



## Factors associated with patient satisfaction with in vitro fertilization services at the Reproductive Support Center, Hospital of Post and Telecommunications, 2024

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### ABSTRACT

**Objective:** To identify factors associated with patient satisfaction regarding In Vitro Fertilization (IVF) services at the Reproductive Support Center in Hospital of Post and Telecommunications in 2024. **Methods:** A cross-sectional study was conducted among 250 female patients diagnosed with infertility who underwent IVF treatment at the Reproductive Support Center, Hospital of Post and Telecommunications, between January and October 2024. Data were collected using a Vietnamese-language questionnaire, translated and validated based on Gonen's (2016) original instrument. Descriptive statistics and correlation analyses were applied. **Results:** Patient satisfaction with healthcare staff, information provision, and facility conditions achieved mean scores ( $X \pm SD$ ) of  $6.31 \pm 0.67$ ,  $6.30 \pm 0.68$ , and  $6.12 \pm 0.87$ , respectively, on a 7-point scale. Satisfaction demonstrated weak negative correlations with age, income, duration of infertility treatment, and number of follow-up visits. **Conclusion:** To improve patient satisfaction in IVF services, it is essential to enhance healthcare staff communication skills, upgrade physical infrastructure, and reduce treatment duration and frequency.

**Keywords:** In vitro fertilization, patient satisfaction, associated factors, assisted reproduction.

### INTRODUCTION

Infertility has emerged as an increasingly significant reproductive health issue, profoundly affecting the quality of life of affected couples. In Vietnam, recent studies have reported a rising prevalence of infertility, with in vitro fertilization (IVF) becoming a primary treatment modality<sup>1</sup>. However, IVF is often lengthy, costly, and imposes considerable psychological as well as physical burdens on patients, thereby positioning patient satisfaction as a crucial indicator for evaluating the

quality and effectiveness of healthcare services<sup>2</sup>. Although numerous domestic and international studies have examined patient satisfaction, particularly in relation to healthcare staff attitudes, professional competence, and facility conditions, evidence specific to IVF services in Vietnam remains limited. For example, Samadaee-Gelekholaee et al. (2015) identified psychological stressors, including financial and social burdens, as key determinants influencing treatment experiences and satisfaction levels<sup>3</sup>. Nevertheless, there

is still a lack of comprehensive, multi-center research within the Vietnamese context, especially given the diverse demographic and socioeconomic profiles of IVF patients<sup>4</sup>. Therefore, this study aims to assess patient satisfaction and identify associated factors among individuals undergoing IVF treatment at the Reproductive Support Center in Hospital of Post and Telecommunications. The findings are expected not only to inform quality improvement initiatives at this institution but also to contribute evidence for shaping supportive policies and comprehensive care strategies for infertility patients in Vietnam.

## **METHODS**

### **Study participants:**

The study population consisted of women diagnosed with infertility who underwent in vitro fertilization (IVF) treatment at the Reproductive Support Center, Hospital of Post and Telecommunications.

*Inclusion criteria:* Female patients who had completed at least one IVF cycle, including oocyte retrieval and either fresh or frozen embryo transfer.

*Exclusion criteria:* Non-Vietnamese nationals, as well as individuals with cognitive or communication impairments that precluded completion of the survey questionnaire.

### **Study setting and duration :**

The study was conducted between January and October 2024 at the Reproductive Support Center, Hospital of Post and Telecommunications, Hanoi.

### **Study design:**

A cross-sectional descriptive study design was applied.

### **Sample size and sampling method:**

The sample size was determined using the formula for estimating a population mean, based on the standard deviation ( $\sigma = 0.57$ ) and mean satisfaction score ( $\mu = 6.75$ ) reported by Gonen<sup>5</sup> (2016). With a relative margin of error of 5% and a 95% confidence level, the required sample size was calculated as 215. An additional 15% was included to account for potential attrition, resulting in a final minimum sample size of 250. Participants were recruited using a convenience sampling method.

**Study instrument:** A structured questionnaire consisting of 28 items was used, divided into three sections:

Section 1: Demographic information. Eight items addressing age, educational level, place of residence, occupation, monthly income, and duration of marriage.

Section 2: Reproductive health history. Five items on duration of infertility treatment, number of follow-up visits, number of children, and cause of infertility.

Section 3: Patient satisfaction scale.

Fifteen items adapted from Gonen<sup>5</sup> (2016), covering three domains: medical staff, treatment information, and facility conditions. Responses were rated on a 7-point Likert scale ranging from “very dissatisfied” to “very satisfied.”

The instrument was translated into Vietnamese using Brislin’s back-translation method to ensure semantic and conceptual equivalence. Reliability analysis demonstrated high internal consistency, with a Cronbach’s alpha coefficient of 0.91.

**Data collection and analysis:** Data were collected using KoboToolbox and subsequently processed and analyzed with

SPSS software version 26. Descriptive statistics, including frequencies, percentages, range, mean, and standard deviation, were employed to present sample characteristics and assess satisfaction levels. Independent Samples T-test and One-way ANOVA were applied to identify statistically significant differences in mean satisfaction scores across categorical variables, while Pearson's correlation coefficient was used for quantitative variables. A p-value of less than 0.05 was considered statistically significant.

## RESULTS

**Table 1. Demographic characteristics of patients (n = 250)**

Characteristic	n	%	
Mean age $\pm$ SD (Min-Max):	32.1 $\pm$ 4.8 (20 - 46)		
Age group	< 35 years old	173	69.2
	$\geq$ 35 years old	77	30.8
Place of residence	Rural areas	97	38.8
	Urban areas	153	61.2
Occupation	Civil servant/public employee	76	30.4
	Self-employed	57	22.8
	Manual worker	52	20.8
	Other	65	26.0
Qualification	Secondary school or below	33	13.2
	High School	72	28.8
	Vocational/college	43	17.2
	Undergraduate or higher	102	40.8
Household Income	< 10 million VND/month	66	26.4
	10-30 million VND/month	153	61.2
	30-50 million VND/month	20	8.0
	> 50 million VND/month	11	4.4
Duration of marriage	< 1 year	10	4.0
	1-5 years	84	33.6
	5-10 years	70	28.0
	Over 10 years	86	34.4

## Ethical considerations:

The study protocol was approved by the Ethics Committee of Nam Dinh University of Nursing (Approval Certificate No. 716/GCN-HDDD, dated April 8, 2024) and received authorization from the Board of Directors of the Reproductive Support Center, Hospital of Post and Telecommunications. All participants were fully informed about the study purposes and procedures and provided written informed consent prior to participation.

The mean age of the study participants was  $32.1 \pm 4.8$  years (range: 20–46). The majority (69.2%) were under 35 years old. Most participants resided in urban areas (61.2%). Regarding occupation, civil servants/public employees accounted for the highest proportion (30.4%). In terms of education, the largest group had an undergraduate degree or higher (40.8%). The majority of households had a monthly income ranging from 10 to 30 million VND (61.2%). The proportion of participants married for more than 10 years (34.4%) was nearly equivalent to those married for 1–5 years (33.6%).

**Table 2. Medical history of patients (n = 250)**

Characteristic		n	%
Number of natural births	0	136	54.4
	1	54	21.6
	$\geq 2$	60	24.0
Number of children born through assisted reproductive technology (ART)	0	207	82.8
	1	36	14.4
	$\geq 2$	7	2.8
Duration of infertility treatment	< 1 year	7	2.8
	1 - 2 years	101	40.4
	3 - 4 years	53	21.2
	$\geq 5$ years	89	35.6
Causes of infertility	Female-related	80	32.0
	Male-related	23	9.2
	Both partners	38	15.2
	Unidentified	109	43.6
Number of hospital visits, consultations, follow-ups, procedures, and IVF cycles	< 10 times	141	56.4
	10 - 20 times	98	39.2
	> 20 times	11	4.4

The majority of participants had no natural births (54.4%), and 82.8% had not had children through assisted reproductive technology (ART). Regarding infertility treatment, most participants had been treated for 1–2 years (40.4%). The cause of infertility remained unidentified in 43.6% of cases, while female-related causes accounted for 32.0% and male-related causes for 9.2%. More than half of the participants (56.4%) had fewer than 10 hospital visits, consultations, follow-ups, or procedures, including IVF cycles.

**Table 3. Mean satisfaction score by aspect**

Aspect	Mean score
	(X ± SD)
Satisfaction with medical staff	6.31 ± 0.67
Information provided during IVF treatment	6.30 ± 0.68
Access to Care and Facilities	6.12 ± 0.87
<b>Overall mean satisfaction score</b>	<b>6.24 ± 0.70</b>

The results in Table 3 indicate that the mean satisfaction score in vitro fertilization (IVF) services at the Fertility Support Center was  $6.24 \pm 0.70$  out of 7 points. Among the aspects, satisfaction with medical staff had the highest mean score ( $6.31 \pm 0.67$ ), followed by satisfaction with the information provided during IVF treatment ( $6.30 \pm 0.68$ ). In contrast, satisfaction with access to care and facilities had the lowest mean score ( $6.12 \pm 0.87$ ).

**Table 4. Differences in patient satisfaction scores based on selected characteristics (n = 250)**

Characteristic	Group	Mean satisfaction score			p-value
		n	X	SD	
Occupation	Farmer + Manual worker	63	6.29	0.59	0.797 <sup>b</sup>
	Civil servant/ Public employee	111	6.25	0.72	
	Housewife + Self-employed + Other	76	6.24	0.76	
Monthly Income	< 10 million VND	66	6.35	0.62	0.013 <sup>b,*</sup>
	10 - 30 million VND	153	6.26	0.65	
	> 30 million VND	31	5.92	0.99	
Duration of marriage	< 5 years	94	6.23	0.71	0.800 <sup>a</sup>
	≥ 5 years	156	6.25	0.70	
Number of natural births	0	136	6.26	0.73	0.824 <sup>b</sup>
	1	54	6.23	0.69	
	≥ 2	60	6.20	0.66	
Number of children born through assisted reproductive technology	0	207	6.26	0.67	0.469 <sup>a</sup>
	≥ 1	43	6.17	0.85	

Characteristic	Group	Mean satisfaction score			p-value
		n	X	SD	
Duration of infertility treatment	< 1 year	7	6.56	0.56	0.291 <sup>b</sup>
	1 - 2 years	101	6.31	0.60	
	3 - 4 years	53	6.23	0.70	
	≥ 5 years	89	6.15	0.80	
Causes of infertility	Female-related	80	6.31	0.63	0.627 <sup>b</sup>
	Male-related	23	6.19	0.57	
	Both partners + Unidentified	147	6.21	0.76	
Number of hospital visits, consultations, follow-ups, procedures, and IVF cycles	< 10 times	141	6.30	0.72	0.204 <sup>b</sup>
	10 - 20 times	98	6.19	0.66	
	> 20 times	11	5.98	0.71	

<sup>a</sup>Independent Sample *t*-test; <sup>b</sup>One-way ANOVA; \**p* < 0.05

Table 4 demonstrates that there was a statistically significant difference in overall satisfaction scores among household income groups (*p* = 0.013). No statistically significant differences were found in the mean satisfaction scores among groups of occupation, marriage duration, number of natural-born children, number of children born via ART, as well as different infertility treatment histories (duration of treatment, cause, and number of hospital visits).

**Table 5. Correlation between selected factors to patient satisfaction (n = 250)**

Element	r	p
Age	-0.141	0.026*
Place of residence	0.001	0.990
Qualification	-0.108	0.088
Occupation	-0.043	0.500
Income	-0.158	0.013*
Duration of marriage	-0.012	0.852
Number of natural births	-0.032	0.616
Number of children born via ART	-0.065	0.308
Number of years of infertility treatment	-0.125	0.048*
Causes of infertility	-0.050	0.429
Number of hospital visits, consultations, follow-up visits, procedures, and IVF cycles	-0.147	0.020*

ART: Assisted Reproductive Technology;  
Note: Pearson correlation coefficient was used. \* $p$ -value < .05

Significant weak inverse correlations were observed between patient satisfaction and several factors: age ( $r = -0.141$ ,  $p = 0.026$ ), income ( $r = -0.158$ ,  $p = 0.013$ ), duration of infertility treatment ( $r = -0.125$ ,  $p = 0.048$ ), and number of hospital visits ( $r = -0.147$ ,  $p = 0.020$ ).

## DISCUSSION

The study findings indicate that the mean age of the patients was  $32.1 \pm 4.8$  years, with 69.2% being under 35 years old. This result is consistent with several domestic and international studies, such as the one by Dang Thi Mai Luong (2020)<sup>6</sup> (mean age of  $32 \pm 5.2$  years, with 29.4% over 35 years old) and Mona Rabeea Ahmed (2019)<sup>7</sup> (52.7% of participants were over 30 years old). These findings reflect the trend of seeking early infertility treatment in Vietnam and underscore the necessity of health education campaigns to raise awareness about reproductive health among adults.

Regarding educational qualification, 40.8% of patients had an undergraduate or postgraduate degree, which is consistent with the findings of Ngo Thi Yen (2018)<sup>8</sup> and Dang Thi Mai Luong (2020)<sup>6</sup>. A higher level of education enables patients to better understand the treatment process and adopt a more proactive attitude during care. In this study, the majority of patients were civil servants or public employees (30.4%), consistent with the results of Ngo Thi Yen (2018)<sup>8</sup>. This suggests that individuals in stable occupations may have greater financial capacity and more flexible schedules to undergo IVF treatment. Most patients reported a monthly family income between 10–30 million

VND (61.2%), which is comparable to the average household income in major cities in Vietnam. In contrast, the study by Ngo Thi Yen (2018)<sup>8</sup> found a high proportion of patients earning less than 5 million VND per month, highlighting regional disparities in economic conditions and differences in the ability to afford IVF treatment.

The proportion of patients married for more than 10 years (34.4%) was approximately equal to those married for 1–5 years (33.6%). This figure is higher than that reported by Dang Thi Mai Luong (2020)<sup>6</sup> (23.2% married over 10 years) and Mona Rabeea Ahmed (2019)<sup>7</sup> (24% married over 10 years). This indicates a significant subgroup of patients with a long-standing desire for children without success, emphasizing the need for prioritized access to timely and effective assisted reproductive services.

A significant proportion of the study cohort (54.4%) had no prior natural births (Table 2), aligning with findings by Limor Dina Gonen<sup>5</sup> (78.87%). This highlights a key characteristic of the IVF patient population—most are childless and face prolonged procreational pressure, underscoring the necessity for integrated psychological support interventions throughout treatment. Furthermore, most patients (82.8%) had no children born via ART, a rate higher than that reported by Limor Dina Gonen<sup>5</sup> (69.35%), indicating that the majority in this study were likely first-time users of IVF services at the center.

Regarding treatment history, 40.4% of patients had undergone infertility treatment for 1–2 years, while a substantial proportion (35.6%) had been in treatment for  $\geq 5$  years. This distribution differs from other studies: Dang Thi Mai Luong (2020)<sup>6</sup> reported that 93% of patients were treated for 1–5 years, and Limor Dina Gonen (2016)<sup>5</sup> noted

only 1.61% beyond 5 years. The higher rate of long-term treatment ( $\geq 5$  years) in our sample may be attributed to delays in referral or financial barriers. In terms of etiology, unidentified causes constituted the largest group (43.6%), consistent with Dang Thi Mai Luong <sup>6</sup> (2020) (40.3%) but considerably higher than in Limor Dina Gonen <sup>5</sup> (2016) (22.58%). This divergence may reflect differences in diagnostic practices, genetic factors, or etiological patterns of infertility within the Vietnamese population compared to other cohorts.

Regarding satisfaction levels, patients reported the highest satisfaction with medical staff ( $6.31 \pm 0.67$  out of 7), followed by the information provided about treatment ( $6.30 \pm 0.68$ ). The lowest satisfaction score was observed for infrastructure conditions ( $6.12 \pm 0.87$ ). These findings are consistent with the study by Dang Thi Mai Luong <sup>6</sup> (2020), which, despite using a different measurement scale (a 5-point Likert scale), also reported the highest satisfaction with medical staff (4.4 points) and the lowest with infrastructure conditions (4.1 points). This consistency across studies highlights a common area requiring improvement: physical infrastructure. Enhancing clinical spaces, waiting areas, and medical equipment is essential to improving the overall patient experience.

Regarding factors associated with satisfaction, age, income, duration of infertility treatment, and number of follow-up visits all demonstrated weak negative correlations with satisfaction levels. Among these, income and the number of follow-up visits showed the strongest associations. This finding is consistent with the results of Limor Dina Gonen <sup>5</sup> (2016), which indicated that patients with higher incomes tend to have higher expectations, leading to lower satisfaction. In contrast, the study by

Naskhanym Chausheva <sup>9</sup> (2023) reported higher satisfaction among patients aged  $\geq 35$  years and lower satisfaction among those with lower incomes regarding their IVF treatment, which differs from our results. These divergent findings may be explained by variations in cultural contexts, expectation levels, and healthcare delivery models across countries. Linear regression analysis revealed that the model explained only 5.3% of the variance in satisfaction, a modest proportion, suggesting that many influencing factors remain unexamined. Future research should explore additional determinants, such as patient expectations, psychological experiences, family support, and broader sociocultural characteristics, to provide a more comprehensive understanding of patient satisfaction.

However, this study has certain limitations. The data were collected at a single time point during IVF treatment, specifically at the embryo transfer stage. Therefore, the findings may not comprehensively reflect patient satisfaction across the entire treatment process, from pre-treatment consultations to post-treatment stages such as after  $\beta$ -hCG testing or childbirth. Future research assessing satisfaction at multiple stages of the treatment journey would allow for a more comprehensive evaluation of the service quality and patient experience at the Reproductive Support Center, Hospital of Post and Telecommunications.

## CONCLUSION

Patient satisfaction with in vitro fertilization (IVF) services at the Reproductive Support Center, Hospital of Post and Telecommunications was generally high. However, several aspects require improvement, particularly waiting times and facility conditions. The analysis of associated factors revealed weak negative correlations between satisfaction levels and

patient age, income, duration of infertility treatment, and number of follow-up visits. These findings suggest that although overall satisfaction was high, patients with higher incomes or those undergoing long-term treatment tend to have greater expectations, which may consequently reduce their satisfaction. Moreover, the results highlight the psychological pressure and financial burden faced by patients undergoing prolonged infertility treatment.

### RECOMMENDATIONS

Based on the study findings, several recommendations are proposed. First, targeted investments should be made to upgrade the physical infrastructure of the Reproductive Support Center, Hospital of Post and Telecommunications, in order to create a modern and patient-friendly treatment environment that enhances overall satisfaction. Second, counseling protocols, follow-up procedures, and psychological support services should be strengthened to reduce the psychological burden on patients, particularly those undergoing long-term treatment. Finally, additional longitudinal studies are needed to provide a more comprehensive evaluation of patient satisfaction and the effectiveness of IVF services across different stages of the treatment process, thereby generating robust evidence to inform policies supporting infertility treatment.

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