

## Comparison of Family Functions in Infertile Women with and without Pelvic Inflammatory Disease

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### Abstract

**Objective:** Pelvic inflammatory disease is a common infection that can reduce family functioning by causing long-term complications such as chronic pelvic pain and infertility. This study aimed to compare family functions in Infertile women with and without pelvic inflammatory disease.

**Method:** The research method was causal-comparative, and the participants included 48 infertile women with pelvic inflammatory disease and 57 infertile women without pelvic inflammatory disease, referred to Al-Zahra Hospital in Rasht in 2021. Based on the patients' records and the diagnosis of the gynecologist, infertile women with pelvic inflammatory disease (tubular factor) and infertile women without pelvic inflammatory disease (due to other causes) were selected purposefully. A demographic checklist and McMaster Family Functioning Questionnaire were used to collect data. Research data were analyzed using one-way and multivariate variance analysis.

**Results:** The results showed that there was a significant difference between the mean scores of emotional fusion in infertile women with pelvic inflammatory disease and infertile women without pelvic inflammatory disease ( $P < 0.05$ ). In addition, there was a significant difference in the two levels of high and low education in emotional control and response and interaction between group and education components ( $P < 0.05$ ).

**Conclusion:** According to the results of this study and the importance of the emotional integration component in women with infertility without pelvic inflammatory disease, this component can be used as a strength in these women for more effective communication in married life and to reduce the negative effects of infertility and education should be further examined as a possible influential variable.

**Keywords:** Emotional fusion, Family functions, Female infertility, Pelvic inflammatory disease, Tubal infertility.

### Introduction

Infertility as a long-standing problem has always affected women's physical and mental health. The World Health Organization estimates that about 10-25% of couples have fertility problems (Podolska & Bidzan, 2011). The experience of infertility may have a negative impact on various aspects of their lives, e.g. on social or marital relationships, that patients with chronic diseases may also experience

(Moutzouri et al., 2021). There are two types of infertility: primary and secondary. In primary infertility, couples have never been able to conceive. While secondary infertility is a problem of getting pregnant after a history of pregnancy (Olooto et al., 2012). The main cause of secondary infertility is a pelvic inflammatory disease (Zhang et al., 2020), which begins with the ascent of vaginal and cervical infections to the uterus and fallopian tubes (Mehraban et al., 2015) and includes a range of upper genital infections, including a combination of endometritis, salpingitis, tuba ovarian abscess, and peritonitis which can occur acutely or chronically (Al-Kuran et al., 2021). Following the

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acute form, a person may experience persistent complications such as ectopic pregnancy, chronic pelvic pain, inflammation and obstruction of the fallopian tubes, and tubal infertility after apparent recovery (Till et al., 2019). Chronic illness is a disease that lasts indefinitely and is not completely cured by medication. In the long run, these diseases cause persistent and progressive pain, disease suffering, disability, and reduced life satisfaction (Sepahmansour & Katebi, 2019).

Chronic pelvic pain is a debilitating problem that affects 15 to 20 percent of women in the United States. They use medicine three times more than women without chronic pelvic pain, undergo gynecological surgery four times more, and have a hysterectomy five times more. Of course, their pain often persists despite these treatments, leading to reduced productivity, emotional health, and quality of life. Also, the family function is severely impaired due to negative emotions, anxiety, and depression, and this vicious cycle leads to irreparable harm in controlling behavior as well as playing an emotional role as a mother or spouse (Till et al., 2019). Patients undergoing surgery report a range of psychiatric disorders such as depression, anxiety, sleep disorders, and cognitive function, as well as many physical problems and sexual dysfunctions (Pournaghash-Tehrani & Abdoli-Bidhendi, 2018). The highest percentage of pelvic inflammatory disease is observed in the group of people aged 20 to 39 years. Higher rates of psychiatric illnesses (e.g. depression and anxiety) have been reported in people with chronic pain and pelvic inflammation. Also, 72% of patients with pelvic pain reported sleep disorders and 51% of them reported depression. They were also clinically depressed and their Beck questionnaire confirmed depression (Shen et al., 2016).

Family functioning includes approaches that the family uses to maintain and integrate. The dimensions of family functions include problem-solving, communication, roles, emotional

responsiveness, emotional fusion, and behavioral control. The McMaster model examines the function and organizational structure of the family with a clinical orientation (Miller, Ryan, Keitner, Bishop & Epstein, 2000). Family functioning, according to the two-dimensional model of marital and family systems and Olson, Goral, and Tessel's (2006) model, consists of two main dimensions' family cohesion and family flexibility. In response to stressors (e.g., cancer diagnosis, treatment, and late effects of disease), family cohesion and resilience can change, whether these changes are compatible or not (Gutiérrez-Colina et al., 2017). Pelvic inflammatory disease can threaten family cohesion and flexibility (Sogaard et al., 2019) by increasing the risk of subsequent reproductive complications and the risk of endometrial, ovarian, and colon cancer (Gutiérrez-Colina et al., 2017). On the other hand, a high sense of cohesion increases the performance of women with cancer (Quintard et al., 2014; quoted in Azarkolah et al., 2020). Infertility is considered one of the most stressful life events and personal tragedies (Kielek-Rataj et al., 2020).

Family functioning as a continuum from efficient to inefficient is affected by external and internal factors, and chronic pain is one of these external factors (Namegh et al., 2015). Other common psychiatric problems among infertile patients include sexual dysfunction (Simionescu et al., 2021). Higher education levels and other factors in dealing with depression in female infertility disorders can significantly affect the prevalence of depression in this population (Adelosoye et al., 2020). The first step in maintaining fertility is awareness of infertility and lifestyle modification. Knowledge and awareness of fertility depend mostly on one's knowledge about fertility or the experience of having children (Deyhoul et al., 2017).

Family functioning is divided into three general categories: (1) factors related to the patient

(2) factors related to family members, and (3) factors related to the family unit. In the category of patient-related factors, there are demographic characteristics, psychological/behavioral factors, and medical factors. Demographic characteristics include education and gender. Factors related to family members include demographic characteristics such as age, education, family role, and psychological factors (Zhang, 2018).

Suffering from pelvic pain leads to high consumption of medication to relieve inflammation and reduce pain and perform difficult surgeries that reduce productivity, emotional health, and sexual function following chronic pelvic inflammation, which ultimately leads to a decrease in quality of life and a serious impact on family functioning, including important dimensions such as problem-solving, role-playing, emotional response, especially appropriate family interaction, and behavior control. Therefore, pelvic inflammatory disease, as an acute disease that becomes chronic and infertile, needs special attention so that a person can maintain his function during the treatment of the disease and infertility and in addition to receiving more effective treatment results, the family environment will have the necessary security and tranquility to continue treatment. Due to limited research in this field, and the lack of enough study on women with infertility with pelvic inflammatory disease, this study was conducted to compare family functions in women with infertility with and without the pelvic inflammatory disease to answer the following question:

“Do family functions differ between women with infertility with and without pelvic inflammation in interaction with education?”

### **Method**

This present study was causal-comparative. The sample includes 105 infertile women who were purposefully selected from 2000 infertile women who were referred to the infertility clinic of Al-

Zahra Educational and Medical Center in Rasht based on the diagnosis of an infertility gynecologist from April 2020 to September 2021. The sample size was determined using The G Power software program (Faul et al., 2007). Considering the alpha level of 0.05 and the acceptable level of test power equal to 0/80 and the effect size with a magnitude of 0.30, the sample size was equal to 90 people (45 in each group). To increase the external validity and the possibility of defects in completing the questionnaires, 80 people were selected for each group (160 people). Finally, after reviewing the questionnaires and eliminating the incomplete cases of 48 infertile women with pelvic inflammatory disease (21 people above the diploma and 27 people below the diploma) and 57 without the inflammatory disease (18 people above the diploma and 39 people below the diploma) were selected based on inclusion criteria including the age range of 20 to 40 years, the education level of fifth elementary to postgraduate, infertility more than one year, and indigenous and non-indigenous people from neighboring provinces. The exclusion criteria were receiving simultaneous psychotherapy or psychiatric treatments, defective filling in questionnaires, answering the questionnaire by another person, or weak willingness to cooperate were selected. After visiting the subjects and giving the required explanations regarding the objectives of the research and obtaining their satisfaction, they were asked to answer the questionnaires individually, online, or on paper according to the instructions. First, the demographic checklist and then the McMaster Family Functioning Questionnaire were completed by the participants. Cases whose education and age in the file did not match the result of the questionnaires were removed from the research. Then, the data were collected and analyzed through one-way and multivariate analysis of variance using SPSS24.

### **Ethical statement**

Ethical issues were fully considered in this study.

Participants were also assured that their information would be kept confidential. Voluntary participation and anonymity were considered. No identity information was requested from the subjects and they completed the online questionnaires with satisfaction.

### Measures

The following tools have been used to collect data:

1) Demographic information questionnaire: Based on this questionnaire, demographic data of the subjects including age, level of education, number of marriages, duration of the marriage, type of infertility (primary or secondary), duration of infertility, number of deliveries, number of children, number of pregnancy, number of abortions, social and economic status, and history of pelvic inflammatory disease were collected.

2) McMaster Family Functioning Questionnaire: The Family Assessment Device (FAD) is a 60-item

problem-solving, communication or interaction, roles, emotional mating, emotional responsiveness, and behavioral control, and 1 dimension of overall family performance. This questionnaire is answered based on a four-point Likert scale, from strongly agree = 1 to strongly disagree = 4. The lower the overall score and subscales of the individual, the lower the dysfunction, resulting in stronger and healthier family functioning. The reliability of the test-retest for all scales was reported between 0.66 and 0.76 by Vandsburger (2001; cited by Rezaei, 2017). Ahmadi et al. (2020) reported a Cronbach's alpha coefficient for the whole questionnaire of 0.88.

### Results

The sample consisted of 48 infertile women with the pelvic inflammatory disease with mean and standard deviation for age ( $M=32.67$ ,  $SD=5.075$ ), 56.3% below the diploma and 43.7% above the

**Table 1:** Mean, and standard deviation of research variable

variable	Inflammatory pelvic disease (tubal closure)		without pelvic inflammatory disease (other causes)	
	Mean	SD	Mean	SD
General family function	24.02	6.37	23.12	6.00
Solve the problem	11.04	2.36	10.73	2.92
Contact	19.04	3.42	18.63	4.28
Roles	25.02	3.78	24.61	4.23
Emotional fusion	17.08	2.87	16.17	2.59
Emotional Response	12.58	2.84	12.22	2.93
Control	20.14	3.42	19.61	3.08
Total	128.93	18.93	125.12	21.65

scale designed to measure family performance based on the McMaster Model of Family Functioning for individuals older than 12 years old. This tool was developed in 1950 by Epstein, Baldwin, and Bishop (cited in Stevenson-Hinde & Akister, 1995). The family assessment device includes 7 subscales that measure six family dimensions including

diploma, and 57 infertile women without pelvic inflammatory disease with mean and standard deviation of age ( $M=31.56$ ,  $SD=4.881$ ), 70.2% below the diploma and 29.8% above diploma. Table 1 shows the descriptive indicators of research variables. The values of Skewness and Kurtosis for all components of the research variable are between 1



and -1.

Therefore, the deviation from the normal distribution is not so much and except for the problem-solving component in the group with pelvic inflammatory disease, the

other components have a normal distribution with a significant level ( $P < 0.05$ ). Multivariate analysis of variance was used to compare the two groups in the studied variables. Before the test, its

assumptions were checked. The Leven's Test result was not significant for the homogeneity of error variances for the components and the total family functioning score ( $P > 0/05$ ,  $F = 0/297$ ), thus the assumption of homogeneity of the error variances was observed. The result of Box's M test ( $M = 0/006$ ,  $F = 1/436$ ,  $P > 0/001$ ) showed that the assumption of

homogeneity of variance and covariance matrices was established. The results of Wilkes's Lambda test showed that the effect of group, educational levels, and group at educational levels on the composition of family functioning components was not significant. In Table 2, the results of the univariate analysis of variance show that the two groups differ in the component of emotional fusion ( $P < 0.05$ ), and at educational levels, the difference between the mean of the two components of family functioning (emotional responsiveness and control) is significant ( $P < 0.05$ ), and higher levels of education show more emotional responsiveness and control. There was an interaction between the group and education in the component, and at all levels of education, the role performance was

**Table 2:** Univariate analysis of variance of family functioning components in women with and without pelvic inflammatory disease

	Family function	SS	Df	MS	F	P	Eta	OP
Group	General family function	62.08	1	62.08	1.65	0.20	0.016	0.247
	Solve the problem	5.97	1	5.97	0.82	0.36	0.008	0.147
	Contact	18.46	1	18.46	1.22	0.27	0.012	0.195
	Roles	22.24	1	22.24	1.42	0.23	0.014	0.219
	Emotional fusion	31.50	1	31.50	4.27	0.04	0.041	0.535
	Emotional Response	9.29	1	9.29	1.13	0.28	0.011	0.184
	Control	25.04	1	25.04	2.56	0.11	0.025	0.355
	Total	1089.19	1	1089.19	2.70	0.10	0.026	0.371
Education	General family function	55.5	1	55.5	1.48	0.22	0.014	0.226
	Solve the problem	9.92	1	9.92	1.37	0.24	0.013	0.213
	Contact	8.87	1	8.87	0.58	0.44	0.006	0.118
	Roles	0.90	1	0.90	0.05	0.81	0.001	0.057
	Emotional fusion	11.70	1	11.70	1.58	0.21	0.015	0.239
	Emotional Response	33.21	1	33.21	4.05	0.04	0.039	0.514
	Control	75.68	1	75.68	7.76	0.00	0.071	0.788
	Total	1049.73	1	1049.73	2.60	0.10	0.025	0.360
Group * Education	General family function	87.08	1	87.08	2.32	0.13	0.022	0.326
	Solve the problem	3.86	1	3.86	0.53	0.46	0.005	0.112
	Contact	5.97	1	5.97	3.38	0.06	0.032	0.446
	Roles	96.95	1	96.95	6.20	0.01	0.058	0.694
	Emotional fusion	7.28	1	7.28	0.98	0.31	0.010	0.166
	Emotional Response	3.79	1	3.79	0.46	0.49	0.005	0.103
	Control	20.69	1	20.69	2.12	0.14	0.021	0.303
	Total	1404.63	1	1404.63	3.49	0.06	0.033	0.457

lower than normal. Also, the lowest decrease in the role of higher education was observed in the group without pelvic inflammation, and the highest decrease was observed in the diploma group in the group with inflammation.

The obtained Eta coefficient indicates that 4.1% of the changes in emotional integration are due to pelvic inflammatory disease, and 3.9% of the difference in emotional response, 7.1% of the changes in emotional control due to changes in educational levels, and 5.8% of role changes are due to the interaction of group and education.

### Discussion

This study compared family functioning in infertile women with and without the pelvic inflammatory disease. The results of this study showed that the difference in the family functioning components between infertile women with and without pelvic inflammatory disease was not significant. However, there was a significant difference in the component of emotional intercourse, and women without inflammation showed better emotional intercourse.

This result is in line with the findings of Namegh et al. (2015), Mousavi Diva et al. (2017), Di Tella et al. (2021), and Garr et al. (2021). Also, the differences between the two groups in terms of components of overall function, problem-solving, communication, role, emotional responsiveness, and control were not significant. These results are consistent with the study of Mohammadi et al. (2018) and Pour Abdullah et al. (2017) and are different from the findings of Mousavi Diva et al. (2017), Gutiérrez-Colina et al. (2017), Simionescu et al. (2021), Di Tella et al. (2021), Garr et al. (2021), and Zandieh et al. (2016). In explaining these results, it can be said that infertile people, such as those with chronic diseases, have long-term health problems, and experience the same feelings and problems (Moutzouri et al., 2021); therefore, chronic inflammation of the pelvis, followed by infertility as a chronic disease, causes long-term physical and mental damage, and both factors can be equally effective in

reducing family functions.

In addition, the findings of the present study showed that the average dimension of overall performance in the groups is normal, which is consistent with the results of Pour Abdullah et al. (2017) and Mohammadi et al. (2018). However, Di Tella et al. and Garr et al. (2021) showed contradictory findings. This difference may be due to the nature of the chronic disease under study, especially the comparison of the two groups of infertile women showed that the mean score of problem-solving was lower than other dimensions and was in the normal range. This finding indicates that the studied families performed better in terms of problem-solving than other dimensions, in which couples are likely to become more responsive to each other over time to manage the disease and solve the problem and related challenges.

The findings also showed that the communication dimension is in the normal range. This result is consistent with the findings of Pour Abdullah et al. (2017). The ability to communicate also increased with increasing marital time. In the role dimension, family function decreased in both groups and this decrease was more in the inflammatory group. These results are consistent with the findings of Arnold et al. (2008).

Emotional responsiveness was also within the normal range. In this regard, Pourabdollah showed that family functioning in terms of emotional response is not impaired, but also improved, which is not consistent with the findings of Simionescu et al. (2021). The results of the present study also showed that family performance decreased in terms of behavioral control. This finding is not consistent with the results of Pour Abdullah et al. (2017) and Mohammadi et al. (2018). In addition, at higher levels of education, the component of emotional responsiveness was significantly different. This result was consistent with the results of Jarareh et al. (2013), Batista et al. (2021), and Adelosoye et al. (2020). Because people with higher education have more cognitive capacities, the rate of response to positive emotions such as emotions, warmth, desire, love, and pleasure is more,

and the management of unpleasant emotions such as anger, fear, anxiety, worry, frustration, and depression in them is higher.

The control component was also significant at the educational levels and individuals at the higher educational level had higher control. This finding was consistent with the results of Batista et al. (2021) and Adelozi et al. (2020). Behavior control is a measure that governs family life by a set of standards, rules, and procedures (Weinstock et al., 2013). Families respond differently to various situations, such as when a family member experiences physical or psychological problems or in socializing inside or outside the immediate family, to develop acceptable standards of behavior to maintain consistent family functioning (Çuhadar et al., 2015). There are different ways to control behavior such as strict, flexible, with no intervention control, and chaos (Epstein, Baldwin & Bishab, 1983). In higher education, people are likely to be able to set accepted and more aware behavioral standards to improve difficult situations and be able to have more flexibility in controlling their behavior.

Of course, low levels of education alone cannot predict functional disorders. In addition, other variables such as pathological factors are also effective in reducing family functioning. It seems that the level of education improves family performance by increasing one's awareness of health and life skills. The difference between the role component was significant in the interaction between the group and education. The best role performance was seen in higher education levels and women without inflammation and the lowest role performance was seen in inflammatory cases. No research has been done on this issue, but peripheral and central inflammation can alter neural activity, thus contributing to the psychological symptoms of depression (Ebrahimi & Abolmaali, 2018). Inflammations, especially pelvic inflammation, can affect a person in some of his/her roles, such as providing comfort in the family, and especially damage the personal and social development, maintaining and managing the family system, and sexual satisfaction

and the low level of education in the individual is another reason why the individual has a lower level of cognition in matters such as problem-solving, decision making and especially cognitive flexibility, and cannot manage the damage caused by inflammation in the role of the family. This can probably be due to the increased power of thinking, planning, and problem-solving and in general the cognitive skills of individuals at higher levels of education.

### Conclusion

According to the findings of the study, some components of family functioning are reduced in infertile women, and women with and without pelvic inflammatory disease differ in the component of emotional fusion, and also educational levels in female infertility may be influential in playing a role in compensating for individual deficiencies in family functioning, especially in the components of emotional responsiveness, control, and role-playing. One of the limitations of the present study was the self-reporting method, online implementation of the questionnaire, and the sampling method that was just from people referring to Al-Zahra Hospital in Rasht. For better and generalizable results, it is suggested that this research be conducted by the sample on a larger scale and if possible with a face-to-face questionnaire. On the other hand, the present study was performed only on infertile women. It is suggested that these variables be compared with fertile women who do not have problems. The results of this study can be used to increase the efficiency of those women who are unwillingly involved in the process of treatment problems and mental disorders following this problem so that the decrease in function does not cause a secondary problem following infertility.

### Acknowledgment

We appreciate the cooperation of Guilan University of Medical Sciences and Al-Zahra Hospital in Rasht, as well as the director of the hospital and all colleagues of midwives, nurses, and gynecologists in the infertility ward of Al-Zahra Hospital in Rasht and the patients

in this ward who participated in the present study. This study did not have any conflict of interest for the authors.

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