RESEARCH ARTICLE

Application and efficacy of pain combined with psychological intervention nursing in patients with craniocerebral trauma combined with ocular trauma after decompressive craniectomy

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Abstract

Objective: To analyse the clinical effect of pain nursing combined with psychological intervention nursing on patients with traumatic brain injury and eye injury after decompressive craniectomy.

Method: The retrospective study was conducted from January 1 to March 31, 2024, at the Baoding No. 1 Central Hospital, China, and comprised data from June 2019 to June 2023 of patients with ocular trauma who had undergone unilateral decompressive craniectomy. Control group A had received psychological intervention nursing, while intervention group B had additionally received pain nursing. The groups were compared for sleep quality, psychological resilience, pain level, self-care ability, mental state, and nursing satisfaction. Data was analysed using SPSS 21.

Results: Of the 90 patients, 45(50%) were in group A; 31(68.9%) males and 14(31.1%) females with mean age 48.96±12.65 years (range: 25-76 years). Group B had 45(50%) patients; 34(75.6%) males and 11(24.4%) females with mean age 49.22±13.00 years (range: 23-75 years) ($p>0.05$). Across all parameters, both the groups showed significant improvement ($p<0.05$), but the degree of improvement was greater in group B compared to group A ($p<0.05$). The nursing satisfaction score of group B was significantly higher than that of group B ($p<0.001$).

Conclusion: Pain combined with psychological intervention nursing could significantly improve the pain level, sleep quality and negative psychology of patients with traumatic brain injury and eye injury undergoing decompressive craniectomy, enhance psychological resilience, and improve patients' self-care ability and nursing satisfaction.

Keywords: Pain education, Psychological intervention, Craniocerebral trauma, Ocular trauma, Decompressive craniectomy, Clinical effect. (JPMA 76: 53; 2026) **DOI: https://doi.org/10.47391/JPMA.21947**

Introduction

Craniocerebral trauma, as a common neurosurgical disease, is a brain injury caused by sudden external violence, impact or shock. Some of these patients may also have ocular trauma, which has a high rate of disability and mortality.[1,2] The disease further damages brain tissue due to increased intracranial pressure caused by haemorrhage and oedema.[3] The incidence of craniocerebral trauma is gradually increasing. Decompressive craniectomy (DC) is the preferred procedure for treating patients with craniocerebral trauma. It can dramatically reduce intracranial pressure, improve brain tissue blood perfusion, and improve compliance, resulting in shortened hospital stay and improved survival rates and reduced disability rates.[4] This procedure has been shown in clinical studies to be effective in treating craniocerebral injuries.[5] However, DC can lead to the destruction of physiological structures, and result in pain for most patients after the operation, which seriously affects their quality of life.[6] Studies have shown that pain can aggravate the condition, affecting patients' recovery and physical and mental health.[7] Most patients with craniocerebral injury suffer great psychological trauma in the process, resulting in a negative psychological state. And such a negative psychological state seriously affects the treatment effect and prognosis. It is crucial to reduce the pain after DC in patients with craniocerebral trauma combined with ocular trauma. Currently, postoperative methods used to cope with pain and improve the psychological state mainly include medication, psychological intervention and pain education. In reducing the response to physiological stress due to pain and in helping patients to be relieved to adverse emotions,[8] pain intervention has been found to be a multifaceted intervention in nursing. This is beneficial to reduce patients' pain and improve their self-efficacy.[9] Psychological interventions reduce patients' negative emotions with attention to their psychological needs and keep them in a good psychological state.[10]

The current study was planned to analyse the clinical effect of pain nursing combined with psychological intervention nursing on patients with traumatic brain injury (TBI) and

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eye injury after DC.

Materials and Methods

The retrospective study was conducted from January 1 to March 31, 2024, at the Baoding No. 1 Central Hospital, China, and comprised data from June 2019 to June 2023 of patients with ocular trauma who had undergone unilateral DC. After approval from the institutional ethics review committee, the sample size was calculated using EpiInfo.[11] Control group A had received psychological intervention nursing, while intervention group B had additionally received pain nursing. Clinical data was extracted from the standardised nursing assessment forms completed within 24 hours of admission (pre-intervention) and 3-month follow-up visits (post-intervention). The assessment process followed the institutional protocols. Trained nurses had administered all the scales using standardised procedures. For analysis, two independent researchers extracted the scores, and any discrepancy (>5% variance in scores) was resolved through consensus with a third researcher.

Patients diagnosed with cranial and ocular trauma and undergoing DC based on imaging and clinical symptoms, with stable condition and normal consciousness, aged 18-70 years were included. Written informed consent had been obtained from all the patients. Patients with a history of previous cranial surgery, severe TBI combined with language, consciousness or cognitive impairments, and patients with incomplete clinical data were excluded.

Both the groups were given conventional nursing, in which control group A received psychological intervention nursing. Immediately after admission, the patients' psychological status was systematically assessed, and a personalised psychological intervention plan was formulated. For those with extroverted personalities, effective communication and games were adopted to divert patients' attention, while for those with introverted personalities, adverse emotions were alleviated through books, newspapers, music and videos. To provide knowledge regarding DC and craniocerebral trauma, scientific health education to the patients was provided collectively, which changed their perception of the disease, and thus alleviated their bad mood. The family members of the patients were explained the knowledge related to disease treatment and nursing care to alleviate their stress reaction caused by anxiety, and to avoid interference with the patients. With instructions on rehabilitation exercises, the patients were followed up regularly, while continuing with psychological counselling and pain medication application.

Pain nursing intervention was additionally provided to intervention group B. The Visual Analogue Scale (VAS) was applied to assess the pain level of the patients,[12] subsequent to the complete understanding the situation of pain of the patients, and an individualised pain nursing intervention plan was formulated based on the findings of VAS combined with the patients' own conditions. A pain nursing intervention team consisting of one nurse-in-charge and two nurse practitioners was set up to provide systematic training to team members, including content, such as ways to assess sedation and analgesia, and knowledge of analgesic drugs. Real-time monitoring and assessments were performed by primary nurses regarding the patients' pain. Knowledge of pain was given to the patients or their families, and the necessity of applying painkillers in case of pain was informed to eliminate the patients' concerns about medication. While keeping an eye on the psychological state of the patients/families, communication was actively carried out with the patients in order to channel negative thoughts and encourage their confidence in overcoming the disease. +Regular follow-ups were conducted for the patients to provide guidance on their pain-related issues after discharge. The intervention in both groups lasted from the time of admission to three months post-operatively.

The sleep quality of the patients was assessed using the Pittsburgh Sleep Quality Index (PSQI),[13] consisting of 7 items with scores ranging 0-21, with higher scores indicating worse sleep quality. The patients' ability of self-care was assessed using the Exercise of Self-care Agency (ESCA) scale,[14] consisting of 43 items under four dimensions of level of knowledge about health, self-care skills, self-concept and self-responsibility, scored on a 4-point Likert scale. Total score ranged 43-172, and higher scores indicated higher self-care ability. VAS was used to grade pain among the patients that was scored on a scale ranging from 0 to 10 points.

Psychological resilience of the patients was assessed using the Connor-Davidson Resilience Scale (CD-RISC),[15] having 3 dimensions of optimism, resilience and strength, with 25 items, and a total score of 100 points. The status of resilience was proportional to the score. The psychological state of the patients was assessed using the Hamilton's Depression Scale (HAMD) and the Hamilton's Anxiety Scale (HAMA).[16] Consisting of 14 items on the HAMA scale, a score of ≥7 indicated anxiety, while the severity of anxiety increasing with the increase in the score. Having 24 items on the HAMD scale, the score of ≥8 indicated depression, with increase in severity being proportionate to the increase in the score. All these scales were used both at baseline and at the 3-month follow-up. At the time of discharge, the level of satisfaction with nursing care was assessed in both groups using the Risser's Patient

Satisfaction Scale (RPSS).[17] The level of satisfaction increased with the increase in the score.

Data was analysed using SPSS 21 For intergroup comparisons, the t test was used, and the quantitative data was expressed as mean±standard deviation. The pre-post comparisons were analysed using paired *t*-tests for intragroup changes, and independent t-tests for intergroup differences. The expression of the qualitative data was done as frequencies and percentages, while intergroup comparisons were done using chi-square test. P<0.05 was considered statistically significant.

Results

Of the 90 patients, 45(50%) were in group A; 31(68.9%) males and 14(31.1%) females with mean age 48.96±12.65 years (range: 25-76 years). Group B had 45(50%) patients; 34(75.6%) males and 11(24.4%) females with mean age 49.22±13.00 years (range: 23-75 years) (p>0.05).

Across all parameters, intergroup difference were not significant at baseline (p>0.05), and both the groups showed significant intragroup improvement post-intervention (p<0.05). However, the degree of improvement was greater in group B compared to group A (p<0.05) (Tables 1-3).

Table-1: Comparison of PSQI and ESCA scores between the two groups before and after the intervention.

Group	PSQI score		ESCA score	
	Before intervention	After intervention	Before intervention	After intervention
Observation group	17.27±1.79	5.44±2.61	83.87±7.17	146.02±7.07
Control group	17.13±1.93	7.42±2.18	85.82±4.58	134.27±5.67
t-test	0.340	3.904	1.541	8.762
p-value	0.734	0.000	0.127	0.000

PSQI: Pittsburgh Sleep Quality Index, ESCA: Exercise of Self-care Agency.

Table-2: Comparison of VAS, HAMA and HAMD scores between the two groups before and after the intervention.

Group	VAS score		HAMA score		HAMD score	
	Before intervention	After intervention	Before intervention	After intervention	Before intervention	After intervention
Observation group	6.60±0.86	1.38±0.49	16.02±0.84	5.02±0.45	16.20±0.46	6.20±0.66
Control group	6.53±0.81	1.87±0.73	16.04±0.77	5.56±0.59	16.24±0.53	6.67±0.52
t-test	0.377	3.743	0.131	4.835	0.426	3.718
p-value	0.707	0.000	0.896	0.000	0.671	0.000

VAS: Visual Analogue Scale, HAMA: Hamilton's Anxiety Scale, HAMD: Hamilton's Depression Scale.

Table-3: Comparison of psychological resilience scores between the two groups before and after the intervention.

CD-RISC	Time	Observation group	Control group	*t*-test	*p*-value
Strength	Before intervention	16.73±0.45	16.64±0.68	0.733	0.465
	After intervention	24.80±1.08	21.56±0.92	15.363	0.000
Resilience	Before intervention	25.73±0.75	25.62±0.83	0.664	0.508
	After intervention	35.00±1.21	31.47±1.16	14.165	0.000
Optimism	Before intervention	7.73±0.45	7.53±0.69	1.625	0.108
	After intervention	14.36±1.00	11.38±1.07	13.602	0.000
Total score	Before intervention	50.20±1.10	49.80±1.20	1.650	0.103
	Before intervention	74.16±2.39	64.40±1.81	21.795	0.000

CD-RISC: Connor-Davidson Resilience Scale.

The nursing satisfaction score of group B (93.46±3.74) was significantly higher than that of group B (83.31±3.47) (t=13.356, p=0.001).

Discussion

Craniocerebral trauma, presently one of the most frequently occurring diseases in neurosurgery, is a result of violent injuries. Some of the patients may have ocular trauma in combination, and they are more psychologically stressed and sensitive to pain than those with craniocerebral injuries alone.[18,19] DC is currently the preferred clinical treatment for craniocerebral trauma. This procedure is ideal for removing intracranial haematoma and relieving compression on brain tissue, nerves and blood vessels, in addition to increasing the volume of the cranial cavity, decreasing intracranial pressure and increasing the perfusion and compliance of brain tissue. Pain is inevitable during hospitalisation. Currently, pain is emphasised as the fifth vital sign in clinical practice. Both pain and pain-related stress are adverse stimuli to patients' recovery. Pain, if not well controlled, not only affects patients' clinical recovery and sleep, but also affects their psychological state; in severe cases, in some patients it could result in negative psychology, like depression and anxiety.[8,10] Untimely or poor pain control may also lead to patients' resistance to treatment, thereby reducing treatment compliance and affecting clinical outcomes, patient prognosis and quality of life.[20] In this sense, intervention for pain and psychology must be carried out during the treatment of patients with craniocerebral trauma combined with ocular trauma, with a view to mitigating patient pain, ameliorating negative psychology, and improving clinical prognosis. It is traditionally believed that the application of pain medication will produce dependence and adverse reactions and that pain will gradually diminish, for which pain medication should be used sparingly, or not at all. This concept has been proven to be incorrect, which will affect the therapeutic effect and rehabilitation of patients.[9] Pain intervention offers systematic, high-quality and standardised pain-care interventions for patients. Psychological intervention fosters a sound psychological environment for patients, which can alleviate negative emotions brought about by surgery and the disease itself, and improve patients' adherence to treatment.[21,22]

Pain results in discomfort, especially at night, and can seriously disrupt sleep, worsening sleep quality. If not well controlled, pain can become chronic. This not only seriously affects the psychological state of patients, resulting in anxiety, depression and negative psychology, but also ultimately affects the self-care ability of patients.[23] The current results indicated that compared to the control group, the scores of ESCA, PSQI and VAS significantly improved in the intervention group ($p<0.05$). Moreover, HAMD and HAMA scores related to negative psychological were found to be significantly lower in the intervention group compared to the control group ($p<0.05$). This was in consonance with the results of several other studies.[24] It shows that pain nursing combined with psychological intervention nursing can significantly reduce patients' pain, improve patients' sleep quality, improve their self-care ability and reduce negative psychology. The reason is that pain-related knowledge and psychological education of patients and their families strengthen their understanding of pain, relieve their negative emotions, and relax them physically and mentally, and establish a positive attitude to face the disease and eliminate the concern about the side effects of pain medication. Besides, it can also reduce the excessive pain reaction resulting from the negative psychology, and further improve the quality of sleep of the patients.[25]

Psychological resilience is an individual's psychological and behavioural response to changes in the external environment, and it is a form of self-protection that allows individuals to effectively respond and adapt to trauma and adversity.[26] Research has confirmed[27] the critical role of psychological resilience in an individual's trauma recovery process. Besides enhancing the stress-resistant and self-repairing capabilities of the patients, the study indicated that pain nursing and psychological intervention together could improve their psychological resilience also. The reasons may include the fact that psychological intervention improves patients' negative psychology, stabilises the mind, and enhances confidence.[28] Also, pain education is patient-centred to meet patients' needs for pain control, effectively improves their psychological state, and enhances psychological resilience.[29] A synergy between the two can be realised to enhance the effect of intervention.

The control group displayed a significantly lower score with nursing satisfaction as against that of the intervention group ($p=0.001$), indicating that pain nursing combined with psychological intervention nursing was highly recognised by patients and their families because of its effectiveness of meeting the nursing needs of the patients.

The current study has limitations as there was no long-term follow-up of interventions to assess the sustainability of treatment effects. Besides, the sample was also small. Future studies should focus on long-term follow-up of interventions with larger sample sizes. In order to validate the current findings, the follow-up period could be increased. Also, the retrospective design limits causal inference. Although standardised assessment tools were used, some variability in intervention delivery may have occurred on the part of the nurses despite prior training. Finally, the lack of randomisation and potential variability in documentation practices may have introduced bias.

Conclusion

Pain nursing combined with psychological intervention nursing was found to be highly effective in treating patients with craniocerebral trauma combined with ocular trauma after DC.

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Conflict for Interest: None.

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Author Contribution:
JL & DX: Design, preparation and final approval.
ZJ & JL: Data collection, analysed clinical data and final approval.
YS: Data acquisition, analysis, interpretation, drafting and final approval.