Do Religious Attitude and Psychological Status Affect Infertility? A Clinical Experience in Central Anatolia

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Purpose: We aimed to investigate the relationship between male infertility and religious attitude level, somatosensory amplification, health anxiety, and depression in a clinic located in Central Anatolia, and we believe this is the first study of its kind.

Materials and Methods: Male patients who presented to the urology outpatient clinic between March 2020 and March 2022 with the complaint of being unable to have a child after at least 1 year of unprotected sexual intercourse were included in the study group. Male patients who presented to the urology outpatient clinic with other mild complaints were selected as the control group. The patients were asked to complete the Religious Attitude Scale, the Somatosensory Amplification Scale, the Health Anxiety Inventory, the Beck Depression Inventory, and the Beck Anxiety Inventory.

Results: A total of 109 patients were included in this study, of whom 50 were fertile and 59 were infertile. The Religious Attitude Scale score was statistically significantly lower in the fertile group than in the infertile group ($P < .001$). The Somatosensory Amplification Scale, Health Anxiety Inventory, Beck Anxiety Inventory, and Beck Depression Inventory scores were higher in the fertile group than in the infertile group, but these differences were not statistically significant. Logistic regression analysis performed to determine the factors associated with infertility showed that body mass index, duration of marriage, Religious Attitude Scale score, and Health Anxiety Inventory score were positively correlated with infertility.

Conclusion: We believe that religion and spirituality may be beneficial in reducing the stress and anxiety caused by infertility.

Keywords: religion; infertility, male; anxiety; depression; Turkey

INTRODUCTION

The World Health Organization (WHO) defines infertility as the inability of a sexually active couple to have a child despite having unprotected intercourse for 1 year.[1] Worldwide, infertility affects 15% of couples, and approximately 20% of infertile men and women have unexplained infertility. While 90% of infertile patients have primary infertility, 10% have secondary infertility. Although the time required for the diagnosis of secondary infertility has not been determined exactly, a 12-month period is generally considered valid.[2] Infertility can be stressful and is associated with an increased frequency of depressive disorders and anxiety.[3] For example, one study found psychiatric disorders in 12.41% of infertile couples.[4] In addition, increased stress can affect hormone levels and oxidative stress in semen and blood, thereby affecting sperm count and quality.[5] Stress due to infertility is also linked to somatosensory amplification, the disturbingly exaggerated perception of somatic and visceral sensations. Somatosensory amplification may cause unnecessary hospital admissions. Increased stress and anxiety may cause somatosensory amplification disorders, which can lead a person to experience a sense of illness or discomfort far greater than that typically caused by the health conditions with which he or she may be diagnosed, or even in cases in which there is no observable health condition other than stress and anxiety.[6]

Religious belief and practice can interact with infertility in several ways. For many people, fertility is seen as a blessing given to people by God for the continuation of the human race. This belief may cause infertile individuals and couples to experience spiritual stress. However, infertile couples and individuals may also turn to their religious beliefs or practices to overcome the stress caused by their infertility.[7] In addition, religious attitudes may affect infertility treatment. For example, deeply religious Jews are required to consult rabbis on all matters. Such religious attitudes may prevent infertile people from seeking medical treatment or may limit the interventions they are willing to undergo. Studies investigating the effects of religious attitude on infertility treatment choices are available in the literature.[8] Additionally, at least one study has examined the relationship between infertility, somatosensory ampli-

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Table 1. Demographic and educational characteristics of the groups

Characteristics	Fertile (n = 50)	Infertile (n = 59)	*P*
Age, median (IQR), years	33.50 (10.00)	30.00 (8.00)	.001
BMI, median (IQR), kg/m2	26.40 (5.50)	26.81 (5.68)	.796
Duration of marriage, median (IQR), years	6.00 (7.25)	2.00 (1.00)	.001
Wife age, median (IQR), years	30.00 (8.25)	26.00 (4.00)	<.001
Marital status, No.			.459
Married	49	59	
Divorced	1	0	
Employment status, No. (%)			<.001
Unemployed	0	5 (8.5)	
Officer (civil servant)	32 (64)	15 (25.4)	
Employee	12 (24)	17 (28.8)	
Self-employed	3 (6)	11 (18.6)	
Farmer	0	4 (6.8)	
Athlete	1 (2)	0	
Soldier	0	7 (11.9)	
Lawyer	1 (2)	0	
Engineer	1 (2)	0	
Previous marriage and child status, No. (%)			.294
No previous marriage	46 (92)	57 (96.6)	
Previous marriage, no child	2 (4)	2 (3.4)	
Previous marriage, child present	2 (4)	0	
Urologic surgery history, No. (%)			.118
Present	8 (16)	46 (78)	
Not present	42 (84)	13 (22)	
Smoking status, No. (%)			.051
Smoker	16 (32)	29 (49.2)	
Ex-smoker	1 (2)	1 (1.7)	
Nonsmoker	33 (66)	29 (49.2)	
Wife's previous marriage and child status, No. (%)			.189
No previous marriage	50	57 (96.6)	
Previous marriage, no child	0	0	
Previous marriage, child present	0	2 (3.4)	
Infertility in the family, No. (%)	4 (8)	6 (10.2)	.696
Educational status, No. (%)	<.001		
Primary education	2 (4)	16 (27.1)	
Secondary education	12 (24)	16 (27.1)	
Associate degree	4 (8)	0	
University	20 (40)	25 (42.4)	
Graduate	12 (24)	2 (3.4)	

Abbreviations: BMI, body mass index; IQR, interquartile range; SD, standard deviation.

fication, health anxiety, and depression.[6] However, to date, no study in the literature has investigated the relationship between religious attitude and the condition of infertility itself.

In this study, we aimed to investigate the relationship between male infertility and religious attitude level, somatosensory amplification, health anxiety, and depression in a clinic located in Central Anatolia, and we believe this is the first study of its kind.

MATERIALS AND METHODS

After ethics committee approval was obtained, this case-control study was planned prospectively. All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Declaration of Helsinki and its later amendments or comparable ethical standards. Informed consent was obtained from all study participants. Male patients who presented to the urology outpatient clinic between March 2020 and March 2022 with the complaint of being unable to have a child after at least 1 year of unprotected sexual intercourse due to male infertility were included in the study group. Male patients who presented to the urology outpatient clinic with other mild complaints were selected as the control group. These patients did not have male or female infertility. The inclusion criteria were being aged 18 to 45 years, having been married at least once, presence of female infertility, not having a psychiatric or endocrinological condition, having hyperlipidemia, not using alcohol, and having the cognitive ability to complete the tests. Patients who used alcohol were excluded because alcohol could be a confounding factor in the study results owing to its demonstrated effects on fertility. Patients who did not meet these criteria were excluded from the study. Divorced patients were not excluded from the study.

Patient age, body mass index (BMI), duration of marriage, spousal age, marital status, employment status, level of education, smoking status, having children from a previous marriage, history of urological surgery, family history of infertility, and presence or absence of any hereditary disease were recorded.

Laboratory tests such as semen analysis and testosterone levels could not be compared because, in the control group attending our clinic, these tests could have caused a problem for the healthcare system in our country.

The patients were asked to complete the Religious Attitude Scale (RAS), the Somatosensory Amplification Scale (SSAS), the Health Anxiety Inventory (HAI), the Beck Depression Inventory (BDI), and the Beck Anxiety Inventory (BAI).

Religious Attitude Scale

The RAS was developed to measure the religiosity levels of Muslims. During the preparation of the scale,

Table 2. Scale scores of the groups

Scale	Fertile (n = 50)	Infertile (n = 59)	*P*
Religious Attitude Scale, median (IQR)	29.00 (6.25)	32.00 (3.00)	<.001
Somatosensory Amplification Scale, mean ± SD	25.96 ± 5.89	24.56 ± 7.94	.305
Health Anxiety Inventory, median (IQR)	12.50 (10.00)	11.00 (8.00)	.207
Beck Depression Inventory, median (IQR)	6.00 (10.25)	3.00 (7.00)	.059
Beck Anxiety Inventory, median (IQR)	7.00 (8.00)	4.00 (9.00)	.089

Abbreviations: IQR, interquartile range; SD, standard deviation.

the knowledge, emotional, and behavioral elements emphasized by social psychology were taken into consideration. The scale comprises 4 subdimensions: the cognitive dimension, the behavioral dimension, the emotional dimension, and the relational dimension. The cognitive dimension of the scale measures the individual's general opinion about religion, while the behavioral dimension measures the participation of those who follow a religion in the specific religious practices of that religion. Furthermore, a validity study of this scale was performed in the Turkish population, and the scale was found to accurately measure religious attitude in this population.[9] The scale is a 5-point Likert-type scale consisting of 8 items. The response options are "I strongly disagree," "I agree a little," "I half agree," "I mostly agree," and "I completely agree." The total score ranges from 8 to 40, and a higher score indicates a higher level of religious attitude. Although there is no standard scoring for religiosity levels, we categorized scores of 8-18 points as low religiosity, 19-29 points as medium religiosity, and 30-40 points as high religiosity.

Somatosensory Amplification Scale

The SSAS was developed by Barsky et al. to measure sensitivity to disturbing bodily sensations.[10] The scale comprises 10 questions, and each question is scored from 1 to 5 points. The symptom amplification score is the total score of all questions. A reliability and validity study of this scale was conducted in the Turkish population, which indicated its reliability in this population.[11]

Health Anxiety Inventory

The HAI is a self-administered scale. The first 14 items assess the mental status of patients, while the remaining 4 items ask patients to predict what their thoughts and mental status would be if they had a critical illness.[12] Each item is scored from 0 to 3. A high score indicates a high level of health anxiety. Aydemir et al. performed a reliability and validity study of this scale in the Turkish population and found it to be an effective measurement tool for this population.[13]

Beck Anxiety Inventory

The BAI is a scale that shows the content of anxiety symptoms.[14] This self-administered scale contains 21 questions. Each question is scored from 0 to 3 points. A higher score indicates greater severity of the individual's anxiety. Ulusoy et al. performed a reliability and validity study of this scale in the Turkish population and found it to be an effective measurement tool for this population.[15]

Beck Depression Inventory

The BDI is a scale that evaluates depression and the associated physical, emotional, cognitive, and motivational symptoms.[16] This self-administered scale comprises 21 questions. Each question is scored from 0 to 3 points. A total score of 0-9 points indicates minimal depressive symptoms, while a score of 30-63 points indicates severe depression. The reliability and validity study of this scale in the Turkish population was performed by Hisli, who found it to be an effective measurement tool for this population.[17]

Demographic data, RAS scores, and psychiatric scale scores of the infertile and control groups were compared to investigate whether a difference existed between the groups.

Statistical Analysis

Statistical analyses were performed using IBM SPSS Statistics, with additional diagnostic analyses conducted in Python using SciPy and statsmodels. Normality was assessed separately in each group using the Kolmogorov-Smirnov and Shapiro-Wilk tests, supplemented by visual inspection of Q-Q plots. Approximately normally distributed continuous variables were summarized as mean ± standard deviation (SD), whereas variables with skewed distributions were summarized as median and interquartile range (IQR). Between-group comparisons were performed using the Student independent-samples t test or the Mann-Whitney U test, as appropriate. Homogeneity of variance was assessed using the Levene test. For the SSAS, which was compared using the Student t test, the equal-variance assumption was not rejected ($P = .095$). Categorical variables were summarized as frequencies and percentages. Multivariable binary logistic regression was performed with infertility as the outcome. Age, BMI, duration of marriage, spousal age, systemic disease, smoking status, RAS score, SSAS score, HAI score, BAI score, BDI score, and educational status were entered simultaneously using the Enter method; no automated stepwise variable selection was applied. Categorical predictors were represented using indicator variables. Linearity between continuous predictors and the logit was assessed by adding predictor-by-logarithm interaction terms to the multivariable model, with x ln(x) defined as zero when x = 0. Bonferroni correction was applied to the 9 linearity tests, yielding a significance threshold of .0056; none of these interaction terms met this threshold. Odds ratios and their 95% confidence intervals (CIs) were reported. All tests were 2-sided, and statistical significance was defined as $P < .05$, except for the multiplicity-adjusted linearity tests.

RESULTS

A total of 109 patients were included in this study, of whom 50 were fertile and 59 were infertile. Age, duration of marriage, and spousal age were statistically significantly higher in the fertile group than in the infertile group. There was no difference between the groups in terms of BMI or marital status. There was a statistically

Table 3. Logistic regression analysis of factors affecting infertility.

Variable	Odds ratio	*P*	95% CI
Body mass index, kg/m^2	1.308	.024	1.03-1.65
Duration of marriage, years	0.748	.017	0.59-0.95
Religious Attitude Scale	1.234	.010	1.05-1.45
Health Anxiety Inventory	0.880	.047	0.77-0.99

Abbreviation: CI, confidence interval.

significant difference between the groups in terms of employment status. While the fertile group consisted predominantly of civil servants, the infertile group had similar proportions of civil servants and private-sector workers. While 5 individuals in the infertile group were unemployed, there were no unemployed individuals in the fertile group. There was no difference between the groups in terms of the number of children from a previous marriage or whether they had a previous spouse or children from a former marriage. The groups were similar in terms of previous urological surgery, smoking status, and family history of infertility. Regarding educational status, the proportion of participants with a bachelor's degree was similar between the groups, whereas those with a master's degree were more common in the fertile group. The proportion of primary and secondary school graduates was higher in the infertile group than in the fertile group. Overall, there was a statistically significant difference between the groups in terms of educational status (**Table 1**).

When the groups were evaluated in terms of the scale scores examined in the study, the RAS score was statistically significantly lower in the fertile group than in the infertile group ($P < .001$). The SSAS, HAI, BAI, and BDI scores were higher in the fertile group than in the infertile group, but these differences were not statistically significant (**Table 2**).

Logistic regression analysis performed to determine the factors associated with infertility showed that BMI, duration of marriage, RAS score, and HAI score were positively correlated with infertility (**Table 3**).

DISCUSSION

In this study, we aimed to investigate the relationships between infertility and religious attitude, somatosensory amplification, health anxiety, depression, and anxiety scores in male patients. Although one previous study evaluated the relationship between psychiatric scales and infertility in men,[6] this is, to our knowledge, the first study to evaluate both psychiatric scales and religious attitude for their associations with male infertility. Infertility is a condition that affects 15% of the population worldwide; couples and individuals seek medical treatment for this condition, often at significant cost.[18] Infertility can cause stress and anxiety in infertile individuals and couples, and repeated hospital visits and interventions can exacerbate this effect. Increased stress and anxiety can negatively affect blood and semen parameters, thereby reducing the overall success of treatment.[19,20] Some research indicates that psychiatric support may be beneficial during infertility treatment.[4] A positive relationship has been shown between depression, anxiety, somatosensory amplification, and health-related anxiety.[21,22]

Various studies have examined the relationships between anxiety, depression, somatosensory amplification, HAI scores, and infertility. Chen et al. reported generalized anxiety disorder in 23.2% and major depressive disorder in 17% of participants in their study of 112 infertile female patients,[23] while Öztekin et al. compared somatosensory amplification levels, HAI scores, depression, and anxiety in infertile and control groups and found that all scores were statistically significantly higher in the infertile group than in the control group.[6] In our study, there was no statistically significant difference in these scores between the infertile and control groups. In fact, somatosensory amplification, anxiety, depression, and HAI scores were higher in the control group. As this study was conducted during the first year of the COVID-19 pandemic, we believe this may have contributed to these results.

The effects of religious attitude on infertility treatment choices have also been studied. Klein reported that the use of donor eggs and embryos is the fertility treatment most affected by religious objections and emphasized that assisted reproductive technology providers should be informed about the religious issues that may influence patients' willingness to consider these fertility treatment options.[24] In another study on infertility, 75% of Jewish participants used donor gametes, compared with only 5% of Catholics and 46% of Protestants.[25] In addition, religious beliefs may affect sperm sample collection. For example, some rabbis oppose sperm retrieval through masturbation; instead, infertile men are permitted to use spermicide-free condoms during sexual intercourse to obtain a sample for use in fertility treatment.[8] Masturbation is not encouraged in Islam either. In Islam, assisted reproduction treatments are typically regarded favorably owing to the importance of continuing the family lineage. Because the integrity of family structure and lineage is important in Islam, sperm donation may be considered equivalent to adultery by Muslims and is therefore prohibited. Some Catholics may also abstain from in vitro fertilization (IVF).[8]

The continuation of the family is culturally particularly important in traditional societies such as Turkey. For this reason, infertile people may feel ashamed of their inability to have children. It has been shown that religion and spirituality may lower the stress levels caused by infertility.[26] In a study involving 195 patients who received infertility treatment, increased spiritual well-being was associated with decreased depressive symptoms and infertility-related stress.[27] Another study reported that more than 70% of infertile women in the United States turn to prayer when faced with infertility. It was also reported that these women consulted religious leaders about their infertility despite the availability of official counseling institutions.[28]

In our study, the RAS score was statistically significantly higher in the infertile group than in the fertile group. In general, the RAS scores of both groups were moderate to high. The vast majority of people living in Turkey are Muslim, and the region where this study was conducted is known to be a particularly religiously conservative area of Turkey; both facts likely contributed to these results. In the logistic regression analysis, one of the factors positively correlated with infertility was the RAS score. We interpreted this result as follows: to cope with the stress and anxiety caused by male infertility, people turn to religion and spirituality. In addition, because Islamic theology holds that everything comes from Allah, a feeling of gratitude to Allah may also help people cope with an infertility diagnosis. In contrast to

previous studies, the lower SSAS, HAI, BDI, and BAI scores in our infertile cohort than in our fertile cohort support this hypothesis. However, the fact that the study was carried out during the COVID-19 pandemic may also have affected these results.

In the logistic regression analysis, we found that BMI, duration of marriage, and HAI score were correlated with infertility. Increased BMI, low serum testosterone, low luteinizing hormone, and oligospermia or azoospermia may cause infertility. Infertility also increases parental age at the time of a successful birth.[29] Stress and anxiety affect semen and sperm quality by increasing the level of oxidative stress in blood and serum; hospital visits and examinations may contribute to this stress, creating a vicious circle in which infertility worsens as a result of diagnosis and treatment.[5]

Limitations of this study include the small sample size, single-center recruitment of participants, and the fact that all participants were Muslim. Furthermore, although patients completed the RAS, we did not perform an in-depth review of the participants' religious behaviors. In addition, laboratory tests such as semen analysis and testosterone levels were not compared. Despite these limitations, we believe the value of this paper lies in its being, to our knowledge, the first study to compare religious attitude scale and psychiatric scale scores in infertile male patients.

CONCLUSIONS

Infertility is an important health problem that may result in stress and anxiety for individuals and couples. As scientists and clinicians, we do not suggest that these results be used in patient education through positive or negative suggestions about religion or religiosity. Instead, we aim to present our investigation of a question that has never been addressed in the existing literature. We believe that religion and spirituality may be beneficial in reducing the stress and anxiety caused by infertility, but more research with larger sample sizes and members of different religions and sects is needed. Additionally, further research, including measurement of oxidative metabolite levels or sex-determining factor (SDF), could be comparative in nature, examining how different religions and sects affect attitudes toward infertility and the associated depression or anxiety.

SUMMARY

Infertile men at our clinic in central Turkey were more religious than fertile men. Faith and spirituality may help people cope with the stress of infertility.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

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