Attitude toward virginity and its determinants among girls in Tabriz: Iran

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Abstract

Background We aimed to assess the attitude of unmarried girls towards virginity, and its determinants, comparing three age cohorts (born in the 70s, 80s, and 90s) in the city of Tabriz in northwestern Iran.

Methods We conducted a cross-sectional survey among 700 girls residing in Tabriz in 2021 employing a population-based cluster sampling based on health clinics and households. We collected data using a pilot-tested instrument, which comprised socio-demographic questions, and statements to assess attitudes towards virginity and its importance, the meaning of virginity, ways of losing virginity, and perception of the hymen. The data was analyzed using SPSS, version 21. Analysis of variance and independent t-test was used for bivariate analysis and linear regression was used to identify the determinants of the attitude. A *p* value under 0.05 was considered statistically significant.

Results Only about one-third (35.2%) of unmarried girls considered preserving virginity as an important issue for girls before marriage in current days. About 27% were uncertain and about 38% believed it was unimportant. The importance of virginity (score range 7–35) was significantly greater for girls born in the 70s than for girls born in the 80s and 90s ($p < 0.05$). In the multivariate linear regression model, the determinants of the importance of virginity were older age, greater religious affiliation, living with both parents and lower consumption of the internet and social networks for sexual information.

Conclusions This study indicates significant shifts in sexual attitudes among young females which may have important implications for marriage age and the culturally and age-appropriate sexual health interventions of young people.

Keywords Virginity, Young adults, Attitude, Females, Sexual abstinence

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Background

Virginity has its roots in medieval Western culture and refers to the ownership of a man over a woman [1]. For centuries, virginity as a "lack of sexual intercourse before marriage" has been considered a value and indication of purity and self-control in numerous religions [2]. One of the significant questions about virginity is whether women maintain their virginity due to individual attitudes and decisions or to conform to socio-cultural structures or moral obligations [3].

Virginity is a complex social concept [4, 5]. It has different definitions and varies across cultural contexts and societies [6, 7]. As in some modern developed societies, sexual activity among adolescents and youth is

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considered a norm. Changes in social and sexual norms in these societies have made premarital sex commonly practiced by most people [8] and apart from that, in these societies, virgin girls are not considered desirable sexual partners by many men [1, 9–11]. In contrast, in traditional societies, all aspects of life, including sex, depend on prearranged and conservative social rules. People in such societies may refuse to express their sexuality due to fear of these social controls and some laws[1] [12]. In these traditional patriarchal societies, the issue of preserving a woman's virginity is important, and the virginity of these women should only be lost through marriage [13]. Virginity is a symbol of decency for women and is respected as a virtue, and the related honour extends to the husband, family, and community in addition to women [14–16].

Regardless of the importance of virginity in many societies, attitudes toward sex and its moral aspects have changed dramatically in many parts of the world in recent decades [17, 18], leading to growing concerns about the consequences of such changes in conservative societies, and there is an inverse relationship between socio-cultural norms and liberal sexual attitudes [19].

Virginity in the socio-cultural context of Iran

Iran is a society with traditional and conservative sexual norms. Even though Iranian society has historical conservative and religious roots, research evidence has shown important social and attitudinal alterations in the younger generation over the past decades similar to sexual attitude changes in other societies [20–26]. Iranian society appears to be transitioning from traditional to modern values [27]. According to the conservative Iranian culture, premarital sexual relations are strictly forbidden [28] and any damage to a girl's hymen before marriage would mean great catastrophe and can have severe consequences for the girl and her family [29].

Instead, the results of some recent studies in Iran reveal that some liberal sexual norms and behaviors have been developed among young people, and a significant minority of youth experience premarital sex, which often remains implicit [28, 30–34]. Some girls who had sex before marriage undergo hymen repair (Hymenoplasty) to introduce themselves as virgins. Girls who seek hymen repair, are concerned about social norms, while they have a liberal sexual attitude towards virginity [35–37]. In addition, evidence shows that a significant percentage of girls who have sex before marriage experience

non-vaginal sexual contact to maintain their physical hymen. This sexual behavior has adverse health consequences because most girls do not protect themselves against sexually transmitted diseases and HIV in non-vaginal sex such as anal and oral sex. The most important concern of young people in sexual relationships is maintaining physical hymen and also preventing pregnancy, rather than a sexually transmitted disease or HIV [35, 38, 39].

The high proportion of the young population of Iran and the impact of international developments, especially in the era of communication and the modernization of social relations, have shaped a promising environment for the growing intergenerational gap. In Iran, between the first years after the Islamic Revolution (February 1979) and the end of the Iran-Iraq war (1980–1988), the issue of "heterosexual relationships" was less of a "social issue" due to people's strong adherence to socio-cultural values and involvement in the war. However, in the 1990s, they gradually developed heterosexual relationships due to fundamental social changes and the emergence of a new young generation with different values and beliefs. The greatest divergence and intergenerational gap occur during a period of rapid socio-cultural change; hence the issue of intergenerational differences becomes especially prominent [40]. Therefore, in the context of socio-cultural developments in Iran over the recent decades, the study of attitudinal changes in age cohorts and different generations about the concept of virginity seems necessary to understand the sexual behaviors and sexual health of young groups and also its sexual health implications.

There is a kind of heterogeneity and inconsistency in understanding the concept of virginity in today's Iranian society. Although the cultural and social values of this society highlight the preservation of virginity, a significant minority of young people including girls, experience premarital sex in Iran. It can be expected that the sexual and marital attitudes of young people, including girls, might have also changed [41, 42].

The social and cultural context of Tabriz in Iran

Tabriz is a city located in the Central District of Tabriz County, within the East Azerbaijan province of northwestern Iran. It ranks as the sixth most populous city in the country. The residents are bilingual, primarily speaking Azerbaijani as their first language and Persian as their second. Iranian Azerbaijanis are individuals of Azerbaijani ethnicity living in Iran, predominantly of Iranian descent. Additionally, they form a notable minority in Tehran. Tabriz is known as a religious city and adheres to traditional customs.

Despite the existence of the nature and traditional social and cultural values that govern this society, due to

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[1] According to Article 221 of Iran's Islamic Penal Code, if an unmarried boy or girl commits sexual intercourse secretly and without intimacy, they are considered guilty, and this sexual intercourse constitutes adultery and is subject to punishment. However, the circumstances for proving is fairly difficult.

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the location of this city in the border region and adjacent to the countries of Turkey and the Republic of Azerbaijan, new attitudes have been developed among the youth of Tabriz. The expansion of global communications, modernization, and the effectiveness of Turkish language satellite channels have been influential in creating such attitudinal changes [43]. From this point of view, Tabriz society, which is a combination of tradition and modernity, can be a suitable setting for research on the role of virginity in the formation of girls' sexual behavior.

Since there are few studies on the concept of virginity in Iran and due to huge ethnic, cultural, and religious diversity in different parts of the country, a knowledge gap exists about the attitudes of young females towards virginity. Therefore, first, we aim to determine the attitudes of young girls in Tabriz towards virginity, secondly, to compare the attitude toward virginity among three generational cohorts (born in the 1970s, 1980s, and 1990s,) and finally to identify the determinants of attitudes toward virginity among unmarried girls in this specific context.

Methods

Study setting and participants

This study is a descriptive-analytical cross-sectional survey conducted among 700 Iranian girls living in Tabriz city in 2021. Inclusion criteria include Iranian nationality, Iranian Azarbaijani ethnicity, no history of previous marriage according to the socio-cultural definition in Iran, ability to read and write, girls born between the 1970s, and 1990s, and lack of physical and mental illnesses as self-report. Hence, exclusion criteria include not responding to all questions of the study instrument and unwillingness to continue completing the questionnaire. Since the experience of marriage might affect sexual attitudes, we have chosen only unmarried females to make the sample more homogeneous.

Sample and the data collection

According to the formula of sample size calculation for a proportion, the *z* value was assumed to be equal to 1.9 at a 95% confidence level and the *p* value based on the study of Honarvar et al. [30] in Iran and considering the *d* value was equal to 10% around *p* (proponents of premarital sexual relationships), the sample size was estimated as 459 girls. Due to the cluster sampling method, the design effect of 1.5 was considered in this study and the final sample size was increased to 700 unmarried girls.

After obtaining ethical approval from the ethics committee of the School of Nursing, Midwifery, and Rehabilitation of Tehran University of Medical Sciences (code: IR.TUMS.FNM.REC.1400.021) and approving the code of ethics in the ethics committee of Tabriz University

of Medical Sciences, permission was obtained for sampling in health centers in Tabriz. The research setting in the current study was health centers in Tabriz. An online method was used to collect data and an online questionnaire was designed using Porsline (https://porsline.ir). The questionnaire was provided to the participants through WhatsApp, Instagram, and Telegram social networks. The sampling method comprised cluster sampling and proportional probability to size. Inhabitants in Tabriz city tend to be more influenced by modern ideas and social developments than small towns and villages. The population of 1,559,000 people in Tabriz (according to the 2016 statistics) was distributed in ten urban areas. First, the list of 83 health centers in the ten districts of Tabriz was determined, and 18 health centers were randomly selected from them. The determined sample size was divided among the selected health centers based on quotas. Households that had at least a single daughter with inclusion criteria through the SIB system (The integrated health system (IHS) entitled "SIB" was launched in 2016 as an electronic health record (EHR) system in the country) [44]. The SIB system in the city of Tabriz covers more than 90–92% of the population living in this city, which is a desirable amount of coverage, and the details of Iranian families with all its members are available in the SIB system in health centers. Hence, we could approach these people, in the mentioned randomly selected centers. In the first step, telephone calls were made to these people; if the participants were single, born in the 1970s, 1980s, and 1990s, invited to participate in the study. If they agreed, their verbal consent was sought and recorded. If the participants were willing and satisfied, an anonymous mobile number was obtained from them, and a questionnaire link was sent to them to fill out at home in a stress-free and confidential manner.

The data was collected from September 2021 until March 2022 (6 months). It should be noted that the cohorts of the 1970s, 1980s, and 1990s were compared as the second concern of this study. Therefore, we mean the 1970s (born 1971.3.21 to 1981.3.20), the 80s (born 1981.3.21 to 1991.3.20), and the 90s (born 1991.3.21 to 2001.3.20). Since the calendar date in Iran is Solar Hijri, the date of birth of the participants in the study is based on the beginning of the solar, and by converting the solar year to the Gregorian, the dates are not from the start of the Gregorian year.

The study instrument

The data collection instrument was a constructed questionnaire. The research team did not find an existing instrument with appropriate socio-cultural adaptation to the concept of virginity by reviewing existing literature. Hence, a constructed questionnaire was developed using

related literature and tools in some other studies [5, 7, 9, 12, 25, 45–58]. The instrument comprised of three main sections:

The first section comprised 16 questions and some questions about individual and social characteristics including age, education, occupation, parents' employment, place of birth, ethnicity, economic status, communication with parents, current life situation, self, and parents' endorsement to religious issues, and consumption of the Internet and social media to obtain sexual information.

The second section comprised some items and statements to assess the attitudes of girls about the importance of virginity. Which includes statements such as: "Girls should not have any sexual intercourse until marriage", "I maintain my virginity due to adherence to cultural values", "I maintain my virginity due to adherence to moral values" and "Love is not a good reason for losing virginity". This section was based on a 5-point Likert scale (completely agree, agree, no opinion, disagree, completely disagree). The attitude scale comprised seven statements. The mean score of girls' attitudes had a range of 7–35, and the higher mean score indicated greater agreement with virginity and vice versa.

The third section comprised of statements about the meaning of virginity from the girls' perspective (4 items), which includes the items "not having any kind of sexual contact with the opposite sex means virginity", "having a healthy hymen means virginity" and "not having any sexual intercourse (in the form of penetration) means virginity", the perception of losing virginity and its circumstances (5 items) which includes the items through vaginal intercourse, anal intercourse, oral sex, touching the genitals and kissing and hugging, and finally the impression that hearing the hymen creates in the girl's mind (8 items) which includes the items "thin layer in the girl's vagina that ruptures in the first vaginal intercourse", "is a symbol and manifestation of purity in girls", "organ which is used to prove the virginity of girls" and "it is associated with pain". This section included 17 statements. All negative statements were scored in reverse.

The validity and reliability of the survey instrument were assessed before the data collection. Face, content, and construct validity were conducted to evaluate the survey tool. Both qualitative and quantitative methods were used to confirm face validity. In qualitative face validity, the items were examined in terms of difficulty, appropriateness, and ambiguity, and quantitative face validity, the effect score of the questions was more than 1.5, and these items were considered suitable for further analysis.

In addition, both qualitative and quantitative methods were used to evaluate the content validity. To determine the validity of qualitative content, the opinions of ten scholars with relevant experience and specialty in sexual and reproductive health were sought. Two indices of content validity ratio (CVR) and content validity index (CVI) were used for quantitative content validity. CVR for an individual attitude of girls was 0.76, and CVI was 0.96.

The construct validity of girls' attitude scales was evaluated using factor analysis. Based on the results of factor analysis, one of the items was excluded from factor 1 (statement 7: Having sex with a boyfriend and losing the hymen does not lead to marriage) and to assess the reliability of the questionnaire, the internal correlation method using Cronbach's alpha coefficient was utilized. The Cronbach's alpha coefficient for individual perspectives with seven questions was 0.897. Hence, the scale of girls' attitudes on the importance of virginity was finalized with seven items of statements (score range: 7–35). We conducted a pilot study to evaluate the survey instrument to ensure the respondents understood the questionnaire statements and identified potential barriers to implementing the fieldwork.

Data analysis

Data cleaning was performed, and analysis was carried out using SPSS software, version 21. The normality of quantitative data was assessed using Kurtosis and Skewness, all of which had normal distributions. Descriptive statistics including frequency (percentage), mean and standard deviation are used to report demographic-social characteristics and examine girls' attitudes. One-way analysis of variance and an independent t-test in the two-way analysis was used to investigate the relationship between socio-demographic status and girls' attitudes. Then, their Pearson correlation coefficients were measured for the variables significantly related to attitude ($p < 0.05$). Because most variables with a significant relationship with girls' attitudes were highly correlated, multivariate linear regression analysis was done in two different models using the enter method to identify the determinants of girls' attitudes after controlling the effect of other factors. The results of multivariate linear regression were reported as regression coefficient (B) with a 95% confidence interval (CI). $p < 0.05$ was considered statistically significant. It should be mentioned that none of the VIFs in the studied variables in the multivariate linear regression model was higher than 10, so there was no problem in terms of high collinearity.

Results

The mean age of girls was 26.6 (SD = 6.3) years. More than half of them (56.9%) had postgraduate and bachelor's degrees, and 46.4% were employed. More than half of the girls (58.3%) reported an average family economic situation. The majority (about 79%) lived

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with their parents. More than half of the girls (59.1%) practiced Islamic acts of worship every day or sometimes. More than one-third (37.6%) of girls sometimes and almost one-third of them (34.3%) often or always used the Internet and social networks to obtain sexual information. About 34% of girls reported that their fathers had an undergraduate degree and 43% reported a mother with an undergraduate degree. More than half of the girls (54.0%) considered their parents somewhat religious. Evaluating the relationship between girls and

their parents showed that communication with mothers was better than with fathers; approximately 79% of girls had a good relationship with their mothers, while only 63% reported a good relationship with their fathers (Table 1).

The description of girls' sexual attitudes showed that nearly half of the girls (44.8%) agreed that girls should not have any sexual intercourse until marriage, while only 34% were opposed or completely opposed to abstaining from premarital sex. Only about one-third (35.2%) of

Table 1 Relationship between demographic, socioeconomic, and family characteristics of girls with their attitudes toward virginity ($n = 700$)

Characteristic	Number (%)	Attitudes towards virginity Mean (SD)	*p* value	Characteristic	Number (%)	Attitudes towards virginity Mean (SD)	*p* value
Age (year)				*Father's education*			
20–30	532 (76.0)	22.8 (7.1)	0.080[a]	High school	236 (33.7)	24.5 (7.4)	0.001[a]
31–40	126 (17.9)	22.5 (7.6)		Diploma	205 (29.3)	22.6 (6.7)	
41–50	43 (6.1)	25.2 (6.9)		University	259 (37.0)	21.7 (7.2)	
Education				*Mother's education*			
Diploma and lower	115 (16.4)	24.9 (7.2)	0.001[a]	High school	297 (42.2)	24.3 (7.0)	0.001[a]
Post-diploma and bachelor's degree	398 (56.9)	23.1 (6.9)		Diploma	232 (33.1)	22.1 (7.1)	
Masters and PhD	187 (26.7)	21.1 (7.5)		University	171 (24.4)	21.4 (7.4)	
Job				*Mother's job*			
Housewife	56 (8.0)	25.3 (6.8)	0.008[a]	Housewife	535 (76.4)	23.2 (7.3)	0.021[b]
University student	319 (45.6)	23.1 (7.6)		Having a job	165 (23.6)	21.7 (7.0)	
Having a job	325 (46.4)	22.2 (6.8)		*Father's job*			
Place of birth				Laborer/unemployed	62 (8.9)	25.6 (7.0)	0.009[a]
City	676 (96.6)	22.9 (7.2)	0.896[b]	Freelance	374 (53.4)	22.6 (7.5)	
Village	24 (3.4)	22.7 (7.4)		*Religious adherence parents*			
Nationality				Little	169 (24.1)	20.1 (7.3)	0.001[a]
Azeri	557 (79.6)	23.2 (7.0)	0.539[b]	Moderate	378 (54.0)	23.1 (6.9)	
Other ethnicities	143 (20.4)	23.8 (7.5)		Very	153 (21.9)	25.4 (6.7)	
Economic situation				*Communication with mother*			
Poor	32 (4.6)	20.8 (8.1)	0.206[a]	Poor	20 (2.9)	19.4 (8.1)	0.001[a]
Moderate	408 (58.3)	23.1 (7.2)		Moderate	127 (18.1)	21.3 (7.1)	
Good	260 (37.2)	22.8 (7.0)		Good	553 (79.0)	23.4 (7.1)	
Religious adherence individual				*Communication with father*			
I perform acts of worship every day/sometimes	414 (59.1)	25.5 (6.1)	0.001[a]	Poor	63 (9.0)	21.0 (7.4)	0.010[a]
I do not perform any acts of worship	190 (27.1)	20.4 (6.6)		Moderate	198 (28.3)	22.2 (6.6)	
I have no religious beliefs	96 (13.7)	16.4 (7.1)		Good	439 (62.7)	23.5 (7.4)	
Consumption of the Internet/social networks to obtain sexual information				*Current status of girls' lives*			
Never/rarely	197 (28.1)	24.8 (6.7)	0.001[a]	Lived with their parents	551 (78.8)	23.5 (6.9)	0.001[a]
Occasionally	263 (37.6)	23.4 (7.0)		Living with one parent	76 (10.9)	23.3 (7.5)	
Often/always	240 (34.3)	20.8 (7.4)		Living independently of parents	73 (10.4)	18.1 (7.6)	

[a] One-Way ANOVA

[b] Independent samples test, the score range is 7–35 and a higher score indicates a greater score of agreement with virginity

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girls agreed that it is important to maintain the virginity of girls before marriage in today's world.

Motivation to preserve virginity was 58.5% due to adherence to cultural values, 73.4% due to adherence to moral values, and nearly 45% due to their religious adherence. More than half of the participants (54.0%) believed that love is not a good reason for losing virginity (Table 2).

In response to the question "What is the meaning of virginity from the perspective of girls?" About 34% reported that virginity means not having the experience of vaginal penetrative intercourse. In response to the question, "How do you think a girl loses her virginity?"

The majority of girls reported it as through vaginal intercourse (96.4%). In response to the question "What does hearing the phrase "hymen" create in your mind?". Girls chose the following options: "thin layer in the girl's vagina that ruptures in the first vaginal intercourse" (61.1%), "only a small part of a girl's external genitalia" (28.3%), and "organ which is used to prove the virginity of girls" (19.9%) and "it is a symbol and manifestation of purity in girls" (18.4%) (Table 3).

The mean score of girls' attitudes towards virginity and its importance was 22.9 (SD: ±7.2) (score range 7–35). Comparison of the mean score of girls' attitudes among different age groups reveals that the mean score of the

Table 2 Individual attitudes of girls about the importance of virginity (*n* = 700)

Individual attitudes of girls	Totally agree Number (%)	Agree Number (%)	No opinion Number (%)	Disagree Number (%)	Totally disagree Number (%)
Girls should not have any sexual intercourse until marriage	176 (25.1)	138 (19.7)	148 (21.1)	152 (21.7)	86 (12.3)
I maintain my virginity due to adherence to cultural values	213 (30.4)	197 (28.1)	116 (16.6)	112 (16.0)	62 (8.9)
I maintain my virginity due to adherence to moral values	296 (42.3)	218 (31.1)	75 (10.7)	72 (10.3)	39 (5.6)
I maintain my virginity due to adherence to Religious	197 (28.1)	121 (17.3)	111 (15.9)	167 (23.9)	104 (14.9)
Love is not a good reason for losing her virginity	233 (33.3)	145 (20.7)	138 (19.7)	118 (16.9)	66 (9.4)
If a girl loses her virginity voluntarily, she has done something wrong	67 (9.6)	44 (6.3)	191 (27.3)	240 (34.3)	158 (22.6)
In today's world, it is important to maintain for girls their virginity before marriage	120 (17.1)	127 (18.1)	188 (26.9)	156 (22.3)	109 (15.6)

Table 3 Girls' attitudes on the meaning of virginity, how to lose virginity and the idea of virginity (*n* = 700)

What is the meaning of virginity from the perspective of girls	Number (%)
Not having any kind of sexual contact with the opposite sex means virginity	193 (27.6)
Having a healthy hymen means virginity	118 (16.9)
Not having experience of vaginal intercourse (in the form of penetration) means virginity	237 (33.9)
Not having any sexual intercourse (in the form of penetration) means virginity	152 (21.7)
How do you think a girl loses her virginity?	
Through vaginal intercourse	675 (96.4)
Through rectal intercourse	149 (21.3)
Through oral sex	91 (13.0)
Through touching the genitals	136 (19.4)
Through kissing and hugging	63 (9.0)
What does hearing the phrase "hymen" create in your mind?	
Thin layer in the girl's vagina that ruptures in the first vaginal intercourse	428 (61.1)
is a symbol and manifestation of purity in girls It	129 (18.4)
Organ which is used to prove the virginity of girls	139 (19.9)
It is associated with pain	56 (8.0)
Only a small part of a girl's external genitalia	198 (28.3)
It only matters when you get married	118 (16.9)
I try not to think about it	82 (11.7)
I do not know anything about it	9 (1.3)

girl's attitudes towards virginity who were born in the seventies was 25.2 (SD: 6.9), eighties was 22.1 (SD: 7.8). Nineties was 22.8 (SD: 7.1). There was a borderline statistically significant difference between the mean score of attitudes among different age groups ($p=0.049$). Therefore, we can suggest that girls born in the 70s are more conservative towards virginity than girls born in the 80s and 90s (Fig. 1).

Bivariate analysis showed some significant relationships between selected socio-demographic and family factors with attitudes toward virginity. These factors comprised of: age ($p=0.049$), education ($p=0.001$), occupations ($p=0.008$), adherence to religion ($p=0.001$), the current status of girls' lives ($p=0.001$), consumption of Internet and social networks for obtaining sexual information ($p=0.001$), father's education ($p=0.001$) and mother's education ($p=0.001$), father's employment ($p=0.009$) and mother's employment($p=0.021$), relationship with mother ($p=0.001$) and relationship with father ($p=0.010$) and religiosity of parents ($p=0.001$). The greatest mean score of attitude about the importance

of virginity was among girls with a diploma and lower education (24.9), those who were housewives (25.3), girls who performed daily or occasional religious acts (25.5), girls who lived with their both parents (23.5), girls who never/rarely used the Internet and social networks to obtain sexual information (24/8). Girls who had a father with an undergraduate education (24.5) and who had a mother with an undergraduate education (24.3); girls whose father's job was a worker or unemployed (25.6) and girls whose mother's job was a housewife (23.2), girls who had a good relationship with their mother (23.4) and father (23.5) and finally girls who considered their parents very much religious (25.4) (Table 1).

Because many of these factors are correlated, Pearson correlation coefficients were estimated between selected demographic and social characteristics of girls. According to the correlation matrix, age strongly and significantly correlates with girls' education (0.387, $p<0.001$) and occupation (0.388, $p<0.001$). Moreover, there was an important and direct relationship between parents' education (0.684, $p<0.001$), parents'
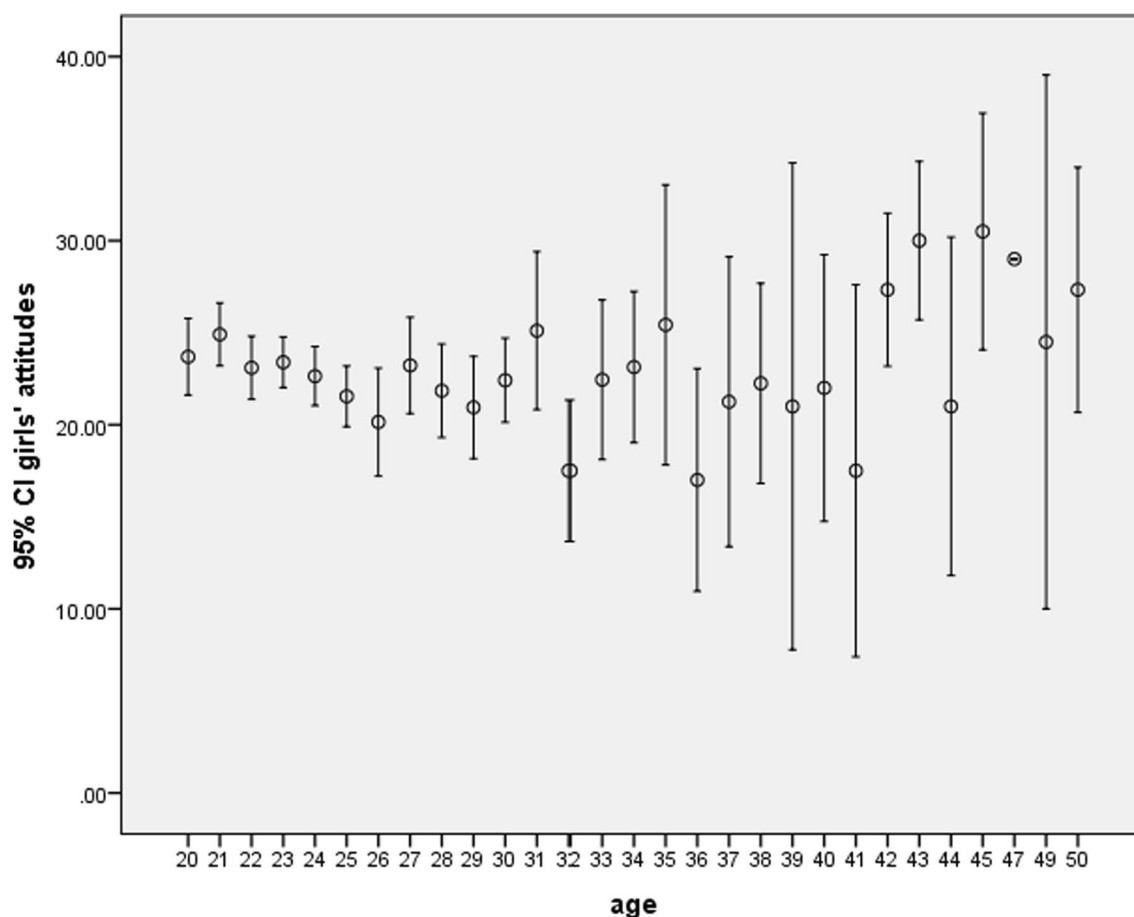

Fig. 1 Comparison of the mean score of girls' attitudes among different age cohorts

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job (0.081, $p < 0.001$), communication with father and father's education (0.083, $p < 0.001$), communication with mother and mother's education (0.28, $p < 0.001$), and parents' religion and the girls' endorsement to religion (0.417, $p < 0.001$) (Table 4).

According to the Pearson Correlation Coefficients, some factors with lower correlation were selected for the multivariate linear regression analysis. Two linear models were performed using the enter method to identify the determinants of girls' attitudes toward virginity after controlling the effect of other factors. The results of model 1 revealed that the variables of age, religious affiliation, current life status, use of the Internet, and social networks for obtaining sexual information were among the predictors of girls' attitudes towards virginity. In a way, the mean score of girls' attitude towards the importance of virginity among unmarried girls aged 41–50 years was 1.3 points greater ($B = 1.3$; 95% Cl: 0.1–2.6, $p = 0.043$) than girls aged 31–40 years. The mean score of attitude towards virginity among girls who performed religious practice daily or occasionally was 7.7 greater ($B = 7.7$; 95% Cl: 6.4–9.0, $p = 0.001$), and this score was 4.9 greater among girls who did not do religious practice of worship ($B = 4.9$; 95% Cl: 3.9–6.0, $p = 0.001$) compared to girls who had no religious beliefs.

The mean score of individual attitude towards virginity among girls who lived with both parents was 3.7 greater ($B = 3.7$; 95% Cl: 2.2–5.3 $p = 0.001$), and girls who lived with one parent were 2.9 greater ($B = 2.9$; 95% Cl: 0.8–5.0, $p = 0.006$) than girls who lived independent of their parents. The mean score of a person's attitude toward virginity among girls who never/rarely consumed the Internet and social media for sexual information was 2.7 greater ($B = 2.7$; 95% Cl: 1.5–3.9, $p = 0.001$) than girls who used it often/always, and this score was 1.6 greater ($B = 1.6$; 95% Cl: 0.5–2.7, $p = 0.005$) among girls who used them occasionally than in the girls who used them often/always.

In the second model, girls' education was also added to other factors. In this model, girls' education and their mothers' education were factors determining girls' attitudes towards virginity as well. The mean score of attitude towards virginity was 3 scores greater ($B = 3.0$; 95% Cl: 1.5–4.6, $p = 0.001$) among girls with a diploma and lower education and also 1.4 greater ($B = 1.4$; 95% Cl: 0.2–2.5, $p = 0.020$) among girls with postgraduate and bachelor's degrees than girls with master's and doctoral degrees. The mean score of personal attitude towards virginity among girls whose mother's education was below diploma was 2.1 scores greater ($B = 2.1$; 95% Cl: 0.6–3.5, $p = 0.005$) than girls who had mothers with university education (Table 5).

Discussion

The results of the study revealed that although about half of the girls (44.8%) agreed that girls should not have any sexual intercourse until marriage, only about one-third (35.2%) of girls were in favour that in today's world, it is important to maintain the virginity before marriage. About one-third of the young population has liberal sexual attitudes about virginity, while their understanding of the moral and cultural values and possibly social norms of marriage prevents them from losing their physical hymen or virginity. People who have sex in a non-vaginal relationship or resort to virginity repair indicate the dominance of social norms over individual attitudes. These results are in line with sexual script theory, which is a framework that explores how cultural norms and social influences shape sexual behaviour, suggesting that such behaviour is not just biologically driven. Individuals develop cognitive scripts through socialization that guide their sexual thoughts and actions, influenced by societal norms and media [59].

Another important finding is that in Tabriz society with religious, traditional, and historical context, there is an important gap between girls' attitudes and their understanding of the normative importance of virginity for marriage. This is consistent with a previous comprehensive study about the premarital sexuality of female college students in Tehran, which showed attitudes were considerably more tolerant of premarital sex than norms. These findings suggest that traditional norms on heterosexual intimacy are eroding among young people [60].

The personal attitudes of unmarried females towards virginity and its importance shown in this study are consistent with the previous literature about liberal sexual attitudes toward premarital sex among the young generation. A qualitative study (2019) indicated that the most significant considerations for premarital sex among female college students in Tehran are the importance and motivation of marriage, norms, values, family expectations, gender and social norms [57]. This means that the gap between an individual's belief in virginity and an understanding of the social norms associated with virginity may lead to other sexual experiences that do not harm physical hymen. Particularly the importance of girls' virginity for boys and their families at the time of marriage is another issue that can play an important role in the sexual behaviour of unmarried women. A study in Kerman, one of Iran's eastern cities, found that in the culture of Iranian society, people believe in blood-stained sheets as an indicator of virginity, half of the grooms who did not experience the bride's bleeding during their first sexual intercourse at marriage had a violent reaction and expected to see bloody sheets as a traditional indicator of virginity, the traditional culture of the community

Table 4 Pearson correlation coefficients between demographic and social characteristics

	Age		Education		Job		Father's education		Mother's education		Father's job		Mother's job		Living status		Communication with mother		Communication with father		Religious adherence parents		Religious adherence individual		Access to social networks	
	Coeff	p value	Coeff	p value	Coeff	p value	Coeff	p value	Coeff	p value	Coeff	p value	Coeff	p value	Coeff	p value	Coeff	p value	Coeff	p value	Coeff	p value	Coeff	p value	Coeff	p value
Age	1																									
Education	0.387	0.001	1																							
Job	0.388	0.001	0.249	0.001	1																					
Father's education	−0.0246	0.001	0.093	0.014	−0.094	0.013	1																			
Mother's education	−0.339	0.001	0.061	0.107	−0.115	0.002	0.684	0.001	1																	
Father's job	0.156	0.001	0.063	0.095	0.072	0.057	0.182	0.001	0.006	0.876	1															
Mother's job	−0.173	0.001	0.021	0.572	−0.087	0.021	0.381	0.001	0.511	0.001	0.081	0.032	1													
Living status	0.197	0.001	0.185	0.001	0.107	0.004	−0.065	0.086	−0.043	0.257	−0.025	0.517	0.039	0.301	1											
Communication with mother	−0.057	0.137	0.008	0.829	−0.022	0.569	0.113	0.003	0.128	0.001	−0.031	0.413	0.002	0.690	−0.011	0.766	1									
Communication with father	0.027	0.479	0.047	0.217	−0.037	0.332	0.083	0.028	−0.010	0.796	−0.058	0.125	−0.143	0.001	−0.026	0.499	0.517	0.001	1							
Religious adherence parents	−0.065	0.087	−0.011	0.764	0.083	0.029	0.138	0.001	0.189	0.001	−0.107	0.005	0.101	0.007	0.056	0.138	0.004	0.906	−0.015	0.690	1					
Religious adherence individual	0.142	0.001	−0.022	0.564	0.031	0.412	0.087	0.021	0.111	0.003	−0.086	0.023	0.091	0.016	0.122	0.001	−0.155	0.001	−0.146	0.001	0.417	0.001	1			
Access to social networks	−0.067	0.076	0.070	0.066	0.047	0.211	0.090	0.018	0.067	0.076	−0.048	0.200	0.073	0.055	0.124	0.001	−0.082	0.030	−0.132	0.001	0.045	0.237	0.116	0.002	1	

Table 5 Determinants of girls' individual attitudes about the importance of virginity based on multivariate linear regression model (*n* = 700)

Characteristic	Model 1				Model 2			
	β (95% confidence interval)	SE	Beta	p	β (95% confidence interval)	SE	Beta	p
Age (reference: 31–40)								
20–30	1.3 (−0.9 to 3.6)	1.138	0.044	0.243	1.4 (−0.8 to 3.5)	1.127	0.046	0.219
41–50	1.3 (0.1–2.6)	0.648	0.077	0.043	0.6 (−0.7 to 1.9)	0.673	0.038	0.340
Education (reference: masters and PhD)	–	–	–	–				
Diploma and lower	–	–	–	–	3.0 (1.5–4.6)	0.775	0.156	0.001
Post-diploma and bachelor's degree	–	–	–	–	1.4 (0.2–2.5)	0.584	0.093	0.020
Mother's education (reference: university)								
High school	2.3 (0.9–3.8)	0.734	0.159	0.001	2.1 (0.6–3.5)	0.731	0.141	0.005
Diploma	1.0 (−0.4 to 2.4)	0.727	0.064	0.173	0.8 (−0.6 to 2.3)	0.722	0.055	0.244
Mother's job (reference: having a job)								
Housewife	−0.4 (−1.8 to 0.9)	0.695	−0.026	0.529	−0.3 (−1.7 to 1.0)	0.689	−0.019	0.631
Degree of religious adherence (reference: I have no religious beliefs)								
I perform acts of worship every day/sometimes	7.7 (6.4–9.0)	0.671	0.415	0.001	7.7 (6.4–9.0)	0.666	0.417	0.001
I do not perform any acts of worship	4.9 (3.9–6.0)	0.530	0.355	0.001	4.9 (3.8–5.9)	0.526	0.330	0.001
Current status of girls' lives (reference: living independently of parents)								
lived with their parents	3.7 (2.2–5.3)	0.805	0.211	0.001	3.4 (1.8–4.9)	0.803	0.191	0.001
Living with one parent	2.9 (0.8–5.0)	1.065	0.126	0.006	2.6 (0.5–4.7)	1.060	0.112	0.014
Use of the Internet and social networks (reference: often/always)								
Never/rarely	2.7 (1.5–3.9)	0.610	0.167	0.001	2.5 (1.3–3.7)	0.606	0.157	0.001
Occasionally	1.6 (0.5–2.7)	0.561	0.104	0.005	1.6 (0.5–2.7)	0.556	0.105	0.005
Constant	12.7 (10.7–14.7)	1.037	–	0.001	12.4 (10.4–14.4)	1.035	–	0.001
Adjusted R square	0.267				0.282			

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influences young men's behaviour [61]. In another study, physical virginity was the only red line for Iranian girls in Iran. Girls who wanted to have sex considered that they had the right to have sex, but their hymen needed to have remained intact [34].

Another important finding of this study was the development of a greater liberal attitude towards virginity among younger girls (born in the 80s and 90s) than girls born in the 70s. It seems that sexual values change over time under the influence of various factors. Traditional values of marriage and premarital sex seem to be in a transition into some liberal attitudes among younger generations. This finding is consistent with the results of another study in Tehran (2016), which showed that young people had a more liberal sexual attitude, which could reflect a socio-cultural transition in the sexual attitudes of different age groups of participants [42]. According to sexual script theory, sexual scripts including those related to virginity, are not fixed or universal, they are subject to change and transformation [62, 63].

However, during life course, people might reassess their attitude to life situations and experiences, and some young girls may change their sexual attitude as they get older. In the absence of marriage opportunities, they may reconsider their view of virginity and premarital relationships. Conversely, in the case of premarital sexual experience, adopt a different view of these relationships, and their experience will lead to a change in their sexual attitudes. People's attitudes toward relationships do not remain constant throughout life and change over time. More qualitative and longitudinal studies can highlight these changes in sexual attitudes over time.

Factors such as age, religiosity, living with both parents, and less consumption of the Internet and social networks to obtain sexual information predict girls' conservative attitudes toward virginity. As a result, virginity was more important for girls in higher age groups, with more religious adherence and living with both parents, than younger girls, with less religious adherence and living independently from parents. Likewise, the prominence of virginity in girls who had less access to social networks was significantly higher than in girls who had more access to social networks. The development of liberal sexual attitudes and values is shown to be associated with access to global media in a way that youth might choose new role models in sexuality. Access to sexually explicit materials on the Internet has also become much easier for young people and this might be responsible for greater liberal sexual norms and attitudes and greater involvement in premarital sex [64, 65].

Since more than 50% of the participants in the present study did not consider religion as a factor in maintaining their virginity, adherence to morality (73.4%) and culture (58.5%) were more important rationales for preserving virginity than religious values. Consequently, it is supposed that the development of liberal sexual attitudes among a portion of the young generation can reduce the importance of virginity and lead to premarital sexual behaviors among the younger generation.

One of the metaphors used by the adolescents in a study about virginity was "virginity as a myth" [66]. Moreover, the most important reason for virginity in a study in the United States was reported to be because of personal beliefs (e.g., believing that premarital sex is wrong), fear (e.g., fear of unwanted pregnancy, and sexually transmitted diseases and HIV), inadequacy (e.g., feeling undesirable), lack of love, lack of desire for sex and reluctant sexual partner [9]. In contrast to the study in the United States, the results of the current study relate the importance of virginity more to the moral and sociocultural values that govern these societies than to personal values and reasons.

In Iran, preserving intact hymen is one of the most significant concerns for girls and even boys in premarital sex and affects sexual intercourse [57]. In this study, most girls (96.4%) believed that girls' virginity is lost through vaginal sexual intercourse, and in fact, virginity is defined by an intact hymen and lack of vaginal intercourse. Although preserving an intact hymen can be a restraining factor for practicing sexual contact among a significant proportion of single girls, some girls might practice non-vaginal unprotected sex and they are exposed to greater sexual risks and are more vulnerable [34]. A survey among university students in Turkey, with similar cultural beliefs about virginity, revealed that sexually experienced females reported greater oral and anal sex compared to vaginal intercourse (67).

In societies where virginity is still normatively and socially important, the occurrence of unprotected non-vaginal intercourse can increase the risk of sexually transmitted diseases, and HIV among young people, which needs to be addressed in sexual health programs and interventions. Moreover, young people need to be informed of the psychological, physical, and social consequences and harms of these high-risk relationships. Future studies are recommended to examine girls' and boys' beliefs about the psychological, social, and health consequences of non-vaginal sexual behaviours.

Strengths and limitations

One of the limitations of this study was the lack of coverage of 8–10% of the population of Tabriz by the SIB system who have not been referred to the health clinics in the city and have not been registered. Consequently, via the stratified cluster sampling method, we compensated for this limitation. This study also only reflects the views

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of unmarried girls towards virginity and the perspective and attitudes of men and young men have not been considered in this study and gender differences were not assessed. The authors suggest future similar studies among young men as well. Likewise, regarding the sensitivity of the research topic, it was probable that the participants did not express the truth; despite that the researcher tried to explain the importance of the research topic and the accuracy of their responses, establish communication, and make friendly interactions with participants and observe ethical principles to gain participants' trust and confidence and overcome this limitation. Finally, this was a cross-sectional survey, hence, causality cannot be established with certainty, and these need to be considered when interpreting these findings.

Conclusion

According to these results, changes in sexual attitudes among young people might have important implications in marriage dynamics, including age at marriage in Iran, and also the sexual and reproductive health of young adults. Due to religious, cultural, societal, and legal expectations of preserving virginity particularly for women, and due to many socioeconomic barriers to marriage, the development of such liberal sexual attitudes will be associated with greater heterosexual intimacy and sex among youth before marriage. Premarital sexuality will have important adverse consequences for young people due to the lack of sexual health programs for unmarried people in the context of Iran. Involvement in such relationships can lead to risky sexual behaviors, including unprotected non-vaginal sex, delayed marriage, engagement with multiple high-risk partners, and increased susceptibility to STIs, HIV, unplanned pregnancies, and abortions. Health policymakers must recognize these shifts in sexual attitudes and implement comprehensive, culturally appropriate educational programs. Such initiatives are crucial for protecting unmarried young adults from engaging in risky sexual behaviors.

Abbreviations
CVR   Content validity ratio
CVI   Content validity index
SD   Standard deviation

Author contributions
SSN, RM, FKF, and MM were involved in the conception and design, acquisition of data, and drafting of the manuscript. FKF(corresponding author) and SN were involved in the conception and design, acquisition of data, blinded analysis of the data, interpretation of data, and writing this manuscript. All authors gave their final approval of this version to be published.

Availability of data and materials
Datasets used and analyzed during this study are available from the corresponding author on reasonable request.

Declarations

Ethics approval
All the procedures performed in this study were in full compliance with the ethical standards of the institutional research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards. Ethical approval was obtained from the organizational ethics committee of the School of Nursing, Midwifery, and Rehabilitation of Tehran University of Medical Sciences (IR.TUMS.FNM.REC.1400.021) to conduct the research. Written informed consent was submitted by all the participants before enrolment in the study. The study protocol was performed according to the relevant guidelines.

Consent for publication
Not applicable.

Competing interests
The authors declare no competing interests.

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