



## APPLICATION OF CLUSTER NURSING IN IMPROVING THE QUALITY OF VIDEO EEG EXAMINATION OF INFANTS

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### ABSTRACT

**Background and objective:** To improve the quality of video EEG examination of infants and young children by adopting cluster nursing method.

**Methods:** 100 infants who came to our hospital for 24-hour video EEG examination from January 2021 to June 2021 were taken as the control group, and 100 infants who came to our hospital for 24-hour video EEG examination from July 2021 to December 2021 were taken as the experimental group. Routine nursing was performed in the control group and cluster nursing was performed in the experimental group. The quality of EEG examination, children's compliance and doctors' approval were compared between the two groups.

**Results:** The quality of EEG examination, the compliance of children and the recognition of doctors in the experimental group were higher than those in the control group, and the difference was statistically significant ( $P < 0.05$ ).

**Conclusions:** Through cluster nursing, the quality of EEG examination of infants and young children has been improved through cluster nursing, which is worthy of reference for clinical nurses.

**Key Words:** Cluster nursing, EEG examination

## INTRODUCTION

Video EEG is a form of EEG monitoring. It monitors the patient's behavior through a digital camera around the head device, and records the patient's clinical manifestations and EEG changes synchronously. It is the most valuable monitoring method in the diagnosis, classification and medication adjustment of epilepsy at present,[1] and is also the basis for judging whether there is abnormal brain discharge. The prevalence rate of epilepsy in Chinese population is 0.33% ~ 0.58%, and more than half of them start their disease within the age of 10.[2] Therefore, the quality of video EEG examination directly affects the diagnosis and treatment of patients. In clinical work, often due to poor coordination of children's examination, poor environmental adaptability and difficult communication, the examination time is delayed, the electrodes fall off repeatedly, the examination is interrupted or failed, so that the diagnosis cannot be made Or the best time for correct treatment.[3] The concept of cluster nursing was first proposed by the American Institute for health care improvement (IHI). It refers to a group of nursing interventions, each of which has been clinically proven to improve patient outcomes. Their joint implementation can improve patient outcomes more than individual implementation.[4] From July 2021 to December 2021, our department implemented cluster nursing intervention for infants and their families who underwent video EEG examination, and achieved good results. The report is as follows.

## METHOD

### Research design:

200 infants who underwent video EEG examination in our department from July 2021 to December 2021 were selected, including 125 males and 75 females, with a minimum age of 2 months and a maximum age of 3 years. All the infants had a history of convulsions, including 135 children with febrile seizures, 45 children with epilepsy and 20 others. It is planned to group 200 infants who underwent video EEG examination. The first 100 children from January to June 2018 are the control group, and the first 100 children from July 2021 to December 2021 are the experimental group. There was no significant difference in sex, age and disease between the two groups ( $P > 0.05$ ), which was comparable. The two groups of children were all monitored by video EEG monitor of Cadwell company. The video EEG room was located in a quiet single ward with few people moving.

### Setting and sample:

Participants were recruited from hospital by a random sampling method. The control group received routine nursing. The experimental group adopted cluster nursing.

### The control group:

When the children and parents of the control group make an appointment in the EEG room before the examination, they shall submit the appointment form to the parents according to the procedure of EEG examination appointment in our hospital. The appointment form shall indicate the date, time and precautions

of the examination, so that the parents can read it carefully. After the parents understand the preparation before the examination, they can leave with the appointment form. During the examination, parents are allowed to accompany the children in the EEG room. The nurse installs scalp electrodes for the children and urges the children to sleep as soon as possible after the examination.

### **The experimental group:**

#### **Appointment work:**

According to the specific contents of the video EEG examination appointment form prepared by the Department, patiently inform the family members who have made the appointment of EEG examination: the examination time is 24 hours, and the time is long. During the examination, the children cannot leave the ward, and they need to carry the children's daily necessities; Be sure to wash the children's hair the day before the examination, which can improve the accuracy of the examination; Do not stop taking the medicine during the examination. Take the medicine at the usual dose and prepare the medicine during the examination; On the day of examination, one or two family members who have close relationship with the children shall be kept, and the children's favorite toys, preferably music, images or videos, shall be carried. The appointment nurse verifies the matters informed by the family members one by one until it is fully confirmed that the family members have understood and understood. Give the appointment form to the family members, and check with the appointment form on the day of examination.

#### **Environmental preparation:**

The walls of the examination room are pasted with vivid, lively and lovely children's animation pictures, and equipped with a TV that can receive multiple children's animation programs; The room temperature shall be adjusted to 22-23°C, so as to make the children comfortable as much as possible, reduce the sweating of the head of the children, and avoid the dissolution of the electrode paste and the falling off of the disk-shaped electrode due to sweating. The bedside is equipped with oxygen and sputum suction devices, and tongue pressure plates are ready to be in emergency state at any time to ensure the safety of children.

#### **Psychological nursing:**

Before the examination, psychological assessment shall be carried out for the children, and psychological counseling and other measures shall be taken for their existing psychological problems. For example, let the children watch the examination process of the previous child, and eliminate the tension and fear of the children; Inform the family members of the possible problems of the children during the examination, assess the psychological status of the family members, introduce the correct attitude and methods of the family members, and emphasize the importance of the family members' cooperation in the examination.

#### **Scalp care:**

During operation, degrease the scalp with 75% alcohol clean the scalp and hair with transparent soap to ensure that the scalp and hair are dry and clean before inspection.<sup>[5]</sup> Children with long hair are

advised to cut their hair short. The children who are not cooperative or have an inch head should be advised to shave their heads to ensure good contact between the scalp and the electrodes.

### **Sleep deprivation:**

Seizures are closely related to EEG activities in awake and sleep cycles. Through sleep deprivation and a series of induction, the sensitivity of EEG examination can be increased to 70% ~ 85%, and the positive rate of examination can be improved. Therefore, it is necessary to implement sleep deprivation based on the sleep habits of each child. The specific implementation is that the day shift nurses do a good job in education. For the children who receive video EEG on the second day, the middle shift nurses urge the family members to let the children sleep 1H ~ 2H late, and the night shift nurses wake up the children and their families 2H ~ 4H early in the morning. However, most of the children who were deprived of sleep were unable to cooperate, which was manifested as continuous crying or unable to prevent him from falling asleep. At this time, the family members have great psychological pressure and complicated emotions. The nurse should emphasize the importance of sleep deprivation to the family members, and take the initiative to give toys, books, TV, etc. to the children when the children are crying. When the family members feel helpless and discouraged, they should give timely encouragement and strive for the full cooperation of the family members. Under special circumstances, the children can be allowed to sleep briefly and wake up in time 30 minutes after the children sleep, so as to ensure the effect of sleep deprivation.

### **Inspection and nursing:**

Before the examination, the responsible nurse guided the children to eat to avoid the influence of low blood glucose after fasting on the EEG results. Do a good job in the epilepsy induction experiment nursing: complete the eye opening and closing, excessive ventilation and flash stimulation induction test during the awake period of the children. For children who cannot cooperate with the eye opening and closing movement, instruct their families to do passive eye opening and closing. By playing hide and seek, the children's eyes are gently covered with their hands when their eyes are closed, so as to reduce their fear and be easily accepted by the children. The nurse uses a small colored windmill to blow to the children. The nurse demonstrates and encourages the children, and praises the children who perform well in time. This can fully stimulate the children's interest and obtain their cooperation. In the flash test, the nurse took advantage of the children's curiosity, first told the children that the instrument would emit light, and then attracted their attention by telling stories and other ways to complete the flash test. During the implementation of the induction, the body posture, breathing, facial expression, induced actions and brain wave activities of the children were closely observed. For the intolerant, stop inducing immediately, instruct the child to rest in bed, make identification and observation records, guide the family members to take proper care and avoid blocking the camera.

### **Evaluation index:**

The quality of EEG examination, children's compliance and doctors' approval were compared

between the two groups. Including: ① successful EEG: monitoring time  $\geq$  2h, including a complete slow phase sleep cycle in natural sleep state, and obtaining a complete and clear EEG map. ② Children's compliance (cooperative examination): Children's quiet, no crying and no electrode falling off under the video camera are cooperative, otherwise they are not cooperative. ③ Doctor's approval: there is no artifact in the EEG results, which shall be evaluated by the doctor who interprets the EEG results.

### Statistical methods:

Spss19.0 statistical software was used for analysis, and the counting data were  $\chi^2$  test, rank sum test was used for rank data, and the difference was statistically significant if  $P < 0.05$ .

## RESULT

The quality of EEG examination, the compliance of children and the recognition of doctors in the experimental group were higher than those in the control group, and the difference was statistically significant ( $P < 0.05$ ).

Group	EEG completed successfully	Therapy Compliance	Doctor approval
The experimental group	92	96	97
The control group	75	79	81
$\chi^2$	10.488	13.211	13.075
P	<0.05	<0.05	<0.05

**Table 1:** Comparison of EEG examination quality between the two groups.

## DISCUSSION

Cluster nursing is a collection of a series of safe and effective operation, treatment and nursing interventions confirmed by evidence-based medicine. During the implementation process, attention must be paid to the continuous implementation of each measure in the cluster intervention, rather than the intermittent implementation or only one or two of them. This is the real implementation of cluster nursing. Otherwise, it violates the spirit of cluster nursing and the measures implemented will not produce obvious results. In this study, the detailed explanation at the time of appointment explained in detail to parents that EEG is a sensitive indicator to evaluate the state of brain function, which is widely used in the diagnosis and research of central nervous system diseases and mental diseases, especially for the determination and localization of paroxysmal brain function abnormalities such as epilepsy. EEG is still a diagnostic technology that cannot be replaced by other methods,[5] so that parents can understand the necessity of EEG examination, Make the family members have sufficient preparation to cooperate with the medical staff.

From meeting the needs of the children to the preparation before the examination of the children, such as sleep deprivation and scalp cleaning, the family members can fully understand and cooperate. This is the primary link of the examination and the key to success; Creating a lively and lovely animation

environment and atmosphere can reduce children's fear and rejection of strange environment, and effectively improve children's cooperation. During the examination, according to the different living habits and interests of each child, meet their reasonable needs, such as requiring the children to be accompanied by their family members who usually like to be together, carrying the children's favorite toys, playing the children's programs that they usually like, playing games with the children, and integrating complex examinations into easy games, so that the children can unconsciously complete some examinations, Through the sleep deprivation nursing intervention, the children's sleep habits were corrected, so that the children were prone to fatigue and sleep during the examination, avoiding the failure caused by the children's failure to sleep during the examination, and the smooth sleep of the children also improved the family's compliance with the doctor. The preparation of scalp also avoids the influence of pulling hair on children's sleep during electrode wearing operation. The familiar and warm environment enables the children to sleep peacefully and ensures the smooth progress of sleep EEG examination. The quality of EEG examination, the compliance of children and the recognition of doctors in the experimental group were higher than those in the control group, and the difference was statistically significant ( $P < 0.05$ ).

To sum up, the quality of EEG examination of infants and young children was improved through cluster nursing, which is worthy of reference for clinical nurses.

#### **Conflicts of Interest Disclosure:**

The authors declare that there is no conflict of interest.

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