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Evaluation of Awareness of Reproductive Health in Couples Referred Premarital Counseling Centers in Tehran

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ABSTRACT

Background: Fertility awareness, including knowledge of ovulation, contraception, age-related fertility decline, STIs, and abortion, is a key aspect of reproductive health literacy. Limited awareness may delay seeking medical care and affect family planning decisions. This study aimed to develop a validated questionnaire and assess reproductive health knowledge among couples attending premarital counseling centers in Tehran, Iran.

Methods: In this cross-sectional study (Nov 2015–Apr 2016), 300 couples completed a structured questionnaire covering demographics, childbearing preferences, and fertility awareness. The fertility awareness section included 25 items on fertility at different ages, chances of conception, assisted reproductive technologies, ovulation, contraception, STIs, and abortion. Correct answers were scored, with higher scores indicating greater awareness. Data were analyzed using t-tests, paired tests, and chi-square tests ($p < 0.05$).

Results: Men were older than women (30.6±6.4 vs. 26.9±6.0 years). Most participants preferred two children. Women were more likely than men to choose assisted reproductive technologies if infertile (77.5% vs. 64.6%; $p < 0.001$). Awareness of peak female fertility was low (men 5%, women 3.5%), while men more often recognized male fertility decline (53.7% vs. 35.6%; $p = 0.000$). Women had higher knowledge of contraception and abortion, whereas men were more aware of condom use and permanent contraceptive methods. Total reproductive health awareness did not differ significantly between sexes (men 11.76±4.35 vs. women 11.47±4.19; $p = 0.538$).

Conclusion: Fertility awareness among couples in Tehran is generally low. Targeted educational programs are needed to improve knowledge on fertility, contraception, and reproductive health, supporting informed family planning decisions.

Keywords: Fertility Awareness, Reproductive Health, Childbearing, Premarital Counseling, Contraception, Iran

Introduction

Infertility, as defined by the World Health Organization (WHO, 2023), refers to the inability to conceive after 12 months of regular, unprotected sexual intercourse. It affects roughly 12–15% of couples worldwide and is now recognized as a significant global public health concern. In recent decades, the average age at first conception has steadily increased for both men and women, while overall fertility rates have declined. This shift is often linked to modern social and economic factors, such as pursuing higher education, career development, financial insecurity, and the delay in finding a suitable partner [1-3].

Despite these societal changes, human fertility—particularly in women—naturally declines with age. After the late twenties, the quality and quantity of oocytes begin to diminish, and the risk of miscarriage increases. Many individuals remain unaware of these biological realities, which can lead to unintended childlessness. Insufficient fertility knowledge is now seen as one of the modifiable contributors to infertility and unmet parenting goals [4].

To better frame this issue, the International Glossary on Infertility and Fertility Care (2017) defines fertility awareness as an individual's understanding of

reproductive processes, fertility, and related risk factors. These include advanced maternal age, sexually transmitted infections (STIs), lifestyle habits such as smoking and obesity, and even environmental or occupational exposures. Beyond biology, fertility awareness also reflects an understanding of the sociocultural and personal factors that shape reproductive decisions and family planning choices. In this sense, fertility awareness represents a crucial element of reproductive health literacy [5].

Globally, studies have shown that young adults and college students—although in their peak reproductive years—often possess limited knowledge about fertility, including misconceptions about the best age for conception and the impact of aging on fertility. Research indicates that such a lack of awareness can delay the decision to seek medical consultation for infertility, ultimately reducing the likelihood of conception. Educational initiatives and premarital counseling programs can help bridge these gaps by promoting fertility education and proactive reproductive health behaviors [6, 7].

While several high-income countries, such as the United Kingdom, have implemented national initiatives to raise fertility awareness through school-based and community education, similar efforts remain limited in many developing contexts. In Iran, for instance, there is still no validated and comprehensive instrument to evaluate reproductive health knowledge and fertility awareness among couples [8, 9].

Therefore, the present study aims to design and validate a culturally sensitive questionnaire to assess fertility awareness and reproductive health literacy among couples attending premarital counseling centers in Tehran. The findings will help identify existing knowledge gaps and guide future interventions to promote informed reproductive choices and healthier family planning among Iranian couples [10].

Methods

Setting and Participants

This cross-sectional study was conducted among couples attending premarital counseling centers in Tehran, Iran, between November 2015 and April 2016. In Iran, premarital counseling and a series of mandatory tests are required for all couples before marriage; therefore, these centers provided an appropriate setting for recruiting participants. Premarital counseling centers in Tehran operate under the supervision of the three major medical universities—Tehran University of Medical Sciences, Shahid Beheshti University of Medical Sciences, and Iran University of Medical Sciences—each responsible for different geographical areas of the city. To ensure coverage of diverse regions, 18 centers from various districts of Tehran were included in the study through a convenience sampling approach.

Questionnaires were distributed separately to men and women and collected upon completion during their waiting time before the counseling session. A trained research assistant was present to provide neutral clarification if needed, without influencing respondents' answers. The target sample size was approximately 300 couples.

The Instrument

The instrument used in this survey was based on earlier research and a validated questionnaire developed by Lampic et al. [11]. However, as it seemed not to cover all aspects of reproductive health, we conducted a qualitative expert opinion study with gynecologists and midwives. It contained 14 in deep interviews, that underwent content analysis. After 14 interviews, we reached data saturation. After gathering all items, we did another review of literature to find forgotten items. Because of importance of childbearing in Middle Eastern countries, we added this section to the questionnaire too. Then convert the items into questions. For content validity, a professional team comprised of obstetricians, gynecologists, public health professors, midwifes, nurses and psychologists evaluated the questionnaire studied for clarity, importance and coverage of contents. For face validity, three Persian language expert and three midwifes read the questionnaire to be clear and have no grammatical or dictation mistake. Then a graphic expert checked fonts and design of the questionnaire. Final version of the questionnaire included three main sections, as follows:

Demographic and Clinical Data (5 items)

Participants were requested to state their age, sex, educational level, and a history of infertility and miscarriage in their family or relatives.

Childbearing and Desire to have Children (8 items)

Some of the important items asked, and the type of responses in the section is as follows:

One of the questions was "Do you have a desire to have children?"(Yes/No). The response was followed by a question on "How many children do you want?" (None, one, two, three, four, and more). "At what age would you like to have your first and last child?" Participants were requested to select the age group (<20, 20-24, 25-29, 30-34, 35-39, 40-44, >=45). "Is it important for you to have children in your life?"(Yes/No). "What would you do if you and your partner could not get pregnant?" Participants were asked to select a desire response (Adoption, assisted reproductive treatment, continue childlessness). In next item, participants were asked to determine the circumstances for their decision on parenthood requirements with multiple choices.

Fertility Awareness (25 items)

Reproductive health awareness was measured using questions on women's and men's fertility in different ages, couples chances of achieving a pregnancy, infertility, successful rate of assisted reproductive

technologies (ART), ovulation and menstrual cycle, contraceptive techniques, sexualhy transmitted infection/disease (STI/STD) transmission pattern and pathways, miscarriage complications for the mother in four domains, containing fertility awareness (11 items), (STI/STD)(6 items), contraceptive methods (4 items) and miscarriage (4 items). In this section, each question has one correct answer, which scored one and others zero. At the same way, the greatest score acquired in fertility awareness was 11, contraceptive methods 6, STI/STD 4 and miscarriage 3. A total score would be 24.

The final questionnaire consisted of 38 items that covers all three above sections.

Ethical Consideration

Ethical approval to conduct the study was obtained by Ethics Committee of Royan Institute (IR.ACECR.ROYAN.REC.1394.125). Aims of the study was written on the questionnaire and clearly explained for all participants prior to the investigation. Participants were assured that they are free to participate and after filling the form a small gift were presented to them as appreciation of their time. They were also assured about their confidentiality and anonymity. Voluntarily filling the questionnaire was considered as consent.

Statistical Analysis

Statistical analyses were carried out with R version 3.2.1. Questionnaires with missing values were not considered in the analyses. Continuous variables were expressed as mean±SD and categorical variables as number (percentage). Chi^2 tests of independence were used to assess relationships between categorical variables. Comparison of total mean score of reproductive health awareness by the female and male were performed with independent sample t test. The MC Nemar test was used for comparing couples' awareness. The statistically significant level was considered less than 0.05.

Results

Demographic and fertility characteristics of the participants are summarized in Table 1. Men were significantly older than women ($p < 0.001$). Most participants in both groups had academic education, although educational level differed significantly between sexes ($p = 0.003$). A family history of abortion was more frequently reported by women compared to men ($p = 0.002$), while no statistically significant difference was observed for family history of infertility. Some questions were not answered by all participants; therefore, the total percentages do not sum to 100% for certain questions.

Childbearing and Desire to have Children

Participants' preferences regarding the number of children and intended coping strategies in case of infertility are summarized in Table 2. Most participants in both sexes preferred having two children, with no significant difference between men and women ($p = 0.096$). Women were significantly more likely than men to choose assisted reproductive technologies Assisted Reproductive Technologies (ART) if they experienced infertility (77.5% vs. 64.6%; $p < 0.001$). No significant sex differences were observed for other coping strategies. The majority of participants also believed it was possible to continue living together without children (male 85.3%, female 86.3%; $p = 0.722$).

Fertility Awareness (FA)

Fertility awareness among participants is summarized in Table 3. Awareness of women's peak fertility (20–30 years) was low in both men (5%) and women (3.5%), with no significant sex difference ($p = 0.371$). Most participants correctly identified the age range of slight fertility decline in women (35–44 years), while awareness of marked fertility decline (>45 years) was lower. A significant difference was observed for men's fertility decline (>45 years), with more men answering correctly than women (53.7% vs. 35.6%; $p = 0.000$). Knowledge regarding ovulation, pregnancy chances at different ages, infertility prevalence, and IVF success rates showed variable awareness levels, generally without significant differences between sexes.

Awareness of Contraceptive Methods

Participants' awareness of contraceptive methods is presented in Table 4. Knowledge about condoms was significantly higher among men (65.5%) compared to women (28.4%; $p < 0.001$). Awareness of other methods, including emergency contraception, ovulation prevention, IUD, natural methods, and permanent methods (vasectomy/tubal ligation), was generally low, with some statistically significant differences between sexes (e.g., vasectomy/tubal ligation: male 25% vs. female 17.2%; $p = 0.013$). Overall, men demonstrated greater awareness of several contraceptive methods compared to women.

Sexually Transmitted Diseases Awareness

Participants' knowledge regarding sexually transmitted diseases is summarized in Table 5. Most participants correctly identified that HIV is not transmitted through saliva (male 76.9%, female 72.8%) and that condom use prevents STDs (male 96.3%, female 99%). Awareness of other items, such as STDs screened before marriage and the ineffectiveness of douching, was generally lower. A small but significant sex difference was observed for condom use awareness ($p = 0.021$), while other items showed no significant differences between men and women.

Miscarriage Awareness

Awareness regarding abortion among participants is presented in Table 6. Overall, knowledge was limited, with women demonstrating higher awareness than men in several items. For instance, awareness of fetal screening during pregnancy was significantly higher among women (41.2%) compared to men (30.3%; $p = 0.003$), as was awareness of abortion law (women 45.1% vs. men 23.7%; $p < 0.001$). No significant sex difference

was observed regarding the effect of pregnancy on blood pressure.

Reproductive Health Awareness

The mean scores for reproductive health awareness are summarized in Table 7. Women scored higher than men in fertility awareness (15.5 vs. 10.5) and overall reproductive health awareness (11.47 vs. 11.76), although the difference in total score was not statistically significant between sexes (p = 0.538). Significant differences were observed in awareness of contraceptive methods (p = 0.001) and abortion-related knowledge (p < 0.001), with women demonstrating higher awareness. No significant sex differences were noted in fertility awareness or STD awareness based on independent group comparisons.

Table1. Demographic and fertility characteristics of the participants

Variable	Male	Female	p-value*	p-value**
Age (years)	30.62 (6.39)	26.86 (5.99)	<0.001	-
Education			0.003	0.636
Under diploma	27 (9.1)	14 (4.7)		
Diploma	88 (29.5)	67 (22.6)		
Academic	182 (61.1)	216 (72.7)		
History of abortion in family			0.002	0.680
Yes	20 (7.2)	45 (15.7)		
No	258 (92.8)	242 (84.3)		
History of infertility in family			0.215	0.237
Yes	15 (5.4)	23 (8)		
No	263 (94.6)	264 (92)		

Data are presented as mean±SD or number (%). *P-values derived from independent samples tests comparing males and females. **P-values derived from paired tests assessing within-couple agreement.

Table 2. Participants' childbearing preferences and intended actions in case of infertility

Variable	Male	Female	p-value*	p-value**
Desired number of children			0.096	0.548
None	15 (4.2)	12 (4.2)		
One child	42 (14.16)	59 (20.6)		
Two children	160 (55.7)	155 (54.2)		
Three children	25 (8.7)	36 (12.6)		
Four or more children	17 (5.9)	10 (3.5)		
Presumed behavior in case of infertility			<0.001	0.436
ART1	175 (64.6)	214 (77.5)		
Child supervision	39 (14.4)	31 (11.2)		
Refrain from having children	22 (8.1)	17 (6.2)		
Others	32 (11.8)	13 (4.7)		
Is it possible to continue living together without children?			0.722	0.431
Yes	250 (85.3)	253 (86.3)		
No	43 (14.7)	40 (13.7)		

Values are presented as number (%). *P-values from independent samples tests comparing males and females; **P-values from paired tests assessing within-couple agreement. [1] Assisted Reproductive Technique

Table 3. Fertility awareness among male and female participants

Question	Correct Answer	Male	Female	p-value*	p-value**
Q16: At what age are women the most fertile?	20–30	14 (5)	10 (3.5)	0.371	0.664
Q17: Slight decrease in women's fertility	35–44	156 (57.1)	176 (62.2)	0.226	0.699
Q18: Marked decrease in women's fertility	>45	79 (27.1)	86 (29)	0.730	0.919
Q19: Decrease in men's fertility	>45	158 (53.7)	105 (35.6)	0.000	0.403
Q20: Relationship between sexual power and male fertility	Yes	95 (32)	98 (33)	0.760	0.262
Q21: Ovulation in women	Correct timing	105 (35.8)	119 (40.6)	0.361	0.175
Q23: Chance of pregnancy after unprotected intercourse <25 yrs.	High	189 (68.2)	199 (69.1)	0.777	0.007
Q24: Chance of pregnancy at 25–30 yrs	High	162 (58.7)	153 (54.1)	0.286	0.203
Q25: Chance of pregnancy at 35–40 yrs	High	162 (59.3)	149 (53.2)	0.236	0.271
Q26: Infertility prevalence in Iran	10–19%	85 (37.8)	104 (45.4)	0.179	0.828
Q27: Success rate of IVF treatment	30–39%	68 (31.6)	75 (34.4)	0.647	0.464

Values are presented as number (%). *P-values from independent samples tests comparing males and females; **P-values from paired tests assessing within-couple agreement.

Table 4. Awareness of contraceptive methods among male and female participants

Question	Correct Answer	Male	Female	p-value*	p-value**
Q29: Does contraception prevent ovulation in women?	Yes	70 (25.1)	77 (27.1)	0.343	0.440
Q30: Maximum effective time for emergency contraceptive pills	72 hours	73 (26.2)	84 (29.5)	0.210	0.110
Q31: Knowledge about condoms	Yes	183 (65.5)	81 (28.4)	<0.001	0.001
Q32: Knowledge about IUD	Yes	44 (15.8)	43 (15.1)	0.445	0.313
Q33: Knowledge about natural contraception methods	Yes	63 (22.6)	48 (16.9)	0.049	0.313
Q34: Knowledge about permanent contraception (vasectomy/tubal ligation)	Yes	70 (25)	49 (17.2)	0.013	0.005

Values are presented as number (%). *P-values from independent samples tests comparing males and females; **P-values from paired tests assessing within-couple agreement.

Table 5. Awareness of sexually transmitted diseases (STDs) among male and female participants

Question	Correct Answer	Male	Female	p-value*	p-value**
Q36: HIV transmission via saliva	No	209 (76.9)	207 (72.8)	0.289	0.068
Q37: STD screened before marriage (Syphilis)	Yes	40 (14.7)	48 (16.9)	0.310	0.441
Q38: Does condom use prevent STD?	Yes	263 (96.3)	284 (99)	0.021	0.164
Q39: Does douching prevent STD?	No	46 (16.8)	47 (16.4)	0.525	0.120

Values are presented as number (%). *P-values from independent samples tests comparing males and females; **P-values from paired tests assessing within-couple agreement.

Table 6. Awareness of abortion among male and female participants

Question	Correct Answer	Male	Female	p-value*	p-value**
Q42: Does pregnancy affect blood pressure related to abortion?	True	97 (35.5)	96 (33.8)	0.432	0.000
Q43: Knowledge about fetal screening during pregnancy	Yes	83 (30.3)	117 (41.2)	0.003	0.001
Q44: Knowledge about abortion law	Yes	65 (23.7)	128 (45.1)	<0.001	0.922

Values are presented as number (%). *P-values from independent samples tests comparing males and females; **P-values from paired tests assessing within-couple agreement.

Table 7. Mean scores of reproductive health awareness domains among male and female participants

Domain	Male	Female	p-value*	p-value**
Fertility awareness	10.5 ±1.75	15.5±1.74	0.764	0.454
Awareness of contraceptive methods	1.72 ±1.59	1.27 ±1.58	0.001	0.001
Awareness of sexually transmitted diseases (STDs)	1.12 ±0.83	1.07 ±0.85	0.519	0.019
Awareness of abortion	3.43 ±1.89	3.63 ±1.79	0.227	<0.001
Total reproductive health awareness score	11.76±4.35	11.47 ±4.19	0.538	0.001

Values are presented as Mean ± SD.*P-values from independent samples tests comparing males and females; **P-values from paired tests assessing within-couple agreement.

Discussion

This study provides one of the first comprehensive assessments of reproductive health and fertility awareness (FA) among couples attending premarital counseling centers in Tehran, Iran. Using both pooled and paired analytical methods, we explored sex-based differences and within-couple concordance, providing a nuanced understanding of reproductive knowledge before marriage. The results revealed a generally low to moderate level of fertility and reproductive health awareness among participants, indicating a critical knowledge gap in this population.

Our findings align with international evidence suggesting that fertility awareness remains insufficient among young adults and individuals of reproductive age. Similar to studies conducted in Finland [11, 12]and the United States [13], most participants in our sample underestimated the effect of age on fertility. Less than 5% of men and women correctly identified the peak fertility period (20–30 years), while over half of men and one-third of women believed that significant fertility decline occurs only after the age of 45. Comparable misconceptions have been reported among university students and newlyweds in Europe and Asia [14].

Participants' desire for two children was consistent with national demographic patterns in Iran and fertility ideals in other middle-income countries (UNFPA, 2023). The preference for assisted reproductive technologies (ART) as the first response to infertility—especially among women—was also in line with previous Iranian and international studies, reflecting growing trust in medical solutions for infertility However, awareness of IVF success rates and infertility prevalence was still limited, suggesting unrealistic expectations regarding treatment outcomes [15].

In terms of contraceptive knowledge, men demonstrated greater familiarity with condom use, while women showed higher awareness regarding abortion laws and prenatal screening. This gender difference reflects sociocultural norms and the uneven distribution of sexual health education resources in Iran [6]. Similar findings have been reported in studies across low- and middle-income countries, where men are more informed about male-centered methods but less engaged in broader reproductive health discussions [16].

Awareness regarding sexually transmitted infections (STIs) and miscarriage was moderate, though some misconceptions persisted—such as the belief that HIV could be transmitted via saliva or that vaginal douching prevents infections. These results mirror recent findings from reproductive health surveys in South and Central Asia, where STI-related misconceptions remain common even among educated populations [17, 18].

Taken together, our findings underscore the urgent need to enhance reproductive health literacy among young Iranian couples prior to marriage. Low awareness of fertility timing, contraceptive methods, and infertility risk factors can lead to delayed childbearing decisions, increased infertility rates, and poor use of reproductive health services. Targeted educational interventions—integrated into premarital counseling programs—could bridge this gap and support informed reproductive choices. Recent frameworks for improving fertility literacy emphasize the importance of culturally tailored, gender-sensitive, and non-judgmental communication [19]. Integrating evidence-based fertility education into

Iran's premarital counseling curriculum could empower couples to make informed decisions, reduce anxiety surrounding infertility, and improve overall reproductive outcomes. Moreover, the adaptation and validation of tools such as the *Male and Female Fertility Knowledge Inventories (MFKI/FFKI)*, recently validated for Iranian couples [6], could facilitate standardized assessments and monitoring of fertility awareness over time.

To the best of our knowledge, this was the first study across the country that assessed awareness of fertility issues in a sample group of Iranian community. Another strong point of our study is that we analyzed our data with both pooled and paired methods. The main finding of the survey reveals that the participants encountered with shortage of FA, which was lower than or equal to the median value. In a national survey on Finnish undergraduate university students, participants filled childbearing and FA questionnaire. The percentage of childless students was 6.1% and 5.9% in and females and males, respectively. As well, over one-thirds of both female and male students wanted three or more children. In the present study, 4.2% of men and women do not desire to have children and approximately one-sixth of participants in both sexes desired to have three or more children. The present study was done on couples that had made their decisions to build a family and were under process of marriage, so, our data seems to be real for this sample and not for all population which includes singles. Our results were in line with the Finnish survey, more than half of the men and about one-third of the women thought that the marked decline in female fertility begins after the age of 45 years. A survey on assessing FA and parenting attitude of American undergraduate university students revealed that of 138 female students and 108 male students who completed Lampic's questionnaire, 12% of females and 9% of males did not want to have children in the future. More than half of women and two-thirds of men wanted 3 or more children. Responses to intended behavior in the event of infertility scored ranging from 0 to 10. Women and men were likely to pursue IVF treatment (mean score of 6 and 6.4 in males and females, respectively). Men and women were likely to choose to seek adoption with women more likely than men (mean score of 6 and 6.4 in males and females, respectively). Also, women and men reported being unlikely to choose to live a childfree lifestyle (mean score of 3.7 and 3.9 in males and females, respectively). In the current study, 77.5% of women and 64.6% of men chose IVF, 11.2% of women and 14.4% of men preferred adoption than other choices and 6.2 % of women and 8.1% of men chose involuntary childlessness. The US undergraduate university students also overestimated the chance of that couples who undergo IVF would have a child following one treatment (52% of women and 64% of men). In a Swedish survey on female and male high-school students to investigate knowledge about fertility in general, 247 students chose to participate. The findings showed that 4% and 3% of women and men did not wish to become parents in the future. Eight and nine percent of female and male respondents had wish to have e children or more. About awareness of fertility issues, the scale used ranged from 0 to 10 (not at all important to the greatest importance). For a question about what options they might consider in case of future fertility problems, women received mean scores of 73, 65 and 25 in IVF, adoption and involuntary childlessness, but men obtained mean scores of 65, 49 and 34 in above options.

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Practical Implications

The findings of this study highlight the critical role of structured reproductive health education within premarital counseling programs.

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Author's Contributions

Conceptualization: M.M, R.OS.; Methodology: M. M, , R.OS.; Data Collection: M.M, B. N., S.V.; Writing – Original Draft Preparation: Sh. AH, M.M; Review & Editing: Samani.; Supervision: R.OS.

Ethical Considerations

All procedures were approved by the Research Ethics Committees of Laboratory Animals-Academic Center for Education, Culture and Research. (Ethical code: IR.ACECR.ROYAN.REC.1394.125).

Conflicts of Interest

The authors declare that they have no competing interests.

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