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Clinical Nursing and Physical Rehabilitation Evaluation of Children with Cerebral Palsy

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Abstract: Cerebral hemiplegia refers to a persistent central movement and posture normal developmental dysfunction and active limitation syndrome. These syndromes are often caused by non-incurring brain damage in growing or normally developing neonates and infants. The aim of this paper is to analyze the evaluation of clinical care and the effectiveness of physical rehabilitation treatment in children with cerebral palsy. This paper first analyzes the necessity of combining education and recovery among kids suffering from cerebral paralysis. Rehabilitation training or intellectual education alone is far from enough for children with cerebral palsy. The two must be combined to truly improve the self-care ability of children with cerebral palsy. Then, the method of medical image segmentation was introduced, and finally, the experimental comparison and analysis of the conditions of the two groups of kids with cerebral palsy before and after treatment were conducted. The experimental findings revealed that after two courses of treatment to compare the two groups of kids with cerebral palsy, the overall efficacy rate was 87.5% for the treated group and 67.7% for the controlled group. The results of the experiment showed that the clinical efficacy of the control group was not as good as that of the treatment group by rank sum test. This shows that on the basis of the most basic comprehensive rehabilitation treatment, acupuncture to relieve the spinal points can be used to treat the symptoms of cerebral palsy. This can effectively enhance the motor function of the major muscles in children with cerebral palsy, and can promote their intellectual development, which is better than the most basic comprehensive rehabilitation treatment alone.

1. Introduction

Cerebral palsy, also known as cerebral palsy in children, refers to a continuous central movement and posture developmental dysfunction and activity limitation syndrome. These syndromes are mainly caused by non-incurring damage to the developing or healthy developing fetus and the brain

of infants and young children. Motor deficits in cerebral hemiplegia are usually followed by difficulties with sensation, cognition, consciousness, speech and behavior, together with epileptic problems and auxiliary muscle and skeletal issues. It is the most serious and common disorder of neurological disability in children. Compared with normal disease and normal children, cerebral palsy seriously impairs the quality of life of children.

The aim of the paper is to study and investigate the evaluation of the effectiveness of clinical care and physical rehabilitation treatment for promoting gross motor function and improving IQ levels in kids with cerebral paralysis. Only then can kids with cerebral paralysis undergo long-term, systematic rehabilitation training. This is of great significance for realizing the comprehensive recovery of cerebral palsy, improving the prognosis of cerebral palsy, and reducing the pressure on family and community life.

The innovation of this paper is: It expounds the necessity of integrating education and rehabilitation for children with cerebral palsy, and then expounds the medical image segmentation method. The original concept of image segmentation is to check the consistency of regions by using a specified feature amount or a certain criterion. In order to realize the purpose of dividing the picture into various regions, the two groups of children with cerebral palsy before and after treatment were analyzed and discussed.

2. Related Work

Based on the progress of national and international research, different scholars also have some collaborative studies on kids with cerebral palsy: The aim of the Duran I research was to compare the prevalence of positive DXA-based markers of skeletal fitness deficits in kids with cerebral palsy with the application of a functional musculoskeletal unit assessment algorithm to account for the prevalence of positive findings following reduced muscle activity [1]. Keawutan P compared the walking status of children with cerebral palsy aged 4 to 5 years with their customary body movements and duration of sedentary activity and compared their activities with physical activity guidelines. The results showed that over half of the kids with cerebral palsy were awake when they were sedentary. children with cerebral palsy aged 4 to 5 years need intensive interventions to decrease sitting activity and improve customary bodily movement [2]. Scofano D reported the results of atropine sulfate administered sublingually for the treatment of salivation in kids with hydrocephaly, by comparison with the Drooling Impact Scale in an uncontrolled, randomized clinical trial [3]. Ma S R aimed to study the effect of electrical stimulation on dysphagia in kids with cerebral palsy and recruited 5 kids with brain damage and swallowing difficulties. The PAS scores of the semi-solid and liquid forms decreased from 3.8 ±1.5 to 2.1 ±1.2 and from 6.4 ±2.1 to 4.3 ± 2.5, respectively, with statistical significance. Electrical stimulation can effectively reduce aspiration in children with cerebral palsy and dysphagia [4]. The purpose of the Young C J study was to investigate the use of a classification system for communication functions and its links to additional characteristics of those functions. The results show that the relationship between the hands-on ability and communication function of these children seems to be more closely [5]. The main objective of the Kim DH was to evaluate torso control, swing and superior limb function in kids with cerebral palsy and to explore the association examine the relationship between torso control and superior limb function [6]. However, these scholars did not conduct research and discussion on the clinical nursing of children with cerebral palsy and the evaluation of the effect of physical rehabilitation, but only discussed its significance unilaterally.

3. Clinical Nursing and Physical Rehabilitation Evaluation Methods for Children with Cerebral Palsy

3.1. The Necessity of Integrating Education and Rehabilitation for Children with Cerebral Palsy

It is clear from the International Society for Cerebral Palsy's classification of cerebral palsy that most kids affected by the disease have varying degrees of upper extremity motor deficits. Depending on the degree of disability, all kids with cerebral palsy have varying degrees of trunk and lower extremity motor deficits. Figure 1 shows the presentation of kids with cerebral palsy. By analyzing the concomitant disease in kids with cerebral palsy, it can be found that most kids with cerebral palsy have varying degrees of mental retardation [7]. These obstacles of children with cerebral palsy have seriously affected all aspects of their lives, and even the most basic self-care ability has been greatly affected. This necessitates their daily life to be taken care of by others, reducing the quality of life for the entire family [8]. For example, the basic self-care ability of children with cerebral palsy:

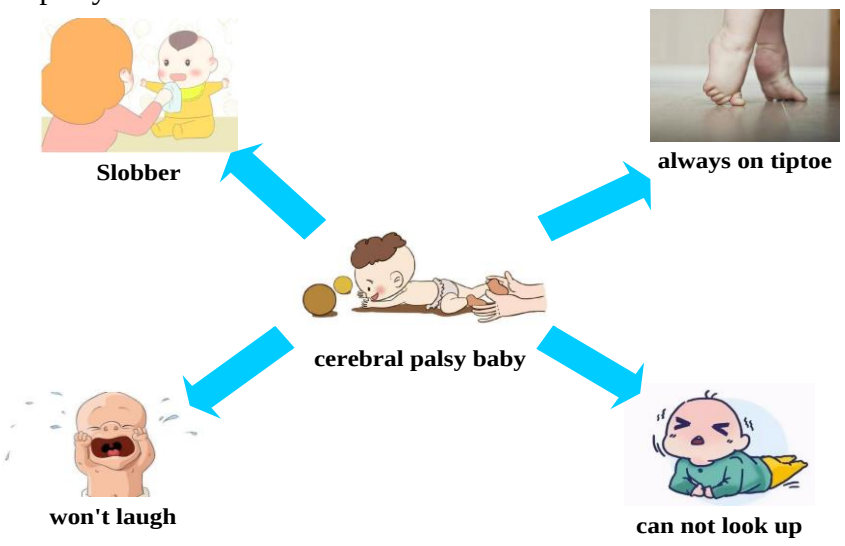

Figure 1. Presentation of children with cerebral palsy

(1) Diet: 1) Children with cerebral palsy have difficulties in swallowing and chewing due to problems with head control, abnormal oral muscle tone, and tongue movement disorders; 2) Abnormal muscle tension of the upper limbs, resulting in poor flexibility of the upper limbs and poor coordination of the hands, making it impossible to use utensils for meals; 3) Intellectual disability and speech disorder make it difficult for children with cerebral palsy to express their desire to eat, and it is difficult for them to have proper table manners [9].

(2) Going to the toilet: 1) Children with cerebral palsy have lower limb movement disorders, so they may not be able to go to the toilet by themselves and need assistance from others; 2) Changes in abnormal muscle tone make them difficult to articulate or confuse their tones, making them unable to turn to others for help when they need to go to the toilet; 3) Intellectual disability leads to incontinence [10].

(3) Dressing: 1) The abnormal muscle tension of the upper limbs leads to poor hand stability and coordination, and it is impossible to dress independently; 2) Intellectual disability affects the understanding and appreciation of beauty, and thus cannot independently choose clothes suitable for

the weather and occasion.

(4) Hygiene and cleaning: 1) Facial nerve is damaged, and saliva cannot be controlled; 2) The tension of the upper limbs makes it impossible to clean the body independently; 3) Intellectual disability leads to not paying attention to one's own image and rejecting hygiene and cleaning [11].

(5) Basic communication: 1) Abnormal oral muscle tone and changes in systemic muscle tone at any time lead to difficulty in articulation or confusion of tones, so that others cannot understand their semantics; 2) Intellectual problems lead to inability to understand each other's speech and unable to respond appropriately opponent [12].

(6) Mobility transportation: This is the inability to walk normally, go up and down stairs, and use ordinary transportation due to the inherent defect of cerebral palsy.

(7) Safety: 1) Intellectual problems make it impossible to use items correctly or avoid danger, and do not have basic safety common sense; 2) Movement disorders and inability to move hands and feet make them easily lead to safety accidents [13].

From the above analysis of the self-care ability of children with cerebral palsy, it is not difficult to find that motor dysfunction and intellectual disability are the main factors affecting the self-care ability of children with cerebral palsy. Therefore, a single rehabilitation training or intellectual education is not enough for kids with cerebral palsy, and both must be combined to truly improve the self-care ability of kids with cerebral palsies [14]. Figure 2 shows the rehabilitation process for children with cerebral palsy.

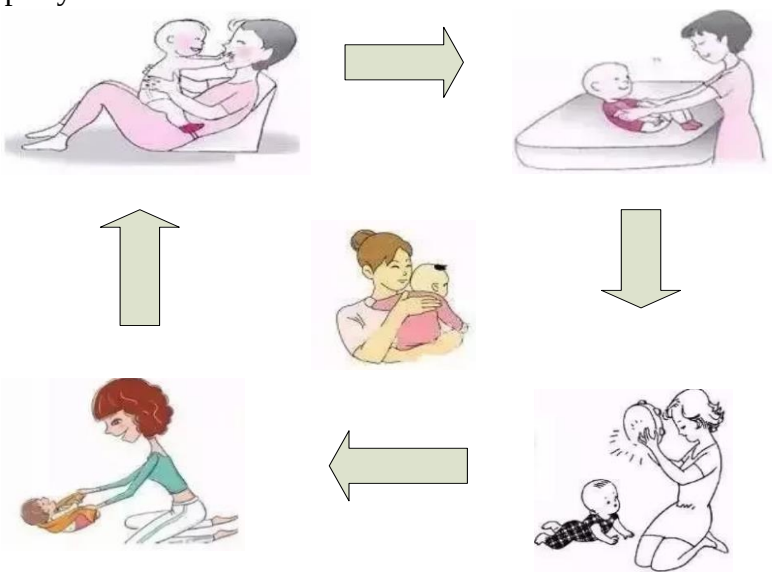

Figure 2. Rehabilitation process for children with cerebral palsy

3.2. Medical Image Segmentation Methods

The original definition of image segmentation is to use a specified feature quantity or a certain standard to check the unity of the region, to achieve the purpose of dividing the image into various blocks, and to make higher-level classification and recognition possible [15]. Generally speaking, medical image segmentation methods can be divided into three parts: Segmentation methods based on thresholds, segmentation methods based on boundaries, and segmentation methods based on range. The separation effect of biomedical graphics has been greatly improved through the rational use of various splitting methods or computer mathematics educational tools [16].

(1) Based on the threshold segmentation method

The principle and application of the threshold segmentation method are relatively simple, and it is one of the most effective and practical techniques in the current image segmentation method. It mainly uses the different degrees of grayscale of the target object and the background to divide the image into the background range and the target range with different grayscale ranges [17]. Figure 3 shows the multi-threshold image segmentation process.

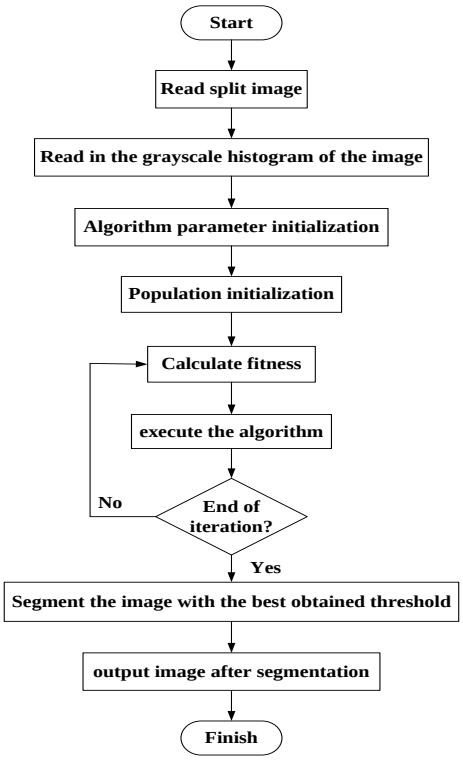

Figure 3. Multi-threshold image segmentation process

Assuming that the value range of the gray level of an image is $K = \{0,1,2,\cdots,H-1\}$ and the size is $P \times Q$, let the gray value at the point *(a,b)* be *j(a,b)*, and select the gray threshold $r \in K$. Then, the segmentation result of the image using the threshold is:

$$k(a,b) = 1, j(a,b) \geq r \; and \; k(a,b) = 0, j(a,b) < r \quad (1)$$

The core of the threshold segmentation method is the process of finding the optimal segmentation threshold according to a certain criterion function. The result of the segmentation is a binary image. Pixels smaller than the threshold are classified as background $(k(a,b) = 0)$, and pixels with gray value greater than the threshold are classified as object $(k(a,b) = 1)$.

The threshold method generally includes the local threshold point method and the global threshold point method. Among them, the local threshold method is to split the original image into several smaller sub-images, and then use the global threshold method to obtain the best predicted cutting threshold point for each sub-image [18].

Common threshold-based division methods mainly include P-tile method, bimodal method, otsu method, maximum entropy method, iterative method, moment preservation method, and secondary statistical value method based on gray level.

1) P-tile method

The P-tile method (also known as the P-quantile method) is one of the oldest threshold selection

methods. The P-tile method assumes that the image includes the background and the target, and the gray value of the target is low, and the percentage of the target occupying the entire image volume is known in advance. The specific method is: Accumulating the grayscale histograms of the original images in order from low to high. However, when the accumulated value is greater than or equal to the percentage of the area occupied by the target, the accumulated gray level is the required segmentation threshold [19].

The P-tile method appeared earlier and has the advantage of simpler calculation. However, in practical applications, it is difficult to know the percentage of the target area in the image area in advance, so the practicability is poor.

2) Otsu method

The Otsu method, also called the Otsu method, is a point-based global threshold method. The basic idea of this calculation is to divide the histogram into two groups by selecting a certain threshold point. When the variance coefficient between the two groups is the average value, the threshold point is the image segmentation threshold point [20].

Given that the value range of a gray level is $K = \{0,1,2,\cdots,H-1\}$ and the size is $P \times Q$, assuming that the number of pixels with gray level n is p_n, the total number of pixels is:

$$P \times Q = \sum_{n=0}^{H-1} p_n \tag{2}$$

The probability of each gray level is:

$$L_n = \frac{p_n}{P \times Q}, n = 0, \cdots, H-1 \tag{3}$$

If a threshold r is taken, the gray level of the image is divided into two groups, D_0 and D_1; v_0 and s_0 are the gray average value and the probability of generation of the D_0 group. v_1 and s_1 are the probability of gray average bit sum generation of D_1 group.

The variance between the two groups can be found by:

$$\varphi^2(r) = s_0(v_0 - v)^2 + s_1(v_1 - v)^2 \tag{4}$$

And the gray average value $v = \sum_{n=0}^{H-1} nl_n$ of the whole image, obviously

$$s_0 v_0 + s_1 v_1 = s_0 \sum_{n=0}^{r} \frac{nl_n}{s_0} + s_1 \sum_{n=r+1}^{H-1} \frac{nl_n}{s_1} = \sum_{n=0}^{r} nl_n + \sum_{n=r+1}^{H-1} nl_n = \sum_{n=0}^{H-1} nl_n = v \tag{5}$$

The optimal threshold r^* is the threshold that maximizes the variance between classes:

$$r^* = argmax\varphi^2(r) \tag{6}$$

The Otsu method also requires an exhaustive method to estimate the contribution rate of the variance between classes for each gray level. This undoubtedly increases the computing time.

3) Double peak method

In an image, when the gray level difference between the background and the object is very large, the gray histogram of the image appears bimodal. The two crests in turn correspond to the overall goal and historical background, while the valley between the two crests corresponds to the boundaries of the image. At this time, to achieve the best separation effect, only the gray value corresponding to the bottom of the histogram is used as the segmentation threshold of the image.

The double-peak method has the disadvantage of a narrow scope of application, and is not suitable for the wide and smooth troughs of the histogram and the insignificant peaks. Its advantage is that it is simple and easy to implement, and the idea is intuitive.

4) Maximum entropy method

The method is to apply the concept of entropy in information theory to image segmentation, select the optimal threshold method and define different entropy measures, resulting in a variety of entropy segmentation methods. Among them, the KSW entropy method is the most widely used and the most representative.

The general approach of the KSW entropy method is that, given an image of size $P \times Q$, the number of pixels with gray level *n* is p_n , and the value range of gray level is $K = \{0,1,2,\cdots,H-1\}$. The probability of occurrence of gray level *n* in this image is l_n. Assuming that the image is divided into two parts, the background and the target, the segmentation threshold is r, the gray distribution of the target X is defined as $\{0,1,\cdots,r\}$, and the gray distribution of the background Y is defined as $\{r+1,r+2,\cdots,H-1\}$, let

$$l_r = \sum_{n=0}^{h} l_n \tag{7}$$

Then the probability distributions of target X and background Y are:

$$L_X: \frac{L_0}{L_h}, \frac{L_1}{L_h}, \cdots, \frac{L_r}{L_h} \tag{8}$$

$$L_Y: \frac{L_{r+1}}{1-L_r}, \frac{L_{r+2}}{1-L_r}, \cdots, \frac{L_{H-1}}{1-L_r} \tag{9}$$

For the probability of the target and the background appearing according to the gray level $n \in K$, the corresponding background entropy *T(X)* and target entropy *T(Y)* are respectively defined.

$$T(X) = -\sum_{n=0}^{h} l_X log l_X = -\sum_{n=0}^{h} \frac{L_r}{L_h} log l_X \frac{L_r}{L_h} \tag{10}$$

$$T(Y) = -\sum_{n=0}^{H-1} l_Y log l_Y = -\sum_{n=r+1}^{H-1} \frac{L_r}{1-L_h} log l_X \frac{L_r}{1-L_h} \tag{11}$$

Define the criterion function: $\gamma(r) = T(X) + T(Y)$, then the optimal segmentation threshold is the gray level r that makes the criterion function obtain the maximum value.

(2) Image segmentation method based on edge detection

The most basic feature of an image is the edge, but it refers to the local features of the image rather than the result of continuity. The basic idea of the pixel division method based on boundary detection is to first measure a boundary starting point, and then find a boundary point similar to the previous one according to a certain similarity principle. Then, according to the corresponding strategy, they are connected into contour shapes, and finally, contour tracking is used for regional division.

As the first step in all boundary-based separation methods, the most classic boundary detection method uses a difference operator that is sensitive to pixel grayscale transformation to achieve pixel separation. Generally, the spatial differential operator is used, and its template is used to realize the pixel convolution. In the digital image, the differential approximation is used to obtain the derivative. Therefore, it can be performed synchronously on different pixels, and thus the time complexity is reduced.

1) Gradient operator

For each pixel *(n,m)* in the two-dimensional graph, its gradient operation is:

$$f(n,m) = \sqrt{[\partial j(n,m)/\partial n]^2 + [\partial j(n,m)/\partial m]^2} \tag{12}$$

Among them:

$$\partial j(n,m)/\partial n \approx j(n,m) - j(n-1,m) \tag{13}$$

$$\partial j(n,m)/\partial m \approx j(n,m) - j(n,m-1) \quad (14)$$

The local change of the image gray level is determined according to the level of the gradient *f(n,m)*. Therefore, the gradient can also be used as the basis for measuring edge points. Step-type boundaries can be measured more efficiently with gradient operators, while roof-type boundaries are prone to double-boundary effects.

In addition, there is another similar operator, the special form of this operator is:

$$U(n,m) = max\{|j(n+1,m+1) - j(n-1,m-1)|, |j(n+1,m-1) - j(n-1,m+1)|\} \quad (15)$$

2) Sobel operator

Sobel operator is a kind of discrete difference operator. It mainly uses the gradient or approximation of the measured image brightness function to perform edge measurement. This operator includes two horizontal and vertical 3*3 matrices. By convolving it with the plane between the pixels, the horizontal and vertical luminance difference approximations can be obtained in turn. Applying this operator anywhere on the screen will generate the corresponding normal or gradient vector. Its formula is as follows:

$$C(n,m) = |\Delta_n j(n,m)| + |\Delta_m j(n,m)| \quad (16)$$

Because the Sobel operator cannot be processed according to the grayscale of the image, sometimes the overall contour of the obtained image is not ideal.

3) Kirsch operator

The 8 templates represent the eight directions, maximizing the response to each specific boundary direction on the image. The average value is taken as the boundary output of the image during the calculation.

The Kirsch operator can be expressed as follows:

$$H(n,m) = max[1, \underset{n=0}{^{max}}|5(x_n + x_{n+1} + x_{n+2}) - 3(x_{n+3} + x_{n+4} + \cdots + x_{n+7})|] \quad (17)$$

Among them, the subscript takes the value after operation with 8 as the modulo.

The Kirsch operator is also quite sensitive to small changes in grayscale in the image. Since the grayscale changes of eight aspects can be measured at the same time and the average value is taken, it belongs to the most suitable edge detection method.

4) Laplacian operator

In digital images, step-shaped edge points correspond to zero-crossing points of the second derivative. The direction-independent boundary detection operator designed based on this characteristic is the Laplacian operator, which can also be described as:

$$R(n,m) = j(n-1,m) + j(n+1,m) + j(n,m-1) + j(n,m-1) - 4j(n,m) \quad (18)$$

After the image *j(n,m)* is filtered by the Laplacian operator, in the resulting image, the existence of the boundary can be judged by detecting the zero-crossing point, because there is a boundary in the middle.

5) Marr operator

It is also called the LoG operator, or the Gauss-Laplace operator. The basic idea of the Marr operator is to first filter the image with Gaussian filtering, and then use the Laplacian operator to complete the boundary check. That is:

$$f(n,m) = F(t) * j(n,m) \quad (19)$$

Using the Laplacian operator for further operations on f(n,m), the Marr operator can be obtained.

$$Q(n,m) = Lg(n,m) = \nabla^2\{f(n,m)\} = \nabla^2\{F(t) * j(n,m)\} \quad (20)$$

In the Marr operator, the size of the Gaussian filter width α directly affects the result of edge detection. Generally speaking, the larger the α, the stronger the anti-noise ability. But it will cause some changes, and subtle edges are difficult to detect.

4. Experimental Results of Clinical Nursing and Physical Rehabilitation Treatment Effect Evaluation of Children with Cerebral Palsy

4.1. Treatment Methods

(1) Treatment group

Basic comprehensive rehabilitation treatment plan + acupuncture at Shumo point

(2) Basic comprehensive rehabilitation treatment plan

1) Tuina massage: Massage is performed using the "dredging and correction" technique. The basic techniques are as follows:

Tui Na along the meridians: Based on the position of the meridians, massage is performed along the positions of the meridians, in order to dredge the Qi and activate the meridians.

Acupuncture point pressure: Apply point pressure treatment on important acupoints in special parts of the body to dredge the meridian qi.

Abnormal muscle massage: Massage the myocardium with high muscle tension to reduce pressure and thereby reduce muscle tension; for the weaker parts of the body, through treatment, muscle strength can be enhanced.

Posture Correction: In view of abnormal body posture, based on the principle of inhibiting movement, implement confrontation and correct abnormal body posture to promote normal movement.

2) Exercise therapy. The specific operation methods and steps are as follows:

A. The key point of control: It is the key part for the medical practitioner to improve the abnormal movement pattern of the patient, control the spasm, and urge the patient to control the disease during voluntary movement. The proximal ones include the neck, crest vertebrae, shoulders, pelvis, manubrium, scapular angle, etc.; the distal ones include: hands, toes, ankles, etc.

B. Reflex suppression mode:

Hands: Make the patient's palms face each other and shake hands with fingers interlaced, with the affected fingers on the left and right of the healthy finger. Its function is to prevent the affected arm from pronation, to straighten the patient's hand on the knuckles of the palm, and to make the patient's thumb abduct greatly, thereby resisting the buckling between the wrist and fingers, and promoting the straightening of the wrist and fingers. This type of handshake is called a Bobath handshake.

Upper limb training: Keep the patient's upper limb in abduction, external rotation, elbow extension, upper arm supination, wrist or finger extension, and thumb abduction to resist abnormal flexion or twitching patterns of the upper limb.

Note that the above treatment should be dynamic. That is, after fighting the spasm, immediately perform the aforementioned small-scale, less forceful and non-spasmodic voluntary activities, or train the balance, protection or righting reflex, instead of staying in the static RIP state.

C. Motor control training:

Put weight on the body and train balance on it.

Holding exercises: Passively move the end of the trunk to a point within the joint range of motion in space, then release, and have the patient practice holding the entire torso on that area.

Thirty minutes once, twice a day, six days a week.

3) Scalp needles. Apply the divisional position and processing method of "Jiao's scalp acupuncture" and "Jin's scalp acupuncture", and use acupuncture to puncture the exercise area, balance area, sensory area, bilateral foot exercise area, pre-exercise area, and other exercise areas of the body. This stimulates physical motor development. After routine disinfection, use a 0.35×25mm needle at an angle of 15° with the horizontal line of the scalp, quickly insert the needle under the galeal aponeurosis, and keep the needle for about 40 minutes. One a day, six days a week, with a day off in between.

4) Physiotherapy: For the patient's condition, low-frequency pulse excitation, electrical biofeedback, cerebral circulation and transcranial magnetic field shock are used as the main treatment contents. Usually 30 minutes at a time, once a day, six days a week, with a day off in between.

(3) Acupuncture at Shumu Point

Disposable acupuncture needles are used. First select the site, routinely sterilize it, then quickly insert the needle, then quickly twist to apply the method of replenishing and reducing, leveling, supplementing, and reducing, and then quickly withdrawing the needle. Once a day, 6 days a week.

(4) Control group

Only the basic comprehensive rehabilitation treatment plan was adopted, and the method was the same as that of the treatment group.

4.2. Subjects of the Study

According to the 70 patients included in the international standard, they were divided into the medical group (n=35) and the control group (n=35) according to the random number table method. There were 19 males and 16 females in the medical group, aged 1-3 years, with an average age of (22.25±6.998) months.

Table 1. Gender comparison of the two groups of children

	male	female
Treatment group	19	16
Control group	22	13
	λ^2	*P*
Treatment group	1.162	0.279
Control group		

As shown in Table 1, the gender of the two groups of children was compared, using λ^2 test, $\lambda^2 = 1.162$, P=0.279>0.05. There was no statistical difference in gender between the two groups.

Table 2. Age comparison of the two groups of children

	Number of cases	month age
Treatment group	35	22.25
Control group	35	22.74
	t	*P*
Treatment group	0.269	0.791
Control group		

As shown in Table 2, the comparison of the age groups of the two groups of patients, as well as the comparison of the age between the two groups, all passed the single-sample t test. P=0.791>0.05, there was no statistical difference in age between the two groups.

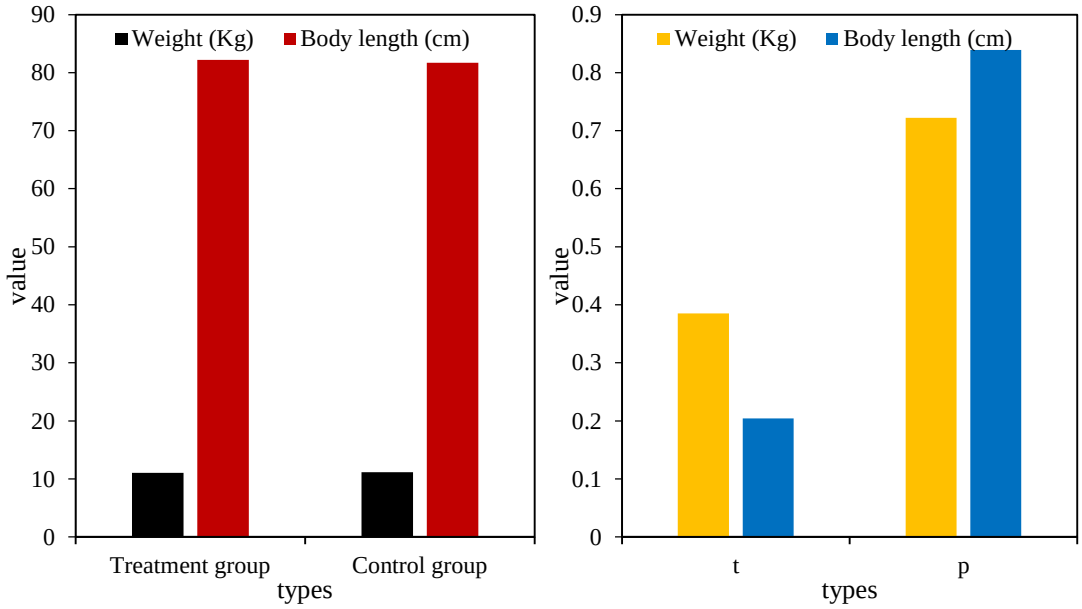

Figure 4. Comparison of body weight and length of two groups of children

Figure 4 shows the comparison of body weight and length of the two groups of children.

4.3. Comparison of Gross Motor Function Total Percentage before and after Treatment in Two Groups of Children with Cerebral Palsy

Before treatment, the percentage of gross motor function of the two groups of patients was compared, and the difference was not statistically significant by the single sample t test (P=0.913>0.05), which had certain reliability; after cure, compared in two patient groups, the total percentage of gross motor function was compared with that before cure, and the difference was statistically significant by independent sample t test (both P<0.05). It shows that the effect of basic comprehensive rehabilitation therapy combined with acupuncture at Shumu acupoint on gross motor function in children with cerebral palsy is better than that of basic comprehensive rehabilitation therapy alone, as shown in Table 3 and Figure 5.

Table 3. Comparison of gross motor function percentages before and after treatment in two groups of children with cerebral palsy

	Treatment group	Control group
Number of cases	35	35
Before treatment	39.95	39.87
After treatment	58.78	49.73

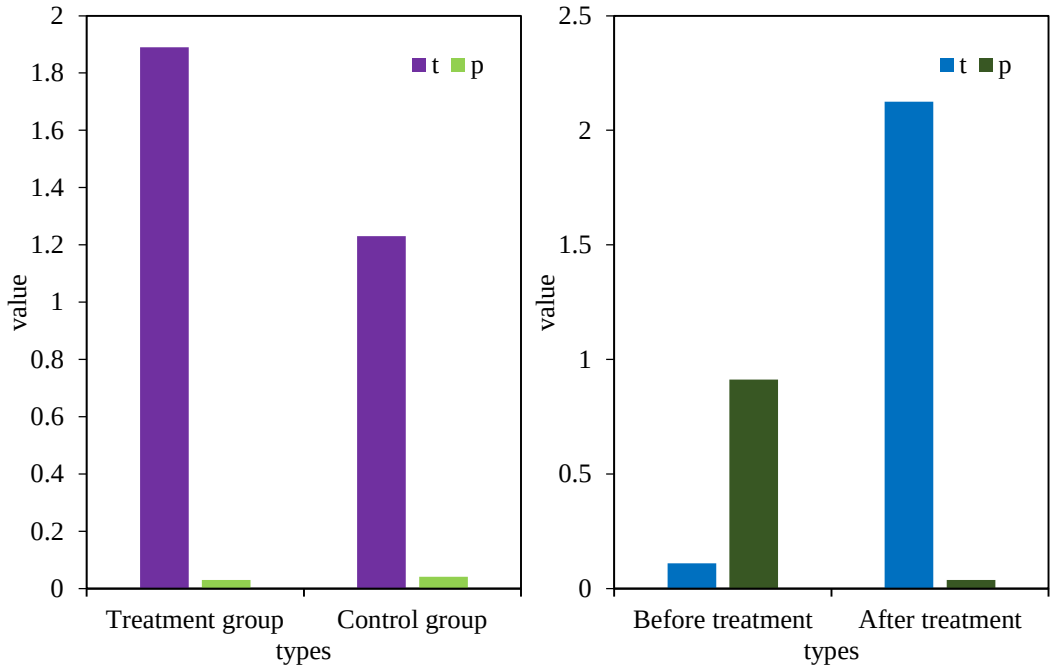

Figure 5. T-test analysis of gross motor function before and after treatment in two groups of children with cerebral palsy

4.4. Comparison of Intelligence Test before and after Treatment in Two Groups of Children with Cerebral Palsy

Following therapy, children in the treatment group had statistically significant differences in IQ test performance compared to the control group by t-test of relevant samples ($P=0.046<0.05$). It shows that the basic comprehensive rehabilitation therapy plus acupuncture at Shumu can improve the intelligence level of children with cerebral palsy more than the basic comprehensive rehabilitation therapy alone, as shown in Table 4 and Figure 6.

Table 4. Comparison of intelligence test before and after treatment in two groups of children with cerebral palsy (points)

	Treatment group	Control group
Number of cases	35	35
Before treatment (DQ)	47.09	47.43
After treatment (DQ)	63.83	57.94

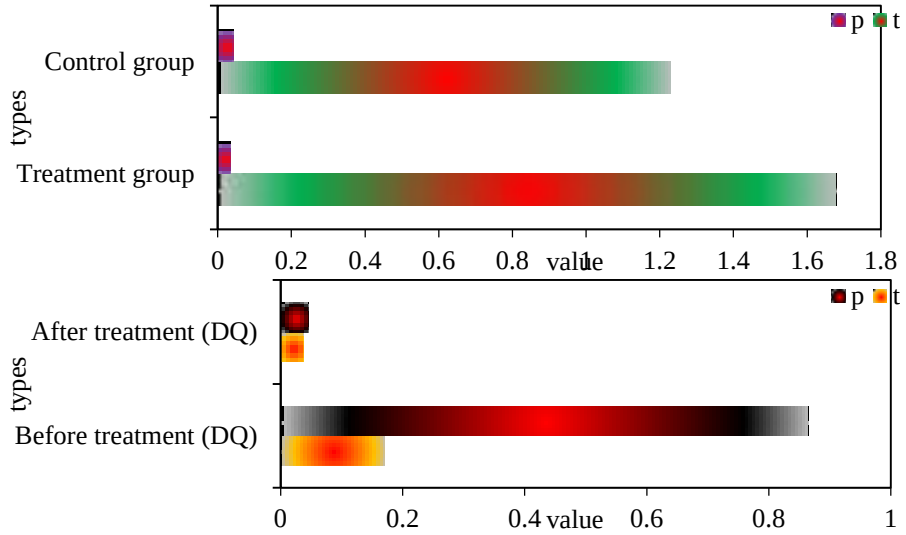

Figure 6. Analysis of intelligence test t-test before and after treatment in two groups of children with cerebral palsy

4.5. Comparison of Weight and Length Growth of Children with Cerebral Palsy in the Two Groups after Treatment

Prior to treatment, the weight and length of the children in the two groups were not found to be statistically distinct and similar; following therapy, the weight and length of the patients in the therapy group were statistically different from those in the treatment group compared with those in the control group by t-test of relevant samples ($P<0.05$). It shows that basic comprehensive rehabilitation therapy plus acupuncture at Shumou can promote the weight and length of children with cerebral palsy, as shown in Figure 7.

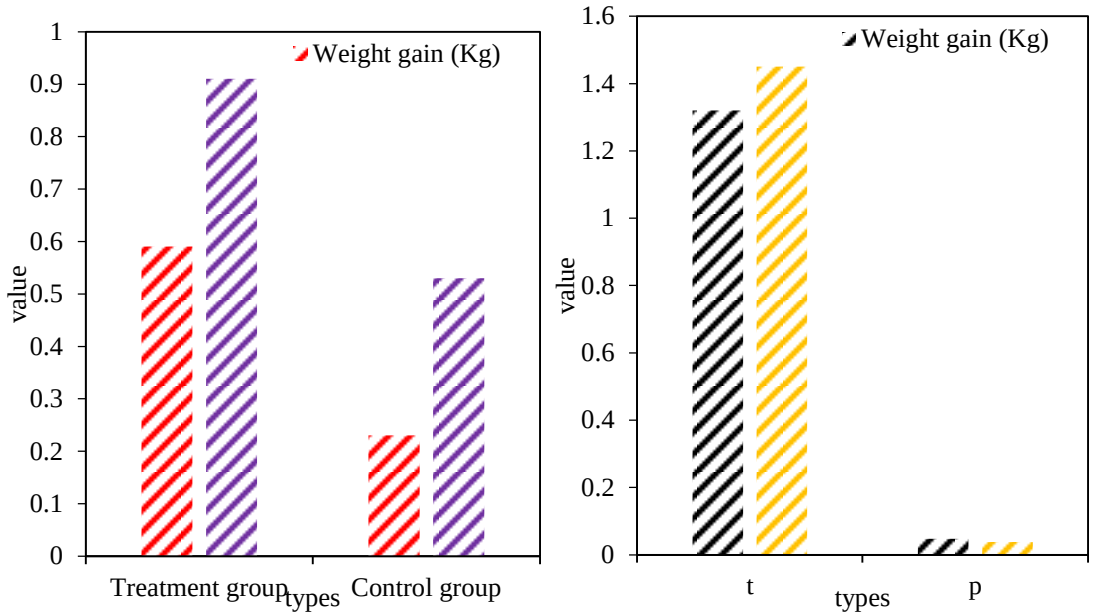

Figure 7. Comparison of weight and length growth of children with cerebral palsy in two groups after treatment

4.6. Comparison of the Number of Infections (Respiratory and Digestive Tract) between the Two Groups of Children with Cerebral Palsy during Treatment

During the treatment period, the infection frequency of the two groups was compared, and the infection frequency of the treatment group was significantly less than that of the control group. The difference was statistically significant (P=0.037<0.05) by the relevant sample *t* test. It shows that the basic comprehensive rehabilitation therapy plus acupuncture at Shumu can reduce the number of infections in children with cerebral palsy, as shown in Figure 8.

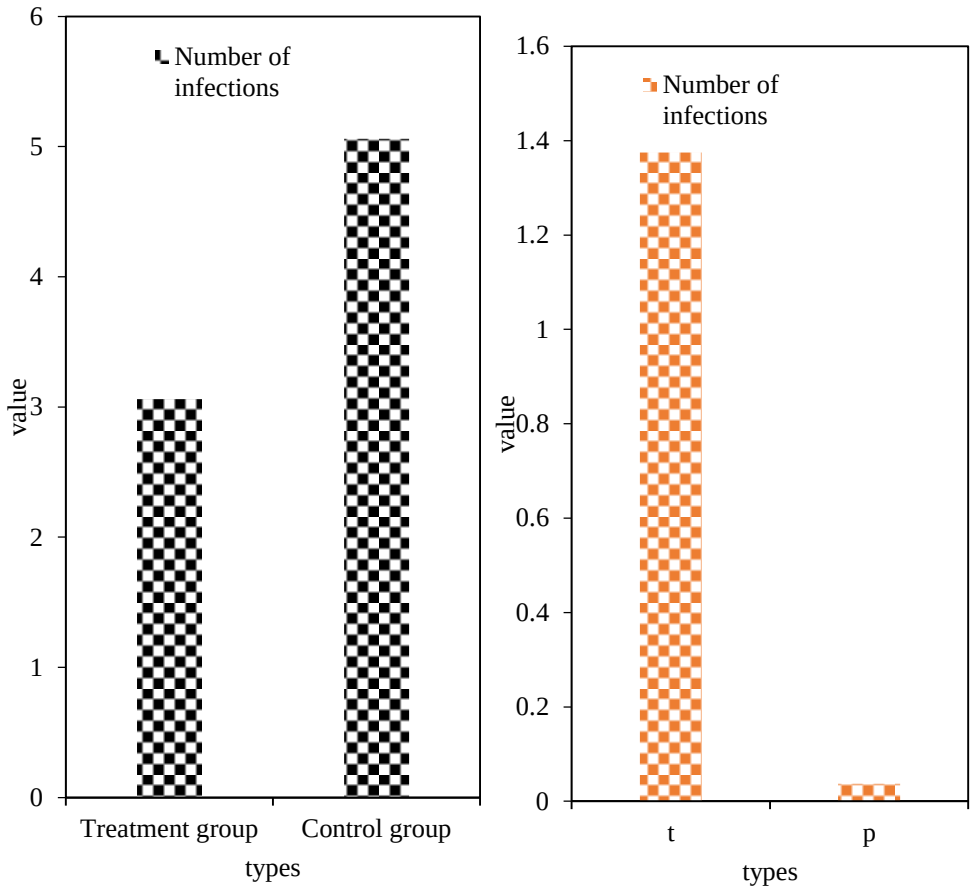

Figure 8. Comparison of the number of infections in the two groups of children with cerebral palsy during treatment

4.7. Comparison of Clinical Efficacy between Two Groups of Children with Cerebral Palsy

After rank sum test, Z=-2.092, P=0.036<0.05, the clinical efficacy of the treatment group was better than that of the control group, as shown in Figure 9.

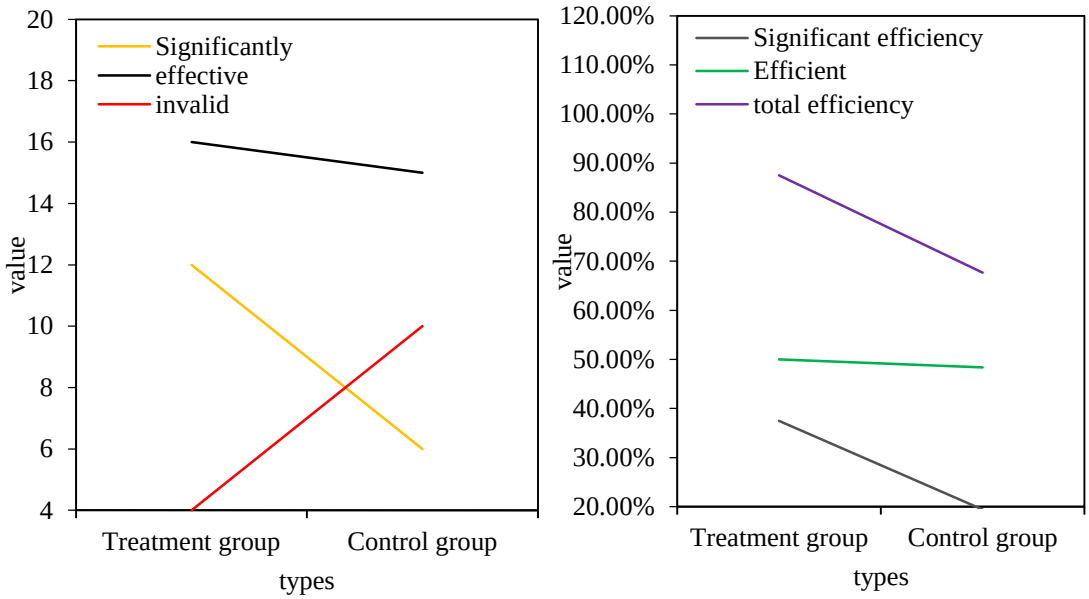

Figure 9. Comparison of clinical efficacy of two groups of children with cerebral palsy after 2 courses of treatment

5. Discussion

Cerebral palsy is one of the main diseases that cause disability in children. In recent years, medical technology in obstetrics and neonatology has developed rapidly, but epidemiological studies at home and abroad have shown that the incidence of cerebral palsy has not decreased with the development of medicine. In addition, most patients with cerebral palsy have a poor prognosis, causing movement disorders to patients, often accompanied by mental retardation, perceived language disorders, epilepsy, and abnormal mental behavior, which have a serious impact on the family and society. At present, there is no effective method for the treatment of cerebral palsy at home and abroad, and the key to its prevention and treatment lies in early detection and early intervention.

6. Conclusion

The aim of this article is to analyze the evaluation of the effectiveness of clinical care and physical rehabilitation treatment in kids with cerebral palsy. In the comparison following the diagnosis of the two groups, the degree of improvement in the patient group was significantly higher compared to the control group. It shows that the effect of basic comprehensive rehabilitation therapy plus acupuncture at Shumu acupoint on gross motor function and mental development level in children with cerebral palsy is better than that of basic comprehensive rehabilitation therapy alone. After treatment, the weight and height growth of children with cerebral palsy in the treatment group were greater than those in the control group; the number of infections in the children with cerebral palsy in the treatment group was less than that in the control group. It shows that the addition of acupuncture at Shumu acupoint on the basis of basic comprehensive rehabilitation therapy can effectively promote the physical growth of children with cerebral palsy and reduce the frequency of infection of common diseases.

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Data Availability

Data sharing is not applicable to this article as no new data were created or analysed in this study.

Conflict of Interest

The author states that this article has no conflict of interest.

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