ORIGINAL RESEARCH

Clinical Efficacy and Prognostic Effects of High-quality Nursing Combined With Albumin in Treating Brainstem Hemorrhage

Yunxia Gao, MM; Li Sun, MM; Xiaojuan Zhang, MM; Wenjuan Wu, MM

ABSTRACT

Context • Brainstem hemorrhage is a disease with a high mortality rate and a poor prognosis. Its onset is urgent and critical, and patients need personalized, high-quality nursing. Also, albumin can have significant benefits in treating brainstem hemorrhage.

Objective • The study intended to explore the clinical efficacy of and improved prognoses from high-quality nursing combined with albumin in treating patients with brainstem hemorrhage.

Design • The research team conducted a prospective randomized controlled trial.

Setting • The study took place at Heibei Fengfeng General Hospital of the North China Medical and Health Group in Hebei, China.

Participants • Participants were 102 patients with brainstem hemorrhages who received treatment at the hospital between November 2020 and October 2022.

Interventions • The research team randomly divided participants into two groups, each with 51 participants: (1) the intervention group, who received high-quality nursing combined with 20% human albumin, and (2) the control group, who received conventional nursing combined with 20% human albumin.

Outcome Measures • The research team examined participants': (1) mortality rate; (2) scores on the Glasgow Coma Scale (GCS) and Glasgow Outcome Scale (GOS); (3) quality of life (QoL) scores, using the 36-Item Short Form Survey (SF-36); (4) scores on the Self-Rating Anxiety Scale (SAS); (5) health-behavior scores, using the Health-Behavior Scale, and (6) nursing satisfaction.

Results: Postintervention compared with the control group, the intervention group's: (1) total mortality rate was significantly lower ($P = .017$), (2) GCS and GOS scores were significantly higher (both $P < .001$), (3) QoL scores for all subdimensions were significantly higher (all $P < .001$), (4) SAS scores for all subdimensions were significantly lower (all $P < .001$), (5) health-behavior scores for all subdimensions were significantly higher ($P < 0.001$), and (6) nursing satisfaction was significantly higher ($P = .015$).

Conclusions • High-quality nursing interventions combined with albumin for brainstem-hemorrhage patients can effectively increase treatment efficacy, ensure patients' QoL, and facilitate recovery. Thus, high-quality nursing combined with albumin for brainstem-hemorrhage patients is of great significance in clinical practice. (*Altern Ther Health Med.* [E-pub ahead of print.])

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A close relationship exists between human brainstem's function and the location of the brainstem and parts of central nervous system.[1,2] Brainstem hemorrhage is quite common in clinical practice, and Das and Regenhardt and Huang et al have confirmed that this condition mainly results from a cerebral hernia due to cerebral edema.[3,4] Brainstem hemorrhage represents approximately 10% of cerebral-hemorrhage disease, mostly in pontine, and the rupture of the penetrating artery of the basilar artery supplying the pontine often causes it.[5,6]

The survival of patients with a brainstem hemorrhage of less than 5 ml is high, but the mortality of patients with a brainstem hemorrhage of over 5 ml can exceed 50% and of over 10 ml can reach 100%.[7] Thus, medical staff must pay significant attention to the severity of a brainstem hemorrhage.

Clinically, brainstem hemorrhage manifests with symptoms that have a sudden onset, including vomiting, dizziness, and diplopia; simultaneously, patients experience other symptoms such as bilateral limb and facial paralysis, positive disease reflex, respiratory changes, and a central high fever.[8]

Patients' disease progression is rapid, and if patients don't receive effective therapy when the disease occurs, the disability and mortality rates are quite high. The volume of the human brainstem isn't large, and it's a prohibited area for surgery.[9,10]

Albumin

Timely and effective drug therapy is a key measure to save patients' lives. To maintain the stability of patients' vital signs and reduce intracranial pressure, clinicians provide neurotrophic drugs and conduct symptomatic treatment according to patients' clinical symptoms, to prevent the occurrence of complications.[10,11]

Conservative management is a major therapy for clinical brainstem hemorrhage. Currently, clinicians have widely used human albumin in treating diseases such as brainstem hemorrhage.[12] Kearns et al found that albumin, for patients with brainstem hemorrhage, can elevate plasma oncotic pressure and effectively improve patients' blood circulation, and it can help eliminate human free radicals, which can have a marked influence in treating brainstem hemorrhage.[13]

Sharma et al demonstrated that conventional doses of albumin can exert significant . benefits in treating cerebral hematoma, effectively reducing edema in patients and protecting their brain tissue, which can have a remarkable impact on recovery of neurological function.[14]

Potential Complications

Cerebral hemorrhage's symptoms can lead to hypoxia and ischemia around hematoma, resulting in the production of a large amount of oxygen free radicals, which are crucial elements leading to brain edema or brain injury.[15] Thus, suppressing and controlling oxygen free radicals is of great significance for preventing the occurrence of brain injury.

A disturbance of consciousness accompanies brainstem hemorrhage, and early diagnosis and therapy is the key to elevating success rates in saving patients' lives and also is the basis of elevating patients quality of life (QOL). Patients with brainstem injury also can experience respiratory-center dysfunction, a disrupted respiratory rhythm, and in severe cases, the cessation of breathing.

Due to patients' varying degrees of disturbance of consciousness, they can't discharge secretions and foreign bodies in the airway through an autonomous cough and should receive a tracheotomy to keep the respiratory tract unobstructed, ameliorating brain tissue hypoxia.

Assisted ventilation is of great significance in treating brainstem hemorrhage, because it can facilitate diffusion of oxygen in the lungs and exchange of blood oxygen in the alveoli, which is also of great significance in ensuring a good prognosis for patients.[16]

Brainstem hemorrhage can cause problems of the digestive tract because it's easy for reflux and aspiration to occur, and patients also have a high probability of a stress peptic ulcer. Thus, it's better to retain nasogastric intubation for gastrointestinal decompression to reduce the probability of aspiration by mistake.

High-quality Nursing

The onset of brainstem hemorrhage is urgent and critical, and patients need personalized, high-quality nursing.[17] For patients receiving active therapy, high-quality nursing can also improve treatment efficacy and facilitate a good prognosis for patients. High-quality nursing refers to patient-centered, strengthened basic nursing, with full implementation of a nursing-responsibility (The nursing-responsibility system refers to the management system in which all tasks are handled by special personnel and the scope of responsibility is clearly defined) system, a deepened focus on professional nursing, and improved nursing service levels as a whole.[18]

Wang et al indicate that the majority of medical workers at present have recognized the benefits of high-quality nursing, which focuses: (1) on the monitoring of patients' disease state; (2) on the most effective use of medicine, (3) on attention to patients' return to consciousness, and to their psychology and diets; (4) prevention of complications; and (5) provision of extended care after hospitalization.[19] . Those researchers also indicate that nurses base patients' care on their rich medical knowledge, professional skills, and insights into patients' existing or potential nursing problems, to provide high-quality nursing and improve the treatment effect and patients' QoL.

Implementing high-quality nursing interventions in treating brainstem hemorrhage is of great significance in elevating treatment efficacy and ensuring patients' safety, which requires high attention from nursing staff. The implementation of high-quality nursing for patients can also enable nurses to elevate their service awareness, change their nursing ideas, elevate the quality of their clinical diagnoses and therapy, meet patients' needs for therapy, and further standardize behaviors of diagnosis, therapy, and nursing.

Patients' Needs and High-quality Nursing

The fatality rate for brain stem hemorrhage is high, and if high-quality nursing isn't available, complications will occur. Nursing staff should first monitor patients' conditions—their consciousness, vital signs, oxyhemoglobin saturation, and other indicators—and record them every half hour. Cerebral vasospasm is a common complication of brainstem hemorrhage and can easily cause delayed cerebral ischemia and brain edema, which is the major reason for patients' deaths. Thus, it's necessary to actively improve cerebral perfusion and apply mannitol to ameliorate brain edema.[20]

Patients with brainstem hemorrhage are prone to eyelid swelling, bulbar conjunctival congestion and edema, and lagophthalmos, and in the long run, conjunctivitis and keratitis sicca can occur. If nursing staff don't take effective preventive measures, visual loss and damage to patients' QOL can occur. Thus, nursing staff should cover patients' eyes with petrolatum gauze, regularly apply eye-protection liquid to flush foreign bodies, and apply erythromycin ointment to smear the eyes.

Gastrointestinal hemorrhage is also a common complication of brainstem hemorrhage. The secretion of catecholamine can cause a contraction of gastric-mucosa blood vessels, and nerve excitement can also facilitate secretion of gastric acid and damage the gastric mucosal barrier, leading to a stress ulcer.

When patients receive nasal feeding, nurses should not only monitor the nature of their gastric juices but also provide anti-acids for protecting gastric mucosa, and if patients'

refluxing gastric juice is a brown color, nurses should rinse patients' mouths with normal saline. Patients receiving nasal feeding need to maintain a comfortable position and minimize stimulation of the nasogastric tube on gastric wall.

Lucchini et al found that patients who receive mechanical ventilation should receive oral nursing 2-3 times per day. Those researchers indicate that patients should receive: (1) a 2-5% boric acid solution if their oral pH value is above 7; (2) a 2% sodium bicarbonate solution if patients' oral pH value is below 7; and (3) a 1-3% hydrogen peroxide solution if their oral pH value is 7.[21]

Proper sedation and analgesia can also prevent patients from becoming restless and worsening bleeding; thus nursing staff should maintain the stability of patients' blood pressures, breathing, and other indicators through sedative and analgesic nursing.

Fang et al found that high-quality nursing could consistently reduce glioma patients' pain and negative moods, reduce their stress responses, and improve their quality of sleep and QoL.[22] Wang found that high-quality nursing can effectively relieve negative emotions, improve clinical nursing satisfaction, and reduce adverse reactions for acute-leukemia patients during chemotherapy.[23]

Current Study

The current study intended to explore the clinical efficacy of and improved prognoses from high-quality nursing combined with albumin in treating patients with brainstem hemorrhage.

METHODS

Participants

The research team conducted a randomized controlled trial, which took place at Heibei Fengfeng General Hospital of the North China Medical and Health Group in Hebei, China. Potential participants were patients with brainstem hemorrhages who received treatment at the hospital between November 2020 and October 2022. We contacted them by communicating with patients or their families to inform them of our study protocol and to ask them if they would like to participate in our study. Patients willing to participate in this study will sign informed consent and cooperate with this study.

The study included potential participants if: (1) an examination had indicated that they met the criteria for brainstem hemorrhage that the World Health Organization (WHO) has set;[24] (2) All patients and their families were aware of this study and voluntarily participate in this study by signing relevant agreements with informed consent. .

The study excluded potential participants if: (1) Patients with serious diseases of heart, liver and kidney; (2) Patients with mental illness.

The hospital's Medical Ethics Committee approved the study's protocols. Our study was in line with the Helsinki Declaration.

Procedures

Interventions. The research team divided participants into two groups using the random number table method, each with 51 participants: (1) the intervention group, who received high-quality nursing combined with 20% human albumin, and (2) the control group, who received conventional nursing combined with 20% human albumin.

Drug therapy. Both groups received conventional drug therapy, such as anti-infective and hemostatic drugs, to keep patients' respiratory tracts unobstructed and maintain electrolyte balance. According to patients' disease conditions, both groups also received 20% human albumin (approval G.Y.Z.Zi. S20043016, Hebei Daan Pharmaceutical, Shijiazhuang, Hebei, China). After every 12-h interval, patients received an intravenous infusion of albumin once at 1-2 ml/min. The medical staff carefully observed patients' disease conditions, and if improvement occurred, they could appropriately reduce the amount of albumin.

Laboratory and other procedures. The research team closely monitored all patients' electrolytes, pH, pulse, brain consciousness, blood pressure, respiratory status, and death status. Additionally, the team measured patients' mild hypothermia response and performed a blood routine, assessed coagulation status, and performed electrocardiograms.

Outcome measures. The research team examined participants': (1) mortality rate, (2) scores on the Glasgow Coma Scale (GCS) and Glasgow Outcome Scale (GOS),[25,26] (3) quality of life (QoL) scores using the 36-Item Short Form Survey (SF-36),[27] (4) scores on the Self-Rating Anxiety Scale (SAS),[28] (5) health-behavior scores using the Health-Behavior Scale,[29] and (6) nursing satisfaction.

Interventions

Control group. The control group received a conventional nursing intervention. Nursing staff monitored changes in patients' vital signs and performed symptomatic therapy for patients in strict accordance with doctors' instructions. Nursing staff paid attention to and implemented the nursing that complications required.

For airway nursing, the nursing staff evaluated patients' GCS and GOS scores. If patients' scores were greater than 12 points, nurses implemented oxygen inhalation using nasal catheters; if patients' scores were between 8 and 12 points, they implemented oxygen inhalation using masks; if patients' scores were lower than 8 points, they implemented oxygen inhalation using the nasopharyngeal airway.

For pulmonary infection nursing, patients received nebulization inhalation therapy on the basis of the results of the use of oxygen inhalation using masks and ensured proper oral hygiene.

For gastrointestinal nursing, patients with GCS and GOS scores below 8 received bedside nasogastric intubation; if patients scores were greater than 8 points, the nurses tilted the patients' heads to one side to avoid suffocation. Afterwards, nurses could provide nasal feeding according to patients' gastrointestinal state.

For analgesic and sedative nursing, patients underwent an intramuscular injection of 5 mg of diazepam for sedation and an intramuscular injection of flurbiprofen axetil or dezocine for pain relief.

Intervention group. The intervention group received a high-quality nursing intervention. For airway nursing, nurses

conducted tracheal intubation immediately after patients' hospitalizations and completed a tracheotomy within 3 days. Nurses used ventilators to assist breathing, using the ventilation mode Synchronized Intermittent Mandatory Ventilation with Pressure Support (SIMV+PS).

For pulmonary infection nursing, it's necessary to implement nebulization inhalation therapy for patients as soon as possible because a secondary pulmonary infection from the brainstem hemorrhage is an inevitable problem. If patients had sputum, nurses performed a sputum smear, sputum bacterial culture, and drug sensitivity tests to screen for pathogenic bacteria as soon as possible and then provided targeted medication for therapy. Nurses made sure that patients rolled over and switched positions every 1-2 h to reduce the incidence of hypostatic pneumonia while also avoiding pressure damage that single fixed positions can cause.

For gastrointestinal nursing, patients underwent nasogastric intubation after admission and nurses eliminated gastric residue through gastrointestinal decompression to avoid patients' vomiting of intestinal contents, which brain-stem nerve paralysis and aspiration of the lung can cause. Nurses retained samples to check the occult blood of the gastric contents as soon as possible to determine whether a secondary, stress, digestive-tract ulcer existed. After 24 h, patients received enteral nutrition support from nasogastric intubation and nasointestinal intubation. Nurses kept the patients in a position with a high head and low feet to reduce intracranial pressure. Nurses also monitored patients' blood-glucose indicators.

For analgesic and sedative nursing, patients received 50 ml of normal saline and 50 mg of midazolam, and simultaneously, received 50 ml of normal saline and 50 mg of baclofen, both through micro pumping.

Outcome Measures

Mortality Rate. Postintervention, the research team analyzed the survival and mortality rates for the groups.

GCS and GOS scales. The research team assessed patients' prognoses and coma status using the GCS and GOS scales.[25,26] The total possible score for the GOS is 5 points and for the GCS is 15 points. The higher the score, the more advantageous the patients' status.

QOL scores. The research team evaluated patients' QOL using the SF-36[27] which includes five subdomains: (1) role emotional (RE), (2) social functioning (SF), (3) vitality (VT), (4) role physical (RP), (5) physical functioning (PF), and (6) general health (GH). The total possible score for each dimension is 25 points. The higher the score, the better the QOL.

SAS scores. The research team assessed patients' anxiety statuses using the SAS,[28] which includes the subdimensions physiology, sexual function, vitality, interpersonal relationships, and somatization. The total possible score is 100 points. The lower the score, the lower the patients' anxiety.

Health status. The research team assessed patients' health-behavior using the Health-Behavior Scale[29] The research team assessed patients' health status using health behavior scores, including four subdimensions: (1) health responsibility, (2) exercise training, (3) psychological state, and (4) nutritional status. The higher the score, the better the patients' health status.

Nursing satisfaction. The hospital developed the nursing satisfaction questionnaire to evaluate the satisfaction of the two groups. Scores ≥9 = very satisfied; scores ≤ 7 = satisfied, and scores <7 = dissatisfied. Total satisfaction rate = (number of very satisfied + number of satisfied)/total number × 100%.

Statistical Analysis

The research team analyzed the data using SPSS 27.0 software (IBM, Armonk, NY, USA). The team: (1) expressed categorical data as numbers (Ns) and percentages (%s) and compared the groups using the Chi-square (χ^2) test and (2) expressed continuous data as means and standard deviations (SDs) and compared the groups using the t test. $P < .05$ indicated a statistically significant difference.

RESULTS

Participants

The research team included and analyzed the data of 102 participants, 51 participants in each group (Table 1). The intervention group included 23 males (45.10%) and 28 females (54.90%), with a mean age of 56.85 ± 5.65 y. The group's mean bleeding volume was 5.62 ± 0.35 ml and duration of onset was 12.25 ± 2.20 h.

The control group included 20 males (39.22%) and 31 females (60.78%), with a mean age of 55.14 ± 5.57 y. The group's mean bleeding volume was 5.58 ± 0.32 ml and duration of onset was 11.58 ± 2.00 h.

No significance difference existed in the groups' gender, age, mean bleeding volume, or duration of onset, with $P = .547$, $P = .121$, $P = .056$, and $P = .164$, respectively, indicating comparability.

Mortality Rate

Table 2 shows that 50 participants in the intervention group survived (98.04%) and one died (1.96%). In the control group, 46 participants survived (90.20%) and five died (9.80%). The intervention group's mortality rate was significantly lower than that of the control group ($P = .017$).

Table 1. Participants' Demographic and Clinical Characteristics at Baseline

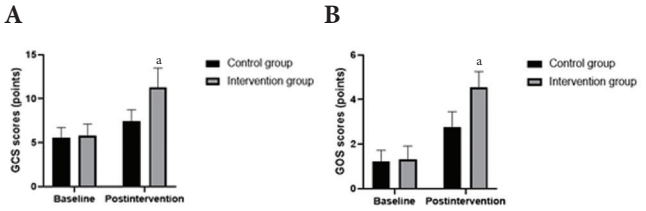
Groups	Gender		Age	Bleeding Volume	Duration of Onset
	Male n (%)	Female n (%)	Mean ± SD	Mean ± SD	Mean ± SD
Control group, n=51	20 (39.22)	31 (60.78)	55.14 ± 5.57	5.58 ± 0.32	11.58 ± 2.00
Intervention group, n=51	23 (45.10)	28 (54.90)	56.85 ± 5.65	5.62 ± 0.35	12.25 ± 2.20
χ^2/t value	0.362		1.577	1.953	1.412
P value	.547		.121	.056	.164

Table 2. Comparison of the Mortality Rate Between the Intervention and Control Groups

Groups	Survived	Died	Total Mortality Rate
Control group, n=51	46 (90.20)	5 (9.80)	5 (9.80)
Intervention group, n=51	50 (98.04)	1 (1.96)	1 (1.96)
χ^2 value			5.674
P value			.017[a]

[a]$P < .05$, indicating that the intervention group's mortality rate was significantly lower than that of the control group

Figure 1. Comparison of the GCS (Figure 1A) and GOS (Figure 1B) Scores Between the Intervention and Control Groups Postintervention. Figure 1A shows the GCS scores, and Figure 1B shows the GOS scores.



[a]*P* < .001, indicating that the intervention group's GCS and GOS scores were significantly higher than those of the control group postintervention

Abbreviations: GCS, Glasgow Coma Scale; GOS, Glasgow Outcome Scale

GCS and GOS Scores

Figure 1 shows that no significant differences existed in the GCS and GOS scores between the groups at baseline, both *P* > .05 (data not shown). The intervention group's GCS and GOS scores were significantly higher than those of the control group postintervention, both *P* < .001 (data not shown).

QOL Scores

Postintervention, the intervention group's mean RE score was 75.20 ± 3.60, mean SF score was 79.50 ± 2.40, mean VT score was 81.40 ± 4.20, mean RP score was 74.60 ± 1.80, mean PF score was 80.10 ± 2.10, and mean GH score was 77.40 ± 2.40 (Table 3).

Postintervention, the control group's mean RE score was 61.20 ± 1.40, mean SF score was 60.30 ± 2.10, mean VT score was 60.70 ± 1.90, mean RP score was 61.70 ± 2.30, mean PF score was 63.10 ± 2.30, and mean GH score was 64.80 ± 2.30.

The intervention group's QoL scores for all subdimensions were significantly higher than those of the control group postintervention (all *P* < .001).

SAS Scores

Postintervention, the intervention group's mean physiology score was 6.20 ± 1.10, mean sexual-function score was 5.40 ± 1.40, mean vitality score was 6.20 ± 1.20, mean interpersonal relationship score was 5.60 ± 1.10, and mean somatization score was 3.30 ± 0.70 (Table 4).

Postintervention, the control group's mean physiology score was 11.30 ± 1.30, mean sexual-function score was 12.40 ± 1.40, mean vitality score was 10.30 ± 2.60, mean interpersonal relationship score was 12.40 ± 2.40, and mean somatization score was 11.70 ± 2.80.

The intervention group's SAS scores for all subdimensions were significantly lower than those of the control group postintervention (all *P* < .001).

Health Status

Figure 2 shows that the intervention group's scores for health responsibility, exercise training, psychological state, and nutritional status were significantly higher than those of the control group postintervention (all *P* < .001).

Table 3. Comparison of the QoL Scores Between the Intervention and Control Groups Postintervention

Groups	RE Mean ± SD	SF Mean ± SD	VT Mean ± SD	RP Mean ± SD	PF Mean ± SD	GH Mean ± SD
Control group, n=51	61.20 ± 1.40	60.30 ± 2.10	60.70 ± 1.90	61.70 ± 2.30	63.10 ± 2.30	64.80 ± 2.30
Intervention group, n=51	75.20 ± 3.60	79.50 ± 2.40	81.40 ± 4.20	74.60 ± 1.80	80.10 ± 2.10	77.40 ± 2.40
t value	28.538	46.532	27.846	30.089	42.968	29.293
P value	<.001[a]	<.001[a]	<.001[a]	<.001[a]	<.001[a]	<.001[a]

[a]*P* < .001, indicating that the intervention group's QoL scores for all subdimensions were significantly higher than those of the control group postintervention

Abbreviations: GH, general health; PF, physical functioning; QoL, quality of life; RE, role emotional; RP, role physical; SF, social functioning; VT, vitality

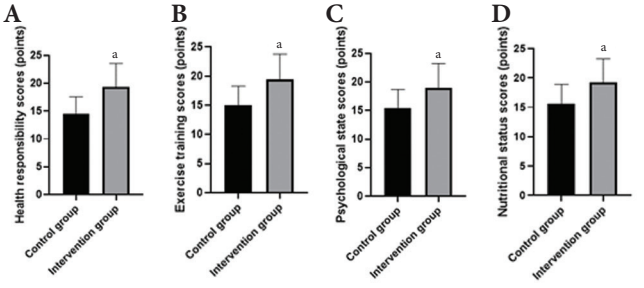
Table 4. Comparison of the SAS Scores Between the Intervention and Control Groups Postintervention

Groups	Physiology Mean ± SD	Sexual Function Mean ± SD	Vitality Mean ± SD	Interpersonal Relationships Mean ± SD	Somatization Mean ± SD
Control group, n=51	11.30 ± 1.30	12.40 ± 1.40	10.30 ± 2.60	12.40 ± 2.40	11.70 ± 2.80
Intervention group, n=51	6.20 ± 1.10	5.40 ± 1.40	6.20 ± 1.20	5.60 ± 1.10	3.30 ± 0.70
t Value	17.728	27.085	9.792	18.528	24.474
P Value	<.001[a]	<.001[a]	<.001[a]	<.001[a]	<.001[a]

[a]*P* < .001, indicating that the intervention group's SAS scores for all subdimensions were significantly lower than those of the control group postintervention

Abbreviations: SAS, Self-Rating Anxiety Scale

Figure 2. Comparison of Health Status Between Intervention and Control Groups Postintervention. Figure 2A shows the subdimension health responsibility; Figure 2B shows the subdimension exercise training; Figure 2C shows the subdimension psychological state; and Figure 2D shows the subdimension nutritional status.



[a]*P* < .001, indicating that the intervention group's scores for health responsibility, exercise training, psychological state, and nutritional status were significantly higher than those of the control group postintervention

Abbreviations: GCS, Glasgow Coma Scale; GOS, Glasgow Outcome Scale.

Table 5. Comparison of Nursing Satisfaction Between the Intervention and Control Groups Postintervention

Groups	Very Satisfied n (%)	Satisfied n (%)	Dissatisfied n (%)	Total Satisfaction Rate n (%)
Control group, n=51	20 (39.22)	23 (45.09)	8 (15.69)	43 (84.31)
Intervention group, n=51	25 (49.02)	25 (49.02)	1 (1.96)	50 (98.04)
χ^2 value	5.971			
P value	.015[a]			

[a]*P* < .001, indicating that the intervention group's nursing satisfaction was significantly higher than that of the control group postintervention

Nursing Satisfaction

Table 5 shows that 25 participants in the intervention group were very satisfied (49.02%), 25 were satisfied (49.02%), and one was dissatisfied (1.96%), for a total satisfaction rate of 98.04% for 50 participants. In the control group, 20 participants were very satisfied (39.22%), 23 were satisfied (45.09%), and eight was dissatisfied (15.69%), for a total satisfaction rate of 84.31% for 43 participants.

The intervention group's nursing satisfaction was significantly higher than that of the control group postintervention ($P = .015$).

DISCUSSION

Combined with albumin therapy, the current study provided conventional nursing and high-quality nursing for patients. The study found that the intervention group's mortality rate was significantly lower than that of the control group. Moreover, the intervention group's GCS and GOS scores, QOL scores, and health status scores were significantly higher than those of the control group postintervention. Also, the intervention group's nursing satisfaction was significantly higher than that of the control group postintervention. And the intervention group's SAS scores were significantly lower than those of the control group postintervention. Through high-quality nursing, the quality of nurses' observations, basic nursing, and specialized nursing for patients had improved, resulting in a significant reduction in patients' mortality and an improvement in their QOL.

However, the current study had some limitations, such as a small sample size and a lack of long-term follow-up of patients. Therefore, future studies should expand the sample size and extend the follow-up time to make the study's results more objective.

CONCLUSIONS

High-quality nursing interventions combined with albumin for brainstem-hemorrhage patients can effectively increase treatment efficacy, ensure patients' QOL, and facilitate recovery. Thus, high-quality nursing combined with albumin for brainstem-hemorrhage patients is of great significance in clinical practice.

AUTHORS' DISCLOSURE STATEMENT

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