

*Original article*

**Anxiety, Depression and Some Related Factors in Infertile Couples Being Treated at a Provincial Reproductive Health Care Center, in the South of Vietnam**

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**Abstract:**

**Objective:** Infertile couples experienced a tremendous amount of emotional turmoil as the result of their diagnosis and have struggled to conceive, leading to an increased risk of anxiety and depression. In Vietnam, few authors mention anxiety and depression in couples undergoing infertility treatment, especially in rural areas where the qualification and technology in infertility treatment is limited than specialized hospitals in big cities. This study was conducted to determine the prevalence of anxiety and depression in couples undergoing infertility treatment and some related factors. **Materials and methods:**

The descriptive cross-sectional study was carried out from November 2020 to May 2021. The study subjects included 385 couples (385 wives and 385 husbands) who came for infertility examination and treatment at the Department of Reproductive Health Care, Center for Disease Control (CDC) of KienGiang Province. The Vietnamese version of the DASS 21 scale was used to measure anxiety and depression through face-to-face interviews with a structured set of questions. Participants were also asked about demographics, socioeconomic status, infertility-related characteristics, and family relationships.

**Results and Discussion:** The prevalence of anxiety among wives is higher than that of husbands (46.2% and 33.3%), similarly the prevalence of depression among wives (17.7%) is also higher than that of husbands (10.06%). Most couples have mild or moderate anxiety disorders, the same goes for depression. In husbands, there is a factor related to anxiety that is living separately (i.e. the couple does not live with their parents in the same house) and there are 2 factors related to depression which are living separately and family economic conditions. Among the wives, more factors were found to be associated with anxiety and depression, including age, living separately, family economic conditions and duration of infertility.

**Conclusion:** The prevalence of anxiety and depression among infertile couples in the rural province of the South, Vietnam is high. Although most anxiety and depression levels are mild or moderate, emotional and mental support must be integrated with clinical support is really necessary, helping to improve the patient's quality of life and indirectly improve the effectiveness of infertility treatment.

**Keywords:** anxiety; depression, infertile couples; reproductive health.

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**Introduction:**

Infertility is a disease of the male or female reproductive system defined by the failure to achieve a pregnancy after 12 months or more of regular unprotected sexual intercourse.<sup>1,2</sup> According to Centers for Disease Control and Prevention data, infertility affected 6.7% of women of reproductive

age between 2011–2015.<sup>3</sup> However, in a more recent study, the number was almost twice as high, at 12.5% in women aged 20–44 years in the United States.<sup>4</sup> Although infertility is common and designated as a “disease” by the World Health Organization, a significant proportion of patients do not or cannot approach treatment services.<sup>5</sup> Infertility is one of the

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personal and social problems affecting couples' lives and family functioning.<sup>6,7</sup> Researchers report that infertility is associated with experiences of stress, health problems, diffident, feelings of resentment, depression, feeling guilty, disappointed and marital problems.<sup>8</sup> Infertile couples experienced a tremendous amount of emotional turmoil as the result of their diagnosis and have struggled to conceive, leading to an increased risk of anxiety and depression.<sup>7</sup> Many studies have shown that anxiety and depression are the most common reactions in infertile couples.<sup>9</sup>

In Vietnam, a few studies have mentioned anxiety and depression in infertile women<sup>10,11</sup> or infertile couples,<sup>12</sup> all of these studies are carried out at big hospitals in Vietnam (Tu Du Hospital, Hue University Hospital and some big hospitals in big cities such as Hanoi, Da Nang, Ho Chi Minh City). Researchers rarely mention anxiety and depression in couples who receive infertility treatment at reproductive health care facilities in rural areas where the qualification and technology in infertility treatment is limited than specialized hospitals in big cities.<sup>13,14</sup> It is important to have knowledgeable about the impact of infertility on psychological health for infertile couples in Vietnam and its correlates.

Therefore, we performed a study in order to estimate the prevalence of anxiety and depression among infertile couples and identify some factors related to anxiety and depression of this group of patients.

## Methods:

### *Research Design and Study Participants*

This study used a cross-sectional design. We conducted a survey of 385 couples (including 355 wives and 355 husbands) who came for infertility examination and treatment at the Department of Reproductive Health Care of the CDC of KienGiang Province, since November 2020 to May 2021. Infertility is defined as failure to achieve a clinical pregnancy after 12 months or more of regular unprotected sexual intercourse.<sup>1</sup> Our research subjects included both primary and secondary infertility. Primary infertility is infertility occurring in a couple who have never had a child. Secondary infertility is failure to conceive following a previous pregnancy. We excluded patients who did not meet the diagnostic criteria for infertility, such as breastfeeding or postpartum amenorrhea. We also excluded patients who did not agree to participate in the study.

### *Measurements / Instrument*

Data on the demographic, socioeconomic and infertility characteristics of the participants were collected using a structured questionnaire. More details on measuring these characteristics are provided in the supplementary material.

The Depression, Anxiety, and Stress Scale-21 (DASS-21) was used to measure psychological disorders in this study. The 21-item Vietnamese version of DASS-42 has been endorsed by Tran et al.<sup>15</sup> We only used 14 questions to assess anxiety and depression without mentioning stress. The depression subscale assesses dysphoria, hopelessness, devaluation of life, self-deprecation, lack of interest / involvement, anhedonia, and inertia. The anxiety subscale assesses autonomic arousal, skeletal muscle effects, situation anxiety, and subjective experience of anxious affect. The score of each item can range from 0 (no symptomatology) to 3 (severe symptomatology). The total depression, anxiety and stress scores are calculated by summing the scores of all items from each subscale; these scores are then doubled to match the diagnostic threshold of the DASS-42. Classification of anxiety and depression levels according to the cut-off points as shown in Table 1.

**Table 1. Classification of anxiety and depression**

Level	Anxiety	Depression
Normal	0-7 points	0-9 points
Mild	8-9 points	10-13 points
Moderate	10-14 points	14-20 points
Severe	15-19 points	21-27 points
Very severe	≥ 20 points	≥ 28 points

Having an anxiety disorder was defined when the anxiety component score was  $\geq 8$  points and having a depressive disorder was defined when the depressive component score of the scale was  $\geq 10$  points.

### *Data Collection*

The data collection procedure included the following three steps:

Step 1: Questionnaire testing (Pilot study). Pilot interviews were conducted with 10 infertile couples, and several questions were then reworded to ensure better comprehensibility and appropriateness with the local context. The pilot study was also aimed to make research staff familiar with the study procedure. Information obtained from the pilot study were not included in the data of the main study. 4 medical staff are working at the Department of Reproductive Health Care were recruited as research assistants and were trained in the study procedure and ethical

conduct of research to conduct interviews both in the pilot study and in the main survey.

Step 2: Participants recruitment. At the Clinic of Infertility, once a female patient was confirmed as having infertility by the attending physician, she would be invited to participate in the study.

Step 3: Conducting interviews. Eligible participants would be informed of the study purpose, procedures, and related risks and benefits. Written informed consent was obtained from all participants who agreed to participate in the study. Once the consent form was signed, the principal investigator would invite the patient to a private room within the same Department for an interview, so that privacy and confidentiality would be ensured. Participation is voluntary and participants can stop the interview at any time or refuse to answer any questions if uncomfortable without facing any adverse effects. The interview was conducted separately between husband and wife.

During each interview, the interviewer asked participants questions in a structured questionnaire, which included several questions about demographic and socioeconomic characteristics and 14 questions for 2 components are anxiety and depression of the DASS 21 scale. If DASS 21 results suggest a diagnosis of depression, the patient is referred to a reputable mental health facility. Each interview lasted an average of 20-30 minutes.

### **Data Analysis**

Demographic variables were identified and collected, including:

- Age: a quantitative variable, calculated in calendar years, by subtracting the year of birth from 2021.
- Education level: identifier variable, divided into 4 levels including primary school and below, junior high school, high school and after high school.
- Occupation: variable identifier, classified into 6 groups as office staff, farmers, workers, trading business, housewives, other occupations.
- Family economic conditions: variable identifier, includes two groups, normal and well-off, determined based on the patient's subjective assessment.

- Living alone: variable has 2 values including living separately with parents and living with parents.
- Duration of infertility: quantitative variable, average by calendar month, standard deviation, shortest time and longest time.
- Type of infertility: the variable has 2 values: primary infertility and secondary infertility.

Data was analyzed using STATA 20.0. Distribution of variables were examined using descriptive analyses. Mean and standard deviation were reported for continuous variables, and frequency and proportion were reported for categorical variables. To identify factors associated with depressive symptoms, multiple binary logistic regression was used. Bivariate logistic regression analyses were conducted first. All independent variables that had a P-value of 0.25 or smaller in bivariate analyses would be included in the multivariable logistic regression model. Adjusted Odds Ratios (AOR) and their 95% confidence intervals were reported.

### **Ethical Clearance:**

This study was warranted for ethical issues in biomedical research in accordance with the Declaration of Helsinki. The study was authorized by the CDC of KienGiang province (Dispatch No. 3645/QD-TTYT) and approved by the Ethics Council in Biomedical Research Thang Long University (Dispatch No.: 182/ TL-HD).

### **Results:**

Table 2 shows that the mean age of both husbands and wives is  $32.7 \pm 5.0$  years, it is compared that the average age of the wives is about 2 years younger than the husbands and the education level is also lower than when the rate of education level below high school is 43.4% while among the husbands it is 37.6%. For occupation, the results show that wives are office workers (27.3%) more than husbands (23.4%), but conversely, the rate of wives are workers (11.2%) or trading business (34.5%) are lower than husbands (16.9% and 51.4% respectively), with 18.4% of wives are housewife while only 2.1% of husbands are housewives, other occupational groups do not seem to have a significant difference between husbands and wives, in summary there is a difference in occupational characteristics between wives and husband ( $p < 0.001$ ).

**Table 2.** Some demographic characteristics and duration of infertility of couples

Characteristics	Wives	Husbands	Both		p
			husbands	and wives	
Age in years(M ± SD)	31.7 ± 4.7	33.7 ± 5.3	32.7 ± 5.0		<0.05
<b>Educational level(n, (%))</b>					
Primary school (grade 1–5)	47 (12.2)	34 (8.8)	81 (10.5)		
Junior high school (grade 6–9)	120 (31.2)	111 (28.8)	231 (30.0)		<0.05
High school	102 (26.5)	132 (34.3)	234 (30.4)		
After high school	116 (30.1)	108 (28.1)	224 (29.1)		
<b>Occupation(n, (%))</b>					
Office staff	105 (27.3)	90 (23.4)	195 (25.3)		
Farmer	22 (5.7)	18 (4.7)	40 (5.2)		
Worker	43 (11.2)	65 (16.9)	108 (14.0)		
Trading business	133 (34.5)	198 (51.4)	331 (43.0)		<0.001
Housewife	71 (18.4)	8 (2.1)	79 (10.3)		
Other occupational	11 (2.9)	6 (1.6)	17 (2.2)		
<b>Family economic conditions (n, (%))</b>					
Normal	-	-	146 (37.9)		-
Well-off	-	-	239 (62.1)		
<b>Living separately(n, (%))</b>					
No	-	-	111 (28.8)		-
Yes	-	-	274 (71.2)		
<b>Duration of infertility (month) (M±SD)</b>			44.9 ± 9.1		-
<b>Classification of infertility (n, (%))</b>					
Primary infertility	-	-	198 (51.4)		-
Secondary infertility	-	-	187 (48.6)		

M: Mean; SD: Standard Deviation

All infertile couples in the study were not from poor/near-poor households, in which the well-off households (62.%) were much higher than those in the normal household (37.9%).The majority of couples live separately with 71.2% but still 28.8% of the couples live with their parents in the same house (most are with the husband’s parents and a few are with the wife’s parents). The average time to experience infertility of couples was 44.9 ± 9.1 (months), the shortest was 18 months and the longest was 63 (months). We also recorded infertile couples in which more than half of the spouses or both had

primary infertility (51.4%).

**Table 3.** Anxiety and depression in infertile couples

Anxiety, depression	Wives		Husbands		p
	n	%	n	%	
Anxiety					
No disorder	207	53.8	256	66.5	
Mild	159	41.3	117	30.4	0.002
Moderate	17	4.4	12	3.1	
Severe	2	0.5	0	0.0	
Depression					
Mild	317	82.3	344	89.4	
Moderate	66	17.1	41	10.6	0.010
Severe	2	0.5	0	0.0	
Mild	0	0.0	0	0.0	

As shown in Table 3, the prevalence of anxiety disorders among infertile wives and husbands was 46.2% and 33.5%, respectively. Mild (41.3%) and moderate (4.4%) anxiety was higher among wives than husbands (mild 30.4% and moderate 3.1%), severe anxiety only occurred in wives with 0.5%. The difference in the prevalence of anxiety disorders in the group of wives compared with the group of husbands was statistically significant (p=0.002). The prevalence of depressive disorder was higher among wives than husbands (17.6% versus 10.6%). There were only 2 cases of the wife with moderate depression (0.5%) and no cases of severe depression. The difference in the prevalence of depressive disorder in wives compared with husbands is statistically significant (p=0.010).

**Table 4.** Some factors related to anxiety and depression disorders in infertile wives through logistic regression

Factors	Anxiety disorders		AOR(95%CI)	p
	Yes (n, (%))	No (n, (%))		
<b>Age</b>				
< 35 age	99 (37.2)	167 (62.8)	1	
≥ 35 age	79 (66.4)	40 (33.6)	2.36 (1.45 – 3.84)	0.001
<b>Family economic conditions</b>				
Normal	48 (35.6)	87 (64.4)	1	
Well-off	130 (52.0)	120 (48.0)	1.33 (0.83 – 2.13)	0.241
<b>Living separately</b>				
No	21 (21.4)	77 (78.6)	1	
Yes	157 (54.7)	130 (45.3)	3.75 (2.15 – 6.56)	<0.001

Factors	Anxiety disorders		AOR(95%CI)	p
	Yes (n, (%))	No (n, (%))		
<b>Duration of infertility</b>				
< 45 months	69 (37.3)	116 (62.7)	1	
≥ 45 months	109 (54.5)	91(45.5)	1.75 (1.12 – 2.72)	0.014
Factors	Depressive disorder		AOR(95%CI)	p
	Yes (n, (%))	No (n, (%))		
<b>Age</b>				
< 35 age	53 (26.5)	147 (73.5)	1	
≥ 35 age	76 (41.1)	109 (58.9)	1.10 (0.61 – 1.97)	0.751
<b>Family economic conditions</b>				
Normal	34 (24.5)	105 (75.5)	1	
Well-off	95 (38.6)	151 (61.4)	2.23 (1.15 – 4.34)	0.018
<b>Living separately</b>				
No	17 (18.9)	73 (81.1)	1	
Yes	112 (38.0)	183 (62.0)	2.16 (1.01 – 4.62)	0.049
<b>Duration of infertility</b>				
< 45 months	53 (28.6)	132 (71.4)	1	
≥ 45 months	76 (38.0)	124 (62.0)	1.63 (0.96 – 2.87)	0.091

*AOR: adjusted odds ratio*

Multivariate logistic regression analysis (table 4) showed that the prevalence of anxiety in wives 35 years old was higher than in the group under 35 years old (OR=2.36; 95%CI: 1.45 – 3.84; p=0.001), in the group living separately was higher than in the group living with the same parents (OR= 3.75; 95% CI: 2.15 – 6.56; p < 0.05) and in the group of infertility duration ≥ 45 months is higher than the group of infertility duration < 45 months (OR=1.75; 95%CI: 1.12 – 2.72; p<0.05). For depressive disorder, this study found that age group and duration of infertility were not statistically significant with depressive disorder in infertile wives, instead, the prevalence of depressive disorder in the group with good family economic conditions is higher than in the group with normal family economic conditions (OR=2.23; 95%CI: 1.15 – 4.34; p<0.05) and higher in the group living separately than in the group living with parents (OR=2.16; 95%CI: 1.01 – 4.62; p<0.05).

Unlike wives, multivariate logistic regression analysis (Table 5) shows that the prevalence of

anxiety disorders in husbands is related only to living separately or living with parents, the prevalence of anxiety disorders in the group of living separately is higher than the group living with parents (OR=2.20; 95%CI: 1.20 – 4.01; p<0.010). However, the factors associated with depressive disorder were relatively similar in the wives. Specifically, the prevalence of depressive disorder among husbands with well-off family economic conditions was higher than in the normal family economic conditions group (OR=2.58; 95%CI: 1.02 – 6.52; p=0.045) and in the group living separately was higher than in the group living with parents (OR=4.74; 95%CI: 1.09 – 20.49; p=0.037), the prevalence of depressive disorder did not differ statistically by age group or duration of infertility (p>0.05).

### Discussion:

The mean age of the wives is 31.7 ± 4.7 years old and that of the husbands is 33.7 ± 5.3 years old, this result is similar to some studies in Vietnam, the common age is from 30 to 35 years old and the husbands are also older than the wives.<sup>10,11</sup> Our study also shows that 51.4% of couples with primary infertility, more than the UNFPA study on reproductive health in Vietnam, the rate of primary infertility is 33.6% and the secondary is 66.4%.<sup>16</sup> This difference may be due to the influence of the study location, because this study was conducted in a rural province and the sample size was smaller, while the UNFPA study was conducted nationwide and the sample size was larger.

This study has provided important evidence on the prevalence of anxiety and depressive disorder among infertile couples in rural South, Vietnam. From our study, the prevalence of anxiety and depressive disorder in infertile couples is higher than the prevalence of anxiety and depressive disorder in the general population of Vietnam.<sup>15,17,18</sup> In studies in different regions, in infertile couples, psychological stress in both husbands and wives is higher than in the control group.<sup>19</sup> Among infertile couples from this study, the prevalence of anxiety and depressive disorder is high: the prevalence of anxiety disorder in the wives and husbands is 46.2% and 33.5%, respectively, while the rate of depressive disorder in wives is higher than in husbands (17.6% vs. 10.6%). However, unlike the survey conducted by Ho, T.T.T. et al on infertile couples at Hue University Hospital,<sup>12</sup> the severity of most of these disorders is mild to moderate. Especially, we found that wives experience heavier psychological pressure than husbands. Because Vietnamese women often

**Table 5.** Some factors related to anxiety and depression disorders in infertile husbands through logistic regression

Factors	Anxiety disorders		AOR(95%CI)	p
	Yes (n, (%))	No (n, (%))		
<b>Age</b>				
< 35 age	53 (26.5)	147 (73.5)	1	
≥ 35 age	76 (41.1)	109 (58.9)	1.34 (0.83 – 2.17)	0.229
<b>Family economic conditions</b>				
Normal	34 (24.5)	105 (75.5)	1	
Well-off	95 (38.6)	151 (61.4)	1.52 (0.93 – 2.50)	0.099
<b>Living separately</b>				
No	17 (18.9)	73 (81.1)	1	
Yes	112 (38.0)	183 (62.0)	2.20 (1.20 – 4.01)	<0.010
<b>Duration of infertility</b>				
< 45 months	53 (28.6)	132 (71.4)	1	
≥ 45 months	76 (38.0)	124 (62.0)	1.36 (0.87 – 2.14)	0.178
Factors	Depressive disorder		AOR(95%CI)	p
	Yes (n, (%))	No (n, (%))		
<b>Age</b>				
< 35 age	12 (6.0)	188 (94.0)	1	
≥ 35 age	29 (15.7)	156 (84.3)	1.81 (0.84 – 3.89)	0.125
<b>Family economic conditions</b>				
Normal	6 (4.3)	133 (95.7)	1	
Well-off	35 (14.2)	211 (85.8)	2.58 (1.02 – 6.52)	0.045
<b>Living separately</b>				
No	2 (2.2)	88 (97.8)	1	
Yes	39 (13.2)	256 (86.8)	4.74 (1.09 – 20.49)	0.037
<b>Duration of infertility</b>				
< 45 months	17 (9.2)	168 (90.8)	1	
≥ 45 months	24 (12.0)	176 (88.0)	1.06 (0.53 – 2.13)	0.865

AOR: adjusted odds ratio

experience higher mental suffering than men, and women's ability to cope with mental suffering is lower than that of men.<sup>20</sup> Among couples with infertility, psychological burden was associated with a common reason for marriage - having children.<sup>12</sup> This is considered a necessary criterion not only for achieving personal satisfaction but also social acceptance. When facing infertility, couples are likely to have negative emotional responses, such as feelings of defectiveness, incompetence, loss, and disappointment. They also may experience stigma and pressure from family members and the people around them and worry about old age without children. In addition, the process of diagnosis and infertility treatment increases psychological

pressure.<sup>21,22</sup> If depression and anxiety are chronic, it can negatively affect treatment,<sup>19</sup> Therefore, infertile couples need psychological support to deal with mental problems. Mental and emotional support must be integrated with clinical support. Obstetricians should consider that minimizing mental and social problems can lead to increased patient satisfaction and increased likelihood of successful treatment.<sup>7</sup>

This study provides useful insight of correlates of anxiety and depressive disorder among infertile couples. We found that in husbands, there is one factor related to anxiety disorder, which is living separately (not living with parents in the same house) and there are 2 factors related to depressive disorder: family economic conditions and living separately.

Meanwhile, in wives, more factors were found to be associated with anxiety and depressive disorder such as age, living separately, family economic conditions and duration of infertility. This finding is consistent with previous studies conducted in other countries that have confirmed that age is associated with rates of anxiety and depressive disorder in infertile women.<sup>23</sup>The longer the duration of infertility, the greater the risk of anxiety and depressive disorder in women,<sup>24</sup>economic conditions and the cost of infertility treatment exacerbate anxiety and depression in both sexes.<sup>25</sup>One thing worth noting in this study is that living separately is associated with anxiety and depression in both wives and husbands, while many previous studies did not mention it. When living separately, only the husband and wife, therefore, lack of sharing and encouragement from family members, so it is easy to lead to anxiety and anxiety can “spread” from wife to husband or opposite. This psychological transmission back and forth easily leads to more severe anxiety and depression. This shows that when providing psychological care for infertile couples, more attention should be paid to couples who do not live with other family members.

Several limitations should be taken into consideration when interpreting the findings of our study. First, due to the cross-sectional design, causal relationships could not be established between depression and independent variables. Second, the data of the study were collected from one health facility, hence the findings cannot be generalized to the population of infertile couples of the whole country. However, surveying a provincial health facility in a rural province, Southern Vietnam, the study provided important evidence on mental health in infertile couples in rural areas of Vietnam, the result can be a good reference for other localities in the region.

### **Conclusion:**

In summary, our study provides evidence on anxiety and depression levels of a sample of infertile couples in a rural province of Vietnam and its correlations. The prevalence of anxiety among wives is higher than that of husbands (46.2% and 33.3%), similarly the prevalence of depression among wives (17.7%) is also higher than that of husbands (10.06%). Most couples have mild or moderate anxiety disorders, the same goes for depression. In husbands, there is a factor related to anxiety that is living separately (i.e. the couple does not live with their parents in the same house) and there are 2 factors related to depression which are living

separately and family economic conditions. Among the wives, more factors were found to be associated with anxiety and depression, including age, living separately, family economic conditions and duration of infertility. Research results show the need to screen for anxiety and depressive disorders and emotional support in couples seeking infertility treatment. Attention should be paid to the characteristics associated with anxiety and depressive disorders, including age >35 years, well-off family, living separately and experiencing long duration of infertility.

### **List of Abbreviations**

AOR Adjusted Odds Ratios

### **Human and Animal Rights**

This study was warranted for ethical issues in biomedical research in accordance with the Declaration of Helsinki.

### **Research Involving Plants**

Not applicable.

### **Consent for Publication**

Not applicable.

### **Availability of Data and Materials**

Data are available upon request to the corresponding author.

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### **Conflict of Interest**

The authors report no conflicts of interest in this work.

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### **Authorship**

All authors made substantial contributions to conception and design, acquisition of data, or analysis and interpretation of data; took part in drafting the article or revising it critically for important intellectual content; gave final approval of the version to be published; and agree to be accountable for all aspects of the work.

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