

# Analysis of Related Factors of Coping Styles in Infertile Patients in Central China

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**Objective:** To investigate the psychosocial factors, including personality characteristics, coping style, social support and alexithymia of infertile patients, and explore the relevant factors regarding the medical coping style choice of infertile patients in central China.

**Methods:** Sixty infertile patients in the reproductive medicine centre in our hospital were investigated using a self-made general situation questionnaire; internal control, powerful others and opportunities scale; social support rating scale; and medical coping questionnaire, and the data was analysed.

**Results:** Of the 60 infertile patients, 57 (95%) were female, with an average age of  $27.85 \pm 14.52$  years old, and 42 (70%) had secondary infertility. The score of the face dimension was lower than the norm ( $19.17 \pm 2.18$  vs  $19.43 \pm 3.82$ ,  $P = 0.012$ ), and those of the avoidance ( $15.98 \pm 2.43$  vs  $14.41 \pm 2.94$ ,  $P = 0.030$ ) and yield ( $9.48 \pm 3.19$  vs  $8.83 \pm 3.19$ ,  $P = 0.012$ ) dimensions were higher than the norm. The multiple linear regression analysis showed that internal control and the utilisation of support were influencing factors for the coping style ( $R^2 = 0.271$ , adjusted  $R^2 = 0.144$ ,  $F = 9.827$ ,  $P < 0.001$ ), and internal control was the influencing factor for the avoidance coping style ( $R^2 = 0.024$ , adjusted  $R^2 = 0.021$ ,  $F = 3.363$ ,  $P = 0.014$ ). The education level, opportunity and utilisation of support factors influenced the yield dimension ( $R^2 = 0.087$ , adjusted  $R^2 = 0.076$ ,  $F = 7.749$ ,  $P < 0.001$ ).

**Conclusion:** Considering the association between the coping styles and psychosocial factors, it was recommended to formulate targeted intervention strategies based on these influencing factors to guide patients to adopt positive coping styles and achieve good outcomes.

**Keywords:** infertility, coping style, psychosocial factors, relevance

## Introduction

Infertility refers to the situation when couples who have had sex for at least 12 months without contraception do not become pregnant. It is a group of fertility disorders with various causes and is an adverse reproductive health event for couples of childbearing age.<sup>1</sup> Infertility refers to fertility problems of couples of childbearing age in various countries and regions across the world. Recently, the prevalence of infertility has increased significantly due to environmental pollution.<sup>2</sup> It is reported that an average of 15% of couples are infertile.<sup>3</sup> The incidence rate of infertility is 8–33% in the United States, 13.2% in Iran<sup>4</sup> and approximately 7–10% in China.<sup>1</sup> Previous studies have shown that the age of Chinese infertile patients is between 25 to 30 years old, which shows a younger trend.<sup>5</sup>

Infertility is a reproductive health defect, and more than 80% of infertile couples bear great psychological pressure, especially infertile women.<sup>6,7</sup> Infertile women in China often feel inferior and crowded due to the influence of China's traditional culture.<sup>4</sup> In addition, the heavy economic burden of infertility, complex treatment process and uncertainty of treatment lead to poor mental health. Continuous psychological stress leads to not only a series of psychological problems, such as long-term depression, anxiety, paranoia and interpersonal sensitivity<sup>8,9</sup> but also the decline of marital life quality, changes in sexual life and reduced pregnancy and childbirth rates.<sup>1</sup> Therefore, increasing scholars suggest that medical workers should pay attention to the psychological pressure and emotional response of infertile women.<sup>10</sup>

Therefore, the purpose of this study is to investigate the current situation regarding the medical coping style choice of infertile patients and explore whether the psychological locus of control and social support have an impact on the choice

of coping style. This will provide a theoretical basis for improving patients' psychological elasticity and guiding them to adopt a positive coping style.

## Methods

### Participants

Sixty infertile patients who were treated in the reproductive medicine centre of our hospital from September 2021 to November 2021 were selected as the research subjects. This study was conducted in accordance with the Declaration of Helsinki and approved by the ethics committee of The First Affiliated Hospital of Henan University of Chinese Medicine. All patients agreed to participate in this study. The inclusion criteria are as follows: (1) meet the WHO diagnostic criteria for infertility;<sup>11</sup> (2) aged between 20–40 years old; (3) the ability to read and fill in by yourself; and (4) voluntary participation in the survey. The exclusion criteria are as follows: (1) those who refuse to cooperate after the researcher explains the study; (2) cognitive and communication barriers; (3) patients with other severe diseases; and (4) those who have experienced major life events during the past six months. Sixty infertile patients were investigated using a general questionnaire; internal control, powerful others and opportunities scale; social support rating scale (SSRs); and medical coping questionnaire.

### Research Methods

The cross-sectional survey method was adopted to select the survey objects using convenient sampling to explain the research purpose, methods and confidentiality principles to them, issue the questionnaire after consent and enable them to fill in it alone and return it after 20 minutes.

(1) General information questionnaire: This was prepared by the researcher and included gender, education level, family residence type, education level, infertility type and treatment time. Due to the uncertainty and complexity of the specific causes of infertility, we divided the patients into primary infertility and secondary infertility groups.

(2) Internal control, powerful others and chance scale (IPC): this scale was compiled by Levenson in 1972 and consists of the following three subscales: the internal control scale (I), which measures the extent to which people can control their own lives; the influential others scale (P), which tests whether individuals believe that others can control events in their lives; and the opportunity scale (C), which measures the individual's belief that opportunities can affect their own life experiences and things. The IPC scale is widely used in the field of psychology in China and has been proved to have good reliability and validity.<sup>12</sup>

(3) SSRs: This was designed by Xiao Shuiyuan in 1986 according to China's national conditions. The scale is comprehensively evaluated from the following three dimensions: subjective support, objective support and utilisation of social support. The score shows the level of individual social support. The scale is widely used in social support-related studies in China, and the scale has been confirmed to have good reliability and validity.<sup>13</sup>

(4) Medical coping modes questionnaire: This questionnaire was prepared by Feifel et al, and the Chinese version was revised by Jiang Qianjin et al. It includes the following three dimensions: face, avoidance and yield, with a total of 20 items. Each item is scored according to levels 1–4, of which eight items are scored in reverse. The higher the cumulative score of each dimension, the more inclined the dimension is to this coping style. The reliability and validity of the revised Chinese version of the scale are acceptable and suitable for the evaluation of Chinese patients.<sup>14</sup>

### Statistical Analysis

After the questionnaire was collected, the scores of each scale and dimension were calculated, and all the steps were checked by two people. The data was presented as descriptive statistics using SPSS 26.0, and a *t*-test was used for intergroup comparisons and expressed as mean  $\pm$  standard deviation ( $\bar{x} \pm s$ ). A single factor analysis was used for general data; a Pearson correlation analysis was used between the dimensions of the questionnaire; the statistically significant variables of the single factor analysis and correlation analysis were used as independent variables; and the dimensions of the medical coping questionnaire were used as dependent variables for the multiple linear stepwise regression analysis.

## Results

After 60 questionnaires were distributed, 60 questionnaires were recovered, and zero invalid questionnaires were excluded. There were 60 valid questionnaires in total, and the effective questionnaire rate was 100%.

### Basic Data of 60 Infertile Patients

The basic data of 60 infertile patients are shown in Table 1. Most patients were female (95%) and had a college or undergraduate degree (56.67%). Secondary infertility was the main type of infertility (70%) in the population, with a range of treatment times.

### Scores of Each Dimension of the Medical Coping Scale and Comparison with Norm

Compared to the norm, there was a significant difference in the face ( $19.17 \pm 2.18$  vs  $19.43 \pm 3.82$ ), avoidance ( $15.98 \pm 2.43$  vs  $14.41 \pm 2.94$ ) and yield ( $9.48 \pm 3.19$  vs  $8.83 \pm 3.19$ ) dimensions in the medical coping scale ( $P < 0.05$  for all) (see Table 2 for the specific results).

### Total Score and Each Dimension Score of the Internal Control, Powerful Others and Opportunities Scale and SSRs

For the 60 infertile patients, the overall scores of the internal control, powerful others and opportunities scale, social support assessment scale, each dimension and the items of each dimension are shown in Table 3.

**Table 1** Basic Data of Infertile Patients

Project	Case (n)	Percentage (%)
Age, years	$27.85 \pm 14.52$	
Gender		
Male	3	5.00%
Female	57	95.00%
Degree of education		
Primary school and below	1	1.67%
Junior high school/senior high school/technical secondary school	19	31.67%
College/undergraduate	34	56.67%
Graduate and above	6	10.00%
Family residence type		
Live with husband	39	65.00%
Live with husband and mother-in-law	15	25.00%
Live with husband and his parents	3	5.00%
Live with husband, mother-in-law, husband's brothers and their children	3	5.00%
Infertility type		
Primary infertility	18	30.00%
Secondary infertility	42	70.00%
Treatment time		
$\leq 1$ year	21	35.00%
2–3 years	25	41.67%
$\geq 4$ years	14	23.33%

**Table 2** Scores of Each Dimension of Medical Coping Scale and Comparison with the Norm

Project	Infertile Women	Norm	t value	P value
Face	$19.17 \pm 2.18$	$19.43 \pm 3.82$	3.47	0.012
Avoid	$15.98 \pm 2.43$	$14.41 \pm 2.94$	8.86	0.030
Yield	$9.48 \pm 3.19$	$8.83 \pm 3.19$	2.73	0.012

**Table 3** Total Scores and Dimensions of Internal Control, Powerful Others and Opportunities Scale and Social Support Rating Scale

Project	Infertile Women	Item Mean
Opportunity	16.83±7.93	2.87±0.29
Internal control	26.65±6.32	3.67 ±0.35
Powerful others	19.93±5.26	2.94 ±0.17
Total score of social support	40.67±0.90	3.96 ±0.74
Objective support	6.38±2.66	2.913±0.54
Subjective support	11.20±2.01	2.80±1.20
Utilization of social support	6.92±1.68	2.00 ±0.90

## Univariate Analysis of the General Data of Each Dimension in the Medical Coping Questionnaire

In the univariate analysis of the general data of each dimension of the medical coping questionnaire, there was a statistically significant difference in the education level of the face dimension ( $P < 0.05$ ). Additionally, there was a significant difference in the family living environment in the avoidance ( $P < 0.05$ ) and treatment time ( $P < 0.05$ ) dimensions (see Table 4 for specific results).

**Table 4** Univariate Analysis of General Data of Each Dimension in Medical Coping Questionnaire

Family Residence Type	Face	Avoid	Yield
Live with husband	18.79±0.94	15.79±0.90	9.56±0.82
Live with husband and mother-in-law	19.53±0.95	16.00±0.87	9.13±0.74
Live with husband and his parents	22.00±1.09	18.00±0.95	11.33±1.12
Live with husband, mother-in-law, husband's brothers and their children	19.33±0.95	16.33±1.04	8.33±0.70
F value	0.884	2.294	0.345
P value	0.455	0.029	0.793
Degree of education	face	avoid	yield
Primary school and below	21.00±1.18	22.00±0.99	5.00±0.00
Junior high school /senior high school/technical secondary school	19.32±0.99	16.11±1.00	10.47±0.96
College/undergraduate	18.91±0.93	15.91±0.88	9.12±0.75
Graduate and above	19.83±0.87	15.00±0.60	9.17±0.52
F value	3.182	2.536	1.444
P value	0.026	0.066	0.4240
Infertility type	face	avoid	yield
Primary infertility	18.50±0.94	16.06±0.94	12.50±0.91
Secondary infertility	18.07±0.93	15.90±0.89	12.57±1.06
F value	0.532	0.062	0.026
P value	0.470	0.804	0.872
Treatment time	face	avoid	yield
≤1 year	18.52±0.91	16.10±0.83	13.00±1.13
2–3 years	18.48±0.96	16.28±0.89	12.60±0.91
≥4 years	17.21±0.90	15.14±1.03	11.79±1.00
F value	2.129	1.365	2.731
P value	0.128	0.264	0.044

## Correlation Analysis of the Medical Coping Style, Locus of Control and Social Support

According to the results of the Pearson analysis, the face dimension of the medical coping style is significantly correlated with the internal control and total scores of social support, objective support, subjective support and utilisation of social support. Moreover, the avoidance dimension is significantly correlated with the internal control, and the yield dimension is significantly correlated with opportunity and utilisation of support (see [Supplemental Table 1](#) for specific results).

## Multiple Linear Regression Analysis of the Medical Coping Styles of Infertile Women

The multiple linear regression analysis showed that internal control and utilisation of support were the influencing factors of the medical coping style ( $R^2 = 0.271$ , adjusted  $R^2 = 0.144$ ,  $F = 9.827$ ,  $P < 0.001$ ) (see [Supplemental Table 2](#) for specific results), internal control was the influencing factor for the avoidance coping style ( $R^2 = 0.024$ , adjusted  $R^2 = 0.021$ ,  $F = 3.363$ ,  $P = 0.014$ ) (see [Supplemental Table 3](#) for specific results) and age, opportunity and utilisation of support were the influencing factors of the yield coping style ( $R^2 = 0.087$ , adjusted  $R^2 = 0.076$ ,  $F = 7.749$ ,  $P < 0.001$ ) (see [Supplemental Table 4](#) for specific results).

## Discussion

In this study, we explored the relationship between various psychosocial factors and coping styles in patients with infertility in central China using questionnaires with IPC scales. The main findings were as follows: 1) internal control and the utilisation of support were the influencing factors of the coping style; 2) internal control was associated with the avoidance coping style; and 3) education level, opportunity and utilisation of support were the influencing factors of yield. When patients believe that their infertility is the result of luck and fate, they feel that their condition is uncontrollable and struggle to believe that treatment will bring positive results. Therefore, they showed minimal cooperation in the treatment of infertility stress, depression and anxiety. Previous studies have shown that coping styles may have adverse effects on the quality of life and well-being of patients and the outcomes of fertility treatment.<sup>15–17</sup> The present study further emphasised the importance of psychosocial factors in coping styles, and personalised treatment was recommended for infertile patients to achieve better pregnancy outcomes.

## Current Situation of Infertile Patients

In this study, the patients' ages ranged from 20 to 40 years, with an average age of  $27.85 \pm 14.52$  years. The minimum age was 20 years, and the maximum age was 40 years. Moreover, 76.2% of them were under 30 years old, which is consistent with the data in the survey report on the current situation of infertility that was issued by China Population Association in 2012,<sup>18</sup> which verifies that infertility patients in China tend to be younger. With the release of the second-child policy, the number of elderly female patients with infertility is gradually increasing. Regarding the type of family residence, 65.0% of nuclear families only live with their husbands. Most women are influenced by China's traditional fertility ideas and place great psychological pressure on themselves. It is worth noting that self-esteem, depression, guilt, anxiety, emotional distress and communication problems are common in infertile couples.<sup>19,20</sup> In a previous study on infertile individuals, although 50.5% of participants had no anxiety, 19%, 17.5%, 11% and 2% of participants had mild, moderate, severe and very severe anxiety, respectively.<sup>21</sup> In addition, infertile women are more likely to have severe physical and mental disabilities and a worse quality of life.<sup>22</sup>

## Disease Characteristics

In this study, there are 18 cases of primary infertility (30.0%) and 42 cases of secondary infertility (70.0%). The proportion of unexplained causes in primary infertility is the highest, and the fallopian tube factor is the primary cause of secondary infertility. The fallopian tube loses its normal physiological function due to chronic pelvic inflammation.<sup>23</sup> Uterine cavity operation and the neglect of reproductive health are the main causes of chronic pelvic inflammatory disease. Most infertility years are two to three years (41.67%), which could reflect the strong medical awareness of female infertility patients, timely and early treatment and the urgent requirement of fertility.

# Multivariate Analysis of the Coping Styles of Infertile Patients

## Education Level

In this study, female infertility patients with high education levels had better adaptability. Patients with a high education level usually have a wide range of knowledge, are understanding and can accept new knowledge, understand more infertility-related knowledge, seek medical treatment formally and confirm that the problem of infertility is not completely caused by women. Moreover, such patients generally have relatively stable work, fixed incomes and light economic burdens. Generally, for patients with a low education level, their families have a limited understanding of new knowledge and infertility diseases. Additionally, the low family status will increase pressure, produce negative emotions and affect the intimacy and adaptability of family relations.<sup>24</sup>

## Type of Family Residence

The type of family residence means that the patients who live with their husband and parents have better family intimacy, which may be due to the patients who live with more relatives and friends of their parents in law and men. The conflict that is caused by the different treatment opinions that are provided by different family members will affect the family's emotional status, and the long-term energy consumption will reduce the patient's family intimacy.<sup>25</sup> Therefore, when intervening with these patients' families, we should actively communicate with them, carry out relevant publicity and education, and help them to understand that they should care more about their patients in real life, respect their choices and form a good atmosphere for the whole family.

## Current Situation Regarding the Medical Coping Styles of Female Infertility Patients

Research shows that female infertility patients use avoidance coping strategies more than the domestic norm. Avoidance refers to indifference and a dilution attitude towards stress events, which is a negative coping method. This shows that as infertility still causes psychological problems for many women, they adopt the avoidance coping method to reduce and avoid adverse psychological emotions. Research shows that female infertility patients tend to adopt the avoidance coping style. The positive coping style, which is conducive to the physical and mental health of patients and the treatment and rehabilitation of diseases, can alleviate anxiety, depression and other adverse emotions.<sup>26</sup>

## Psychological Intervention Measures for Infertile Patients

### Provide Sufficient Information About Support

Nursing staff should design targeted information on support according to the different health knowledge needs and levels of infertile patients, such as general knowledge about reproduction, common causes of infertility, assisted reproductive technology and possible adverse reactions. It should also be noted that in work, we should pay attention to emotional communication with patients. Instead of mechanically explaining and guiding the patients, one should listen to the patient, show sympathy and understanding for the patient's condition and provide gentle and appropriate suggestions so that the patient feels emotional care. Then, one should take the initiative to obtain disease-related knowledge and reduce the patient's level of disease uncertainty.

### Have a Positive Response

When communicating with infertile patients, nurses should encourage patients to adopt positive coping styles, such as talking with the surrounding people, participating in collective activities and listening to others' suggestions, to help patients gain more social support and reduce patients' negative emotions, such as anxiety and fear. Moreover, patients should be reminded to avoid waiting, dependence and other negative avoidance methods, as these may hinder patients' access to social support, worsen their physical and mental health and increase the level of disease uncertainty. Relevant domestic research results show that through the intermediary protection of social support, a positive coping style can effectively reduce patients' bad psychological stress and level of disease uncertainty, improve their overall marriage and life quality and increase their pregnancy rate.<sup>27</sup>



## Provide Sufficient Social Support

Studies have shown that there are many sources of social support, such as their spouse, children, relatives, friends, colleagues, medical personnel and sick friends. Among them, their family provides basic social support, and their spouse, children, other relatives and friends provide social support. By working together, they can effectively reduce the level of disease uncertainty of infertile patients. In addition, social support nursing can expand the social support network of patients to a certain extent. Moreover, medical staff can impart health knowledge to patients, which is conducive to obtaining more support and encouragement through other ways. Social support nursing not only meets the spiritual needs of patients but also gives patients positive support through their emotional experience.

## Limitations

The sample size of this study is small, and it did not conduct a more in-depth study on the proposed interventions, which is a limitation of this paper.

## Conclusion

To summarise, different locus of control and social support dimensions will lead to different coping styles of infertile patients during medical treatment. Considering the association between coping styles and psychosocial factors, targeted treatment was recommended for these infertile patients to improve their compliance and achieve better outcomes.

## Implications

Appropriate intervention methods can guide patients to adopt positive coping methods during diagnosis and treatment and help them to obtain satisfactory pregnancy outcomes.

## Data Sharing Statement

All data generated or analyzed during this study are included in this published article.

## Ethics Approval and Consent to Participate

This study was conducted in accordance with the Declaration of Helsinki and approved by the ethics committee of The First Affiliated Hospital of Henan University of Chinese Medicine. All participants were informed about the purpose of the study. Written informed consent was obtained from all participants.

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## Disclosure

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