

Analysis of Present Situation and Influencing Factors of Coping Methods by Parents of Children with Central Nervous System Tumors

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How to cite this paper: Bai, L., Zhao, Q.Q., Xiao, C.J. and Zhou, Z.H. (2020) Analysis of Present Situation and Influencing Factors of Coping Methods by Parents of Children with Central Nervous System Tumors. *World Journal of Neuroscience*, 10, 206-215.
<https://doi.org/10.4236/wjns.2020.104020>

Received: October 20, 2020

Accepted: November 7, 2020

Published: November 10, 2020

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Abstract

Background: Central nervous system (CNS) tumors are the most common solid tumors among children. Due to the severity of the tumors and the complexity of therapeutic regimes, it is very important to examine whether parents of the children with CNS tumors have positive coping methods against the disease. This study aims to analyze the coping methods of the parents and the factors influencing the methods. **Methods:** A total of 108 parents of brain cancer children admitted from January 2019 to September 2020 were selected as subjects. After collecting the general information of the parents, they were studied using the Coping Health Inventory for Parents (CHIP, Chinese version). Additionally, their coping pattern and the influencing factors were analyzed. **Results:** The average scores of the three subscales of the CHIP were (4.25 ± 0.939), (3.11 ± 1.205) and (3.60 ± 1.187), respectively. Univariate analysis showed that parents' education, medical payment methods, places of residence and economic concerns were the main factors influencing the coping methods (all $P < 0.05$). **Conclusions:** Healthcare staff should fully evaluate the coping methods adopted by the parents having children with CNS tumors, take targeted nursing measures accordingly, and assist the parents in seeking social support and learning disease-related knowledge. In addition, public education on disease is equally important.

Keywords

Coping Methods, Parents, Children, Central Nervous System Tumors

1. Introduction

In recent years, the incidence of nerve tumors in children has been increasing,

ranking the first among solid tumors for children [1]. During the long treatment process, children may suffer from epilepsy, hemiplegia and cognitive impairment, resulting in a great difficulty in family nursing. Parents, as the main caregivers for the children, have been under great pressure physically, psychologically and economically for a long time, thus reducing the standards of living of the whole family [2]. Coping methods are how individuals manage pressure [3]. Research [4] [5] [6] has shown that positive coping methods can ease the pressure of caregivers, reduce negative emotions, improve the care for patients, and provide the children with good family support. Most previous studies were limited to the outcomes or effects of different coping styles of individual patients [7] [8], lacking in-depth research on the coping process or enough attention to parents and family situations in China. Therefore, this study delved into the coping methods of the parents of children with CNS tumors and analyzed the influencing factors accordingly, so as to provide an effective basis and reference for the implementation of clinical intervention measures.

2. Subjects and Methods

2.1. Subjects

A total of 108 parents were selected as subjects who have children with CNS tumors admitted from January 2019 to September 2020 to our department. Inclusion criteria were as follows: 1) the diagnosis was in accordance with the *NCCN Guidelines for Central Nervous System Cancers*; 2) the parents could read and write, and they had normal cognitive abilities and mental status; and 3) the parents were willing to accept the survey research and sign the informed consent forms. Exclusion criteria included: 1) the parents had reading, writing and cognitive dysfunctions; and 2) the parents refused to be the subjects.

2.2. Methods

2.2.1. Data Collection

Trained staff sent out questionnaires when the children were hospitalized, and explained the purpose and significance of the questionnaires. After signing the informed consent forms, the parents filled in the questionnaires anonymously. The questionnaires were distributed and then collected. A total of 108 questionnaires were sent out, and all were returned. All the questionnaires were valid, and the response rate was 100%.

2.2.2. Survey Tools

1) The basic information questionnaire was developed by researchers according to literature review. It was composed of two parts, first, basic information of parents of children with CNS tumors, including the relationship with the children, age, education, number of children, place of residence, and family income; second, basic information of the children, such as diagnosis, gender, age, treatment period and medical payment method. 2) The English version of the CHIP was created by McCubbin *et al.* [9] in 1983, and the CHIP in Chinese was intro-

duced to China by Li Yang *et al.* [10]. The CHIP scale comprises three subscales with 45 items: a) maintaining family integration, cooperation, and an optimistic definition of the situation; b) maintaining social support, self-esteem, and psychological stability; and c) understanding the medical situation through communication with other parents and consultation with healthcare workers. The parents were asked whether they used the 45 coping methods in the scale, and the frequency options included “never, seldom, sometimes, often, and always”, with the scores ranging from 1 to 5. A high score presents the parents’ high frequency and dependence in using a certain coping method. The overall Cronbach’s alpha coefficient of the CHIP in Chinese version is 0.91, and the Cronbach’s alpha coefficient of each of the three subscales is 0.92, 0.80 and 0.70.

2.2.3. Statistical Analysis

Statistical analysis was carried out using SPSS 20.0. The measurement data were expressed as $\bar{x} \pm s$, and analyzed with the t test. Descriptive analysis was conducted using the constituent ratio. The independent-sample t test was performed for comparison between the two groups, and the LSD test for multiple comparisons. Multivariate analysis was performed by the multivariate linear regression model. $P < 0.05$ or $P < 0.01$ was considered as statistically significant.

3. Results

3.1. Basic Information of Parents of Children with CNS Tumors (Table 1)

The 108 children’s parents were 25 - 47 years old, with an average age of (36.51 ± 6.165) years old. There were 41 fathers and 67 mothers. 81.5% of the children were not the only child. Parents living in other cities and towns account for 52.8%, those with junior middle school education level account for 42.6%, and those with a family income of 3000 - 10,000 account for 62.9%.

3.2. CHIP Scores of Parents of Children with CNS Tumors

The average frequency and effect scores of the three CHIP subscales for parents of children with CNS tumors are shown in **Table 2**. The average frequency and effect scores were ranked as follows: maintaining family integration, cooperation, and an optimistic definition of the situation; understanding the medical situation through communication with other parents and consultation with healthcare staff; and maintaining social support, self-esteem, and psychological stability. It can be found that the most commonly-used coping pattern was maintaining family integration, cooperation, and an optimistic definition of the situation, which was believed to be the most effective.

3.3. Univariate Analysis of Coping Methods by Parents of Children with CNS Tumors

The results demonstrated that the educational background, place of residence, monthly family income and payment methods for medical expenses of the parents

influenced the scale of overall frequency of the coping methods. Being the only child, parents' education, place of residence, monthly family income and medical payment methods had influences on the subscale 1. Parents' educational background impacted the subscale 2. Place of residence had an impact on the subscale 3 (**Table 3** and **Table 4**).

Table 1. General demographic data of parents of children with CNS tumors (n = 108).

| Items | Number of cases | Constituent ratio (%) |
|---|-----------------|-----------------------|
| Gender | | |
| Male | 43 | 39.8 |
| Female | 65 | 60.2 |
| Marital status | | |
| Married | 105 | 97.2 |
| Divorced | 2 | 1.9 |
| Widowed | 1 | 0.9 |
| Relationship with children | | |
| Father | 41 | 38.0 |
| Mother | 67 | 62.0 |
| Only child or not | | |
| Yes | 20 | 18.5 |
| No | 88 | 81.5 |
| Place of residence | | |
| Provincial capitals | 13 | 12.0 |
| Other cities and towns | 57 | 52.8 |
| Countryside | 38 | 35.2 |
| Educational background | | |
| Primary school | 7 | 6.5 |
| Junior high school | 46 | 42.6 |
| Senior high school/secondary specialized school | 29 | 26.9 |
| Junior college | 12 | 11.1 |
| Undergraduate or above | 14 | 13.0 |
| Monthly family income | | |
| <RMB 3000 | 18 | 16.7 |
| RMB 3000 - 5000 | 32 | 29.6 |
| RMB 5000 - 10,000 | 36 | 33.3 |
| >RMB 10,000 | 22 | 20.4 |
| Payment method | | |
| Self-funded | 6 | 5.6 |
| New rural cooperative medical system | 63 | 58.3 |
| Urban resident basic medical insurance | 37 | 34.3 |
| Commercial medical insurance | 2 | 1.9 |

Table 2. Average frequency and effect scores of 3 CHIP subscales for parents of children with CNS tumors (score, $\bar{x} \pm s$).

| Items | Score range | Frequency | Score range | Effect |
|--|-------------|--------------|-------------|--------------|
| Maintaining family integration, cooperation, and an optimistic definition of the situation | 1 - 5 | 4.25 ± 0.939 | 0 ~ 3 | 2.45 ± 0.730 |
| Maintaining social support, self-esteem, and psychological stability | 1 - 5 | 3.11 ± 1.205 | 0 ~ 3 | 1.95 ± 0.961 |
| Understanding the medical situation through communication with other parents and consultation with the medical staff | 1 - 5 | 3.60 ± 1.187 | 0 ~ 3 | 2.19 ± 0.865 |

Table 3. Univariate analysis of the coping methods in the CHIP scale of overall frequency (n = 108).

| Items | Overall frequency | | | |
|--------------------------|-------------------|-----------------|-------|---------|
| | Number of cases | $\bar{x} \pm s$ | F | P |
| Gender | | | 1.091 | 0.299 |
| Male | 43 | 168.21 ± 18.609 | | |
| Female | 65 | 163.91 ± 22.358 | | |
| Age | | | 1.944 | 0.148 |
| ≤35 | 47 | 165.47 ± 20.443 | | |
| 36 - 45 | 49 | 163.14 ± 19.991 | | |
| 46 or above | 12 | 176.33 ± 25.119 | | |
| Only child or not | | | 2.606 | 0.109 |
| Yes | 20 | 172.40 ± 21.279 | | |
| No | 88 | 164.08 ± 20.702 | | |
| Monthly family income | | | 2.817 | 0.043* |
| RMB 0 - 3000 | 18 | 156.61 ± 21.241 | | |
| RMB 3000 - 5000 | 32 | 162.94 ± 25.101 | | |
| RMB 5000 - 10,000 | 36 | 167.03 ± 19.026 | | |
| RMB > 10,000 | 22 | 174.59 ± 13.114 | | |
| Educational background | | | 4.222 | 0.007** |
| Primary school and below | 7 | 145.86 ± 25.478 | | |
| Junior high school | 46 | 168.02 ± 20.512 | | |
| Senior high school | 29 | 166.59 ± 19.807 | | |
| Undergraduate and above | 26 | 174.46 ± 17.998 | | |
| Place of residence | | | 3.635 | 0.030* |
| Cities | 13 | 178.15 ± 22.003 | | |
| Towns | 57 | 166.16 ± 20.321 | | |
| Countryside | 38 | 160.53 ± 20.158 | | |
| Medical payment methods | | | 3.948 | 0.010* |

Continued

| | | | | |
|--|----|-----------------|-------|-------|
| Self-funded | 6 | 175.50 ± 17.986 | | |
| New rural cooperative medical system | 62 | 160.03 ± 19.624 | | |
| Urban resident basic medical insurance | 38 | 173.41 ± 21.391 | | |
| Commercial medical insurance | 2 | 168.00 ± 15.556 | | |
| With religious belief or not | | | 0.834 | 0.363 |
| Yes | 12 | 170.83 ± 15.868 | | |
| No | 96 | 164.97 ± 21.491 | | |

Table 4. Univariate analysis of the coping methods in each CHIP subscale (n = 108).

| Items | Subscale 1 | | | Subscale 2 | | | Subscale 3 | | |
|--|-----------------|----------|----------|-----------------|----------|----------|-----------------|----------|----------|
| | $\bar{x} \pm s$ | <i>F</i> | <i>P</i> | $\bar{x} \pm s$ | <i>F</i> | <i>P</i> | $\bar{x} \pm s$ | <i>F</i> | <i>P</i> |
| Only child or not | | 0.713 | 0.029* | | 0.472 | 0.210 | | 0.008 | 0.732 |
| Yes | 84.30 ± 8.099 | | | 58.90 ± 10.731 | | | 29.20 ± 5.818 | | |
| No | 80.01 ± 7.730 | | | 55.40 ± 11.322 | | | 28.67 ± 6.324 | | |
| Monthly family income | | 3.745 | 0.013* | | 2.328 | 0.079 | | 0.613 | 0.608 |
| RMB 0 - 3000 | 78.06 ± 5.374 | | | 51.11 ± 12.175 | | | 27.44 ± 6.224 | | |
| RMB 3000 - 5000 | 79.13 ± 8.071 | | | 55.53 ± 12.654 | | | 28.28 ± 7.194 | | |
| RMB 5000 - 10,000 | 80.97 ± 8.856 | | | 56.36 ± 10.795 | | | 29.69 ± 5.947 | | |
| RMB > 10,000 | 85.23 ± 6.294 | | | 60.32 ± 7.325 | | | 29.05 ± 5.141 | | |
| Educational background | | 4.341 | 0.006** | | 3.362 | 0.022* | | 2.61 | 0.055 |
| Primary school and below | 77.29 ± 9.552 | | | 45.43 ± 11.617 | | | 23.14 ± 7.988 | | |
| Junior high school | 78.39 ± 7.600 | | | 55.43 ± 11.421 | | | 29.20 ± 5.932 | | |
| Senior high school | 82.28 ± 7.488 | | | 56.10 ± 10.445 | | | 28.21 ± 5.833 | | |
| Undergraduate and above | 84.38 ± 7.150 | | | 59.92 ± 10.217 | | | 30.15 ± 6.064 | | |
| Place of residence | | 5.592 | 0.005* | | 1.167 | 0.315 | | 3.329 | 0.040* |
| Cities | 85.69 ± 6.921 | | | 59.62 ± 13.550 | | | 32.85 ± 6.743 | | |
| Towns | 81.58 ± 7.604 | | | 56.42 ± 11.134 | | | 28.16 ± 5.806 | | |
| Countryside | 77.97 ± 7.855 | | | 54.26 ± 10.528 | | | 28.29 ± 6.255 | | |
| Medical payment methods | | 5.497 | 0.002* | | 1.364 | 0.258 | | 2.602 | 0.056 |
| Self-funded | 85.83 ± 6.824 | | | 58.33 ± 7.554 | | | 31.33 ± 6.121 | | |
| New rural cooperative medical system | 78.37 ± 7.391 | | | 54.21 ± 10.800 | | | 27.46 ± 5.864 | | |
| Urban resident basic medical insurance | 84.05 ± 7.619 | | | 58.68 ± 12.345 | | | 30.68 ± 6.498 | | |
| Commercial medical insurance | 82.50 ± 10.607 | | | 58.50 ± 4.950 | | | 27.00 ± 0.000 | | |

4. Discussions

4.1. Present Situation of Coping Methods by Parents of Children with CNS Tumors

The survey research on coping methods by parents of children with CNS tumors

aims to thoroughly understand whether the pressure on parents as caregivers can be effectively dealt with. The goal is to enable each family to use its own resources and adopt the most effective coping pattern against the disease, thus improving the life of the family. Through the survey, targeted guidance can be provided for parents to better handle psychological stress, enhance their problem-solving abilities and seek better help. This study found that a majority of the parents of children with CNS tumors adopted the coping pattern of “maintaining family integration, cooperation, and an optimistic definition of the situation”, but rarely used the pattern of “understanding the medical situation through communication with other parents and consultation with the medical staff” or “maintaining social support, self-esteem, and psychological stability”. On the one hand, it’s costly, difficult and complex to diagnose and treat CNS tumors. On the other hand, our results indicated that the parents were inactive in seeking social and medical support, partly because of the uneven distribution of medical resources, parents’ education and economic concerns. In addition, it was found that the parents were ready to devote more energy into taking care of their children, but didn’t care much about their own psychological and physical health. Affected by traditional psychological concepts, Chinese parents tend to deal with the depressing situation themselves because they don’t want to trouble others or let others know. Studies [11] [12] have shown that after their children are diagnosed with cancers, it’s common that parents suffer from insomnia, anxiety and depression, which impairs the psychological and physical health of the parents. Therefore, it is suggested that the healthcare staff should pay attention to the coping methods by the parents of children with CNS tumors. Moreover, in daily work and communication with the parents, healthcare workers should guide them to consult more about the cancer, improve their understanding of the disease and seek social support, so as to reduce their negative emotions and ease psychological burden when taking care of their children.

4.2. Influencing Factors of Coping Methods by Parents of Children with CNS Tumors

4.2.1. Maintaining Family Integration, Cooperation, and an Optimistic Definition of the Situation

Our study revealed that the influencing factors of “maintaining family integration, cooperation, and an optimistic definition of the situation” included payment methods for medical expenses, place of residence, parents’ educational background, monthly family income and being the only child or not. Among them, medical payment methods, place of residence and educational background were the main influencing factors. The parents in remote areas may consider the tumor as an ominous sign due to their low educational level, insufficient medical resources caused by low income and a lack of knowledge about the cancer. As a result, they were rejected or misunderstood by their relatives, thus dividing the families. In contrast, parents in cities are more educated, with better medical insurance, more medical resources and higher family income, as well as a better

understanding of the tumor. Moreover, they are better at understanding and dealing with family nursing and medical treatment, which is more conducive to family stability and doctor-patient cooperation [13]. Healthcare staff should care more about the parents with low income and educational level in remote areas, help the parents and other family members to learn more about the disease, and encourage the families to support and participate in the family nursing of children, so as to strengthen family bonds.

4.2.2. Maintaining Social Support, Self-Esteem, and Psychological Stability

According to the present study, the least commonly-used coping pattern for the parents was “maintaining social support, self-esteem, and psychological stability”, and the main influencing factor was the educational background of the parents. For one thing, less educated parents have no resource to ask for help partly because they are not good communicators. For another, these parents don't have a correct understanding of the cancer and can't identify effective information due to their poor cognitive abilities [14]. Therefore, it's necessary to make the less educated parents understand the medical staff when the staff carried out the public education on the cancer, and encourage them to actively seek social support.

4.2.3. Understanding the Medical Situation through Communication with Other Parents and Consultation with the Medical Staff

The results showed that the coping pattern of “understanding the medical situation through communication with other parents and consultation with the medical staff” by the parents was influenced by the place of residence. Parents living in remote areas failed to gain effective medical support due to a lack of medical resources and knowledge about the disease. Additionally, parents in remote areas have more difficulties in seeking medical resources than parents in cities, which made them less willing to leave the remote areas for better medical resources. Therefore, the medical staff should encourage the parents in remote areas to actively consult about the disease and home care measures, and guide them to communicate with other parents for a better understanding of the disease.

5. Conclusion

According to the present study, the most common coping method adopted by the parents of children with CNS tumors was maintaining family integration and stability, but the parents were less likely to seek social support, and less willing to learn about the cancer through consultation with the medical staff and communication with other parents. The main influencing factors of parents' coping methods included payment methods for medical expenses, educational level and place of residence. Therefore, nurses should formulate targeted programs based on the coping patterns of parents, effectively educate the family members on the cancer, and evaluate the effect of the education. The convenience sampling used in this study has limitations, and therefore, a multi-center joint survey will be

conducted in the future to expand the sample size, and carry out a more in-depth study on the coping methods by the parents of children with CNS tumors.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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