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Original Article

The effects of comprehensive nursing intervention on the negative emotions of patients with infertility

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Abstract: Objective: To investigate the effects of comprehensive nursing intervention (CNI) on the negative emotions of patients with infertility. Methods: A total of 132 patients were recruited as the study cohort and randomly divided into an observation group (n=62) and a control group (n=70). The patients in both groups underwent routine treatment and nursing. In addition, the patients in the observation group were administered CNI. The quality of life (QOL) scores and depression levels of all the patients were evaluated after the intervention. Results: Before the CNI, the QOL scores and the anxiety and depression levels showed no significant differences between two the groups (P>0.05). After the intervention, the observation group showed much higher mild-depression and non-depression levels, higher mild-anxiety and non-anxiety levels and higher QOL and physiological function scores than the control group (all *P*<0.05). Conclusion: CNI has an effect on the negative emotions of patients with infertility.

Keywords: Infertility, depression, anxiety, quality of life, comprehensive nursing intervention

Introduction

Infertility refers to a failure to become pregnant in spite of a normal sexual life without any contraceptive measures. It can be classified into primary and secondary infertility. The former refers to a once normal pregnancy but then infertility, and the latter refers to never having been pregnant [1]. Generally, infertility is a common disease in couples of childbearing age, and it has attracted a lot of concern, with an impact range of 10% to 15%. Both males and females may develop infertility, and this infertility classification standard is also recognized by the World Health Organization [2]. The main causes of infertility include endometriosis, unexplained infertility, fallopian tube abnormalities, semen abnormalities, ovulation disorders, immunological infertility, *etc*. In addition, abnormal cervical function in women may also lead to infertility, of which cervical stenosis is the most common cause. The common factors of female infertility are fallopian tube factors and ovulation disorders, while the main causes of male infertility are abnormal ovulation and abnormal spermatogenesis [3, 4].

Negative emotions are psychologically defined as pain, sadness, depression, anger, tension, anxiety, and other emotions [5]. The reason why it is called negative emotion is that such emotions exert inactive effects on humans, cause discomfort to the body, and even may restrict people's life and work, harming their physical and mental health eventually [6]. Everyone experiences emotions, which are a necessary psychological activity. Both positive and negative emotions have an impact on people. However, people are more likely to feel negative emotions. It should be noted that even the emotions with the same propensity may have different effects on people's survival and life [7, 8].

Infertility brings adverse effects on individuals, couples, and families, and is accompanied by its most serious impact, psychological pressure. Especially under the influence of traditional culture, patients face heavier psychological burdens, which will impair their self-esteem, reduce their appetites, and increase their loneliness, guilt, and frustration [9]. In recent years, infertility has become a common disease under

the environmental effect. Many patients with infertility may have a great psychological burden and mental pressure, and their psychological state may become more and more negative. According to recent studies, whether the nursing measures are accurate and reasonable will greatly affect the patients' emotions. Favorable nursing can help patients to have a positive and active understanding of disease and reduce the impact of negative emotions, so it is conducive to disease treatment and recovery [10].

Many studies on infertility have investigated the familial pathogenic factors of infertility, and found that 50% of the pathogenic factors come from women and 30% from men. In addition, the unknown factors and the common factors of husband and wife account for 10%, respectively. Routine surgery and drug therapy are necessary measures for infertility treatment, and the regulation of patients' emotions is also an indispensable method of treatment [11]. Reasonable psychological intervention should be given to infertile patients to eliminate their negative emotions of anxiety, tension, and panic and to assist in their infertility treatment, in order to improve the infertility recovery rate [12].

This study included 132 infertile patients in our hospital to explore the effect of comprehensive nursing intervention (CNI) on the negative emotions of the infertile patients, in order to help the infertile patients adjust their psychological states, discard all kinds of negative emotions, improve their quality of life (QOL) and psychological states, and promote disease recovery.

Materials and methods

General materials

A total of 132 infertility patients were included in the study using the convenient sampling method and divided into a control group (n=70) and an observation group (n=62). This study was approved by the Ethics Committee of The First Affiliated Hospital of Hainan Medical University. All the patients signed the written informed consent.

Inclusion criteria: (1) female infertility patients, (2) patients with complete clinical data, and (3) patients with communication and understanding abilities.

Exclusion criteria: (1) patients with other serious organ dysfunctions, (2) patients with mental disorders, and (3) patients with poor compliance.

Intervention method

The infertile patients in the control group underwent routine nursing, which mainly included maintaining a good diagnostic and treatment environment, rectifying incorrect living habits, monitoring their ovulation and the patients' questions and building complete health files. In addition to the above measures, the patients in the observation group underwent scientific CNI. The nursing measures were implemented in the two groups until the end of the treatment.

The specific CNI measures the observation group underwent were as follows: (1) A psychological nursing team was specially established and comprised of a team leader (head nurse), a deputy leader (chief physician), guiders (psychiatrists), and team members (nurses). The psychologists and specialists carried out special training for their team members. The main contents of the training were communication skills, psychological skills, and a basic knowledge of psychological nursing. All the nurses needed to conduct targeted and comprehensive studies and participate in the assessment. The premise of the post was to pass the assessment. (2) Cognitive intervention. Knowledge of assisted reproductive technology and infertility was introduced to the patients and their families via video materials of imaging and health education manuals. (3) Subconscious therapy. Infertility treatment requires a good environment. A clean and quiet ward accompanied by mild and friendly behavior and language should be applied to stabilize the patients' psychological states and ensure their relaxation. (4) Emotional support. In the process of communication, the medical staff should always maintain a kind and cordial attitude, so as to obtain the patients' recognition and trust and to better and fully comprehend the patients' views on the disease. An appropriate conversation method should be determined based on the patients' psychological characteristics. (5) Behavioral intervention. Diet regulation was a necessary measure. A reasonable and scientific diet with balanced nutrition and fresh food should be arranged according to the patients'

Table 1. Comparison of the general clinical data in the two groups

General clinical material		Observation group (n=62)	Control group (n=70)	*t*	*P*
Average age		27.31±4.83	27.62±5.32	0.374	0.708
Average infertility duration		3.65±2.43	3.98±2.57	0.076	0.451
Infertility type	Primary	34	31	1.465	0.226
	Secondary	28	39		

eating habits. More vegetables, fruit, and protein were encouraged, while tobacco, alcohol, and spicy foods were avoided. A reasonable exercise plan (such as aerobics, yoga, walking, *etc*.) should be established according to the patients' conditions in order to regulate the physical and mental states of the patients.

Observation indices and evaluation standard

The Self-rating depression scale (SDS) and the self-rating anxiety scale (SAS) were used to evaluate the depression and anxiety levels in the two groups [13]. There are 20 items in both the SDS and the SAS, and they all use the four-grade scoring method, based on which the standard score and total score are calculated, with a total possible score of 100. The patients' scores represent their depression and anxiety levels [14]. In terms of the SDS, 42-52 indicates depression symptoms, 53-62 indicates mild depression, 63-72 indicates moderate depression, and ≥ 73 indicates severe depression. As for the SAS, 40-49 indicates anxiety symptoms, 50-59 indicates mild anxiety, 60-69 indicates moderate anxiety, and ≥ 70 indicates severe anxiety. The short-form 36 health survey scale (SF-36) was used to evaluate the QOL in the two groups. SF-36 includes 9 dimensions, namely physical functioning, role-physical, bodily pain, general health, vitality, social functioning, role-emotional, mental health and reported health transition. The above 9 dimensions include 36 items and all use the centesimal system. Higher scores indicate higher QOL. In addition, the high-quality embryo and pregnancy rates were calculated in the two groups [15].

Statistical analysis

SPSS 20.0 software was used to perform the statistical analysis. The measurement data were expressed as mean ± standard deviation. The count data were expressed as n (%). The data with a normal distribution were tested using Student's *t*-tests. *F* tests were used to compare the differences between groups. $P<0.05$ was considered statistically significant.

Results

Comparison of the general clinical indices between the two groups

The general clinical indices showed no significant differences between the two groups ($P>0.05$), so they were comparable (**Table 1**).

Comparison of SAS scores before and after the intervention between the two groups

Before the CNI, there was no significant difference in the SAS scores between the two groups ($P>0.05$). After the intervention, the SAS scores declined significantly in both groups ($P<0.01$) and the scores were lower in the observation group than they were in the control group ($P<0.05$, **Figure 1**).

Comparison of the SDS scores before and after the intervention between the two groups

Before the CNI, the SDS scores showed no significant difference between the two groups ($P>0.05$). After the intervention, the SAS scores declined significantly in both groups ($P<0.01$) and were lower in the observation group than in the control group ($P<0.05$, **Figure 2**).

Comparison of SF-36 scores before and after the intervention between the two groups

Before the CNI, the SF-36 scores showed no significant differences between the two groups ($P>0.05$). After the intervention, the SF-36 scores increased significantly in both groups ($P<0.01$) and were higher in the observation group than in the control group ($P<0.01$, **Figure 3**).

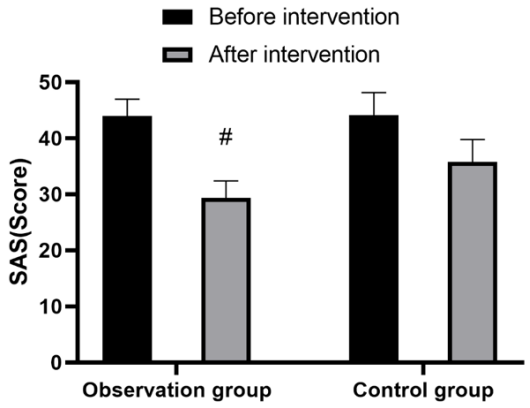

Figure 1. Comparison of SAS scores before and after the intervention between the two groups. Before the CNI, there was no significant difference in SAS scores between the two groups ($P>0.05$). After the intervention, the SAS scores declined significantly in both groups ($P<0.01$) and were lower in the observation group than in the control group ($P<0.05$). #represents a comparison with the control group at the same time, and the difference was statistically significant.

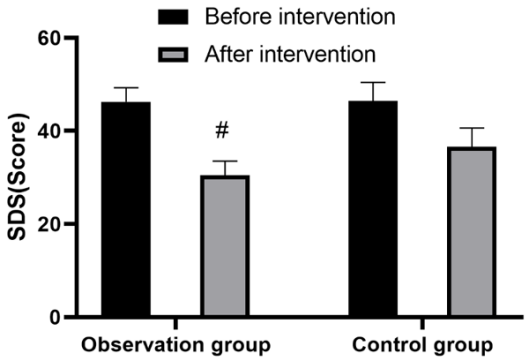

Figure 2. Comparison of SDS scores before and after the intervention between the two groups. The SDS scores showed no significant differences between the two groups before the CNI ($P>0.05$). After the intervention, the SAS score declined significantly in both groups ($P<0.01$) and were lower in the observation group than in the control group ($P<0.05$). #represents the comparison with the control group at the same time, and the difference was statistically significant.

Comparison of QOL scores before and after the intervention between two groups

Before the CNI, the QOL scores of each dimension showed no significant differences between the two groups ($P>0.05$), but they were significantly higher after the intervention ($P<0.05$, **Figure 4**).

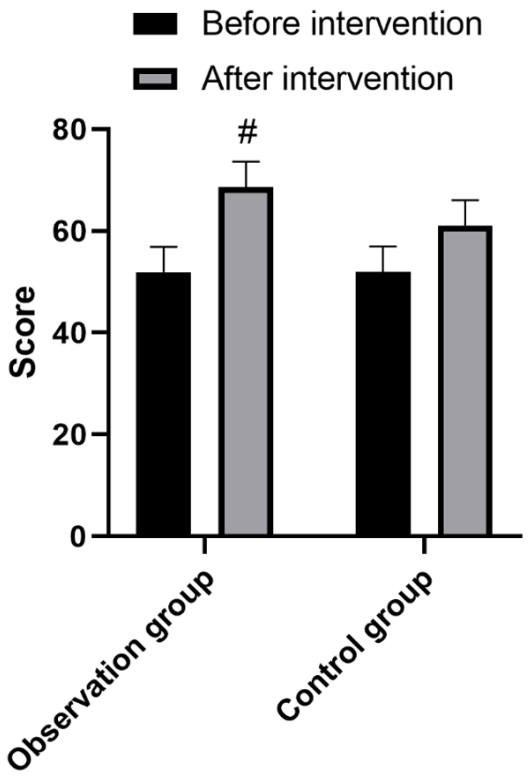

Figure 3. Comparison of the SF-36 scores before and after the intervention between the two groups. Before the CNI, the SF-36 scores showed no significant difference between the two groups ($P>0.05$). After the intervention, the SF-36 scores increased significantly in both groups ($P<0.01$) and were higher in the observation group than in the control group ($P<0.01$). #represents a comparison with the control group at the same time, and the difference was statistically significant.

Comparison of pregnancy rate and high-quality embryo rate before and after the intervention between the two groups

After the CNI, the high-quality embryo and pregnancy rates in the observation group were significantly higher than the corresponding rates in the control group ($P<0.05$, **Figure 5**).

Comparison of the anxiety levels before and after the intervention between the two groups

There was no significant difference in the anxiety levels between the observation group and the control group before the intervention ($P>0.05$). After the intervention, the total incidences of severe, moderate, and mild anxiety were lower in the observation group compared with the control group, and the difference was statistically significant ($P<0.05$, **Figure 6**).

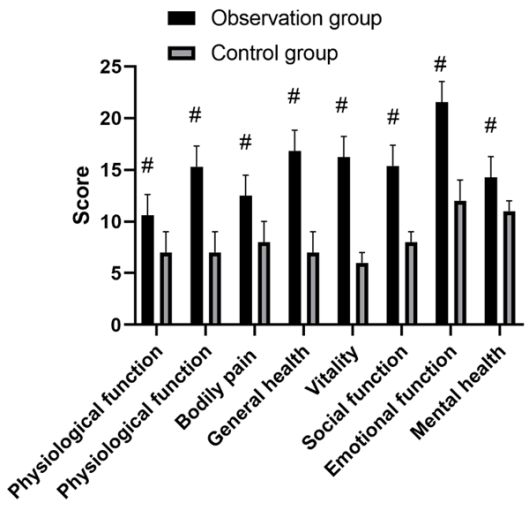

Figure 4. Comparison of the QOL scores before and after the intervention between the two groups. Before the CNI, the QOL scores for each dimension showed no statistical difference between the two groups ($P>0.05$), and were increased significantly after the intervention ($P<0.05$). #represents a comparison with the control group at the same time, and the difference was statistically significant.

Discussion

Generally, infertile women are more likely to suffer from physical and mental health problems than infertile men due to the physical characteristics of females. According to bigdata surveys, the incidence of female infertility in China is about 5% at present. There are a variety of reasons for infertility, among which gynecological diseases are the primary cause [16]. At present, assisted reproductive technology is the most common treatment for female infertility. With the continuous development of advanced science and technologies, assisted reproductive technology has successfully helped many infertile patients conceive [17]. However, patients with infertility have always been under high psychological pressure during the long treatment period, and many of them do not understand assisted reproductive technology. In particular, patients with repeated unsuccessful treatment may have more serious psychological pressure and even develop depression, anxiety, and other negative emotions. Related studies have shown that these negative emotions can hinder normal pregnancy, impairing patients' cooperation and thus affecting the stable progress of the treatment program. Therefore, it can be concluded that in the process of infertility treatment, some psychological counseling is required as an external intervention to correct the patients' incorrect psychological states [18].

The treatment and diagnosis of infertility is a long and complex process [19]. Huge psychological pressure, high medical costs, and long-term physical discomfort will bring an enormous physical and mental burden on infertile patients. Many studies have demonstrated that infertile patients' mental states can be affected to a certain extent under the long-term influence and effect [8]. Maintained and unrelieved psychological pressure is highly likely to induce serious psychological problems, and the most common manifestations are symptoms such as guilt, depression, anxiety, *etc*. Meanwhile, these negative emotions can also be reflected in the body. What's more, some patients fail to lead a normal life [20]. The failure to exclude negative emotions directly hinders normal treatment progression and deteriorates the patients' emotions gradually, forming a vicious circle [21].

In this study, CNI was administered to the infertile patients, aiming to investigate the alleviative and corrective effect of reasonable and scientific CNI on the negative emotions in infertile patients. The results showed that compared with the control group, the observation group had significantly lower SAS and SDS scores and significantly higher SF-36 scores after CNI (all $P<0.01$), indicating that reasonable and scientific CNI as an external intervention was able to relieve depression and anxiety to a great extent and played a positive role in improving the patients' QOL and treatment efficiency. Meanwhile, our results showed that after the selective implementation of CNI, the infertile patients in the observation group had better indicators to a certain extent, and their high-quality embryo and pregnancy rates were significantly improved. Considering this, we concluded that a favorable and stable psychological state can partly help patients maintain their vital signs. Consequently, the patients may accept and cooperate with the treatment more easily in a positive and active psychological state, so it is beneficial to improving the effect of the clinical treatment [22].

In essence, CNI is a kind of psychotherapy. As a novel and scientific nursing model, CNI pays more attention to the mental health of the

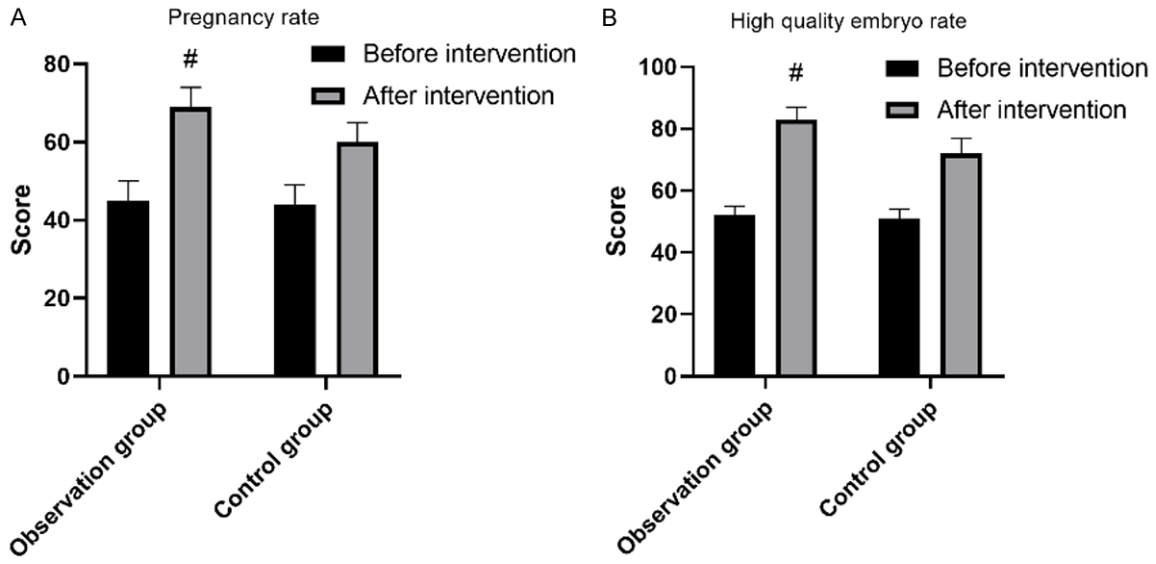

Figure 5. Comparison of the pregnancy and high-quality embryo rates before and after the intervention between the two groups. After the CNI, the pregnancy (A) and high-quality embryo rates (B) in the observation group were significantly higher than they were in the control group ($P<0.05$). #represents a comparison with the control group at the same time, and the difference was statistically significant.

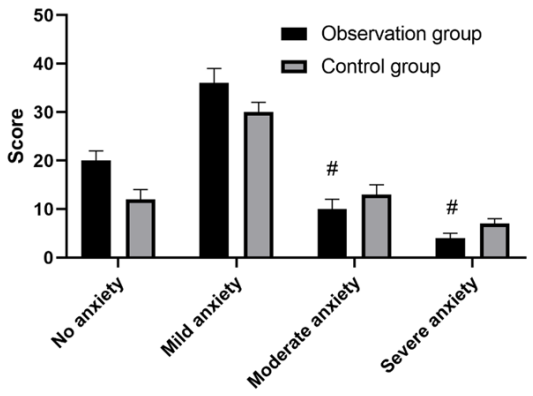

Figure 6. Comparison of the anxiety levels before and after the intervention between the two groups. There was no significant difference in the anxiety levels between the observation group and the control group before the intervention ($P>0.05$). After the intervention, the total incidences of severe and moderate anxiety were lower in the observation group compared with the control group, and the difference was statistically significant ($P<0.05$). #represents a comparison with the control group at the same time, and the difference was statistically significant.

patients [23], among which the most important premise is whether the nurses have a high operational level and a solid theoretical foundation. The effectiveness of the interventional measures determines whether the final goal of alleviating the patients' negative emotions such as tension and anxiety can be achieved [24]. Emotional support combined with reasonable and effective subconscious therapy is able to facilitate helping infertile patients out of their conceptual misunderstandings and emotional dark areas and helping them to become active. Furthermore, a targeted, reasonable, and scientific exercise plan and an appropriate diet can also assist in the treatment of infertile patients and play a positive role in promoting the treatment.

To conclude, CNI can effectively improve the negative emotions of patients with infertility, significantly improve QOL, the high-quality embryo and pregnancy rates, and is suitable for clinical application. The limitation of this study is that the included sample source was relatively singular, and this may lead to a certain bias in the research results. A multi-center and large-sample investigation will be carried out in further studies to make up for the deficiencies of the research and to provide more detailed data support for the clinical investigation.

Disclosure of conflict of interest

None.

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