Study and discussion on nursing and psychological comfort after heart valve replacement surgery: a new method to explore the nursing for patients receiving heart valve replacement surgery

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Abstract

In order to explore the clinical effects generated by the post-operative nursing and psychological comfort implemented for the patients with heart valve replacement surgery. In this study, select 50 patients receiving heart valve replacement surgery in recent one year from our hospital, and divide the patients into treatment group and control group by randomization method (each group contains 25 patients). Implement conventional nursing for 25 patients in control group, and implement post-operative nursing and psychological comfort for 25 patients in treatment group, and compare the treatment effects of two groups. The final result shown, after post-operative nursing and psychological comfort, the patients in treatment group realized an overall effective rate significantly higher than the control group; the Self-Rating Anxiety Scale (SAS) score of the treatment group was significantly lower than the control group, and the inter-group difference had statistical significance (P<0.05). Therefore, we came to the conclusion that **t**aking reasonable and effective post-operative nursing measures and psychological comfort for the patients with heart valve replacement surgery, could effectively reduce the post-operative mortality rate and incidence of complications of the patients, reduce the anxious mood of the patient, is the key factor for success of heart valve replacement surgery and smooth recovery after the surgery, and is suitable for clinical promotion.

Keywords: heart valve replacement surgery; post-operative nursing; psychological comfort.

Practical Application: With the increasing improvement of heart valve replacement surgery, more and more patients are implementing heart valve surgery. For the problem of postoperative rehabilitation, major hospitals have applied the comprehensive nursing method of postoperative comprehensive nursing and psychological comfort, so as to improve the rehabilitation rate of patients and reduce the pain and hospitalization time of patients.

1 Introduction

Valvular heart disease refers to valvular stenosis or valvular inadequacy caused by dissection or dysfunction of the valve and its accessory structure, it is a common and high-incidence heart disease, and the causes for such disease are generally rheumatic, ischemic, congenital, degeneration and other factors (Wu & Luo, 2007). Including, rheumatic fever is the most common cause for heart valve disease, and according to survey, the probability of rheumatic valvular heart disease among adults in our country is up to 2.34-2.72‰, which has seriously influenced people's daily work and life. At present, with constant development of medical technology and equipment, the Cardiopulmonary Bypass (CPB) has been greatly improved, the heart valve replacement surgery has also been increasingly perfect, and many heart valve patients would receive artificial heart valve replacement surgery every year, therefore, this surgery has gradually become the most effective surgery method in treating heart valve disease clinically. However, although the heart valve replacement has significant treatment effect, there are also disadvantages such as great surgery risks, high mortality and high incidence of complications after surgery (Zhang & Zhu, 2000). Therefore, implementing reasonable and effective

post-operative nursing measures and psychological comfort has become the key factor for success of heart valve replacement surgery and smooth recovery after the surgery. In this study, we selected 50 patients receiving heart valve replacement surgery in recent one year from our hospital, and carried out nursing research, the final research results found that implementing post-operative nursing and psychological comfort for the patients not only contributed to improving the survival rate of the patients and reducing incidence of the complications, but also reduced the anxious mood of the patient, helped to improve the quality of survival and quality of life of the patients, thus proving that it is suitable for clinical promotion. Now, the specific reports will be reported in details as follow.

2 Materials and methods

2.1 General materials

50 patients receiving heart valve replacement surgery in recent one year from our hospital as the main observation

object were selected; the patients participating in this study all conform to the clinical diagnosis of heart valve replacement surgery and all treatment and nursing methods wre approved and passed by the Ethics Committee of our hospital. These 50 patients included 28 male patients and 22 female patients, with the youngest being 20 years old, and the oldest being 69 years old, and the average age being (42.84 ± 15.02) years old. This study randomized the patients into treatment group and control group (each group contained 25 patients). We implemented post-operative nursing and psychological comfort for treatment group, and implemented conventional nursing for control group. The patients and their family members have been informed of all nursing contents and the plan of this study, and they accept this study out of their own will and cooperate actively. Two groups of patients have no significant difference in age, gender, clinical symptoms and manifestations, and other general clinical data, have no statistical significance (P>0.05), and are comparable. Nursing methods

2.2 Nursing methods

Control group

Implement conventional nursing for the patients in control group, and assign special nursing personnel to record various research data of this group and periodically sort such data.

Treatment group

Implemented post-operative nursing and psychological comfort for the patients in treatment group, and assign special nursing personnel to record various research data of this group on time and periodically sort the records. Now, the specific nursing measures are reported as follows.

Strengthen basic clinical nursing after surgery

Monitoring nursing of the respiratory system. Since the heart valve patients generally have cardiac insufficiency before surgery, which results in obstruction of venous return, thus causing congestion in the lung, therefore, the patients would have pulmonary arterial hypertension (PAH) at different degrees, thus making it quite easy to have the problem of respiratory insufficiency after surgery. Therefore, after patients return to ICU after surgery, connect their tracheal cannula with the ventilator whose parameters have been set completely in advance immediately, so as to ensure stability of the function of respiration and circulation of the patients, and judge the operating state of the ventilator according to the data displayed on the ventilator dashboard and the fluctuation in thorax of the patients (Xu et al., 2006). After surgery, the patients shall generally use the ventilator for assisted respiration of 5-16 h, and during the period of using ventilator, pay attention to making regular analysis and check of the arterial blood gas (ABG) of the patients, and adjust parameters of the ventilator based on analysis of ABG, and meanwhile, pay attention to making timely warming and humidification of the respiratory tract, and aspirate the sputum immediately once discovered, and pay attention to giving 2 minutes of pure oxygen inhalation to the patients before and after the aspiration

of sputum, in order to avoid increasing oxygen consumption of the heart (Feng & Liu, 2010), and ensure that the patients could get safe and effective respiratory support. After the patients recover consciousness, the nursing personnel shall kindly and gently encourage and comfort the patients to conquer physical discomfort, increase sense of safety of the patients, and then inform the patients of the advantages and disadvantages of the ventilator, and withdraw the ventilator after the patients have a good recovery of myodynamia. Before extubation, pay attention to the depth of intubation, monitor and listen to the bilateral breath sounds of the patients at fixed time with stethophone, and aspirate immediately once discovering sputum and other tracheal secretion; at the time of extubation, pay attention to instructing the patients to make autonomous respiration slowly with patients, and encourage them to build up confidence; after extubation, pay attention to taking aerosol inhalation, chest treatment, oral nursing and other measures for the patients at fixed time, so as to help the patients to excrete the sputum.

Monitoring nursing of the circulatory system. Nursing of arrhythmia and low cardiac output syndrome. Arrhythmia and low cardiac output syndrome are the most common complications and the complications mostly likely to cause death after heart valve replacement (Xu, 2010; Li et al., 2004). Due to intraoperative anesthesia, and tractive and surgical damage of the heart, and myocardial edema, hypotension, electrolyte disturbance, hypovolemia and other factors occurred after surgery, result in that it is quite easy to have arrhythmia after surgery (Chen & Chen, 2009). Therefore, immediately after the surgery, the nursing personnel shall use electrocardiomonitor to make continuous monitoring of the patients' pulse, cardiac rhythm, blood pressure, respiration, etc. continuously, so as to discover abnormal cardiac rhythm timely, be clear about the causes, and assist with the attending doctor in making treatment. The nursing personnel shall also give anti-arrhythmia drugs to the patients following the doctor's advice, so as to reduce the cardiac load and enhance the cardiac output of the patients, and according to the examination results, supplement potassium element and blood volume to avoid electrolyte disturbance, or use sodium nitroprusside to reduce preload, and take electrical cardioversion, temporary cardiac pacing and other measures for the patients. As for the low cardiac output syndrome after surgery, the nursing personnel shall lay emphasis on monitoring changes in blood pressure, urine volume, heart rate and central venous pressure (CVP) and peripheral circulation condition, etc. Following the doctor's advice, use appropriate positive inotropic drugs and vasodilators to enhance myocardial contractility and improve the cardiac function, and when using vasodilators, pay attention to using micro-infusion pump to pump into the drugs, so as to ensure accurate medication, and when pumping into the drugs, pay attention to making close observation of the patients' reaction after medication, so as to adjust the pumping speed timely and safely, and meanwhile, pay attention to observing and recording the urine output per hour of the patients, and keep the urine output per hour above 0.5 mL as much as possible, and pay attention that within 24 hours, there should be basically a negative balance between the infusion volume and the urine output. In addition, since low cardiac output syndrome (LCOS) would result in histanoxia and tissue hypoperfusion, the patients

would develop dysphoria, cyanosis in peripheral limbs, moist in the skin, etc., and the nursing personnel shall pay more attention to spiritual situation of the patients, and pay attention to warm-keeping problems of the patients; ② Observation nursing of the drainage tube. After the surgery, the nursing personnel shall connect the pericardium, mediastinal drainage tube to the chest bottle, and the selected length of the drainage tube shall generally be suitable for turnover and activities of the patients. Pay attention to making negative pressure suction at early period after surgery, extrude the pericardium and mediastinal drainage tube once every 15-30 minutes in the first 4 hours, and reduce the extrusion times slowly after the condition becomes stable gradually, and keep the drainage tube unobstructed so as to avoid occurrence of pericardial tamponade. The nursing personnel shall also pay attention to carefully monitoring the volume of drainage and the color of the drainage liquid, record once an hour, and in case of discovering that the drainage liquid is excessive and the color is bright red, in general, there is possibly intrathoracic bleeding in adults if the bleeding volume is above 300 mL per hour and continues to increase, therefore, in case of such circumstances (Xu & Xin, 2001), report to the doctor immediately, and take corresponding treatment measures. Since the patients with heart valve replacement have impaired liver function due to long-term cardiac insufficiency before surgery, it's very likely for them to have errhysis and bleeding after surgery, therefore, the nursing personnel shall pay close attention to whether the patients have hemoproctia, nosebleed, hematuria, bleeding gums, hemafecia, haematemesis, hemopericardium and other conditions or not, and as for the patients with large volume of bleeding, lengthen the activated clotting time (ACT), and give protamine, and give hemostasia drugs when necessary; ③ Application nursing of anticoagulants. On Day 2-3 after the surgery, if discovering that the drainage liquid in the pericardium and mediastinal drainage tube is normal without bleeding, the drainage tube could be withdrawn, and if there is no errhysis within 2 hours, give the anticoagulant – warfarin to the patients for oral taking, and adjust the dosage of the anticoagulant according to the prothrombin time (PT), and under normal conditions, keep the PT between 1.5-2 times of the normal value, and under accurate dosage, instruct the patients to take the anticoagulants on time, and observe whether there are bleeding gums, menorrhagia, nosebleed and other phenomena in the patients or not during the medication period, and if there are, it means that the dosage is excessive, and must be adjusted timely.

Nursing of avoiding post-operative infection

Due to long-time suffering of disease, serious disease condition, poor systematic resistance and other factors, the patients with heart replacement surgery are quite likely to have post-operative infection. Therefore, in addition to using essential antibiotics after surgery following the doctor's advice, the nursing personnel shall also pay attention to maintaining sterility of various tubes, and sterile nursing of the skin at the month of intubation, and every day, replace the dressings of the patients, sterilize the wound, scrub the perineum, and give ultrasonic aerosol inhalation by conventional nursing, and every day, make 3 times of oral nursing and one systematic scrubbing, maintain the ward and bed clean and tidy, and make

sterilization at fixed time. Meanwhile, measure the temperature, white cells, etc. of the patients from time to time, and withdraw the tube which may cause bacterial invasion timely according to recovery condition of the patients, so as to avoid post-operative infection (Lu, 2007).

Nursing on post-operative diet and instruction on discharge

4-6 h after extubation of the patients, the nursing personnel may give some liquid diet to the patients, and on Day 2 after the surgery, prepare high-protein, high-calorie and vitamin-rich food for the patients, but pay attention to intake of water, so as to avoid myocardial edema due to excessive water intake (Shan et al., 2021; Lu et al., 2021). Upon discharge, the nursing personnel shall warn the patients to rest in bed for 3-6 months after being back home, do activities out of bed according to the physical capacity, gradually and without haste, not to do heavy physical labor, make frequent communications with the people around, and remain an optimistic and positive mental attitude; after discharge from hospital, continue to take anticoagulants, do not discontinue the drug without permission, and in diet, continue to take high-protein, high-calorie and vitamin-rich food, and do not take the food and other drugs which are incompatible with the anticoagulants; pay attention to keeping warm in daily times, so as to avoid cold and respiratory tract infection (RTI), and do not make overwork of the body; ask the patients to come back to the hospital for re-examination regularly, and as for the nonlocal patients far away from the hospital or the patients with economic difficulties, provide them with a health card to help them consult and inquire the hospital timely.

Post-operative psychological comfort

After detailed conversation with the patients receiving surgery, the post-operative nursing personnel understood that there are mainly the following causes for the patients' anxiety after surgery: ① The patients are not so clear about their own disease condition, lack knowledge in the heart valve replacement surgery, fear of the artificial valves implanted in the body, and worry about the surgery risks and the treatment effect after surgery, and the quality and service life of the valves; ② The patients lack confidence in recovery condition after surgery, lack patience in long-term taking of anticoagulants after surgery, and there are also some patients feeling more anxious due to the treatment cost; ③ The patients worry about how to take the anticoagulants and about monitoring of blood clotting time, and feel agitated and scared due to pain of various incisions and stimulation brought by various tubes after surgery; ④ The patients worry about that the surgery would decrease their quality of life and self-care ability, would influence daily work and life and increase burden to their families, and some patients with replacement of mechanical valve prosthesis would often hear some noise, which enhances their anxiety, fear and agitation; ⑤ Due to physical and mental reasons, after surgery, the patients would have insomnia and dreamful sleep, and together with disturbance by the surrounding environment, they would feel more anxiety and agitation. As for the above-mentioned reasons, after the patients wake up, the nursing personnel shall gently and kindly conform the patients, stabilize their emotion, understand their psychologic status and

emotional characteristics, make symptomatic psychotherapy, and answer their questions patiently; after the surgery, tell the patients that the surgery is very successful, and ask them to cooperate with the nursing personnel in recuperation in the following day, and do not have great psychological burden, and in case of changes in the patients' condition, the nursing personnel shall handle in a calm manner, so as to increase sense of safety of the patients (Ma et al., 2010), in case of the patients in the same ward requiring emergency treatment, use a screen to keep them out in order not to avoid panics in the other patients; after the patients' condition and emotion become stable, the nursing personnel shall explain relevant knowledge after the heart valve replacement surgery and the importance of post-operative rehabilitation training to the patients patiently, and encourage them to make rehabilitation training actively, so as to recover their physical status as soon as possible; as for some patients receiving mechanical valve prosthesis, the nursing personnel shall explain the advantages and disadvantages of the valve replacement surgery to them patiently, and enable them to understand occurrence of various conditions so as not to feel anxious any longer; the nursing personnel may also cooperate with the patients' family members in making psychological comfort for the patients, distracting the patients' attention by telling some funny stories or talking about family matters, so as to make the patients not only care about physical discomforts any longer; the nursing personnel shall also create a quiet and comfortable ward environment, reduce personnel visits, so as to enable the patients to have a good rest, and as for some insomniac patients, play light music for them to help them to sleep, and as for the seriously insomniac patients, give sleeping pills to them as appropriate; as for those patients with anxiety due to poor economic conditions, explain to them that they could be able to conduct normal work and life after a period of recovery upon discharge, as long as they cooperate well in treatment after surgery, therefore, they shall not be too worried about the conditions after surgery.

2.3 Observation indexes

Use the percentage calculation method to observe the post-operative mortality, thus assessing the treatment effects of two groups of patients in this study; use Self-Rating Anxiety Scale (SAS) score to assess the anxiety conditions of the patients in two groups before and after nursing: there are total 20 items in this table, and by applying the 4-level score rule and according to the theory of Zung, when the SAS score is more than 50, the patients are in anxious state.

2.4 Statistical methods

This study uses SPSS 17.0 statistical software for data processing and analysis, indicates the measurement data by $(\bar{x} \pm s)$, uses t test and x^2 test for inter-group comparison, and describes the enumeration data by (n)%, and when P<0.05, the inter-group difference has statistical significance.

3 Results

3.1 Comparison of treatment effect between two groups of patients

The nursing personnel recorded and sorted the daily data of two groups of patients participating in this study, and summarized in Table 1.

In order to be convenient for analyzing the influencing factors, we divided the evaluation results of treatment effect into two categories: Fully Healed and Complication Occurred were expressed as effective, death was expressed as ineffective. Based on the data in Table 1, we used x^2 test in SPSS 17.0 statistical software to analyze the data of two groups and reached the conclusion; the specific operating steps are as follows.

Data entry

Open the SPSS data edit window, click "Define View" button to define three variables, g, r and f; g indicates group (1 is treatment group, 2 is control group); r indicates treatment effect (1 is effective, 2 is ineffective); f indicate frequency. Then, click the "Data" button to enter the data.

Data analysis

Click the "Data" button in Data Editor window and select Weight dialog box, open the Weight dialog box, define the weight, select weight variable f, and click "OK" button ; click "Analyze" button in Data Editor window, and select "Chi-squared Test" under "Descriptive Statistics"" ; open the Chi-squared Test dialog box, select row variable g and column variable r ; open the Statistics sub-dialog box, select Chi-squared Test, click "Continue" to return to the main dialog box ; open the Cell Display sub-dialog box to define the output row percentage, click "Continue" to return to the main dialog box; finally, click "OK" to execute the analysis.

Statistical results

Through the above analysis, the analysis results are obtained and shown in Table 2 and Table 3.

Table 2 and Table 3. Statistical analysis results of Comparison of treatment effect between two groups of patients

Table 2 and Table 3 shows the x^2 test results of comparison of treatment effect between two groups of patients: in Chi-Square Tests table, Pearson x^2 value in the first line is the chi-square test result when n≥25 and T_{min}≥5, the followed columns report the x^2 value (Value), degree of freedom (df) and probability value

Table 1. Comparison of treatment effect between two groups of patients (n) %.

Group	Number of patients (n)	Fully healed	Complication occurred	Death	Overall effective rate
Treatment group	25	21 (84)	2 (8)	2 (8)	23 (92)
Control group	25	12 (48)	4 (16)	9 (36)	16 (64)
Total	50	33 (66)	6 (12)	11 (22)	39 (78)

(Asymp. Sig), and the last two columns show the probability value of Fisher's Exact Test (Exact Sig.). The second line is the chi-square test result of Continuity Correction x^2 when n≥25 and $1 \leq T_{min} < 5$, followed by Fisher's Exact Test results and Linear-by-Linear Association results, etc. Therefore, the results of this study are: $x^2 = 5.711$, P=0.017; if the standard is α=0.05, the difference in treatment effect between two groups of patients has statistical significance.

According to the statistical results in Table 2 and Table 3, Table 4 is finally obtained

From the results in Table 4, the effective rate of patients in treatment group after receiving nursing is 92.0%, while the rate of the control group is only 64.0%, which is far below the treatment group; the ineffective rate of patients in treatment group after receiving nursing is 8.0%, while the rate of the control group is 36.0%, which is much higher than the treatment group. In addition, in this study, $x^2 = 5.711$, P=0.017, if the test criterion is α=0.05, the data analysis concludes that the comparative difference between two groups is of statistical significance (P<0.05).

3.2 Comparison of SAS score of two groups of patients before nursing and after nursing

According to survey results of the two groups of patients' anxiety and other conditions before nursing and after nursing, the SAS scores obtained are as shown in Table 5 and Table 6.

We use t test in SPSS17.0 statistical software to analyze the data in Table 5 and Table 6, and obtain the relevant results. The detailed operating steps are as shown below.

Data entry

Firstly, open the SPSS data editor, click the "Variable View" to define two variables g (1 means treatment group, 2 means

Table 2. Group*Effect Crosstabulation.

			Effect		Total
			Effective	Ineffective	
Group	Treatment Group	Count	23	2	25
		% within Group	92.0%	8.0%	100.0%
	Control Group	Count	16	9	25
		% within Group	64.0%	36.0%	100.0%
Total		Count	39	11	50
		% within Group	80%	22.0%	100.0%

* represents that this table is generated from data × 2 cross table.

Table 3. Chi-Square Tests.

	Value	df	Asymp. Sig.(2-sided)	Exact Sig.(2-sided)	Exact Sig.(1-sided)
Pearson Chi-Square	5.711[a]	1	.017		
Continuity Correction[b]	4.196	1	.041		
Likelihood Ratio	6.081	1	.014		
Fisher's Exact Test				.037	.019
Linear-by-Linear Association	5.597	1	.018		
N of Valid Cases	50				

[a]0 cells (.0%) have expected count less than 5. The minimum expected count is 5.00; [b]Computed only for 2×2 table.

Table 4. Comparison of treatment effect between two groups of patients (n) %.

Group	Number of patients (n)	Effective	Ineffective
Treatment group	25	23 (92.0)	2 (8.0)
Control group	25	16 (64.0)	9 (36.0)
x^2		5.71	
P		0.017	

Table 5. SAS score of the two groups of patients before nursing (score).

	SAS score before nursing (SAS)								
Treatment group	51	50	48	49	54	52	54	51	52
	47	51	58	42	58	47	52	40	57
	55	48	49	50	53	46	40		
Control group	53	51	52	53	55	46	40	52	50
	56	50	58	43	51	39	52	56	52
	53	48	52	53	55	52	53		

control group) and x (SAS score), and then click "Data View" for data entry.

Data analysis

Click the "Independent-Samples T Test" under the "Compare Means" under the "Analyze" button in the data editing column, and after opening the dialog box of Independent-Samples T Test, select the variable "x" as the Test Variable, and the variable "g" as the Grouping Variable, and then open the dialog box of Define Groups, enter "1" in Group 1, and "2" in Group 2, and click "Continue" to return to the main dialog box, and click "OK" to execute the analysis.

Output results

According to the data analysis in 2.2.2, we conclude the results as shown in Table 7, Table 8, Table 9 and Table 10 .

Table 7, Table 8, Table 9 and Table 10. Statistical analysis results of Comparison of SAS score of two groups of patients before nursing

Table 6. SAS score of the two groups of patients after nursing (score).

SAS score after nursing (SAS)								
Treatment group	36	38	29	34	40	20	36	34	40
	38	32	32	48	32	46	40	28	30
	30	28	31	34	37	21	32		
Control group	52	38	36	48	30	29	34	40	49
	40	30	54	40	36	30	48	50	52
	47	32	50	31	35	32	36		

Table 7. Group Statistics.

	Group	N	Mean	Std.Deviation	Std.Error Mean
x	Before the Nursing	25	50.16	4.854	.971
	After the Nursing	25	51.00	4.664	.933

x: Analysis variables.

Table 8. Independent Samples Test.

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
x	Equal variances assumed	.193	.662	-.624	48	.536	-.840	1.346	-3.547	1.867
	Equal variances not assumed			-.624	47.924	.536	-.840	1.346	-3.547	1.867

x: Analysis variables.

Table 9. Group Statistics.

	Group	N	Mean	Std.Deviation	Std.Error Mean
x	Before the Nursing	25	33.84	6.504	1.301
	After the Nursing	25	39.96	8.379	1.676

x: Analysis variables.

Table 10. Independent Samples Test.

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
x	Equal variances assumed	4.183	.046	-2.885	48	.006	-6.120	2.121	-10.385	-1.855
	Equal variances not assumed			-2.885	45.219	.006	-6.120	2.121	-10.392	-1.848

x: Analysis variables.

Table 11. Comparison of SAS score of the patients in two groups before nursing and after nursing (score, $\bar{x} \pm s$).

Group	n	SAS score	
		Before nursing	After nursing
Treatment group	25	50.16 ± 4.85	33.84 ± 6.50
Control group	25	51.00 ± 4.66	39.96 ± 8.38
t value		0.62	2.89
P value		0.54	0.006

Table 7, Table 8, Table 9 and Table 10 show the t test results of comparison of SAS score of two groups of patients before and after nursing respectively: the Independent Samples Test table shows the Levene's Test for Equality of Variances (homogeneity test of variance), F (F value of homogeneity test of variance) and Sig. (P value of homogeneity test of variance). In this study, the F values of two groups of patients before and after nursing are 0.193 and 4.183 respectively, the P values before and after nursing are 0.662 and 0.046 respectively, so that heterogeneity of variance can be concluded, and corrected t test (i.e. t' test) is needed. In t-test for Equality of Means (comparing whether the population means of two groups are equal), due to heterogeneity of variance, corrected results are needed, which are showed in the line of "Equal variances not assumed". In this study, the t values of two groups of patients before and after nursing are 0.62 and 2.89 respectively, the P values before and after nursing are 0.54 and 0.006 respectively; if the standard is α=0.05, the difference in SAS score between two groups of patients after nursing has statistical significance.

According to the statistical results in Table 7, Table 8, Table 9 and Table 10, Table 11 is finally obtained

According to the results in Table 5, the SAS score of the patients in treatment group before nursing is (50.16 ± 4.85), the SAS score of the patients in control group before nursing is (51.00 ± 4.66), and the difference between two groups has no statistical significance (P>0.05). The SAS score of the patients in treatment group after nursing is (33.84 ± 6.50), the SAS score of the patients in control group after nursing is (39.96 ± 8.38). The SAS scores of the patients in two groups after nursing both decrease compared with the scores before nursing, but the decrease degree of the treatment group is much higher than that of the control group, so that the difference between two groups has statistical significance (P<0.05).

4 Conclusions

Valvular heart disease is a common and high-incidence clinical heart disease, and the causes for such heart disease are generally rheumatic, ischemic, congenital, degeneration and other factors, while rheumatic heart disease is of the highest morbidity as shown by researches, the morbidity of patients with rheumatic heart disease in recent years tends to increase year by year, which has seriously influenced the daily work and life of the people. At present, with constant development of medical technology and equipment, Cardiopulmonary Bypass (CPB) has been greatly improved, and the heart valve replacement surgery has also been increasingly perfect, and many heart valve patients would receive artificial heart valve replacement surgery every year, therefore, this surgery has gradually become the most effective surgery method in treating heart valve disease clinically, it is conducive to improving cardiac function, and has significant clinical treatment effect (Hou, 2018; Fu & Li, 2018). However, this surgery also has great risk of surgery and risk of post-operative complications which are very easy to occur, and would threaten the patients' life and result in death if being serious, besides, the patients would have fear, anxiety and other psychological problems after surgery, and lack confidence in successful treatment, which also influence recovery of the patients (Jiang, 2004). Therefore, after surgery, the nursing personnel shall take reasonable and effective nursing measures and psychological comfort to reduce the post-operative complications, and improve the patients' quality of survival and quality of life.

The results of this study show that the overall effective rate of treatment for the patients in the treatment group after post-operative nursing and psychological comfort is 92%, while the rate for the patients in the control group after conventional nursing is only 64%, which is far below the treatment group (P<0.05). Meanwhile, the SAS score of the treatment group is significantly lower than the control group (P<0.05), and the inter-group comparison difference has statistical significance. Therefore, effective post-operative nursing measures and psychological comfort are good for post-operative recovery of the patients, improvement of the patients' survival rate, and improvement of the patients' quality of life.

To sum up, taking comprehensive and effective post-operative nursing measures and psychological comfort for the patients with heart valve replacement surgery, grasping the mental and physical conditions of the patients timely, and making symptomatic treatment, are very conducive to improving the quality of survival of the patients after surgery and after discharge from hospital, improving anxiety, fear and other psychological problems of the patients, and improving the quality of life of the patients, and are suitable for clinical promotion (Han, 2018, Luo et al., 2017).

References

Chen, H., & Chen, J. (2009). Prevention and nursing of post-operative complications of 55 cases with intensive valvular heart disease. *Chinese General Practice Nursing*, 7(2), 501.

Feng, H., & Liu, H. (2010). Perioperative nursing experience of 56 cases with heart valve replacement. *Journal of Practical Clinical Medicine*, 14(22), 87-88.

Fu, S., & Li, F. (2018). Impact of humanization nursing on quality of life of the patients after heart valve replacement. *Wisdom Health*, 4(10), 143-144.

Han, J. (2018). Impact analysis of systematic rehabilitation nursing on quality of life of the patients after heart valve replacement. *China Foreign Medical Treatment*, 37(10), 143-145.

Hou, Y. (2018). Research on continuing nursing in improving quality of life of the patients after heart valve replacement. *Electronic Journal of Practical Clinical Nursing*, 3(24), 70.

Jiang, Q. (2004). *Medical psychology* (152 p.). Beijing: People's Medical Publishing House.

Li, R., Zhang, J., & Chen, L. (2004). Perioperative nursing of patients with intensive valvular heart disease. *Journal of Qilu Nursing*, 10(7), 492-493.

Lu, W. (2007). Nursing after heart valve replacement. *Qiqihar Medical Journal*, 28(15), 1879-1880.

Lu, Z., Zhang, Y., Ge, K., Zhangm, J., Xue, M., & Ge, Y. (2021). Regulation of n-3 polyunsaturated fatty acids on secreted mirna derived from hypothalamic neural stem cells. *Food Science*, (1002-6630), 1-9.

Luo, J., Lin, S., Cai, J., Xu, X., Wei, C., Pan, L., Huang, Q., Zheng, H., & Huang, A. (2017). Impact of continuing nursing on quality of life of the patients after heart valve replacement. *Nursing Journal of Chinese People's Liberation Army*, 34(18), 70-73.

Ma, Y., Huang, L., Zhang, H., & Jin, L. (2010). Perioperative psychological nursing of patients with heart valve replacement. *Chinese Journal of Tissue Engineering Research*, 5, 163.

Shan, Y., Pu, D., Zhang, Y., & Li, P. (2021). Research progress of food salt reduction methods. *Food Science*, (1002-6630), 1-15.

Wu, G., & Luo, J. (2007). Overview of pathology of valvular heart disease. *New Medicine*, (5), 289-290.

Xu, H., & Xin, W. (2001). *Cardiac surgical care* (143 p.). Beijing: People's Military Medical Press.

Xu, J., Yi, S., Ge, Y., Pan, S., Qian, X.,& Liu, F. (2006). Analysis of risk factors for respiratory function failure after valve surgery. *Chinese Journal of Thoracic and Cardiovascular Surgery*, 22(4), 217-219.

Xu, L. (2010). Post-operative nursing experience of 87 cases with heart valve replacement. *Medical Journal of Chinese People's Health*, 22(8), 20.

Zhang, B., & Zhu, J. (2000). *Artificial heart valves and valve replacement* (2nd ed., pp. 56-57). Beijing: People's Medical Publishing House.