RESEARCH ARTICLE

Fertility Awareness and Knowledge among Infertile Women in Georgia: A Cross-sectional Study

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Abstract

Aim: Infertility has an impact on both demographics and social events. The study aims to evaluate fertility knowledge, awareness, and practices among infertile women.

Materials and methods: Quantitative cross-sectional study design was used. The study population included 105 infertile women that referred to the specialized infertility clinic in Tbilisi (Georgia).

Results: Respondents used to visit doctors to get treatment for their infertility at a very late stage. The treatment was financially affordable for only 20% of patients. A significant part of respondents (42.9%) were smokers, which indicates that they have lack of knowledge about the effects of lifestyle factors on fertility. The majority of respondents (78%) were aware that fertility declines with age; however, only 21% of participants could correctly identify the critical age threshold of 36 years, after which it becomes difficult to achieve pregnancy. The fertile window in the menstrual cycle was missed by approximately 77% of participants. On inquiry regarding the ovulatory period, it was found that only 12.6% (n = 12) were aware that the mid-cycle is the most likely phase to achieve pregnancy. Most respondents (93%) believed that past history of pill intake was associated with infertility. People often incorrectly attribute infertility to contraceptive pill use. The majority of respondents (53%) believed that it was possible to achieve pregnancy at 50 years, either naturally or with the help of assisted reproductive technique with self-oocytes.

Conclusion: The study demonstrated a low level of public awareness. It is advisable to increase the affordability of infertility treatment and improve reproductive education initiatives to increase fertility awareness. Increasing the level of knowledge of risk factors and fertility practices has important public health implications and may help to decrease the incidence of infertility. Targeted fertility education and public enlightenment programs may help in reducing the number of women experiencing infertility and also enable timely referral for assisted fertility treatment.

Keywords: Awareness, Fertility, Infertility, *In vitro* fertilization.

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Introduction

Infertility is a disease of the male or female reproductive system defined by the failure to achieve a pregnancy after 12 months or more of regular unprotected sexual intercourse.[1] The most important cause of female infertility is ovulatory disorders, damage to one or both of the fallopian tubes, endometriosis, fibroids, sexually transmitted infections, diabetes, and cancer.[2,3] Male factor infertility comprises approximately 30% of cases.[4] The main causes of male infertility are low sperm count and low sperm motility, genetic factors and ejaculation dysfunctions, trauma or surgery to the testicles, extreme obesity, and lifestyle factors (smoking, alcohol, and drug use).

Infertility is a global health issue affecting approximately 8–10% of couples.[5] The average prevalence of infertility in developed countries is 3.5–16.7%, and in developing countries is 6.9–9.3%.[6] According to research, in 35–40% of cases, the man is infertile, and in 35–40% of cases, the woman is infertile, and in 20–30% of cases, it is related to a combination of other factors.[7] The overall average of infertility was reported at 0.9% in men and 3.5% in women in Georgia.[8]

The best method of solving the problem of infertility is *In Vitro* Fertilization (IVF). The world's first test tube baby Louis Brown was born in 1978 in England at the Patrick Steptoe and Bob Edwards clinic. The fact of the first child-birth by IVF was a real milestone because it gave hope to infertile couples as it offered a possible solution to the problem. In 2018, The International Committee Monitoring Assisted Reproductive Technologies (ICMART) reported that an estimated 8 million babies are born throughout the world from IVF.[9] The most active countries are the USA and Japan and the most active region is Europe.

In 1997 in Georgia and generally in Caucasian Region, the first in vitro fertilization clinic was founded. The first Georgian test tube baby was born in 2000 and led to the rapidly increasing application of this method and the creation of specialized centers.

A major factor responsible for delayed childbearing and increasing incidence of infertility is the lack of awareness about fertility potential. An accurate understanding of reproductive facts is essential for informed fertility decision-making. Currently, awareness about fertility is low worldwide. According to research, the majority of women lacked significant knowledge related to fertility.[10] To treat infertility, patients usually go to the doctors very late. Most women have little awareness of the fertile window, the period of the month in which they are most fertile.[11] These patients

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are then subjected to unnecessary investigations and subsequent use of assisted reproductive techniques.[12]

Increasing the level of knowledge of risk factors and fertility practices has important public health implications and may help to decrease the incidence of infertility. Targeted fertility education and public enlightenment programs may help in reducing the number of women experiencing infertility and also enable timely referral for assisted fertility treatment. However, in Georgia, no previous studies have been conducted to assess the level of knowledge and awareness related to infertility. The aim of the study was to evaluate fertility knowledge, awareness, and practices among infertile women, to identify the prevalence of common causes of infertility, and assess the affordability of treatment.

Materials and Methods

A quantitative cross-sectional study design was used. The study population included 105 infertile women that referred to the specialized Infertility Clinic of Tbilisi (Georgia) between February and December 2021. The sampling criteria were infertile women being married for at least one year, aged 20–50 years, and who either directly consulted the infertility clinic, and were trying for conception for at least 6 months. Women were invited to participate in the study at the initial consultation, and those who voluntarily gave written consent were interviewed by a fertility counselor.

Responders were interviewed using a semi-structured questionnaire. The questionnaire was designed after reviewing previous papers on fertility awareness.[13] The validity and reliability of the questionnaire were assessed by pretesting in a pilot study of 10 participants. Discussions with various relevant experts at the Infertility Clinic of Tbilisi confirmed the content validity and feasibility of the questionnaire to ensure relevance and clarity of the questions. Several additions and amendments were made to ensure that the questions were valid in a Georgia context.

Prior to starting the research, we received approval from the Research and Ethics Committee of the Caucasus University. Before being included in the study, selected persons were given the informed consent forms, and after their verbal consent, they were included in the study. As part of the consent process, personnel were provided with information about the confidentiality of their participation in the survey. The study participants were able to withdraw from the study at any time of their own will.

All statistical analysis was carried out using SPSS version 19.

Results

The baseline demographic characteristics of the study population are presented in Table 1. The studied population consisted of 105 infertile women. The age of the women was ranged from 20–50 years, with a mean of 27.8 ± 5.4 years. More than half of respondents (59%, *n* = 62) were 20–29 years old.

Regarding family status, 97.1% (*n* = 102) of the women were married and 2.9% (*n* = 3) were single. The majority of participants (39%; *n* = 41) were school graduates. Regarding residence, 76% of the respondents were from Georgia and 24% from other countries (Table 1). Among the foreign respondents, a majority were in the age group of <35 years (50%). A majority of foreign respondents were from the Russian Federation (16%). Answers of foreign respondents to the question of why they choose to be treated in Georgia vary by country. Residents of North Ossetia (RF) stated that the treatment in Tbilisi was more advantageous since it was closer to their places; furthermore, it was more affordable to get treatment in Tbilisi. As for German respondents, they said that such services were prohibited by law in Germany, that's why they had come to Georgia. As respondents from Great Britain and Austria said, the cost of such services in Georgia was lower than in their countries. Foreign respondents emphasized the high quality of treatment received in Georgia.

We noticed that 82 (78%) women suffered from primary infertility, while secondary infertility was reported in 23 (22%) women. The duration of the infertility period ranged from one year to 21 years, with a mean of 5.1 ± 1.7 years for the primary group and 3.2 ± 1.5 years for the secondary group (Table 1).

The most common cause of female infertility was ovulatory dysfunction in 32% of the cases, while the second most common cause was infertility by disorders of menstruation (24%), and the third most common cause was problems in the fallopian tubes (22%). As to the habits of the participants, 42.9% were smokers, and 39% occasionally drank alcohol (Table 1).

Some women visited an appropriate medical institution for getting infertility treatment very late after their marriage. Only 15% of those respondents within the age group of <35 years, visited physicians due to infertility problems during the first year of their marriage and 15% of them visited physicians after more than 10 years of their marriage. Out of those respondents aged 38–40, only 7% visited physicians during the first year of their marriage and 27%–after more than 10 years. In total, out of the respondents of all age groups, 10% applied to medical institutions for help during the first year of their marriage, 12%–during the second year of their marriage, and 40% during the third-fifth year of their marriage (Table 2).

The economic status of the infertile woman can affect their continuation in seeking management for their problem. As answers demonstrated, the prices of treatment received at the clinic were financially affordable for only 20% of them. For 80%, the treatment was expensive, but they had to undergo the treatment course. The study subjects noted that for such patients, sources of financing were bank loans and relatives' financial support.

Among all used methods, artificial fertilization turned out to be the most frequent (46%), and then followed by the method of donor sperm (32%), insemination (28%), and surrogate mother (14%). According to the survey data, in women of the <35 age group, methods of insemination and artificial fertilization are used more frequently (20%). In the 35–37 age group, patients tend to use a donor method (20%), and in the 38–40 age group–a method of artificial fertilization (22%) (Table 2).

When we assessed the response in relation to age-related decline in fertility, it was found that most participants (74%; *n* = 78) were aware that young women are more fertile and it is easier to achieve pregnancy between 20 and 30 years. However, only 21% (*n* = 23) of participants could correctly identify the critical age threshold of 36 years, after which it becomes difficult to achieve pregnancy. On inquiry regarding the ovulatory period, it was found that only 12.6% (*n* = 12) were aware that the mid-cycle is the most likely phase to achieve pregnancy. Only 5.7% (*n* = 6) participants didn't associate past intake of combined oral contraceptive pills with infertility. 68% (*n* = 71) of participants were not aware of the duration after which to consult a fertility specialist if they have been trying for pregnancy and are unable to achieve the same. Only 47% (*n* = 49) of women were aware of the need for assisted reproduction and donor oocytes at the age of 50 years. 78% (*n* = 82) correctly answered regarding surrogacy (Table 3).

Table 1: Demographic characteristics of respondents, the causes of infertility and lifestyle factors

Social-demographic indicators	*Frequency*	*%*
Age		
20–29	62	59,0
30–39	29	27,6
40–50	14	13,3
Occupation		
Private employee	34	32,4
Public employee	31	29,5
Household	16	15,2
Self-employee	24	22,9
Family status		
Married	102	97.1
Not-married	3	2.9
Educational status		
Incomplete secondary education	4	3,8
Full secondary education	41	39,0
Undergraduate (bachelor)	37	35,2
Graduate (master)	23	21,9
Other		
Residence		
Georgia	72	76
Foreigner	33	24
Secondary	23	22
Infertility		
Primary	82	78
Secondary	23	22
Duration of infertility		
First year	10	9
Second year	12	11
Third–fifth year	44	42
Sixth–tenth year	21	20
Over 10 years	18	17
Causes of infertility		
Menstrual dysfunction	25	24
Ovulatory dysfunction	34	32
Problems in the fallopian tubes	23	22
Uterine factors	13	12
Problems in the cervix	10	10
Lifestyle factors		
Tabaco consumption		
I've never smoked	22	21
I stopped smoking	38	36.2
I now smoking daily	13	12.4
Occasionally	32	30.5
Alcohol consumption		
I drink alcohol		
Regularly	5	4.8
Occasionally	41	39
No	59	56.2

Table 2: Duration of infertility, methods of treatment and financial affordability of the treatment by age

Age	*<35*	*35–37*	*38–40*	*Total*
		Duration of infertility		
First year	6 (11%)	2 (7%)	2 (7%)	10 (9%)
Second year	4 (8%)	6 (20%)	2 (7%)	12 (11%)
Third–fifth year	18 (40%)	14 (47%)	12 (40%)	44 (42%)
Sixth–tenth year	11 (28%)	4 (13%)	6 (20%)	21 (20%)
Over 10 years	6 (12%)	4 (13%)	8 (27%)	18 (17%)
		Methods of treatment		
Insemination	13 (52%)	2 (13%)	2 (13%)	14 (31%)
Surrogate mother	5 (20%)	1 (7%)	1 (7%)	7 (14%)
Donor	5 (20%)	10 (67%)	1 (7%)	16 (32%)
Artificial fertilization	12 (48%)	2 (13%)	11 (73%)	23 (48%)
		Financial affordability of the treatment		
Affordable	12 (24%)	6 (20%)	10 (33%)	28 (20%)
Expensive	33 (76%)	24 (80%)	20 (67%)	77 (80%)
Total	45 (100)	30 (100%)	30 (100%)	105 (100%)

Discussion

Primary infertility was more common (78%) in infertile women. These findings are similar to findings from other studies,[14] but are different from other researches.[15]

The duration of the infertility period ranged from 1 year to 21 years; the mean duration of infertility was 5.1 years (± 1.7 years), and 42% of the infertile women their problem extends from 3–5 years. The women began to seek medical advice after the end of the first year of marriage. The duration of the infertility period is higher than the result of another studies[16-18] and was comparable with some studies.[19,20] Infertility had a significant relationship with age, family history of infertility, education level, abortion history and still-birth, BMI, and waist circumferences.[21]

Women in this study were younger, with a longer duration of infertility, than those in other studies.[22,23] Most of the women (40%) visited an appropriate medical institution for getting infertility treatment very late, during the sixth and tenth years after their marriage. The most common cause of female infertility was ovulatory dysfunction (32%), which is similar to other studies.[24,25] According to some studies, tubal factor was the first infertility cause.[26]

Research shows that a significant part of respondents (42.9%) were smokers, which indicates that they have lack knowledge about the effects of lifestyle factors on fertility. Although, the majority of participants (78%) were aware that fertility declines with age, however, they were unable to identify the critical threshold of 35 years, after which fertility rapidly declines. Similar findings were reported from other studies.[27] The fertile window in the menstrual cycle was missed by approximately 77% of participants. Similar findings were reported from other studies.[28]

Most women (93%) believed that past history of pill intake was associated with infertility. People often incorrectly attribute infertility to contraceptive pill use. Similar findings were reported from other studies.[29] Implementation of contraceptive education is essential to dispel such myths. The majority of respondents (53%) believed that it was possible to achieve pregnancy at 50 years, either naturally or with the help of assisted reproductive technique with self-oocytes. Similar findings were reported from other studies.[30]

Taking into account low fertility knowledge, it is important to start fertility education Initiatives to increase fertility awareness which will help people to make well-informed choices regarding reproduction and family planning.

The economic status of the infertile women can affect their continuation in seeking management for their problems. The financial affordability of the medical service is low for the study subjects, but they have to get treatment. Sources of financing for such patients are bank loans funding from relatives and friends.

The study demonstrated that a low public awareness aggravates, even more, the problem related to infertility treatment. Patients tend to seek medical help at a very late stage of infertility. These circumstances demonstrate that the level of public awareness is low.

Conclusion

The study demonstrated the low level of women's knowledge and awareness regarding fertility practices. These include poor knowledge of factors affecting fertility, especially age-related decline in fertility, a fertile period in the menstrual cycle, and the risk of infertility. It is advisable to increase the affordability of infertility treatment and improve reproductive education initiatives to increase fertility awareness. Increasing the level of knowledge of risk factors and fertility practices has important public health implications and may help to decrease the incidence of infertility. Targeted fertility education and public enlightenment programs may help in reducing the number of women experiencing infertility and also enable timely referral for assisted fertility treatment.

Limitations of the Study

Our study had some limitations. First, the study was recruited from only one clinic and a relatively small sample size of IVF patients. The small sample size reduces the generalizability of our findings. Despite these limitations, the study provides comparative and confirmative data to other previous studies.

Table 3: Frequency of correct answers with possible correct answers highlighted

	Overall (n = 105)
After which age it becomes difficult to achieve pregnancy? 20–25 years 26–30 years 31–35 years 36–40 years	23 (21%)
Which phase of the menstrual cycle are you more likely to get pregnant? Just before the period Just after the period Halfway between two periods The moment doesn't matter I don't know	12 (12.6%)
At what age it is easier to become pregnant? 20–30 years 31–35 years 36–40 years Age doesn't matter I don't know	78 (74%)
Which of these is the highest risk factor for infertility? >35 years To be under a lot of stress Smoking more than 10 cigarettes per day Having more than 2 alcoholic drinks per day	18 (17%)
Is past history of intake of COC, associated with infertility? No	6 (5.7%)
When does a woman attempting to become pregnant have to consult a fertility specialist if she is aged Less than 35 years? After 3 months of unprotected sex without becoming pregnant After 6 months of unprotected sex without becoming pregnant After 1 year of unprotected sex without becoming pregnant After 2 years of unprotected sex without becoming pregnant	71 (68%)
When does a woman attempting to become pregnant have to consult a fertility specialist if she is aged More than 35 years? After 3 months of unprotected sex without becoming pregnant After 6 months of unprotected sex without becoming pregnant After 1 years of unprotected sex without becoming pregnant After 2 years of unprotected sex without becoming pregnant	33 (31.4%)
A 50-year-old woman desires pregnancy. Which is the most likely option? Spontaneous natural pregnancy Natural pregnancy with a healthy diet and exercise Pregnancy following assisted reproduction with her own eggs Pregnancy following assisted reproduction with the eggs of donor	49 (47%)
What do you know about surrogacy? Putting embryos in your own uterus Putting embryos in other woman's uterus Taking donor eggs from others Taking semen from male other than husband	82 (78%)

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