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Research Article

Knowledge, Attitudes, and Practice of Infertile Couples About Assisted Reproductive Technology, 2020: A Cross-Sectional Study

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Abstract

Background: The World Health Organization (WHO) has referred to infertility as a worldwide reproductive health problem that threatens the mental health of infertile couples and can lead to disorders such as stress, depression, isolation, and guilt.

Objectives: This study aimed to determine infertile couples' knowledge, attitudes, and behavior regarding assisted reproductive technology in 2020.

Methods: This cross-sectional descriptive study was performed on 331 infertile persons referred to Al-Zahra Infertility Center in Shahrekord, Iran, in 2020. Sampling was done by convenience sampling method. Data were collected by a self-administered questionnaire consisting of four parts. The first consisted of 17 demographic questions, the second consisted of 20 questions, the third consisted of 23 questions, and the fourth consisted of 9 questions. The data were analyzed by SPSS software. A P-value of less than 0.05 was considered significant.

Results: In this study, 331 infertile persons referred to the infertility clinic of AL-Zahra were studied. The mean awareness of infertile couples was 14.26 (moderate knowledge level), and their mean attitude was 57.01 (negative attitude). Comparison of study participants' knowledge with gender, address, ethnicity, language, education, the duration of infertility, causes of infertility, female factor, age, and years since marriage was significant ($P < 0.05$). Comparison of attitudes of study participants with gender, address, education, job, and the duration of infertility and causes of Infertility was significant ($P < 0.05$). The relationship between the knowledge of study participants and the duration of infertility, cause of infertility, knowledge of (IUI, IVF, ICSI, ZIFT, replaced uterus, donated ovum, sperm donation, and the donating embryo) and attitude towards (IUI IVF replaced uterus donated ovum) was significant ($P < 0.05$). The relationship between the attitude of study participants and the duration of infertility, knowledge of (IUI, replaced uterus and donated ovum), and attitude of (IUI IVF replaced uterus donated ovum) was significant ($P < 0.05$).

Conclusions: The results of this study indicated that the higher the level of awareness was, the more negative the attitude toward assisted reproductive technology became. In addition, in people who used more pharmacological methods to treat infertility, the rate of using the new assisted reproductive method was less than the pharmacological methods. Therefore, it is recommended that health system policymakers and guardians improve childbearing status in the country by establishing counseling classes and heightening people's awareness of new methods of assisted reproduction to address misconceptions about these methods.

Keywords: Knowledge; Attitude; Practice; Assisted Reproductive Technique; Infertility

1. Background

Infertility is defined as failure to conceive after one year of regular sexual intercourse without any contraception (1). The World Health Organization (WHO) has referred to infertility as a worldwide reproductive health problem that threatens the mental health of the infertile person and can lead to disorders such as hopelessness, stress, anger, depression, isolationism, anxiety, guilt, marital and self-esteem issues (2). According to WHO statistics, about ten to fifteen percent of people worldwide have infertility problems (3), and it is also estimated to be 8% among Iranians (4). Generally, infertility treatments are divided into three categories: (1) drug treatment, (2) surgical treatment, and (3) assisted reproductive technology (ART) (1).

The first and second methods do not significantly treat infertility, and the third is more important. Assisted reproductive technology is a collection of several procedures that permit a bypass of the barriers to achieving pregnancy by the conventional methods (including the consumption of drugs and surgery singly or in combination) to allow pregnancy and childbirth to happen where there is no possibility of conception otherwise (5).

Assisted reproductive technology are techniques that increase the pregnancy and birth rate using sperm or ovum. Assisted reproductive technologies include two types of intrauterine and extrauterine insemination. On the other hand, using ART like the donor sperm, donor ovum, and surrogate uterus increases hope for fertility in an infertile person. Third-party reproduction includes using sperm, ovum, and embryo by a donor and someone else's uterus (1). However, not all infertile persons can benefit from these methods (4). There are differences in adopting these methods in developed countries, and they are illegal in some countries (4, 6). However, Ayatollah Khamenei's fatwa allowed it in Iran and Lebanon regarding sperm donation, egg donation, and embryo and uterus donation, where it is advocated as the keeper of marital life (7). A study by Mahmoodian et al. showed that 72.5% of infertile women had negative attitudes, and the rest had positive attitudes toward surrogacy (8). Also, in a study by Mohamed et al., the level of knowledge of infertile couples regarding assisted reproductive techniques was low, and such couples had a positive attitude toward assisted reproductive techniques (9). According to a study by Latifnejad Roudsari et al., sociocultural beliefs surrounding reproductive donation can influence infertile couples' attitudes toward accepting these therapeutic alternatives. Moreover, women and men with a higher score of sociocultural beliefs had higher attitudes (10).

The use of assisted reproductive technologies in different societies to treat infertility has always faced challenges, and its rapid growth has raised concerns. Some of these concerns are related to these methods' ethical, religious, and legal aspects (11). Assisted reproductive technology utilization, effectiveness, and safety have increased globally (12). In a study by Nwotite, the results showed that assisted reproduction was soaring with the increase in infertility in Nigeria (13). A large population does not accept infertility in Iranian society (14). Not all infertile persons use these technologies because cultural and religious factors influence their treatment decisions, even though individuals may have different attitudes toward ART (15). Therefore, one can say that one of the factors that affect the acceptance of this treatment is attitude (16). How infertility is understood and dealt with is probably influenced by cultural factors and varies across societies. Some cultures promote the use of traditional therapists, such as sorcery. Many do not accept novel medical technologies for cultural reasons and instead use new technologies to support social networks through parenting or divorce and remarriage. Another solution many societies adopt is changing the law or religious laws regarding technology (17). Considering the importance of this issue and the researcher's experience visiting infertile women in Shahrekord, the research team decided to conduct this research to determine the knowledge, attitude, and practice of infertile persons about assisted reproductive technology who referred to Al-Zahra Infertility Center in Shahrekord in 2020. Several studies examined separately the knowledge or attitude or practice of infertile persons towards assisted reproductive technology, but we did not find a study specifically focusing on the knowledge, attitude, and practice of infertile persons towards assisted reproductive technology. Researchers' experiences show that by researching this field, solutions can be obtained and used in counseling infertile couples. Moreover, by informing the authorities and requesting appropriate training and support programs for these couples, their problems can be addressed.

2. Objectives

The present study was conducted to determine the knowledge, attitude, and practice of assisted reproductive technology by infertile individuals referring to Al-Zahra Infertility Center in Shahrekord in 2020.

3. Methods

3.1. Study Design and Setting

This cross-sectional descriptive study was performed on 331 infertile individuals referred to Al-Zahra Infertility Center in Shahrekord in 2020.

3.2. Study Participants and Sampling

The convenience sampling method was used for sampling. Research subjects included in the study were briefed about the purpose and design, and the confidentiality of the information was stressed. Inclusion criteria included age 15 - 45 years, infertility diagnosis, willingness to participate in the study, and availability during the data collection. Exclusion criteria included any known mental illness and a history of any severe mental stress, such as an accident or loss of a first-degree relative during the past three months, and not answering all questions of the questionnaires.

3.3. Data Collection Tool and Technique

Two questionnaires were used to obtain the data. Data were collected using self-administered questionnaires consisting of four parts. The first consisted of 17 demographic questions, the second consisted of 20 questions, the third consisted of 23 questions, and the fourth consisted of 9 questions.

To determine the validity of the questionnaire, ten professors interested in the subject contributed, and their inputs were considered. Then, the questionnaire was completed again for ten research units within two weeks. The correlation coefficient between the two-stage results was 0.87% and 0.65% for the knowledge and attitude tests, respectively. Individual characteristics included the couple's age, education, place of residence, occupation, number of years of infertility, cause, and medical records. The questionnaire scoring method was such that the scores

of those who scored less than ten were considered as "poorly knowledge", those who scored 10 - 15 achieved "moderate knowledge," and those who scored more than 15 were considered "good knowledge. For the attitude questionnaire, the Likert scale was used; generally, I quite agree with "5 points", I agree with "4 points", no idea "3 points", I disagree with "2 points," and I totally disagree with "1 point" was scored.

Accordingly, the attitude variables were classified into two positive and negative groups. If they scored 58 or lower, they were classified as the negative attitude group, and if the score was 58 or higher, they were placed in the positive attitude group. The 9-questions questionnaire contained information on drug treatment, surgical treatment, non-medical treatments, complementary therapies (acupuncture, acupressure, herbs, etc.), and the use of supernatural means (prayer, etc.). The interpretation of this questionnaire was presented as a couple's performance report. The questionnaires were filled out by the researcher, who first described the research design and objectives of the study. Then, after obtaining written consent, the questionnaire was completed by the subjects themselves. If the subjects could not read and write, the researcher read the questions, and the participants' answers were included in the questionnaire.

3.4. Ethical Consideration

This study was extracted from a research project approved by Shahrekord University of Medical Sciences with a code of ethics IR.SKUMS.REC.1397.233 (2018-12-23)

3.5. Statistical Analysis

The data were analyzed by SPSS software. The Kolmogorov-Smirnov test was used to check the normality of the data. Nonparametric Spearman correlation coefficient tests were used to determine if the data distribution was abnormal. ANOVA, chi-square, and t-tests were used to determine the normal data distribution. A P-value of less than 0.05 was considered significant.

4. Results

This study studied 331 infertile persons referred to the Al-Zahra Infertility Clinic. Most participants held diploma degrees, and a minority were illiterate. Regarding location, most people were urban dwellers, and most were unemployed (housewives). Most people had a history of infertility of about 1 - 5 years, and the least had a history of more than ten years (Table 1).

Table 1. Demographic Information of the Participants a

Variables and Subgroups	No. (%)
Gender	
Man	128 (38.7)
Female	203 (61.3)
Language	
Farsi	252 (76.1)
Larry	52 (15.7)
Turkish	21 (6.3)
Other languages	4 (1.2)
Education	
Illiterate	2 (0.6)
Elementary	14 (4.2)
Tips	38 (11.5)
Diploma	124 (37.5)
Licentiate	122 (36.9)
Masters	26 (7.9)
PhD	5 (1.5)
Address	
City	274 (82.8)
Village	55 (16.6)
Other cases	2 (0.6)
The duration of infertility	
Less than one year	63 (19)
1 - 5 years	197 (59.5)

5 - 10 years	53 (16)
More than ten years	18 (5.4)
The type of infertility	
Primitive	255 (77)
Secondary	76 (23)
Male factors	
Azoospermia	17 (5.1)
Oligospermia	15 (4.5)
Varicocele	34 (10.3)
Other factors	24 (7.3)
Duration of treatment	
Less than one year	88 (25.4)
1 - 2 years	71 (21.5)
2 - 3 years	23 (6.9)
3 - 4 years	31 (9.4)
4 - 5 years	26 (7.9)
More than five years	30 (9.1)
Ethnicity	
Fars	177 (53.5)
Lor	26 (7.9)
Turkish	47 (14.2)
Bakhtiari	79 (23.9)
Kurdish	2 (0.6)
Religion	
Islam Shia	327 (98.8)
Islam Sunni	2 (0.6)
Zoroastrianism	2 (0.6)
Job	
Unemployed (housewife)	168 (50.8)
Worker	37 (11.2)
Employee	43 (13)
Self-employed	69 (20.8)
Other jobs	14 (4.2)
Divorce record	
Has divorced	5 (1.5)
Had not divorced	326 (98.5)
History of treatment in first-degree family	
No	279 (84.3)
Yes	52 (15.7)
Cause of infertility	
Male factor	34 (10.3)
Female factor	157 (47.4)
Male - female	58 (17.5)
Idiopathic	82 (24.8)
Female factor	
PCOs	137 (41.4)

Fallopian tube causes	22 (6.6)
Uterine malformations	4 (1.2)
Endometriosis	20 (6)
Functional endometers	11 (3.3)
Other factors	15 (4.5)
Type of treatment	
Medicinal	170 (51.4)
Pharmaceutical and surgical	86 (26.0)
Traditional and herbal medicine	5 (1.5)
Complementary	2 (6)

[a] Kolmogorov-Smirnov test.

The mean knowledge score of the infertile individuals was 14.26 (moderate knowledge level), and their mean attitude score was 57.01 (negative attitude). The results demonstrated that 19% of participants had poor knowledge, 34.5% had moderate knowledge, and 46.6% had good knowledge of assisted reproductive technology. In addition, 49.4% of the participants had a positive attitude, and 50.6% had a negative attitude towards assisted reproductive technology. Also, 46.4% of the infertile persons had used only one assisted reproductive technology, and 66.1% had used these methods several times. Most people had used medication several times, and the least practice spiritual rituals and had used prayer books. 77.4% of the participants had a history of infertility treatment, 49.4% were on medication alone, and 22.6% of infertile people had less than one year of infertility treatment. The Demographic information of the study participants is demonstrated in Table 1.

According to the result demonstrated in Table 2, the level of knowledge among the ethnicities was significantly different; the highest was Turkish, and the lowest was Lor. Furthermore, there was a significant difference in the level of knowledge between different languages and dialects, the highest level of knowledge was among the Turkish-speaking individuals, and the lowest level of knowledge was in those who spoke the Lori language. In addition, there was a significant difference between the levels of knowledge of people with different levels of education. The highest level of knowledge was among Ph.D. holders, and the lowest was among elementary degree holders.

Table 2. Comparison of Knowledge and Attitudes of Study Participants with Other Variables a, b

Variables and Subgroups	Knowledge Level	P-Value of Knowledge	Attitude	P-Value of Attitude
Gender		0.020		0.014
Female	14.81 ± 4.264		55.67 ± 8.894	
Man	13.51 ± 4.750		58.40 ± 8.967	
Location		< 0.001		0.010
City	11.67 ± 4.804		60.77 ± 6.803	
Village	14.68 ± 4.357		56.25 ± 9.267	
Other cases	13 ± 0.000		58 ± 0.000	
Ethnicity		< 0.001		0.135
Fars	14.96 ± 4.010		56.65 ± 9.709	
Lor	11.64 ± 5.104		57.91 ± 8.777	
Turkish	16.19 ± 3.600		54.77 ± 8.566	
Bakhtiari	12.22 ± 4.904		58.83 ± 7.453	
Kurdish	19.00 ± 0.000		48.00 ± 0.000	
Language		< 0.001		0.68
Farsi	14.84 ± 4.423		57.25 ± 9.702	
Lorry	10.55 ± 3.418		57.24 ± 8.065	
Turkish	17.18 ± 2.892		54.64 ± 8.835	
Other languages	15.00 ± 5.657		51.50 ± 4.950	
Education		< 0.001		0.000
Elementary	12 ± 4.114		65.36 ± 5.048	

Tips	11.37 ± 4.881		59.37 ± 7.643	
Diploma	13.33 ± 4.879		58.36 ± 9.378	
Licentiate	15.62 ± 3.381		54.49 ± 8.736	
Masters	16.35 ± 3.790		54.59 ± 8.239	
PhD	19.60 ± 0.548		49.80 ± 1.643	
Job		0.316		0.001
Unemployed (housewife)	14.29 ± 4.626		56.72 ± 9.362	
Worker	13.66 ± 4.518		62.23 ± 9.855	
Employee	15.14 ± 4.044		53.83 ± 8.733	
Self-employed	13.39 ± 4.441		57.29 ± 7.117	
Other jobs	15.29 ± 5.455		53.36 ± 6.476	
The duration of infertility		0.002		0.013
Less than one year	13.36 ± 4.041		61 ± 7.022	
1 - 5 years	13.73 ± 4.586		56.28 ± 9.178	
15 - 10 years	16.70 ± 3.770		55.54 ± 9.651	
More than ten years	15.06 ± 5.323		56.88 ± 8.437	
Causes of infertility		< 0.001		0.001
Male factor	16.04 ± 5.007		50.86 ± 10.076	
Female factor	14.38 ± 3.926		57.49 ± 8.640	
Male and female agent	15.36 ± 4.466		58.62 ± 9.383	
Idiopathic	12.11 ± 4.772		57.55 ± 8.029	
Male factor		0.199		0.137
Azoospermia	14.13 ± 5.343		57.07 ± 9.968	
Oligospermia	16.93 ± 3.689		52.14 ± 4.959	
Varicocele	15.23 ± 4.667		54.29 ± 10.064	
Other male factors	17.06 ± 3.897		60 ± 12.995	
Female factor		0.007		0.741
PCO	13.90 ± 4.176		57.99 ± 9.167	
Fallopian tube agents	15.32 ± 4.347		56.50 ± 11.875	
Uterine malformations	17.50 ± 2.887		64.25 ± 4.193	
Endometriosis	17.35 ± 2.597		57.24 ± 5.696	
Functional endometers	15.67 ± 4.123		57.89 ± 5.667	
Other feminine factors	16.33 ± 2.605		56.92 ± 8.152	
The type of infertility		0.423		0.631
Primitive	14.04 ± 4.551		56.85 ± 8.925	
Secondary	14.56 ± 4.551		57.47 ± 9.337	
Age		< 0.05		
Poor knowledge	27.8125 ± 5.34269			
Moderate knowledge	29.8621 ± 7.00739			
High knowledge	31.5513 ± 4.73903			
Age				0.72
Positive attitude			30.0964 ± 6.82287	
Negative attitude			30.4118 ± 4.78414	
Years of married life		< 0.001		
Poor knowledge	4.1125 ± 2.33525			
Moderate knowledge	4.9193 ± 3.46464			

High knowledge	6.4615 ± 3.29479		
Years of married life			0.93
Positive attitude		5.5019 ± 3.10367	
Negative attitude		5.4619 ± 3.53961	

[a] Values are expressed as mean ± standard deviation (SD).
[b] Nonparametric Spearman, ANOVA, chi-square, and t-tests.

There was a significant difference in people's attitudes toward different occupations; the most positive attitude was among workers, and the most negative was among other occupations. There was a significant difference in the knowledge and attitude of people with different causes of infertility. The highest level of knowledge was among those with male factor infertility, and the lowest was among the idiopathic factor. Moreover, the most positive attitudes were among the female factor, and the most negative attitude was among those with the male factor. The age and the duration of marital life had a significant effect on the knowledge of individuals, and as the age and the years of living together increased, the level of Knowledge increased ($P > 0.05$) (Table 2).

From the results of the present study, it can be contended that the variables of divorce, cause of infertility, duration of infertility, history of infertility treatment in first-degree relatives, and type of infertility had no significant relationship with the level of knowledge. However, among all types of IUI, IVF, ICSI, ZIFT, surrogate uterus, donor ovum, donor sperm, and embryo donation, there was a significant relationship with the level of knowledge of people with IUI, IVF ZIFT, ICSI, surrogate uterus, donor ovum, donor sperm, and donor embryo. They were known to have a higher knowledge of all assisted reproductive technologies than those who did not (Table 3).

Table 3. Relationship Between Knowledge and Attitudes of Study Participants with Other Variables (Nonparametric Spearman, ANOVA, Chi-square, and t-Tests)

Variables and Subgroups	Average Strong Knowledge	Chi-square in Relation to Knowledge	P-Value Relation to Knowledge	Average Positive Attitude	Chi-square in Relation to Attitude	P-Value Relation to Attitude
Divorce		1.722	0.42		0.000	0.98
No	46.4			49.4		
Yes	50			50		
The duration of infertility		12.788	0.04		15.890	< 0.001
Less than one year	28.6			82.1		
1 - 5 years	43.4			40.6		
5 - 10 years	75			54.2		
More than ten years	60			40		
Cause of infertility		16.224	0.01		5.929	0.11
Masculine factor	76.5			23.5		
Feminine factor	45.3			53.3		
Male and female agent	54.5			45.5		
Idiopathic	30.2			55.8		
Duration of infertility treatment		17.850	0.05		1.973	0.85
Less than one year	43.6			46.2		
1 - 2 years	50			42.1		
2 - 3 years	41.7			41.7		
3 - 4 years	80			40		
4 - 5 years	58.3			58.3		
More than five years	78.6			57.1		

History of infertility treatment in first-degree relatives		2.991	0.22		0.031	0.86
No	45.6			49.7		
Yes	52.4			47.6		
Type of infertility		0.493	0.78		0.397	0.53
Primitive	45.5			48		
Secondary	48.9			53.3		
IUI		71.953	< 0.001		6.055	0.01
No	0			66.7		
Yes	60.5			44.2		
IVF		81.705	< 0.001		3.141	0.07
No	0			59.6		
Yes	67.2			44.8		
ICSI		73.370	< 0.001		2.516	0.11
No	18.6			54.6		
Yes	84.5			42.3		
ZIFT		51.727	< 0.001		1.839	0.17
No	27			53.2		
Yes	84.2			42.1		
Surrogate uterus		106.721	< 0.001		6.077	0.01
No	6.2			59.3		
Yes	83.9			40.2		
Donated ovum		101.105	< 0.001		8.089	0.00
No	1.6			63.9		
Yes	72			41.1		
Sperm donation		61.851	< 0.001		3.479	0.06
No	12.3			58.5		
Yes	68			43.7		
The donating embryo		90.162	< 0.001		1.906	0.16
No	7.9			55.3		
Yes	78.3			44.6		
IUI		27.978	< 0.001		59.701	0.00
I quite agree	66.7			8.3		
I agree	51.5			37.9		
No idea	32.6			82.6		
I disagree	0			100		
I totally disagree	45.5			72.7		
IVF		33.352	< 0.001		61.962	0.00
I quite agree	67.6			8.1		
I agree	51.5			37.9		
No idea	28.9			84.4		
I disagree	14.3			100		
I totally disagree	38.5			76.9		
Surrogate uterus		18.771	0.01		49.969	0.00

I quite agree	61.3			6.5		
I agree	53.4			37.9		
No idea	37.1			69.4		
I disagree	20			80		
I totally disagree	33.3			100		
Donated ovum		26.821	< 0.001		50.503	0.00
I quite agree	67.7			6.5		
I agree	51.7			36.2		
No idea	35.5			72.6		
I disagree	12.5			87.5		
I totally disagree	44.4			88.9		
Sperm donation		29.110	< 0.001		52.941	0.00
I quite agree	69.2			0		
I agree	56.6			35.8		
No idea	34.4			64.1		
I disagree	27.3			90.9		
I totally disagree	35.7			92.9		
The donating embryo		27.654	< 0.001		55.712	0.00
I quite agree	62.1			6.9		
I agree	56.9			29.4		
No idea	35.3			70.6		
I disagree	25			75		
I totally disagree	41.7			100		

Among these methods, people with a positive attitude towards IUI, IVF, and sperm donation had a significantly higher general knowledge of assisted reproductive methods. People with a more positive attitude had higher knowledge. Also, positive attitude towards the surrogate uterus, donor ovum, and embryo donation follow-up was not significantly correlated with peoples' knowledge.

The data also demonstrated that the variables of divorce, duration of infertility, cause of infertility, duration of infertility treatment, history of infertility treatment in first-degree relatives, and type of infertility had no significant relationship with the attitude of individuals. Among assisted reproductive technologies, the knowledge of those who knew about IUI, IVF, ICSI, ZIFT, surrogate uterine, donor sperm, and embryo donation had no significant relationship with their attitudes. However, those with donor ovum knowledge significantly differed in attitude, and people who knew this method had more negative attitudes (Table 3).

Among all methods, people with a positive attitude toward IUI, IVF, donor sperm, surrogate uterus, donor ovum, and donor embryo had a significant relationship with the general attitude towards assisted reproductive technology. Therefore, people with more positive attitudes toward these methods had a lower general attitude towards using assisted reproductive technology.

5. Discussion

Since few studies have been conducted on the knowledge, attitude, and practice of infertile people in the field of assisted reproductive technology, and, on the other hand, in Shahrekord, which inhabits different ethnicities, Fars, Lor, and Turkish, no study has been conducted in this field. This descriptive cross-sectional study was conducted to obtain information on the knowledge, attitudes, and practice of infertile couples about assisted reproductive technology. According to the results, the knowledge level of most participants was acceptable.

In the study of Abolfotouh et al., the level of knowledge of most participants (59%) was reported to be poor (18). Moreover, in a study by Mohamed et al., the level of knowledge of infertile couples regarding assisted reproductive techniques was low, and these couples had a positive attitude towards assisted reproductive techniques, contrary to the results of our study (9). The present study showed a significant difference among ethnicities regarding knowledge. In Turkish ethnicity, it was the highest, and in Lor ethnicity, it was the lowest. The next influential factor on individuals' knowledge level was their level of education, with the highest level of knowledge being related to Ph.D. degrees and the lowest level associated with elementary education. However, regarding other factors, including gender, type of occupation, cause of infertility,

duration of infertility, and history of infertility treatment in first-degree relatives, there was no significant relationship with the level of knowledge of individuals. However, in the study of Pourmasumi et al., women's average level of knowledge was higher than men (19). Regarding the attitude variable, in the present study, the level of education was one of the influential factors; the most positive level of attitude was related to elementary education, and the most negative level of attitude was related to Ph.D. degrees. The type of job also significantly affected people's attitudes, and workers had the most positive attitude towards infertility treatment. The cause of infertility was also influential in the attitude variable; the most positive attitude was related to the female factor, and the most negative attitude was related to the male factor. In a study by Mohamed et al., the relationship between age, level of education, occupation, and place of residence with knowledge and attitude towards assisted reproductive techniques was not statistically significant (9).

In the present study, people who were familiar with the types of assisted reproductive technology had a higher knowledge score but had a negative attitude toward these methods. In contrast, in the study of Abolfotouh et al., participants had a positive attitude toward these methods (18). In the present study, the attitudes of men and women were not significantly different from each other, which was consistent with the study of Shakiba et al. (20) and Fereydouni et al. (16). Other studied variables, such as ethnicity, dialect, duration of infertility, and history of infertility treatment in first-degree relatives, had no significant relationship with the attitude levels of individuals

In the present study, the most commonly used infertility treatment was medication, and most participants had used assisted reproductive technology only once. The use of prayer writing and non-medical treatments was reported to be minimal. Nonetheless, in a study by Abolfotouh et al., the most frequently used method was IVF, and the least used was related to smoking cessation (18). In the study of Kashani et al., 31% of infertile persons used herbal medicines to treat infertility (21).

In the present study, the comparison of knowledge of the study participants with gender, address, ethnicity, language, education, the duration of infertility, causes of Infertility, female factor, age, and years of marriage were significant. In a study by Szalma and Bito, there was a significant relationship between participants' gender and age and their knowledge of ART. Women reported higher self-rated knowledge about ART, which was higher in the older subgroup than the younger ones. Moreover, there was no significant relationship in this study between education level and the knowledge of assisted reproductive technology (22).

In the present study, differences in the attitudes of study participants with gender, address, education, Job, the duration of infertility, and the causes of infertility were significant. However, in a study by Szalma and Bito, there was no significant relationship between variables such as gender, education, age group, religiosity, and attitudes toward ART (22).

In the present study, the relationship between the knowledge of study participants and the duration of infertility, cause of infertility, knowledge of (IUI, IVF, ICSI, ZIFT, surrogate uterus, donated ovum, sperm donation, and the donated embryo) and attitude of (IUI, IVF, surrogate uterus, donated ovum) was significant. Furthermore, in the present study, the relationship between attitudes of the study participants and the duration of infertility, knowledge of (IUI, replaced uterus, and donated ovum), and attitude of (IUI, IVF, replaced uterus, donated ovum) was significant.

A higher awareness of assisted reproductive techniques was seen in women compared to men, urban dwellers compared to rural dwellers, some ethnicities compared to other ethnicities, doctoral education compared to other levels of education, infertility for more than ten years, and infertility with male factor. The most positive attitude towards assisted reproduction methods was more common in men compared to women, rural residents compared to urban dwellers, and participants with diploma education compared to other levels of education, in workers, infertility durations of 5 - 10 years, and male factor infertility. Therefore, it can be concluded that urban people are more aware but have a more negative attitude, and consequently, their less frequent use assisted reproductive methods, but the contrary is true in rural people. Such a relationship also exists regarding the other described variables. In a study by Mohamed et al., the relationship between place of residence and knowledge and attitude toward assisted reproductive techniques was not statistically significant (9).

5.1. Conclusions

The results of this study indicated that with a higher level of awareness, attitude became negative toward fertility assistance methods, couples preferred medications for infertility treatment, and the rate of application of new fertility methods was reduced. Therefore, it is recommended that health system policymakers and health guardians boost the fertility rate in the country by establishing counseling services and improving the awareness of new methods of assisted reproduction to correct people's misconceptions. Maintaining family integrity and survival through education and awareness-rising is of utmost importance.

5.2. Limitations

One limitation of the study was related to the falsified answers of the participants, as infertility is still considered taboo in Iran. However, the researcher tried to minimize this by establishing friendly relationships with the participants.

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Authors' Contribution:

M. Sheikhian and Z. Tavakol designed the study. M. Sheikhian and P. Hasanzadeh analyzed the data and interpreted the results. All authors prepared, reviewed, and revised the manuscript. Finally, Z. Tavakol submitted the manuscript and completed other necessary stages. All authors read and approved the final version of the manuscript.

Conflict of Interests:

The authors declare that they have no conflict of interest.

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Informed consent:

Written informed consent was obtained from all individuals.

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