–74% (54), and 59% (46) in Oman, Saudi Arabia, Pakistan, and Palestine. The fact that the number of participants who absolutely support the CMs in Iran is roughly one third of adults is challenging.

We found that participants whose parents had CMs were more likely to have a positive attitude and married with their biological relatives (Table 3). This was also reported from other countries (7, 55–57). The higher level of positive attitudes could be related to the correlation of more old beliefs and motives with the strengthening or development of family ties. This could be interpreted in terms of the crucial role of the family in children's acceptance of CMs.

Table 3 Multivariate logistic regression analysis showing the adjusted odds ratio for positive attitude toward consanguineous marriage across background characteristics in Iran

Predictor variable	B	SE	Wald	df	Adjusted OR	95% CI	P
Sex							
Female (Ref.)					1.0		
Male	0.831	0.065	162.12	1	2.29	2.02–2.61	<0.001
Location of residence			8.590	3			0.035
Tehran (Ref.)					1.0		
Provincial centers	0.116	0.094	1.515	1	1.12	0.93–1.35	0.218
Small cities	0.262	0.111	5.589	1	1.30	1.04–1.61	0.018
Rural areas	0.445	0.207	4.638	1	1.56	1.04–2.33	0.031
Educational level			11.394	2			0.003
High school or less (Ref.)					1.0		
Undergraduate	–0.209	0.087	5.706	1	0.81	0.68–0.96	0.017
Postgraduate	–0.340	0.101	11.374	1	0.71	0.58–0.86	0.001
Marital status			48.757	2			<0.001
Single (Ref.)					1.0		
Married	0.451	0.065	48.511	1	1.57	1.38–1.78	<0.001
Divorced/Widowed	0.111	0.227	0.236	1	1.11	0.71–1.74	0.627
Type of parental marriages			27.702	3			<0.001
Unrelated (Ref.)					1.0		
Second cousins	0.321	0.099	10.583	1	1.37	1.13–1.67	0.001
First cousins	0.356	0.076	22.112	1	1.42	1.23–1.65	<0.001
Double first cousins	0.329	0.301	1.196	1	1.38	0.77–2.50	0.274
Having a book-reading habit							
Negative (Ref.)							
Positive	–0.343	0.070	24.301	1	0.70	0.61–0.81	<0.001
Constant	–0.985	0.136	52.705	1	0.37		<0.001

CI, Confidence interval; OR, odds ratio.

This study investigated the relationship between the educational level and the positive attitude. It revealed a significant relationship between different educational levels in terms of being for or against CM, where most of the postgraduates were against CMs. Similar to our findings, numerous studies reported a strong inverse relationship between the educational level and positive attitude (21, 22, 39, 44, 47, 48, 52). These findings were supported by a study on high school students in Turkey, which showed a change in knowledge and attitudes after the training program (58).

The results of the multivariate logistic regression analysis showed that a reading habit was a significant predictor of negative attitude toward CM after controlling for other socioeconomic and demographic factors (sex, educational level, place of residence, type of parents' marriage, and marital status). However, family income had no significant relationship with attitude toward CM. Further statistical analysis showed that the positive attitude was lower among participants who had the habit of reading literary works ($P < 0.001$, Table 3). Therefore, regular book-reading habits seem to be effective in forming an attitude toward family marriage in Iran.

Table 4 Relationship between the reading of book subjects and the attitudes toward CM

Study field	Attitude toward CM		Statistical comparison		
	Negative	Positive	OR*	95% CI	P
Reading literary books					
No	2507	1504	1.0	–	–
Yes	549	173	0.52	0.43–0.63	<0.001
Reading political books					
No	2741	1526	1.0	–	–
Yes	315	151	0.86	0.70–1.05	0.150
Reading historical books					
No	2783	1525	1.0	–	–
Yes	273	152	1.01	0.82–1.25	0.881
Reading religious books					
No	2980	1624	1.0	–	–
Yes	76	53	1.28	0.89–1.82	0.174

*Curd OR CI, Confidence interval; CM, consanguineous marriage; OR, odds ratio.

It is obvious that the higher the positive attitude toward CM, the higher the probability of high-risk marriages and, consequently, the risk of autosomal recessive and multifactorial diseases in society. On the contrary, the overall prevalence of CM and the positive attitude toward CM in Iran were high, indicating the need to increase awareness about the possible risk of familial diseases in the general population, especially among young people. Since a strong correlation exists between negative attitudes toward CM and book-reading habits, it can be expected that the positive attitude of society toward CM will shift as regular book-reading habits increase, especially among the youth.

This study was novel in reporting the relationship between the book-reading habit and attitude toward CM. Our data analysis showed that the study of literary works had an extremely strong inverse relationship with positive attitudes.

Future studies should focus on the type of books studied and the amount of time spent on studying. Also, similar studies should be conducted on other populations before drawing final conclusions.

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Table 5 Multivariable logistic regression analysis showing the adjusted odds ratio for positive attitude toward CM across background characteristics in Iran

Predictor variable	B	SE	Wald	df	Adjusted OR	95% CI	P
Sex							
Females (Ref.)					1.0		
Males	0.860	0.065	176.933	1	2.36	2.08–2.68	<0.001
Location of residence							
Tehran (Ref.)			9.991	3			0.019
Provincial centers	0.124	0.094	1.733	1	1.13	0.94–1.36	0.188
Small cities	0.282	0.111	6.502	1	1.32	1.06–1.64	0.011
Rural areas	0.477	0.206	5.349	1	1.61	1.07–2.41	0.021
Educational level							
High school or less (Ref.)			12.958	2			0.002
Undergraduate	-0.222	0.087	6.481	1	0.80	0.67–0.95	0.011
Postgraduate	-0.360	0.100	12.931	1	0.69	0.57–0.84	<0.001
Marital status							
Single (Ref.)			48.324	2			<0.001
Married	0.449	0.065	48.035	1	1.56	1.38–1.77	<0.001
Divorced/Widowed	0.100	0.228	0.194	1	1.10	0.70–1.72	0.659
Type of parental marriages							
Unrelated (Ref.)			27.725	3			<0.001
Second cousins	0.323	0.098	10.769	1	1.38	1.13–1.67	0.001
First cousins	0.355	0.076	21.963	1	1.42	1.22–1.65	<0.001
Double first cousins	0.334	0.300	1.243	1	1.39	0.77–2.51	0.265
Reading literary books							
Negative (Ref.)							
Positive	-0.451	0.096	21.879	1	0.63	0.52–0.77	<0.001
Constant	-1.169	0.126	85.943	1	0.31		<0.001

CI, Confidence interval; CM, consanguineous marriage; OR, odds ratio.

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