

An interventional study on the influence of social and family support systems on the fertility pattern of HIV-infected women

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Abstract

Objectives: This study was designed to explore the influence of social and family support system on the fertility pattern of human immunodeficiency virus (HIV)-infected women.

Trial design: An interventional study including 70 participants.

Methods: HIV-infected female participants treated from January 2015 to January 2019 were selected, randomly divided into 2 groups, with 35 cases in each group. The experimental group was given complete social and family support, whereas the control group was given basic treatment only. Changes in fertility rate, fertility number, and fertility interval were compared between the 2 groups. We also compared the changes in the quality of life (QOL), Self-rating Anxiety Scale (SAS), and Self-rating Depression Scale (SDS) of the 2 groups of participants.

Results: The fertility rate of the experimental group was 43.29%, and that of in the control group was 31.96%, and the childbearing age is mainly concentrated in the 20 to 29 years; the difference was statistically significant ($P < .05$). The mean number of births in the experimental group was (1.47 ± 0.61) , which was significantly higher than that of in the control group (0.63 ± 0.22) , and the difference was statistically significant ($P < .05$). The fertility interval of the experimental group was significantly lower than that of in the control group $(2.65 \pm 1.34$ vs $3.77 \pm 0.85)$, and the difference was statistically significant ($P < .05$). Before the intervention, there were no significant differences in the QOL scores, SAS, and SDS scores between the experimental group and the control group ($P > 0.05$). After intervention, the scores of QOL in the experimental group was significantly higher than those of in the control group $(54.1 \pm 1.7$ vs $41.2 \pm 2.5)$; the SAS and SDS scores of the experimental group were significantly lower than those of in the control group $(39.3 \pm 4.2$ vs 56.1 ± 5.7 ; 32.2 ± 6.7 vs $51.9 \pm 5.8)$, and the difference were statistically significant ($P < .05$).

Conclusions: Social and family support for female participants infected with HIV can improve the fertility rate of women to some extent, increase the number of births and shorten the interval between births, and can help relief the women's anxiety, depression, and other emotional problems, which is worthy of extensive application and promotion in the society.

Abbreviations: AIDS = acquired immune deficiency syndrome, HIV = human immunodeficiency virus, QOL = quality of life, SAS = Self-rating Anxiety Scale, SDS = Self-rating Depression Scale, SPSS = Statistical Product and Service Solutions.

Keywords: HIV infection, social support, family support, fertility pattern

1. Introduction

Acquired immune deficiency syndrome (AIDS) is a serious sexually transmitted disease caused by HIV infection. HIV is a virus that can attack the body's immune system. It mainly attacks the most important CD4+ T cells in the human immune system.

When the cells are destroyed in large quantities, the body will lose its immune function.^[1] So people often turn pale at the mention of it. People often have prejudice and discrimination against AIDS participants and carriers of HIV infection, especially female participants, to some extent.^[2] This has led to poor family care

Editor: Jorddy Neves Cruz.

Availability of data and materials: All authors confirm that the data and material are available, and no additional data are available.

Patient consent for publication: All authors agreed to publish the final manuscript.

The authors report no conflicts of interest.

The datasets generated during and/or analyzed during the present study are not publicly available, but are available from the corresponding author on reasonable request.

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How to cite this article: Chen S, Ning Y, Tan Y, Lin X, Wang M. An interventional study on the influence of social and family support systems on the fertility pattern of HIV-infected women. *Medicine* 2021;100:20(e26027).

Received: 16 January 2021 / Received in final form: 23 April 2021 / Accepted: 26 April 2021

<http://dx.doi.org/10.1097/MD.00000000000026027>

and low social support for this group of people, which not only brought a devastating blow to their families and individuals themselves, but also indirectly affected the fertility pattern of HIV-infected women.^[3] To investigate the impact of social and family support system on the fertility pattern of HIV-infected female participants, 70 cases of HIV-infected female participants admitted in our hospital from January 2015 to January 2019 were selected as research subjects and randomly divided into the experimental group and control group. Changes in the fertility rate, the mean number of fertility, and fertility interval were compared between the 2 groups, and also, SAS, SDS, and quality of life (QOL) were compared between the 2 groups. Now it is reported as follows.

2. Methods

2.1. Trial design

2.1.1. Interventions. In experimental group social support was provided until the end of their fertility:

1. Material social support: to give participants specific material and physical support and help, that is, to understand and solve the patient's physical discomfort, and to meet the patient's reasonable material needs.
2. Emotional support: to give participants reasonable care and help, listen to participants' confusion and anxiety and intervene in a timely manner.
3. Informative support: to provide relevant information and knowledge to participants in a timely and effective manner, conduct relevant knowledge lectures, and distribute relevant manuals.
4. Evaluation support: to give the patient affirmation and encouragement, improve the patient's self-evaluation and cognition, eliminate the patient's negative self-negative evaluation, such as inferiority, self-negation, and so on.

In experimental group, family support was also provided until the end of their fertility to organize family support intervention activities, such as convening family mobilization conferences, organizing family exchange conferences, conducting home visits, and so on; at the same time, relevant training and communication with participants' families to help participants gradually restore family life and society function were done.

Control group' function was to give the participants related medical support, and solve the patient's physical problems in a timely manner. In case of abnormal indicators, intervene promptly.

2.1.2. Ethics and consent' statement. The participants have agreed to our study and signed an informed consent form. Our study was approved by the ethics committee of Shenzhen Third People's hospital.

2.2. Eligibility criteria for participants

Inclusion criteria included: all participants have been diagnosed with HIV; participants' data are complete; participants' age, duration of disease, and past fertility were recorded; participants and their families have signed informed consents.

Exclusion criteria included: participants with mental disorders such as communication barriers, language barriers; participants with other fertility-related diseases such as gynecological malignancies; participants died or lost contact during this study; participants and their families failed to fill in SAS, SDS and QOL

forms as required; participants' marital status and sexual partners and other confounding factors that may affect fertility (eg, birth control, desire to become pregnant, among others).

2.3. Outcomes

SAS, SDS, and QOL forms have been filled in on time. Changes in the fertility rate, the mean number of fertility, and fertility interval were compared between the 2 groups. SAS, SDS, and QOL scores before and after treatment were compared between the 2 groups (SAS: the standard cutoff value is 50 points, 50–59 is mild anxiety, 60–69 is moderate anxiety, and ≥ 70 is severe anxiety; SDS: standard cutoff value is 50 points, the higher the score, the more the depression tendency obviously; QOL: The full score of QOL scale is 60 points, worst < 20 points, bad 21–30, average 31–40, better 41–50, good 51–60). Record and compare the improvement of depression and anxiety between the 2 groups of participants.

2.4. Statistical methods

All the experimental data were analyzed using Statistical Product and Service Solutions (SPSS Inc, Chicago, IL) 23.0 software. Measurement data were expressed as mean \pm standard deviation ($\bar{x} \pm s$), and independent sample *t* test was used between the 2 groups. Counting data are expressed in (%) and tested by χ^2 . The difference was statistically significant at $P < .05$.

2.5. Patient and public Involvement

We request by recruiting participants to join our research plan. According to the actual condition of participants, psychological state, the opinions of the participants and families, we decide whether to join the study plan. Research results with the participants' completion SAS, SDS, and of QOL questionnaire will be presented to us, and we will timely feedback. The burden of the intervention is assessed by participants and researchers together. In acknowledgements, we also appreciate the patient's participation.

2.6. Availability of data and materials

All authors confirm that the data and material are available, and no additional data are available.

3. Results

3.1. Participant flow

Seventy cases (total cases are 700) of HIV-infected female participants, treated in our hospital from January 2015 to January 2019, were selected as research subjects and randomly divided into the experimental group and control group. The sampling method was stratified according to age. The experimental group was given the social and family support, and the control group was given basic treatment only. The age range of the control group was 19 to 51 years, the average age was (26.7 ± 2.4) years, the course of disease was 1 to 17 years, and the average course was (7.1 ± 2.3) years. In the experimental group, the age range was 18 to 49 years, the average age was (25.2 ± 2.1) years, the course of disease was 2 to 16 years, and the average course was (6.8 ± 1.9) years. There were no significant differences between the 2 groups in terms of age and course of disease ($P > .05$).

3.2. Comparison of baseline data

Before intervention, we compared baseline sociodemographic characteristics of the 2 groups of participants to determine whether they were comparable, focusing on age, disease duration, and past fertility. All factors that might interfere with the experiment will be eliminated. The details are shown in Table 1.

3.3. Comparison of fertility rate

The fertility rate of participants in the experimental group was 43.29%, and that of in the control group was 31.96%. The difference was statistically significant ($P < .05$). The fertility age of the participants in the 2 groups was mainly 20 to 29 years. The details are shown in Table 2.

3.4. Comparison of the mean number of births

The mean number of births in the experimental group was (1.47 ± 0.61), which was significantly higher than that of in the control group (0.63 ± 0.22), and the difference was statistically significant ($P < .05$). The details are shown in Table 3.

3.5. Comparison of fertility interval

The fertility interval of participants in the experimental group (2.65 ± 1.34) was significantly shorter than that of in the control

group (3.77 ± 0.85), and the difference was statistically significant ($P < .05$). The details are shown in Table 4.

3.6. Comparisons of SAS, SDS and QOL scores

The SAS and SDS scores in the experimental group were significantly lower than those of in the control group, whereas the QOL scores in the experimental group was significantly higher than that of in the control group (54.1 ± 1.7 vs 41.2 ± 2.5), and the difference was statistically significant ($P < .05$). The details are shown in Table 5.

4. Discussion

HIV infection is one of the sexually transmitted diseases, which is extremely harmful. The disease is more common in young adults, and is usually transmitted through sexual contact, blood and blood products (including sharing needles and intravenous drugs, interventional medical procedures, among others), mother and infant (including transplacental, delivery, and breastfeeding, among others).^[4,5] It takes years, or even ≥ 10 years, for HIV infection to develop into AIDS.^[6] People with AIDS and living with HIV/AIDS (PLWHA) often suffer from prejudice or discrimination, which seriously affects their mental health and QOL.^[7] Especially for female participants, external interference and insufficient support from family and friends have seriously

Table 1

Comparison of baseline characteristic data in the 2 groups of patients.

Groups	Cases (n)	Average age	Average disease duration	Average past fertility
Experimental group	35	25.2 ± 2.1	6.8 ± 1.9	32.13 ± 2.3
Control group	35	26.7 ± 2.4	7.1 ± 2.3	28.98 ± 1.5
χ^2		34.665	40.426	42.862
<i>P</i>		.26	.43	.45

Table 2

Comparison of fertility rate between 2 groups of patients (%).

Groups	Cases (n)	<20 y	20–29 y	30–39 y	≥ 40 y	Fertility rate
Experimental group	35	0	49.06	40.21	10.73	43.29
Control group	35	0	33.68	21.56	44.76	31.96
χ^2		1.665	9.491	8.912	11.997	9.991
<i>P</i>		14.998	.027	.031	.008	.026

Table 3

Comparison of the mean number of births between the 2 groups of patients ($\bar{x} \pm s$).

Groups	Cases(n)	<20 y	20–29 y	30–39 y	≥ 40 y	Mean no. of births
Experimental group	35	0	2.01 ± 0.15	1.93 ± 0.07	0.86 ± 0.25	1.47 ± 0.61
Control group	35	0	1.11 ± 0.17	0.78 ± 0.14	0.49 ± 0.03	0.63 ± 0.22
<i>T</i>		1.665	9.891	8.912	6.997	8.991
<i>P</i>		14.998	.021	.031	.048	.026

Table 4

Comparison of fertility interval between the 2 groups of patients ($\bar{x} \pm s$).

Groups	Cases(n)	<20 y	20–29 y	30–39 y	≥ 40 y	Fertility interval
Experimental group	35	0	1.66 ± 0.15	2.09 ± 1.11	4.67 ± 1.55	2.65 ± 1.34
Control group	35	0	2.98 ± 1.14	4.65 ± 0.33	6.01 ± 0.12	3.77 ± 0.85
<i>T</i>		1.236	7.981	8.657	9.882	9.127
<i>P</i>		15.277	.045	.044	.029	.032

Table 5
Comparisons of SAS, SDS, and QOL scores between the 2 groups of patients ($\bar{x} \pm s$).

Groups	Cases (n)	SAS		SDS		QOL	
		Baseline	After intervention	Baseline	After intervention	Baseline	After intervention
Experimental group	35	64.1 ± 7.6	39.3 ± 4.2	61.4 ± 7.2	32.2 ± 6.7	39.4 ± 1.1	54.1 ± 1.7
Control group	35	65.3 ± 6.2	56.1 ± 5.7	63.6 ± 6.1	51.9 ± 5.8	40.8 ± 2.3	41.2 ± 2.5
T		6.665	6.912	7.891	9.001	8.912	9.014
P		.44	.041	.39	.033	.35	.032

QOL = quality of life, SAS = Self-rating Anxiety Scale, SDS = Self-rating Depression Scale.

affected their marriage and social life. It is reported that social support and family care have currently become one of the important indicators in clinical treatment and nursing, and are the most potential influencing factors. However, people with AIDS and PLWHA is always discriminated and alienated in social interactions, and the social support available is seriously insufficient.^[8] Surveys show that 18% of people living with HIV believe that getting care is more important than receiving treatment.^[9] A large number of studies have shown that women with HIV infection can be unmarried or infertile for life up to 21.05%.^[10] This has also become a factor affecting the current female fertility pattern. In this study, randomly selected female participants infected with HIV in our hospital were divided into experimental groups with complete social and family supporters, a total of 35 participants, and 35 participants who received only basic treatment were selected as controls. Group, the changes of fertility rate, number of births, and birth interval were compared between the 2 groups. The results showed that the fertility rate of participants in the experimental group was significantly higher than that of in the control group (43.29% vs 31.96%), and the difference was statistically significant ($P < .05$). The average number of births in the experimental group was significantly higher than that of in the control group (1.47 ± 0.61 vs 0.63 ± 0.22), the difference was statistically significant ($P < .05$); the fertility interval in the experimental group was significantly shorter than that of in the control group (2.65 ± 1.34 vs 3.77 ± 0.85), and the difference was statistically significant ($P < .05$). This suggests that giving social support and family care to HIV-infected participants can, to a certain extent, increase female fertility, increase the number of births, and shorten the interval between births. There are reports in the literature that HIV-infected female participants have no significant differences in social resource utilization, social support, and subjective support score results compared with married and nonmarried women.^[11] This shows that regardless of their marital status, they have not been able to obtain adequate social support. At present, there are 3 types of fertility, one is the natural mode, that is, uncontrolled fertility; the second is the late marriage and late childbirth eugenic model; the third is the self-regulation/control model.^[12] And HIV-infected female participants are affected by both physical and psychological effects and tend to choose the second model, even unmarried and infertile for life. Studies on normal female fertility patterns have found that the first child is gradually stable and the second child is gradually increasing; however, in the HIV-infected population, the structure of the first child is unstable and the second child fertility rate is low, which is gradually decreasing.^[13] This is related to their social and family influence. Studies have found that 31.25% of AIDS participants and HIV-infected persons have severe functional impairments in their

families.^[14] This also shows that many participants are worried about the impact on their families and lack of in-depth communication and communication with their families. Some scholars have shown that about 59.67% of HIV-infected female participants can receive heterosexual relation and obtain normal life after psychological and emotional counseling.^[15] This further confirms the results of this study.

In addition, we also compared the SAS, SDS, and QOL scores of the 2 groups of participants. The results showed that the SAS and SDS scores in the experimental group were significantly lower than those of in the control group. The QOL scores in the Experimental group was significantly higher than that of in the control group, and the difference was statistically significant ($P < .05$). This means that providing social and family support to HIV-infected participants can significantly improve their QOL and improve their emotional state. Studies have found that 15.16% of HIV-infected participants can develop anxiety, depression, and even suicidal behaviors.^[16] Other studies have confirmed that social support is negatively correlated with negative emotional states and positively correlated with positive emotions.^[17] By increasing the communication between participants and the outside world, spreading the relevant knowledge about HIV to participants, guiding participants and family members to acquire the knowledge of correct living together, basic nursing skills and self-protection first-aid measures, can significantly reduce participants' anxiety and depression and improve the QOL of participants. There is a report that counseling centers are set up in AIDS clinics, disease control centers, and other medical places, and corresponding training courses are carried out regularly, about 66.9% of female participants can love and marriage normally.^[17] This shows that giving psychological counseling can significantly improve the psychological problems of female participants, increase the possibility of marriage, and then affect their fertility patterns. This is consistent with the results of this study.

In summary, giving effective social support and family support to female participants infected with HIV can increase the fertility rate of participants, increase the number of births, shorten the birth interval, and also help to regulate their own negative emotions. In summary, giving effective social support and family support to female participants infected with HIV can increase the fertility rate of participants, increase the number of births, shorten the interval between births, and also help to regulate their negative emotions. It is worthy of promotion in society.

Acknowledgments

The authors are very grateful to all the participants involved in this study and their families for their active cooperation.

Author contributions

Shaoping Chen is responsible for Abstract and Introduction, Yifang Ning, Yunhuan Tan, and Xiaoli Lin are responsible for Methods, Shaoping Chen is responsible for Results, Miao Wang is responsible for Discussion.

Data curation: Yunhuan Tan.

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Investigation: Miao Wang.

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