Fertility Knowledge and Its Correlates with General and Reproductive Health Literacy among Iranian Medical Students

Abstract

Aims: This study aimed to examine the association between fertility knowledge, general health literacy, and reproductive health literacy among female students at Saveh University of Medical Sciences.

Instrument & Methods: This descriptive-analytical cross-sectional study was conducted in 2025 on 208 female medical sciences students. Data collection tools included standardized questionnaires: The Cardiff Fertility Knowledge Scale (CFKS), the Short Form Health Literacy for Iranian Adults (HELIA-SF), and the Women's Reproductive Health Literacy Questionnaire. Data were analyzed using SPSS version 24. Descriptive statistics such as mean, standard deviation, frequency, and percentage were reported. For inferential analysis, Spearman's correlation and backward linear regression were employed. A significance level of 0.05 was considered for all statistical tests.

Findings: The mean age of participants was 22.34±3.27 years. The mean fertility knowledge score was 7.68 out of 13, while the mean scores for general health literacy and reproductive health literacy were 74.07 and 73.54 out of 100, respectively. A significant positive correlation was observed between fertility knowledge and both general health literacy (r=0.401, P<0.001) and reproductive health literacy (r=0.386, P<0.001). Regression analysis revealed that general health literacy (P=0.003) and reproductive health literacy (P=0.007) were significant positive predictors of fertility knowledge.

Conclusion: Fertility knowledge among female university students was found to be moderate and significantly influenced by both general and reproductive health literacy. These findings highlight the need for targeted educational interventions, especially for students from economically disadvantaged backgrounds, to improve reproductive health outcomes.

Introduction

Fertility knowledge is recognized as one of the key components in promoting sexual and reproductive health [1]. It refers to individuals' awareness regarding the reproductive system, pregnancy, contraceptive methods, and risks associated with unintended pregnancies [2]. Those with adequate fertility knowledge are more capable of making informed decisions concerning their sexual and reproductive health [3] and are consequently less exposed to adverse outcomes such as unplanned pregnancies and sexually transmitted infections [4]. Studies have shown that insufficient knowledge of the menstrual cycle, conception, and preventive methods, particularly among adolescents and young adults, can lead to high-risk sexual behaviors and early pregnancies [5, 6].

General health literacy is a fundamental concept referring to individuals' ability to access, understand, evaluate, and apply health-related information across various domains, including prevention, treatment, and health promotion [7]. Beyond mere knowledge acquisition, health literacy emphasizes empowering individuals to make informed decisions regarding their personal health [8]. Health literacy is commonly categorized into three dimensions: Functional, interactive, and critical. Functional health literacy includes basic reading and comprehension skills necessary for understanding health information in daily life [9]. Interactive health literacy involves communication skills and the ability to use information effectively in various social contexts. Critical health literacy refers to advanced cognitive skills needed to analyze and evaluate health information and make informed decisions to better control one's life circumstances [9-11]. Numerous studies have linked low health literacy with unfavorable health outcomes, including reduced use of healthcare services, higher prevalence of chronic diseases, increased hospitalization rates, unhealthy dietary patterns, obesity, engagement in risky behaviors, and a higher incidence of medication errors [12-14].

Reproductive health literacy, a specialized subset of health literacy, focuses on individuals' ability to understand and use information related to sexual and reproductive health [15]. Contrary to the common perception, reproductive health literacy encompasses more than basic knowledge, such as naming contraceptive methods. It includes skills in evaluating information sources, critical thinking, and making informed decisions regarding sexual and reproductive health [16]. A growing body of evidence indicates that low levels of sexual and reproductive health literacy among adolescents and

young adults are associated with outcomes such as high-risk sexual behavior [17], unintended pregnancies [18], unsafe abortions [2], higher rates of sexually transmitted infections, and substance misuse [19].

Globally, studies indicate that despite its importance, sexual and reproductive health literacy remains inadequate or moderate in many countries. For example, in low-income African and Asian countries, adolescent and youth sexual health literacy levels have been found to be particularly low, contributing to high-risk sexual behaviors [4]. In Asia, the sexual health literacy of adolescents and youth is frequently reported as low, largely due to limited access to educational resources and cultural taboos [4, 20]. In Sri Lanka, 47.4% of adolescents had limited sexual health literacy, and over half scored poorly in health promotion skills [21]. Similarly, in Thailand, the average sexual health literacy among girls aged 15-19 was moderate, but access to information and services received the lowest score (54.72%) [22].

In Iran, recent studies have reported mixed results. In a study conducted in Kerman, the mean sexual health literacy score among couples was 68.76 out of 100; However, factors such as feelings of shame and the ability to differentiate reliable information sources were influential [23]. Another study in Qazvin province among women attending healthcare centers reported a mean score of 76.90±18.32, with approximately 50% of participants demonstrating adequate literacy and 32% categorized as having excellent literacy [24]. In rural areas of southern Iran, about 82.5% of women exhibited a favorable level of sexual health literacy, although improvements were needed in access and analytical skills [25].

Given that youth is a critical and formative stage in life for the development of sustainable health behaviors, enhancing health literacy, particularly in the domain of sexual and reproductive health, can have long-term implications for both individual and public health. Despite several studies independently examining fertility knowledge, general health literacy, or reproductive health literacy, there remains a lack of research that integrates these three components within youth populations. Accordingly, the present study aimed to investigate the relationship between fertility knowledge, general health literacy, and reproductive health literacy among young people.

Instrument and Methods

Study design and participants

This descriptive-analytical cross-sectional study was conducted to examine the relationship between fertility knowledge, general health literacy, and reproductive health literacy among female students at Saveh University of Medical Sciences. The study population consisted of 208 female students who met the inclusion criteria: willingness to participate, completion of informed consent, age between 18 and 35 years, and current enrollment at Saveh University of Medical Sciences. The exclusion criterion was being married.

Sample size and sampling method

The required sample size was calculated using the following formula for estimating sample size in correlational studies:

$$n = \left(\frac{Z_{1-\alpha/2} + Z_{1-\beta}}{\frac{1}{2}\ln\left(\frac{1+\rho}{1-\rho}\right)} \right)^2 + 3$$

Given the limited number of previous studies in Iran on the association between fertility knowledge and both general and reproductive health literacy, the expected correlation coefficient (ρ) was set at 0.20. A Type I error (α) of 0.05 and statistical power (1-β) of 0.80 were assumed. Based on these parameters, the required sample size was estimated at 193 participants. To account for potential attrition, a total of 208 students were ultimately enrolled in the study.

Participants were selected using a stratified sampling method based on academic departments. First, the number of female students in each department was determined, and then the required number of students was randomly selected from the attendance lists. Data collection was conducted from April to June 2025.

Instruments

Demographic Questionnaire

This section collected participants' demographic information, including age, occupation, economic status, history of chronic illness, smoking status, and other relevant characteristics.

Short-Form Health Literacy for Iranian Adults (HELIA-SF)

This questionnaire was developed and psychometrically validated in 2022 by Tavousi *et al.* [26], demonstrating validity and reliability coefficients of 0.91 and 0.81, respectively. The questionnaire consists of 9 items assessing both basic and decision-making skills in the target population. These items measure five dimensions of health literacy: Access, reading, comprehension, evaluation, and decision-making/behavior. Items 1 to 5 use a 5-point Likert scale ranging from 1="Very difficult" to 5="Very easy". Items 6 to 9 are rated on a 5-point Likert scale ranging from 1="Never" to 5="Always".

Reproductive Health Literacy Questionnaire

This tool was developed by Kawata *et al.* in 2014 to assess women's reproductive health literacy. The instrument has demonstrated satisfactory reliability, with a Cronbach's alpha of 0.80 and a correlation coefficient of 0.71. It includes 21 items rated on a 4-point Likert scale ranging from 1="Not true at all" to 4="Completely true". The total score ranges from 21 to 84, with higher scores indicating higher reproductive health literacy [27].

Cardiff Fertility Knowledge Scale (CFKS)

Originally developed by Zhou *et al.* in 2012 and validated in Iran by Mirghafourvand *et al.* [28] in 2024 [28, 29], the CFKS consists of 13 items evaluating fertility knowledge across three domains: a) factors contributing to reduced fertility, b) misconceptions about fertility, and c) basic facts regarding infertility. Items are rated using a 3-point scale (True, False, Don't know). Correct answers are scored as 1, while incorrect or "Don't know" responses receive a score of 0. Total scores are summed, divided by the number of items, and multiplied by 100. The original version reported a Cronbach's alpha of 0.79, while the Persian version demonstrated internal consistency and validity coefficients of 0.85 and 0.95, respectively.

Data analysis

Data were analyzed using SPSS version 24. Descriptive statistics, including tables, graphs, means, and standard deviations, were used to describe the distribution of variables. Due to non-normal data distribution, assessed using the Kolmogorov-Smirnov test, Spearman's correlation coefficient was employed to examine associations between variables. Linear regression analysis was also performed to evaluate predictive relationships. A significance level of 0.05 was considered for all statistical tests.

Ethical approval

This study was approved by the Ethics Committee in Biomedical Research at Saveh University of Medical Sciences (Ethics Code: IR.SAVEHUMS.REC.1403.067). All ethical principles of research were strictly adhered to, including providing participants with complete information about the study's objectives, methods, and rationale; ensuring confidentiality of the collected data; and obtaining written informed consent from all participants.

Findings

The mean age of the participants was 22.34±3.27 years. Among the 208 students, fewer than 5% reported smoking. Twelve participants had a history of chronic illness, and 30% reported engaging in regular physical activity. Additional demographic characteristics are presented in Table 1.

Table 1. Demographic characteristics of participants

Variable	Level	Frequency (%)
Occupation	No	158 (76)
	Yes	50 (24)
Economic status	Income less than expenses	86 (41.3)
	Income equal than expenses	109 (52.4)
	Income greater than expenses	13 (6.3)
Health self-assessment	Good	102 (49)
	Moderate	105 (50.5)
	Bad	1 (0.5)
Chronic disease	No	196 (94.2)
	Yes	12 (5.8)
Physical activity	Never	38 (18.3)
	Moderate	107 (51.4)
	Regularly	63 (30.3)
Smoking	Never	198 (95.2)
	Former	7 (3.4)
	Current	3 (1.4)

More than 61% of participants had not attended any educational sessions on fertility knowledge and lacked the necessary information in this area. Consequently, the majority (122 individuals) expressed a need for education on fertility-related topics and showed a willingness to learn more in this field. Among the various sources of fertility knowledge, healthcare professionals were identified as the primary source, followed by social media platforms, which also played a significant role (Table 2).

Table 2. Participants' fertility knowledge needs, learning preferences, and information sources

Variable	Level	Frequency (%)
Feeling the need for fertility knowledge	No	86 (41.3)
	Yes	122 (58.7)
Participating in reproductive health classes	No	128 (61.5)
	Yes	80 (38.5)
Desire to learn more about reproductive health topics	No	72 (34.6)
	Yes	136 (65.4)
Using sexual and reproductive health services	No	165 (79.3)
	Yes	43 (20.7)
Ways to gain fertility knowledge	Social media	77 (37)
	Television	13 (6.3)
	Healthcare professionals	84 (40.4)
	Books, magazines	16 (7.7)
	Friends	13 (6.3)
	Parents	5 (2.3)

The mean score of fertility knowledge (13 items) among participants was 7.68±2.56, with scores ranging from 0 to 12. The mean general health literacy score (9 items) was 74.07±18.76 (range: 3.13-100). Additionally, the mean reproductive health literacy score (21 items) was 73.54±9.91, with observed values ranging from 39 to 84.

Spearman correlation analysis revealed a significant positive correlation between fertility knowledge and general health literacy (P<0.001). Similarly, fertility knowledge was positively and significantly correlated with reproductive health literacy (correlation coefficient=0.386, P<0.001). Moreover, a strong and significant positive correlation was observed between general health literacy and reproductive health literacy. These associations are also illustrated in Figure 1 and Table 3.

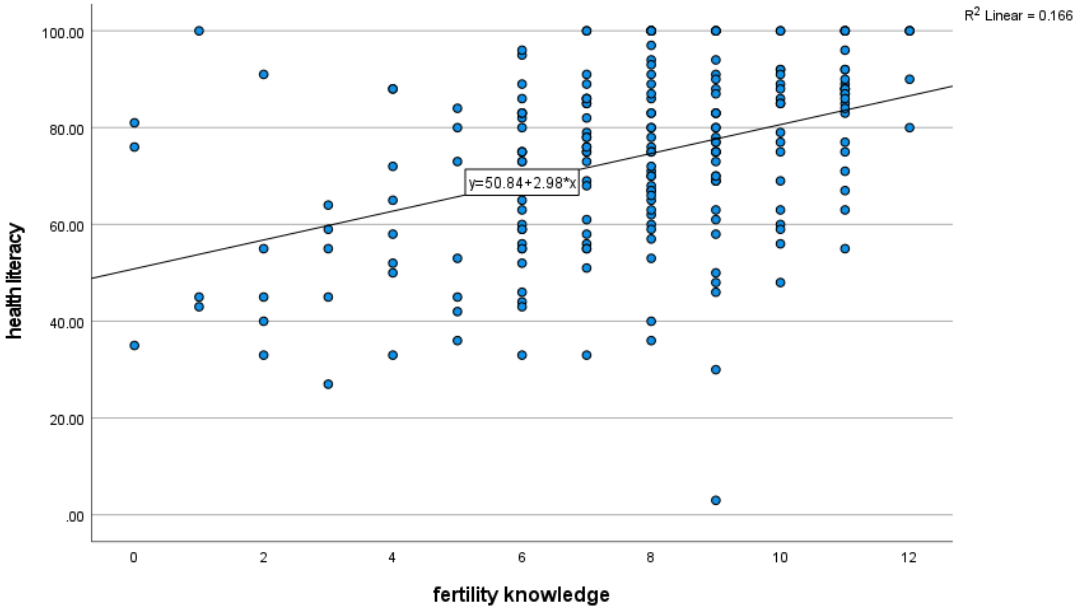

Figure 1. Scatter plots illustrating the correlations between fertility knowledge, general health literacy, and reproductive health literacy among participants

Table 3. Spearman correlation coefficients between fertility knowledge, general health literacy, and reproductive health literacy

Correlation		Fertility knowledge	Health literacy	Reproductive health literacy
Fertility knowledge	Correlation coefficient	1.000	0.401	0.685
	p-value	-	<0.001	<0.001
	N	208	208	208
Health literacy	Correlation coefficient	0.401	1.000	0.386
	p-value	<0.001	-	<0.001
	N	208	208	208
Reproductive health literacy	Correlation coefficient	0.685	0.386	1.000
	p-value	<0.001	<0.001	-
	N	208	208	208

The results of the linear regression analysis using the backward elimination method indicated that both general health literacy and reproductive health literacy were significant positive predictors of fertility knowledge scores. Specifically, general health literacy was positively and significantly associated with fertility knowledge (*P*=0.003), and reproductive health literacy also positively predicted fertility knowledge (*P*=0.007).
Additionally, economic status showed a significant negative association with fertility knowledge (*P*=0.045). Although age had a positive association with fertility knowledge, this relationship was borderline in terms of statistical significance (*P*=0.058; Table 4).

Table 4. Linear regression analysis of fertility knowledge

variable	Unstandardized B	SE	Standardized B	p-value	CI 95%	
					Lower	Upper
Age	0.095	0.050	0.121	0.058	-0.003	0.193
Economy	-0.541	0.269	-0.125	0.045	-1.071	-0.011
Health literacy	0.034	0.011	0.251	0.003	0.012	0.057
Reproductive health literacy	0.058	0.021	0.223	0.007	0.016	0.100
Constant	-0.330	1.534	-	0.830	-3.356	2.695

Discussion

This study aimed to simultaneously examine the relationship between fertility knowledge, general health literacy, and reproductive health literacy among young Iranian women. The findings indicated that the mean level of fertility knowledge was moderate. Analysis revealed a significant positive relationship between fertility knowledge and both general health literacy and reproductive health literacy, with both variables serving as significant predictors of fertility knowledge. Furthermore, a strong correlation was observed between general health literacy and reproductive health literacy. In contrast, socioeconomic status showed a significant inverse relationship with fertility knowledge, while age demonstrated a positive, albeit marginally significant, association.
The average general health literacy score among the female students in this study was 74.07, which falls within the "adequate" range. Several other studies have similarly assessed health literacy levels among Iranian students and women, with most findings aligning with the current study [24, 29-32]. International studies have also corroborated these results [33, 34]. However, a study by Khajouei & Salehi reported that only 29% of high school students possessed adequate health literacy [35], a finding further supported by a systematic review [36], which contrasts with the present study. This discrepancy may stem from differences in the measurement tools used and the varying age groups of participants.
In the current study, the mean fertility knowledge score was moderate, while the mean reproductive health literacy score was high. Similar results have been reported in previous research. For example, a study on married students at Mazandaran University of Medical Sciences reported adequate sexual health literacy [37], and another study found that reproductive health literacy among young Iranian couples (average age 32) was at a desirable level [23]. Jamali *et al.* also reported that only 23.3% of Iranian women had limited health literacy [38], while Dehghankar *et al.* assessed Iranian women's reproductive and sexual health literacy as favorable [39]. Other studies have shown that nearly half of women aged 18-49 possess adequate health literacy [40] and that fertility and sexual knowledge among men and women aged 15-49 in Tehran is at an acceptable level [41]. These findings are consistent with a study by Kohan *et al.*, which employed a similar measurement tool and reported that 91% of women in Isfahan had adequate reproductive health literacy [42]. Similar findings were also presented in the study by Panahi *et al.* [43]. Sayadi & Ahmadipour found high reproductive health literacy levels among women in Chabahar [44], and a study in Amol indicated that only one-fourth of women had inadequate sexual health literacy [45]. Nonetheless, some studies reported differing

results. For instance, two studies in Iran found that more than half of the women had moderate reproductive health literacy, with only 3.9% demonstrating adequate literacy. These differences may be attributed to sociocultural and economic variations in the studied populations [46, 47]. Additionally, a study of 400 young individuals attending a premarital counseling center in Bandar Abbas revealed suboptimal sexual and reproductive health literacy, possibly due to the use of a researcher-developed tool [48]. Some international studies support the current findings [49, 50]; However, a study conducted in Lao PDR among adolescents aged 15-19 reported that 65% had inadequate sexual and reproductive health literacy [16], likely influenced by the country's low level of economic development. This aligns with the present study's finding that economic status is a key determinant of sexual health literacy.

Spearman correlation analysis indicated significant positive correlations between fertility knowledge, general health literacy, and reproductive health literacy. This was further confirmed by linear regression analysis, which identified both general and reproductive health literacy as positive predictors of fertility knowledge. A significant positive correlation was also found between general health literacy and reproductive health literacy. These findings are consistent with previous research, suggesting that health literacy is closely linked to reproductive health knowledge and may influence various aspects of reproductive health [46, 51-54].

This study also found a significant inverse relationship between economic status and fertility knowledge. This finding is consistent with research by Nematzadeh *et al.*, which demonstrated that students with lower economic status were less likely to have adequate sexual health literacy [55]. Other studies have also confirmed the positive association between socioeconomic conditions and health literacy, including those by Sayadi & Ahmadipour [44], Abedian Kasgari *et al.* at Mazandaran University of Medical Sciences [37], and studies by Vakili *et al.* [56] and Small *et al.* [57]. This negative association may result from financial constraints that limit access to educational and informational resources related to reproductive and sexual health.

The results also revealed a positive relationship between age and fertility knowledge, indicating that older participants possessed greater awareness of fertility-related issues. This is consistent with findings from Kohan *et al.* [42, 58], Sayadi & Ahmadipour [44], and other national [41] and international studies [59, 60]. In contrast, some studies have found that younger individuals exhibit higher levels of sexual health literacy [38, 61], which may be due to those studies' focus on adolescents. Increased internet use among adolescents, targeted reproductive health education in schools, and sociocultural shifts associated with modernization in Iran may explain these divergent findings. In particular, generational differences in attitudes toward sexuality—between those born in the 1960s and the 1990s—may have significantly influenced these trends [38].

Conclusion

The findings of this study indicate that while fertility knowledge among female university students is moderate, their general and reproductive health literacy levels are relatively favorable. A significant positive association was observed between health literacy and fertility knowledge, underscoring their crucial role in enhancing fertility awareness. Poor economic status was inversely associated with fertility knowledge, while age showed a marginally significant positive correlation. These findings highlight the importance of promoting health literacy, particularly among economically disadvantaged groups. Overall, strengthening formal and targeted reproductive health education for students appears essential.

Strengths and limitations

One of the key strengths of this study is the use of stratified random sampling, which enhances the representativeness of the sample and reduces selection bias. However, the study also has several limitations. First, due to the cross-sectional design, causal relationships between variables cannot be established. Future research using longitudinal or interventional designs is recommended to address this limitation. Second, although validated tools were used, all data were collected through self-report, which may be subject to information bias. Incorporating observational or mixed-method data in future studies could enhance reliability. Third, most participants were medical students, which may limit the generalizability of the findings. Future studies should aim to include more diverse geographic and demographic samples.