ORIGINAL ARTICLE

The effect of ADOPT nursing intervention mode on the compliance and quality of life of kidney transplant patients in 1-3 years after surgery

Ruijuan Huang[1], Ruiling Guo[2], Lixia Zhao*[1]

[1] *Baogang Hospital, Baotou, Inner Mongolia, China*
[2] *Fenyang Maternity and Child Care Center, Shanxi, China*

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ABSTRACT

Objective: To explore the effect of ADOPT (Attitude, Definition, Open mind, Planning, Try it out) nursing intervention mode on the living habit compliance, self-monitoring compliance and quality of life of kidney transplant patients in 1-3 years after surgery.
Methods: From December 2020 to August 2021, 48 patients in 1-3 years after kidney transplantation who met the inclusion and exclusion criteria and were regularly followed up in the Kidney Transplantation Clinic of the Department of Urology Surgery in Baogang Hospital were selected as the research subjects, and 48 kidney transplant patients were divided into the intervention group and the control group by simple random sampling. The control group was given routine nursing care in the Kidney Transplantation Clinic of the Department of Urology Surgery, and the intervention group was given nursing care measures formulated on the basis of ADOPT nursing intervention mode. The compliance and quality of life of the two groups were compared with the Kidney Transplant Patient Compliance Scale and the Kidney Transplant Patient Quality of Life Related Rating Scale in 1-3 years after surgery.
Results: After 2 months and 4 months of intervention, the scores of living habit compliance and self-monitoring compliance in the intervention group were significantly higher than those in the control group ($p < .001$), and the scores of quality of life in the intervention group and the total score of quality of life were better than those in the control group, and the difference was statistically significant ($p < .001$).
Conclusions: The implementation of the ADOPT nursing intervention mode for kidney transplant patients in 1-3 years after surgery can improve their compliance level and enhance the quality of life, which is worthy of reference.

Key Words: ADOPT, Post-kidney transplantation, Compliance, Quality of life

1. INTRODUCTION

With the advancement of medical care, kidney transplantation has become the preferred treatment for patients with end-stage renal disease, and the survival rate of patients and grafts is impressive in the short term and steadily improving in a long time.[1] Compared with hemodialysis and peritoneal dialysis, the overall cost of kidney transplantation is lower, and the survival rate and quality of life of patients are higher.[2,3] Nowadays, with the development of medical modes, the indicators of the success of kidney transplanta-

*Correspondence: Lixia Zhao; Email: zlx-1975@163.com; Address: Baogang Hospital, Baotou, Inner Mongolia Autonomous Region, 014010, China.

tion have gradually changed from the survival rate and the recurrence rate to comprehensive indicators of physiological, psychological, and social function that can reflect the overall quality of life, which is more critical as a broad outcome measure[4] and closely related to their level of compliance. After surgery, patients need to take immunosuppressants on time and in the right amount, which requires patients to have good adherence to lifestyle habits and self-monitoring adherence. Studies have shown that the main factors affecting the quality of life of kidney transplant patients in 1-3 years after surgery are: poor compliance.[5] Because there are many literatures[6] studying the relationship between medication compliance and quality of life during the follow-up visit. It would not be discussed in detail in this article. ADOPT[7, 8] is a problem-solving-oriented behavioral intervention mode that includes attitude (A): emphasizing that the problem solver's attitude influences the success of the problem-solving outcome; Definition (D): refers to the definition of one's own health problems; Open Mind (O): It is expected that patients will discover new strategies to solve problems with an open and creative attitude; Planning (P): refers to the process of making a decision; Try it out (T): It is the process of implementing the plan (5 operational functions), this mode emphasizes the establishment of the partnership between medical staff and patients, mobilizes patients' subjective initiative and ability to perform the self-care, and is especially suitable for the intervention in people with chronic diseases. This research is designed to explore the effect of ADOPT nursing intervention mode on the living habit compliance, self-monitoring compliance and quality of life of kidney transplant patients in 1-3 years after surgery. It was reported as follows.

2. DATA AND METHODS

2.1 General information

From December 2020 to August 2021, 48 patients 1-3 years after kidney transplantation who were regularly followed up in the Kidney Transplantation Clinic of the Department of Urology Surgery in Baogang Hospital were selected as the research subjects. Based on ethics compliance, a simple random sampling method was adopted, and 24 patients who received ADOPT nursing intervention were included in the intervention group, and the other 24 patients who received the routine care were included in the control group. The included patients were numbered with the consent from the patients.

2.2 Inclusion, exclusion and rejection criteria

Inclusion criteria were as follows:

(1) Patients whose age was no less than 18 and no more than 65 when transplantation[9]
(2) Patients who undergone a kidney transplant for the first time with DCD
(3) Patients with kidney transplantation no more than 3 years
(4) Patients who could listen, speak, read and write, and was able to cooperate with the investigation
(5) Patients who voluntarily participated in this survey

Exclusion criteria were as follows:

(1) Patients with other organ transplants
(2) Patients who were participating in other surveys

Rejection criteria were as follows:

(1) Patients who actively requested to withdraw during the study
(2) Patients who had failed or died of kidney transplantation
(3) Patients who were unable to cooperate with the investigation due to other internal and external factors that cause the patient to have a mental disorder

2.3 Methods

The medical staff carried out routine nursing intervention for the control group, and conducted oral education in the Kidney Transplantation Clinic of the Department of Urology Surgery through face-to-face methods, and guided the patients to learn to observe urine output and the status of the transplanted kidney area, monitor body weight, vital signs, and make records. The patients were informed of the importance of self-monitoring, keeping good living habits and understanding their creatinine levels. It was necessary to strengthen the prevention and monitoring of lung infection, and take good protection when going out; and it was recommended to persuade patients to quit smoking.

ADOPT nursing intervention measures were implemented in the intervention group, and the specific methods were as follows:

A: When coming to the outpatient for the follow-up, a one-to-one face-to-face method was adopted to assess the patient's compliance with their living habits and self-monitoring compliance, so that the patient could give a subjective attitude towards the current status of his or her quality of life. The content of ADOPT nursing intervention mode would be explained to the patient in detail, to inform the patient that the current problems could be improved through efforts.

D: Through open-ended questioning, the causes of the patient's current problems were clearly defined, mainly compliance (living habit compliance and self-monitoring compliance).

O: According to the current problems and their main factors in kidney transplant patients, it was recommended to encourage patients and accompanying caregivers to actively participate in expressing their own ideas and suggestions, and the intervention team members would propose targeted solutions based on the specific problems in patients and set goals with them. During the weekly telephone follow-up, the program was readjusted according to the physical condition of the kidney transplant patient and the completion of the established goals, and the mind was opened up once a week and about 10 min/time.

P: According to the established objectives, the intervention was carried out as follows:

According to the patient's compliance with living habits: (1) In terms of diet, by consulting nutrition experts, formulated a diet plan for the problems existing in the patients' diet, and instructed the patients to eat a high-quality protein, high vitamin, low-salt, low-sugar and low-fat diet, and avoid foods that are significantly supplemented, such as ginseng, royal jelly, etc. The expected goal was for the patient to articulate dietary considerations. (2) In terms of daily life, it was necessary to develop good living habits, exercise reasonably and appropriately according to the tolerance of the body (maximum heart rate = 220 - age), such as walking, cycling, swimming, jogging, etc. It was required to avoid entering public places and wear a mask when going out for half a year after surgery to prevent infection. The expected goal was for the patient to be able to articulate what to do in daily life and what to do to protect against accidents.

In terms of self-monitoring compliance for patients: it was required to make a daily monitoring of vital signs, body weight, urine output, etc. (1) For the monitoring of blood pressure, the position, time, hemomanometer and location should be fixed, and it was recommended to make a five-minute rest, or 15-30 minutes were better if there was emotional agitation, in order to avoid inaccurate blood pressure measurement. (2) For the monitoring of urine output, anuria: 24-hour urine < 100 ml or 12-hour anuria or oliguria: 24-hour urine < 400 ml or less than 17 ml per hour. (3) For the monitoring of body weight, it was recommended to monitor at a fixed time with a fixed dress, it was better to measure in the morning in the state of defecation and fasting, with BMI maintained between 18.5-23.9 kg/m^2.

If you had fever, decreased urine output, increased blood pressure, swelling and pain in the transplanted kidney, feeling weak, loss of appetite, and weight loss without obvious causes, you should see a doctor promptly. The expected goal was that the patient was in good compliance with the medical advices and aware of the precursors of complications such as rejection after kidney transplantation.

T: The intervention plan was implemented with a good supervision and management.

According to the problems in patients, a one-to-one method was adopted, and the intervention group were intervened according to the provisions of the postoperative follow-up visit, each time for 30 minutes, and the compliance guidance was carried out according to the patient's condition. Patients' companions were encouraged to participate as well. According to the patient's intervention results, patients were asked to conduct a self-evaluation, and then nursing experts and investigators evaluated the intervention effects. If the intervention proved to be effective, patients and the intervention team were encouraged to share their successes; If the intervention effects were not satisfactory, the patient's existing problems would be re-evaluated, with the second care measures developed and the plan carried out. Meanwhile, it was required to establish a guidance and supervision record card for patients, which included: patient' existing problems, formulated measures, implementation effect evaluation, and patient self-evaluation.

2.4 Indicator observation

The quality of life of kidney transplantation patients before and after intervention was compared according to the kidney transplant quality-related rating scale designed by a domestic scholar Fan Zhongzhen.[10] The scale is made up of 34 items such as the physiological dimension, psychological dimension, social dimension, treatment dimension and the overall quality of life. Each item in the scale is rated according to the Likert 5-level scoring method, with a total score of 34-170 points. The higher the total score of the respondents, the higher their quality of life. A score of less than 102 points indicates a poor quality of life, a score of 102-136 points indicates a moderate quality of life, and a score of more than 136 points indicates a good quality of life. See Table 1 for details.

Dong Jingjing's[11] Kidney Transplant Patient Compliance Scale was used to compare the compliance level of kidney transplant patients in the two groups before and after the intervention. There were 25 items, including five dimensions of medication compliance, living habit compliance, self-monitoring compliance and follow-up compliance. The dimension of medication compliance includes items 1, 2, 3, and 4, the dimension of living habit compliance includes items 5, 6, 7, 8, 9, 12 and 13, the dimension of self-monitoring compliance includes items 10, 11, 14, 15, 17 and 18, and the dimension of follow-up compliance includes items 16, 19, 20, 21, 22, 23 and 24, and there is also an item investi-

gating total compliance, with a total of 25 items, and items 1, 2, 3, and 4 are items with negative scores. The scores of all dimensions are added together to form the total score of compliance, and the total score ranges from 25 to 100 points. The higher the score, the better the compliance, as shown in Table 2.

Table 1. Quality of life rating scale for kidney transplant patients

I. Physiological function
1. I sleep well
2. I don't have enough energy
3. I have a normal appetite
4. I'm happy with my sex life
5. I live completely on my own
6. I am satisfied with my physical mobility
II. Psychological function
7. I feel nervous and anxious
8. As I struggle with the disease, I become more and more disappointed
9. I'm worried that the transplanted kidney will not function well
10. I'm afraid I'm going to die suddenly
11. I have a lot of faith in life
12. I'm worried about my looks
III. Social function
13. I'm able to get support from my family, both mentally and materially
14. I'm able to get support from my neighbors and friends
15. I have access to medical help and psychological support from medical staff
16. I'm very close to my own spouse (or someone who supports me)
17. I exchange experiences, questions and knowledge about transplantation with my wardmates
18. I discuss my illness with my family
19. I care about current events
20. I have the ability to handle daily tasks (housework, rides, shopping)
21. I am satisfied with my ability to handle daily matters
22. I'm satisfied with the financial income and social welfare
23. I often participate in recreational activities
IV. Treatment dimension
24. I'm happy with the results of the treatment so far
25. I can take the initiative to prevent complications (I can pay attention to food hygiene, the prevention of colds and do a good job of disinfection and isolation)
26. I can take my medication according to my condition
27. I can actively monitor the signs of danger (blood pressure, 24-hour urine output, cyclosporine or tacrolimus concentration)
28. I am concerned that long-term use of immunosuppressants will complicate other diseases (hypertension, infection, liver and kidney damage)
29. I have trouble with regular blood tests and doctor visits
V. Overall quality of life
30. Overall, I'm satisfied with the quality of life after the transplant
31. Overall, I'm satisfied with my current state of health
32. In general, I think the transplant affects my interpersonal relationship
33. I don't think the transplant fundamentally solved my health problems
34. I regret having my transplant

Note. Answer the questions according to the situation in the last 1 month, and assign points: never for 1, occasionally for 2, sometimes for 3, often for 4, always for 5

2.5 Statistical methods

SPSS22.0 statistical software was used to analyze the research data. Repeated measures ANOVA was used to evaluate whether there were any differences in self-monitoring compliance, living habit compliance and quality of life between the two groups before intervention, 2 months and 4 months after intervention. Two-sided test was used in the statistical analysis, with the test level of $\alpha = 0.05$, and the difference was statistically significant ($p < .05$).

Table 2. Kidney transplant patient compliance questionnaire

1. I think my kidney functions well and then I reduce my dose on my own
2. I increase my medication on my own because I don't feel good about myself
3. I reduce my medication on my own because I am worried about the side effects of my medication
4. I reduce the number of medications I took on my own due to financial burden
5. I can stick to a low-salt diet
6. I can stick to a high-quality protein diet
7. I don't eat cholesterol-rich foods like animal innards
8. I don't eat grapes and shaddocks
9. I can control my body weight.
10. I can avoid going to public places as much as possible
11. I can avoid squeezing or bumping the transplanted kidney
12. I record my urine output every day
13. I take my temperature every day
14. I measure my blood pressure every day
15. I keep track of water intake every day
16. I measure my body weight every week
17. I touch my transplanted kidney every day
18. I know when my next follow-up visit will be
19. I can read basic lab results on my own
20. I am able to follow up with my doctor as scheduled
21. During the follow-up visit, I can take the initiative to tell the doctor about my physical condition
22. I am able to do all kinds of tests and examinations as the doctor ordered
23. I can remember what the doctor told me to do
24. If I feel not good, I can see a doctor in time
25. I am able to receive all the treatments after my kidney transplant as ordered by my medical staff

Note. Answer the questions according to the situation in the last 1 month, and assign points: never for 1, occasionally for 2, often for 3, always for 4

3. RESULTS

3.1 Living habit compliance

The living habit compliance of the intervention group was higher than that of the control group, and the difference was statistically significant ($p < .001$), as shown in Table 3.

3.2 Self-monitoring compliance

The self-monitoring compliance of the intervention group was higher than that of the control group, and the difference was statistically significant ($p < .001$), as shown in Table 4.

3.3 48 kidney transplant patients in 1-3 years after surgery in the two groups were compared in terms of quality of life scores

3.3.1 *Physiological function*

The physiological function of the intervention group was higher than that of the control group, and the difference was statistically significant ($p < .05$), as shown in Table 5.

3.3.2 *Psychological function*

The psychological function of the intervention group was higher than that of the control group, and the difference was statistically significant ($p < .001$), as shown in Table 6.

3.3.3 *Social function*

The social function of the intervention group was higher than that of the control group, and the difference was statistically significant ($p < .001$), as shown in Table 7.

3.3.4 *Treatment function*

The treatment function of the intervention group was higher than that of the control group, and the difference was statistically significant ($p < .05$), as shown in Table 8.

3.3.5 *Total score of quality of life*

The total score of quality of life of the intervention group was higher than that of the control group, and the difference was statistically significant ($p < .001$), as shown in Table 9.

Table 3. Comparison of living habit compliance scores between the two groups in 1-3 years after surgery (points, $\bar{x}\pm s$)

Time	Intervention Group (n = 24)	Control Group (n = 24)	F_{Group}	P_{Group}
Before Intervention	19.46±4.58	19.69±4.79	0.057	.811
2-month Intervention	23.48±2.33[§]	19.88±4.27[*]	26.467	< .001
4-month Intervention	24.79±2.01[§€]	20.17±3.59[*]	60.733	< .001
F_{Time}	19.862	0.185		
P_{Time}	< .001	.832		
$F_{Time*Group}$	8.318			
$P_{Time*Group}$	< .001			

Note. [*] in comparison with the intervention group, $p < .05$; [§] in comparison with the condition before intervention, $p < .05$; [€] in comparison with the condition after 2-month intervention, $p < .05$

Table 4. Comparison of self-monitoring compliance scores between the two groups in 1-3 years after surgery (points, $\bar{x}\pm s$)

Time	Intervention Group (n = 24)	Control Group (n = 24)	F_{Group}	P_{Group}
Before Intervention	14.29±3.96	14.67±3.96	0.215	.644
2-month Intervention	19.23±2.42[§]	15.33±2.71*	55.303	< .001
4-month Intervention	20.69±2.19[§€]	15.17±2.96*	107.612	< .001
F_{Time}	50.826	0.494		
P_{Time}	< .001	.612		
$F_{Time*Group}$	21.614			
$P_{Time*Group}$	< .001			

Note. [*] in comparison with the intervention group, $p < .05$; [§] in comparison with the condition before intervention, $p < .05$; [€] in comparison with the condition after 2-month intervention, $p < .05$

Table 5. Comparison of physiological function scores between the two groups in 1-3 years after surgery (points, $\bar{x}\pm s$)

Time	Intervention Group (n = 24)	Control Group (n = 24)	F_{Group}	P_{Group}
Before Intervention	17.54±1.61	18.42±1.59	3.588	.064
2-month Intervention	20.92±3.67[§]	20.70±2.88[§]	0.048	.828
4-month Intervention	24.54±3.20[§€]	21.33±3.67[*§]	10.420	.002
F_{Time}	32.931	6.974		
P_{Time}	< .001	< .001		
$F_{Time*Group}$	5.858			
$P_{Time*Group}$	.004			

Note. [*] in comparison with the intervention group, $p < .05$; [§] in comparison with the condition before intervention, $p < .05$; [€] in comparison with the condition after 2-month intervention, $p < .05$

Table 6. Comparison of psychological function scores between the two groups in 1-3 years after surgery (points, $\bar{x}\pm s$)

Time	Intervention Group (n = 24)	Control Group (n = 24)	F_{Group}	P_{Group}
Before Intervention	18.04±1.52	18.29±1.46	0.339	.564
2-month Intervention	19.50±2.25[§]	19.17±2.26	0.707	.405
4-month Intervention	23.75±3.14[§€]	19.42±2.02[*]	32.358	< .001
F_{Time}	46.432	2.359		
P_{Time}	< .001	.106		
$F_{Time*Group}$	14.664			
$P_{Time*Group}$	< .001			

Note. [*] in comparison with the intervention group, $p < .05$; [§] in comparison with the condition before intervention, $p < .05$; [€] in comparison with the condition after 2-month intervention, $p < .05$

Table 7. Comparison of social function scores between the two groups in 1-3 years after surgery (points, $\bar{x}\pm s$)

Time	Intervention Group (n = 24)	Control Group (n = 24)	F_{Group}	P_{Group}
Before Intervention	29.92±3.51	28.25±2.90	3.219	.079
2-month Intervention	33.96±4.23[§]	33.13±4.47[§]	0.441	.510
4-month Intervention	40.376±4.70[§€]	32.17±3.79[*§]	44.437	< .001
F_{Time}	45.266	10.397		
P_{Time}	< .001	< .001		
$F_{Time*Group}$	13.588			
$P_{Time*Group}$	< .001			

Note. [*] in comparison with the intervention group, $p < .05$; [§] in comparison with the condition before intervention, $p < .05$; [€] in comparison with the condition after 2-month intervention, $p < .05$

Table 8. Comparison of treatment function scores between the two groups in 1-3 years after surgery (points, $\bar{x}\pm s$)

Time	Intervention Group (n = 24)	Control Group (n = 24)	F_{Group}	P_{Group}
Before Intervention	18.13±2.70	18.54±2.57	0.299	.587
2-month Intervention	20.63±1.80[§]	18.42±2.32[*]	13.102	.001
4-month Intervention	24.67±3.33[§€]	21.08±2.57[*§€]	17.408	< .001
F_{Time}	26.391	5.623		
P_{Time}	< .001	.007		
$F_{Time*Group}$	6.296			
$P_{Time*Group}$	.003			

Note. [*] in comparison with the intervention group, $p < .05$; [§] in comparison with the condition before intervention, $p < .05$; [€] in comparison with the condition after 2-month intervention, $p < .05$

Table 9. Comparison of the total score of quality of life between the two groups in 1-3 years after surgeryc (points, $\bar{x}\pm s$)

Time	Intervention Group (n = 24)	Control Group (n = 24)	F_{Group}	P_{Group}
Before Intervention	98.63±5.19	98.50±3.80	0.009	.925
2-month Intervention	110.00±7.12[§]	1.6.21±6.83[§]	3.546	.066
4-month Intervention	128.33±7.84[§€]	109.00±6.43[*§]	87.229	< .001
F_{Time}	142.882	18.436		
P_{Time}	< .001	< .001		
$F_{Time*Group}$	31.004			
$P_{Time*Group}$	< .001			

Note. [*] in comparison with the intervention group, $p < .05$; [§] in comparison with the condition before intervention, $p < .05$; [€] in comparison with the condition after 2-month intervention, $p < .05$

4. DISCUSSION

The results of this study showed that the self-monitoring score and living habit compliance score of the intervention group were lower before intervention, and the scores of the intervention group were significantly higher than those of the control group after 2 months and 4 months of intervention, and the difference was statistically significant ($p < .001$), which was consistent with the results (poor compliance with living habits and self-monitoring in patients after kidney transplantation) of Hofmann and Bunze,[12] while the scores of the control group did not improve significantly before and after intervention. This may be the case when ADOPT nursing intervention, the intervention staffs take the initiative to guide the patients, so that the patients can articulate their daily habits, the intervention staffs find the problem in time, use the simple and easy-to-understand PPT animation form to inform the patients of a reasonable lifestyle and the self-monitoring method, and establish a guidance and supervision card for the patients who have problems, and the patients' enthusiasm is improved. The routine care mode can satisfy the actual needs. It can be seen from the literature that most studies mainly focus on the study of patients' medication compliance and follow-up compliance, while ignoring patients' self-monitoring compliance and living habit compliance. Self-monitoring (blood pressure, blood glucose, urine output, etc.) can detect potential risk factors in time, prevent complications, seek medical attention in time, and good living habit compliance can effectively improve prognosis. The results of this study suggest that ADOPT nursing mode can improve patients' self-monitoring and living habit compliance.

After the intervention on the compliance of patients' quality of life, the scores of the two groups in five dimensions of quality of life, physiological function, psychological function, social function and treatment function were improved to varying degrees at 4 months of intervention, and the scores of the intervention group were higher than those of the control group, and the difference was statistically significant ($p < .001$). It is consistent with the results of related studies.[13] The above results show that ADOPT nursing intervention mode is suitable for the intervention of patients' quality of life, is applicable to clinical practice, and is superior. Meanwhile, the scores of 32 scoring items in the quality of life scale in the intervention group have been improved to varying degrees. During the outpatient review, we were able to actively grasp the key issues, intervene on the main factors that affect the quality of life of kidney transplant patients, and take one-to-one specific nursing intervention based on the specific measures developed by ADOPT nursing intervention mode, which improves the quality of life of patients in 1-3 years after surgery. In addition, we can try to use this mode to study the quality of life of patients more than 3 years after kidney transplantation in the future, and further validate the intervention effects of ADOPT nursing intervention mode.

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