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Levels of anxiety sensitivity, somatosensory amplification and alexithymia in patients with unexplained infertility

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Abstract

Objective: In this study, we aimed to focus on the psychological aspect of unexplained infertility by comparing their psychological features to those of infertile patients with a known causes and fertile patients.

Patients and methods: Sixty unexplained infertility patients, 50 infertile patients with a known cause and 56 fertile patients were included in the study. Patients were evaluated using socio-demographic data form, Toronto Alexithymia Scale (TAS-20), Somatosensory Amplification Scale (SAS) and Anxiety Sensitivity Index (ASI-3).

Results: No significant differences in the levels of alexithymia, somatosensory amplification and anxiety sensitivity were detected between the groups ($P > .05$). When the correlation of clinical scale scores with each other was analysed in the whole group of infertile patients regardless of the cause, a weak positive correlation was found between anxiety sensitivity and difficulty in identifying feelings.

Conclusion: In our study, it has been found out that; regardless of the knowledge of the aetiology of infertility, the levels of alexithymia, somatosensory amplification and anxiety sensitivity of infertile cases did not differ from those of fertile women. However, it has been shown that as the difficulty in identifying emotions increases in infertile cases, anxiety sensitivity, which may cause psychological infertility, also increases.

1 | INTRODUCTION

Infertility is defined as not establishing pregnancy in the absence of contraception despite regular sexual intercourse for one year. According to the data of the World Health Organization, 8%-10% of couples have infertility problems and this rate is gradually increasing.[1] For most couples, infertility is a psychological trauma; even described by many couples as the most difficult life experience in their lives.[2] Besides the psychological challenges of infertility, the treatment process also affects couples both psychologically, economically and physically.[3] Additionally, the mental state of the couple acts not only on the process of coping with the treatment procedures but on the pregnancy process and the upcoming parenting processes as well.[4,5] However, it is thought that there is a bidirectional relationship between infertility and psychological factors; infertility and treatment processes affect mental health and mental health has effects on infertility.[3] Nevertheless, a literature review reveals that studies have been conducted mostly to investigate the effects of infertility on mental health and the evidence on the opposite direction is lacking.[6-8] Many studies have shown that the two most common psychiatric disorders in infertile patients are anxiety disorders and depression.[9,10] Depression and anxiety in such patients are attributed to subjective feelings of stress, future uncertainty, concerns about treatment processes and techniques, and economic difficulties.[9] Importantly, childhood traumatic experiences may be linked to the development of alexithymia and negative outcomes in depressed subjects.[11,12]

The concept of "psychogenic infertility" has a long history in the field of infertility.[13,14] The concern that mental stress could put a possible pregnancy at risk is discomforting not only for women trying to

get pregnant but also for their physicians. Although some studies are available supporting that mental disorders such as anxiety or depression cause infertility,[15,16] the number of population-based prospective studies investigating the effect of stress on live births is limited.[17] In 2014, a study showed that biomarker levels indicating high-stress severity in infertile women were associated with a longer time to establish a pregnancy and an increased risk of infertility.[18] Stress suppresses gonadotropin-releasing hormone (GNRH) in the hypothalamic-pituitary axis and causes alterations in the secretion of gonadal steroids and suppression of luteinizing hormone (LH), leading to impaired reproductive functions.[19] Furthermore, it is suggested that stress may be involved in the pathophysiology of infertility by culminating in lifestyle changes and decisions that may lead to a reduction in fertility. Controversial results were reported by other studies that investigated the relationship between mental stress and fertility.[20,21]

In this study, which was planned based on the hypothesis that medically unexplained infertility might be a stress-related somatic symptom, infertile patients were divided into groups according to whether their aetiologies were known or not and we aimed to compare the levels of alexithymia, anxiety sensitivity and exaggeration of body sensations of infertile individuals to those of fertile individuals. This study contributes to the literature significantly because it is the first study examining infertile patients in two groups as unexplained infertility and infertility of known causes and comparing them with fertile patients.

What's known

- Infertility causes anxiety, depression and high-stress levels. These psychiatric problems may also lead to unexplained infertility.

What's new

- This is the first study, which compares the psychological features of infertile patients according to their aetiologies.
- Unexplained infertile patients do not have different psychological characteristics than infertile patients with known cause.
- We cannot say that psychological factors play a role in the aetiology of unexplained infertility according to this study.

2 | MATERIAL AND METHODS

2.1 | Patients

This cross-sectional case-control study included a total of 166 patients aged between 21 and 39 years, who were admitted to the gynaecology outpatient clinic of the Recep Tayyip Erdogan University's School of Medicine in the period from December 2018 to June 2019. Informed consent was obtained from the participants before the study. The study was conducted in compliance with the ethical guidelines including the World Medical Association (1975) Declaration of Helsinki 2008 and the legal requirements of the Ethics Committee of the Recep Tayyip Erdogan University (Approval no: 2018/187).

Sixty individuals who met the following criteria; such as the absence of pregnancy despite regular sexual intercourse for more than 12 months, exclusion of male infertility, the absence of an abortion history, the presence of at least one ovary, the presence of at least one active fallopian tube confirmed through hysterosalpingography or laparoscopy, the absence of pelvic pathology, normal hormone levels on the third to fifth days of the ovulatory cycle and the presence of adequate follicular reserves, were considered to have "unexplained infertility." Fifty patients, who had infertility and whose infertility could be explained by tubal, anovulatory or male factors were included in the group of patients with "infertility due to a known cause." The "control group" was selected from among those who applied to the Gynecology and Obstetrics outpatient clinic with non-infertility complaints. And 56 outpatients, who had at least two healthy pregnancies, who gave birth in the last two years and who used contraceptive methods were included in the control group. Patients with a chronic disease and a history of previous or current psychiatric treatment were excluded from the study. Clinical psychiatric examinations were performed by the same psychiatrist who worked at the Recep Tayyip Erdogan University's School of Medicine and was blinded to the infertility status of the participants. Diagnostic criteria were based on the International Statistical Classification of Diseases and Related Health Problems (ICD-10). Psychiatric histories were collected with a socio-demographic data form. The participants answered the questions about previous psychiatric problems themselves. As a result of the interview, three patients who were diagnosed with a current psychiatric disorder and seven patients who had a psychiatric illness history were excluded from the study.

2.2 | Data collection tools

2.2.1 | Socio-demographic data form

The socio-demographic data form was developed by the investigators to collect participant's information about age, educational level, employment status, social support, infertility history and clinical condition. In the infertile group, patients were asked to score the support they thought they had received from their spouses and families during the treatment process. Such questions were not included in the data form in the fertile patient group.

2.2.2 | Toronto Alexithymia Scale (TAS-20)

TAS-20 is a Likert-type scale including 20 items to evaluate alexithymia, which is defined as the inability of the individual to identify his/

her feelings or affect. Each item is scored on a scale from 1 to 5. The adaptation of the scale to the Turkish language was performed by Dereboy[22] and it was revised by Motan and Gençöz in 2007. Through a factor analysis in that study, the three following factors were identified; including "difficulty identifying and describing feelings (TAS-A)," "difficulty communicating feelings (TAS-B) and "externally-oriented thinking (TAS-C)." The sum of the points obtained from those three factors is a measure of general alexithymia (TAS-T). High scores obtained from the scale indicate high alexithymic features.[23]

2.2.3 | Anxiety Sensitivity Index-3 (ASI-3)

ASI-3 comprises 16 items scored on a five-point Likert scale. The validity and reliability of ASI-3 in the Turkish language was shown by Mantar et al[24] It has been suggested that anxiety sensitivity predisposes the individual to develop various anxiety disorders.[25]

2.2.4 | Somatosensory Amplification Scale (SAS)

It is a Likert-type scale that investigates the amplification of somatic sensations experienced by the individual. The total score is evaluated as the amplification score. The validity and reliability of ASI-3 in the Turkish language was shown by Güleç et al[26]

2.3 | Statistical analysis

The normal distribution of continuous variables was evaluated by using visual (histograms and probability graphs) and analytical (Kolmogorov–Smirnov and Shapiro–Wilk tests) methods. Statistical differences between the groups for continuous variables were evaluated using one-way analysis of variance (ANOVA) and Kruskal–Wallis tests. Statistical differences between the groups for categorical variables were determined using Chi-square and Fisher's Exact tests. Spearman's correlation analysis was used for analysing correlations between non-parametric continuous variables. Statistical significance was considered at a $P < .05$. For the statistical analyses, the R-version 3.6.3 was used.

3 | RESULTS

The mean age was 28.72 (±3.63) years in the "infertility due to known causes" group; 30.13 (±4.59) years in the "unexplained infertility" group and 34.17 (±4.65) years in the "fertile" group. The mean age of the fertile individuals was significantly higher compared to infertile individuals. The length of marriage was longer in the fertile group compared to the infertile patient group ($P < .01$). The sociodemographic data of the groups are shown in Table 1.

No significant differences in the levels of alexithymia, somatosensory amplification and anxiety sensitivity were detected between the groups ($P > .05$). The scale scores of the groups are presented in Table 2.

When the correlations between clinical scale scores were analysed; anxiety sensitivity was found to increase as difficulty in identifying feelings increased in the whole group of infertile patients regardless of their causes (Table 3).

When the effect of spouse and family support on scale scores was examined in the infertile patient group, no statistically significant differences were found between the group of individuals who received and did not receive support by the family and/or the spouse ($P > .05$).

4 | DISCUSSION

In this study; which compared the levels of alexithymia, somatosensory amplification and anxiety sensitivity of the patients with unexplained infertility to those of fertile patients and the patients with infertility due to a known cause, no statistically significant differences have been detected between the groups ($P > .05$). To our knowledge, this is the first study in the literature which compares psychological features of infertile patients with different aetiologies. We could not find any study which compares psychological features of different infertile patient groups directly in the literature.

It is known that difficulty in identifying and communicating feelings, anxiety and somatosensory amplification is associated with somatic disorders.[27-29] Somatic disorders are described as diseases with no organic causes and medical explanation. A prevalence study in our country in 2009 found the prevalence of somatic disorders as 7.7% and reported that somatic disorders were more common in women, among patients suffering from chronic diseases and in patients whose mothers had a low level of education.[30] Somatisation is a coping mechanism in traditional cultures. Considering the social structure in Turkey, the somatisation of distress appears to be commonplace for women feeling dependent on men and suffering from difficulty communicating feelings openly. Alexithymia was found at a rate of 45.9% in individuals with somatisation disorders in a study conducted in our country in 2016.[31] Prior to our study, we conceptualised that unexplained infertility might be a form of somatisation; therefore we hypothesised that the scores of the somatisation-associated scales (such as the alexithymia, somatosensory amplification and anxiety sensitisation scales) of such patients would be higher than those of participants in the control group and the "infertility due to a known cause" group. However, our study result may lead us away from the conclusion that unexplained infertility is a form of somatisation. The limited sample size of our study might have had an effect on our contradicting findings.

Most people associate being a woman with the ability to conceive and have children. Studies have reported that infertile women suffer from anger, sadness, shame, self-blaming and feelings of being incomplete.[32] The extent of their communicating and sharing such feelings is debatable. In the literature, difficulty in identifying and communicating feelings and lacking imaginative capacity are

TABLE 1 Socio-demographic data of the participants

	Unexplained infertility (n = 60)	Infertility due to a known cause (n = 50)	Control group (n = 56)	*P* values	Test statistic
Age (mean ± SD)	30.1 ± 4.5 (a)	28.7 ± 3.6 (a)	34.1 ± 4.6 (b)	<.001*	37.028
Duration of marriage [n (%)]					
2 y	10 (33.3)	10 (40.0)	(10.7)	.002*	42.497
3 y	3 (10.0)	8 (32.0)	(3.6)		
4 y	3 (10.0)	1 (4.0)	(7.1)		
5 y and more	14 (46.7) (a)	6 (24.0) (a)	22 (78.6) (b)		
Educational level [n (%)]					
High school	14 (46.7)	16 (64.0)	11 (39.3)	.374	12.923
University	16 (53.3)	9 (36.0)	17 (60.7)		
Employment status [n (%)]					
Not working	17 (56.7)	15 (60.0)	9 (32.1)	.078	10.187
Working	13 (43.3)	10 (40.0)	19 (67.9)		
Social security [n (%)]					
No	0 (0.0)	1 (4.0)	1 (3.6)	.557	2.341
Yes	30 (100.0)	24 (96.0)	27 (96.4)		
Income (monthly) (TL) [median (IQR)]	3100 (a) (2500-4000)	3450 (a) (3000-6250)	5000 (b) (4375-7500)	0.003*	22.865
Living with family [n (%)]					
Husband	18 (60.0)(a)	23 (92.0) (b)	26 (92.9) (b)	.002*	25.943
Large family	12 (40.0) (a)	2 (8.0) (b)	2 (7.1) (b)		
Previous treatment history [n (%)]					
No	16 (53.3)	19 (76.0)	28 (100.0)	<.001*, α	34.489
Yes	14 (46.7)	6 (24.0)	0 (0.0)		
Spousal support [n (%)]					
No/partly yes	5 (16.7)	3 (12.0)	0	.715	0.478
Yes	25 (83.3)	22 (88.0)	0		
Family support [n (%)]					
No/partly yes	9 (30.0)	8 (32.0)	0	.873	0.051
Yes	21 (70.0)	17 (68.0)	0		
Chronical disease [n (%)]					
No	27 (90.0)	22 (88.0)	26 (92.9)	.833	0.730
Yes	3 (10.0)	3 (12.0)	2 (7.1)		

Abbreviations: IQR, inter quarter range; SD, standard deviation.

a-b: There is not any statistically significant difference between the groups with the same letter.

*$P < .05$ was accepted to be statistically significant.

αControl group was not involved in statistical analysis for previous treatment history.

defined as alexithymic characteristics.[33] The severity of alexithymia has been reported to be high in depression and anxiety disorders in many studies.[31,34] There are studies in the literature suggesting that a two-way relationship exists between depression and alexithymia.[35] Such alexithymic characteristics may cause individuals to develop psychiatric disorders including anxiety disorders and depression. Considering the social aspects of infertility; it is possible to foresee that alexithymic characteristics of infertile women will be at the forefront, resulting in not only difficulty in communicating but recognising the feelings as well. We hypothesised in our study that alexithymic characteristics would be more severe in the infertile patient group compared to the control group but no such conclusion has been reached. The total scores of alexithymia were found similar and at moderate severity in all three groups. One of the reasons for the lack of differences across the groups may result from incompetency of women in our country in identifying their feelings in general. Another reason may be the inadequacy of the sample size. In the literature, there are no studies in which the levels of alexithymia of infertile women have been measured; therefore the results of our study are important for contributing to the literature.

TABLE 2 Clinical scale scores between groups

	Unexplained infertility (n = 60)	Infertility due to a known cause (n = 50)	Control group (n = 56)	Total (n = 166)	*P* values	Test statistics
ASI-3 [Median (IQR)]	16.0 (7.0-20.0)	12.0 (5.0-24.0)	13.0 (6.7-24.2)	13.0 (6.0-23.5)	.929	0.298
TAS-A [Median (IQR)]	13.5 (11.2-16.0)	11.0 (9.0-15.0)	13.0 (10.7-15.2)	13.0 (10.0-16.0)	.424	3.453
TAS-B [Median (IQR)]	10.5 (9.0-13.0)	12.0 (9.0-14.0)	10.0 (9.0-12.0)	11.0 (9.0-13.0)	.635	1.827
TAS-C [Median (IQR)]	20.0 (18.2-23.0)	21.0 (18.0-23.0)	22.0 (19.0-24.0)	21.0 (18.0-23.0)	.466	3.069
TAS-TOTAL [Median (IQR)]	45.0 (41.2-52.0)	45.0 (37.0-51.0)	45.0 (41.5-49.0)	45.0 (40.5-51.0)	.938	0.259
SAS [Median (IQR)]	26.5 (21.2-30.7)	28.0 (20.0-34.0)	26.0 (20.0-31.7)	26.0 (20.5-33.5)	.819	0.805

Abbreviations: ASI, Anxiety Sensitivity Index-3; IQR, inter quarter range; SAS, Somatosensory Amplification Scale; TAS, Toronto Alexithymia Scale.

TABLE 3 Correlation analysis of clinical scales in infertile cases

	R coefficient	*P* values
TAS-A		
ASI-3	0.564	<.001*
SAS	0.376	.005*
TAS-B		
ASI-3	0.375	.005*
SAS	0.044	.747
TAS-C		
ASI-3	0.063	.658
SAS	0.011	.932
TAS-TOTAL		
ASI-3	0.492	<.001*
SAS	0.291	.030

Abbreviations: ASI-3, Anxiety Sensitivity Index-3; SAS, Somatosensory Amplification Scale; TAS, Toronto Alexithymia Scale.

*$P < .05$ was accepted to be statistically significant.

The decision to have a child and raising a child instigates considerable responsibility with the potential to induce anxiety. Moreover, such a decision will give rise to another concern, whether the woman will ever get pregnant. Expectations begin from the first month when people begin to monitor their menstrual cycles and schedule the days of sexual intercourse accordingly. Anxiety starts building up with every upcoming month when pregnancy cannot be established. Medically unexplained infertility can sometimes contribute to further rise in anxiety because known causes make things easier to control; whereas uncertainty is perceived as uncontrollable and threatening, thus building up stress.[36] Studies have shown that high levels of perceived uncertainty are associated with high levels of anxiety and depression and with the quality of life.[37]

Anxiety sensitivity is defined as an individual difference variable arising from the individual's conceptions that anxiety or fear experiences will lead to maladies, embarrassment or further anxiety.[25] In our study, we found that anxiety sensitivities of infertile patients were correlated with difficulty in identifying and describing feelings, difficulty in communicating feelings and somatosensory amplification regardless of the cause of infertility ($P < .05$). This might be stemming from their inability to identify feelings, in other words from their alexithymic characteristics, resulting in the somatisation of anxiety. Studies show that anxiety and depression act on the outcomes of treatment for infertility.[38,39] Starting from such information, the ability to identify feelings can be worked through for improvement to reduce anxiety sensitivity and somatic complaints so that the levels of anxiety and depression can be reduced; thus making a difference in the treatment process of infertile patients. Infertile individuals may undergo psychiatric examinations before treatment to identify and ameliorate difficulties in identifying and communicating feelings and inadequate social support. Thus, the development of depression and anxiety disorders can be prevented, potentially increasing both spontaneous pregnancy rates and the success of infertility treatment indirectly. Therefore, we think that routine psychiatric evaluation is important in patients presenting for infertility treatment even in the absence of findings in the pre-treatment medical history which suggest potential mental disorders.

This study is important because by evaluating the awareness of feelings, the level of ability to express feelings, anxiety sensitivity and the perception of somatosensory sensations, it sheds light on the mental health of infertile cases who did not have any known psychiatric disorder or who did not need to receive any medical treatment.

5 | LIMITATIONS

This study has some limitations. The cross-sectional study design does not allow for the formulation of opinions about the changes in findings longitudinally. Both undergoing treatment and the stage of treatment can induce changes in individuals, particularly in infertile patients. Regarding the study sample; the normal distribution of variables including age, educational status, employment status and the length of marriage in the infertile patient group strengthens the results. However, the limited sample size makes it difficult to generalise the results and prevents some statistical comparisons to be made. Because of the use of self-administered scales in the study, potential bias in responses of participants to the scale items should also not be ignored.

6 | CONCLUSION

In conclusion, it has been found out that; regardless of the knowledge of the aetiology of infertility, the levels of alexithymia, somatosensory amplification and anxiety sensitivity of infertile cases did not differ from those of fertile women. However, it has been shown that as the difficulty in identifying emotions increases in infertile cases, anxiety sensitivity, which may cause psychological infertility, also increases. However, according to this study we cannot say that psychological factors play a role in the aetiology of unexplained infertility and, unexplained infertile patients do not have different psychological characteristics than infertile patients with known cause. These results suggest that more research is required to understand the role of psychological disorders in the aetiology of unexplained infertility due to the complicated nature of human fertility.

DISCLOSURES

The authors declare no conflicts of interest.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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