Research Square

Preprints are preliminary reports that have not undergone peer review.
They should not be considered conclusive, used to inform clinical practice,
or referenced by the media as validated information.

Factors and Pathways of Coping Style of Parents of Children with Hemangioma

Jie Zheng
The First People's Hospital of Nanning
Chaojie Huang
The First People's Hospital of Nanning
Hongyuan Xue
1018425037@qq.com

The First People's Hospital of Nanning

Research Article

Keywords: Children with hemangioma, Parent, Coping style, Influencing factors, Path analysis

Posted Date: May 27th, 2026

DOI: https://doi.org/10.21203/rs.3.rs-9548256/v1

License: This work is licensed under a Creative Commons Attribution 4.0 International License.
Read Full License

Additional Declarations: No competing interests reported.

Factors and Pathways of Coping Style of Parents of Children with Hemangioma

Jie Zheng[1†], Chaojie Huang[1†], Hongyuan Xue[1*]

[1]The First People's Hospital of Nanning, Nanning, Guangxi, China，530022

† These authors contributed equally to this work and share first authorship

*** Correspondence:**

Corresponding Author：Hongyuan Xue 1018425037@qq.com

【Abstract】Objective: To investigate the current coping style of parents of children with hemangioma and analyze its influencing factors and the action paths between influencing factors, so as to provide reference for formulating intervention plans in the later stage. **Methods:** By using the convenience sampling method, from July 2024 to June 2025, A questionnaire survey was conducted on 203 parents of children with hemangioma in the interventional department of Nanning First People's Hospital, using the general information questionnaire, the Simple Coping Style Scale, the Social Support Rating Scale, and the Psychological Resilience Assessment Scale. Univariate analysis, Pearson correlation analysis and multiple linear regression analysis were used to explore the influencing factors of coping styles of parents of children with hemangioma, and a structural equation model was constructed. **Result:** The score of coping styles of parents of children with hemangioma was (33.29±8.69) points. Multiple linear regression analysis showed that gender, medical payment form and the degree of understanding of the disease were the main influencing factors of positive coping styles of parents of children with hemangioma ($P < 0.05$). The results of Pearson correlation analysis indicated that the positive/negative coping styles of parents of children with hemangioma were significantly positively correlated with social support and psychological resilience ($P < 0.05$). Social support is also significantly positively correlated with psychological resilience. Psychological resilience plays a partial mediating role between social support and coping styles. **Conclusion:** Medical staff should formulate effective preventive measures in response to relevant influencing factors, and at the same time guide them on how to regulate emotions more effectively under the protection of social support and

psychological resilience, ultimately achieving a strategic transformation from negative coping to positive coping.
【 **Key Words** 】 Children with hemangioma; Parent; Coping style; Influencing factors; Path analysis.

Hemangioma is the most common benign tumor on infant body surface. Its formation results from abnormal hyperproliferation of vascular endothelial cells [1, 2], with an incidence of 4%~5% [3]. Hemangioma can be found in any part of the body, among which maxillofacial region, trunk and limbs are the most common [4]. Clinical characteristics are rapid local tumor expansion, red tumor color on body surface, tissue deformation, non-compression and negative postural test. Relevant studies show that [5, 6], most of the tumors of children can naturally regress with growth and development, but if children do not receive timely treatment, they may have sequelae such as scar, hypopigmentation or telangiectasia, which not only affect appearance, but also may hinder normal functional activities [7]. Relevant research results show that [8], the psychological state of caregivers is related to the quality of life of children and affects their communication with medical staff. Therefore, parents 'good psychological state and positive coping style are key factors in the treatment process of children's hemangioma. Coping style refers to a series of cognitive and behavioral strategies adopted by individuals to maintain psychological balance in the face of changes in internal and external environment or emotional pressure [9]. During the treatment process of children's hemangioma, the more coping styles adopted by parents of children, the more positive their mentality is, and the less negative emotions are relatively, which can promote the recovery of children. Previous studies

have shown [10] that resilience, social support, and coping styles are closely related, but the pathway of action among families of children with hemangiomas has not been clarified [11]. Therefore, this study analyzed the coping styles of family members of children with hemangioma, and explored the relationship between coping styles and social support of family members of children with hemangioma, so as to provide references for family members of children with hemangioma to seek and implement positive intervention based on coping styles, help family members of children to cope with negative psychological emotions positively, and improve the quality of care for children.

1 Objects and Methods

1.1 Respondent

By convenience sampling method, parents of 203 hospitalized children with hemangioma were selected from Interventional Department of NanNing City First People's Hospital from July 2024 to June 2025. Inclusion criteria: ① Hemangioma diagnosis criteria in Guidelines for Diagnosis and Treatment of Hemangioma and Vascular Malformation (2016 Edition) were met, and hemangioma was diagnosed by color Doppler ultrasound;② Parents of children were immediate relatives of children;③ Age ≥18 years old, clear consciousness. Exclusion criteria: ① Poor compliance; ② The parents refused to cooperate with the investigation;③ The parents had major changes in the past 3 months. The study has been approved by the Ethics Committee of the hospital (KY2024-Comment-022), and all subjects participating in the study have signed the informed consent form.

1.2 Research Methods

1.2.1 Survey Instruments

1.2.1.1 General Information Questionnaire

The general information questionnaire of caregivers included their gender, age, education level, work status, payment method of medical expenses and understanding degree of children's diseases.

1.2.1.2 Simplified Coping Style Questionnaire

The questionnaire was compiled by Xie Yaning [12] and had 2 dimensions, namely positive coping (item 1~ item 12) and negative coping (item 13~ item 20). Likert4-grade scoring method was adopted. The results were expressed as total score of positive coping and total score of negative coping respectively. The overall Cronbach's α coefficient of the questionnaire was 0.90, and the reliability and validity were good.

1.2.1.3 Social Support Rating Scale

Compiled by Chinese scholar Xiao Shuiyuan [13] in 1986, there are 3 dimensions, which are subjective support (item 1, item 3, item 4, item 5), objective support (item 2, item 6, item 7), utilization of support (item 8~ item 10). The higher the score, the higher the level of support. The total score ≤22 is low, 23~44 is medium, and 45~66 is high. The overall Cronbach'sα coefficient of the scale is 0.92, and the reliability and validity are good.

1.2.1.4 Resilience Assessment Scale

In order to effectively quantify the psychological endurance and adaptability of the population, Connor and Davidson jointly compiled the Mental Resilience Scale. Chinese scholar Yu Xiaonan et al [14]. translated this scale. The Chinese version of the Mental Resilience Scale divides mental resilience into 3 dimensions: tenacity (13 items), strength (8 items) and optimism (4 items), totaling 25 items. Each item adopts Likert5-level scoring method, which are respectively: "Never","rarely","sometimes","often" and "always" are set as 0~4 points, with the lowest score of 0 and the highest score of 100 points. The more scores, the stronger the psychological resilience of patients.

1.2.2 Data Collection

The investigators first explained the purpose, significance and investigation methods of this study to the patients who met the inclusion criteria. After the subjects gave informed consent and signed the informed consent form, they used unified guidelines for guidance and requirements, and collected data by self-filling questionnaires or filling in by the investigators. The four questionnaires were completed within 1 hour as much as possible, collected and checked on the spot, and supplemented in time for missing items and missing items to improve the effectiveness of the questionnaires. If the patient has reading and vision abnormalities, the investigator will interpret the corresponding items to the patient, and the patient will record the answers. If the questionnaire is discontinued due to various reasons during the questionnaire survey,

the questionnaire will be regarded as invalid. After the questionnaire is recovered, the questionnaire will be numbered.

1.2.3 Statistical Method

The statistical software SPSS 20.0 and AMOS26.0 were used to analyze the data. Normal distribution was described by mean ± standard deviation, while non-normal distribution was described by median and interquartile interval. Counting data was described by percentage and frequency. The scores of coping style, resilience and social support were analyzed by independent sample t test and one-way ANOVA; Pearson correlation coefficient was used to analyze the correlation among resilience, coping style and social support; Bootstrap method was used to test the significance of mediation model; Harman one-way test was used to test the mediation model, and the test level $\alpha=0.05$.

2 Results

2.1 General characteristics of subjects

A total of 203 parents of children with hemangioma were included in this study. Their general characteristics are shown in Table 1.

Table 1. General Characteristics of the Study Subjects

		Number of people	Proportion（%）
Age	＜30	70	34.48
	30-45	131	64.53
	45-55	2	0.99
Gender	male	11	5.42
	female	192	94.58

Educational attainment	Junior high school education or below	11	5.42
	High school education	25	12.32
	Bachelor's degree or higher	167	82.27
Work situation	In-service	135	66.50
	Retired	2	0.99
	Other	66	32.51
Medical payment form	Medical Insurance	142	69.95
	Self-pay	61	30.05
The degree of understanding of the disease	Understood perfectly	31	15.27
	Partially understand	168	82.76
	Completely unaware	4	1.97

2.2 Coping styles, social support and psychological resilience of parents of children with hemangioma

The total score of coping style, social support and mental toughness of parents of children with hemangioma was (33.29±8.69),(36.91±6.03) and (59.68±15.11) respectively. See Table 2 for the scores of different dimensions.

Table 2. Scores of Coping Styles, Social Support, and Psychological Resilience Among Parents of Children with Hemangioma.

Project	Dimension	Score
Coping mechanism	Positive coping	23.50±6.16
	Negative coping	9.79±4.44

Social support	Perceived social support	23.47±4.58
	Actual social support	6.11±1.56
	Utilization of support	7.35±1.72
Psychological resilience	Tenacity	32.57±7.99
	Strength	18.25±5.27
	Optimism	8.86±3.07

144

145 **2.3 Analysis of influential factors on coping style of parents of children with**
146 **hemangioma**

147 **2.3.1 Single factor analysis of influential factors on coping style of parents of**
148 **children with hemangioma**

149 Univariate analysis showed that gender, medical payment form and understanding of
150 disease were the influencing factors of parents 'positive coping style of children with
151 hemangioma, and the difference was statistically significant (P<0.05), see Table 3.

152 Table 3. Univariate Analysis of Factors Influencing the Coping Styles of Parents of
153 Children with Hemangioma.

Project	N(%)		Coping mechanism					
			Positive coping	F/t	P	Negative coping	F/t	P
Age	＜30	70（34.48）	22.90±6.20	1.22	0.30	9.31±4.22	1.08	0.34
	30-45	131（64.53）	23.72±6.16			10.10±4.53		
	45-55	2（0.99）	29.00±0.00			7.00±7.07		
Gender	male	11（5.42）	19.09±	2.47	0.014	9.82±	-0.02	0.98

			8.34			6.01		
	female	192（94.58）	23.75±5.95			9.79±4.36		
Educational Level	Junior high school education or below	11（5.42）	22.82±7.03	1.22	0.29	8.64±6.50	0.53	0.59
	High school education	25（12.32）	21.80±6.06			9.40±4.82		
	Bachelor's degree or higher	167（82.27）	23.80±6.11			9.92±4.24		
Work situation	In-service	135（66.50）	23.96±6.45	1.54	0.22	9.87±4.37	1.45	0.24
	Retired	2（0.99）	26.50±3.54			4.50±3.54		
	Other	66（32.51）	22.47±5.51			9.79±4.57		
Medical payment form	Medical Insurance	142（69.95）	24.21±6.22	-2.55	0.011	10.09±4.30	-1.51	0.13
	Self-pay	61（30.05）	21.84±5.73			9.08±4.71		
The degree of understanding of the disease	Understood perfectly	31（15.27）	25.97±6.56	3.17	0.044	9.65±4.73	0.99	0.37
	Partially understand	168（82.76）	23.01±6.01			9.89±4.37		
	Completely unaware	4（1.97）	24.75±6.13			6.75±5.50		

154

2.3.2 Multiple linear regression analysis of influential factors on coping styles of parents of children with hemangioma

In order to further clarify the influencing factors of the general information of parents 'coping style of children with hemangioma, linear regression analysis was performed with the score of active coping style as the dependent variable and statistically significant related factors such as gender and medical payment form as the independent variable. The results showed that gender, medical payment form and understanding of the disease were the main influencing factors of parents' active coping style of children with hemangioma, as shown in Table 4.

Table 4. Multiple Linear Regression Analysis of Factors Influencing Positive Coping Styles in Parents of Children with Hemangioma

Independent variable	Unstandardized Coefficient（B）	Standard Error（SE）	Standardized Coefficient (β)	*t*	*P*
Constant	21.117	4.156		5.082	0.000
Gender	4.858	1.855	0.179	2.619	0.009
Medical payment form	-2.128	0.916	-0.159	-2.324	0.021
The degree of understanding of the disease	-2.305	1.071	-0.147	-2.153	0.033

2.4 Correlation Analysis of Coping Style, Social Support and Psychological Resilience among Parents of Children with Hemangioma

Correlation analysis showed that positive coping style, negative coping style, social support and psychological resilience of parents of children with hemangioma were positively correlated, as shown in Table 5.

Table 5. Correlation Analysis of Coping Styles, Social Support, and Psychological Resilience Among Parents of Children with Hemangioma

	Positive coping	Negative coping	Psychological resilience	Social support
Positive coping	1	-	-	-
Negative coping	0.325**	1	-	-
Psychological resilience	0.639**	0.208**	1	-
Social support	0.380**	0.154*	0.363**	1

Note: ** indicates P < 0.01; * indicates P < 0.05

2.5 Mediating Effects of Coping Style, Social Support and Psychological Resilience on Children with Hemangioma

The mediating effect model was established with the total score of social support as independent variable, positive/negative coping style as dependent variable and total score of mental resilience as mediating variable. The mediating effect test was carried out with Model4 of Process Bootstrap program. The results showed that the total effect of total score of social support on total score of positive coping style was 0.370 (P<0.001), the total effect on negative coping style was 0.209 (P<0.05). The direct effect of total social support on positive coping style was 0.234 (P<0.05), the direct effect value of negative coping style was 0.111. The total score of social support had an effect of 0.081 on the total score of mental resilience, and the total score of mental resilience had an effect of 1.567 on the total score of positive coping style. The total score of mental resilience had a partial mediating effect between social support and positive coping style, and the mediating effect was 0.127 (P<0.05), the mediating effect accounted for 34.32%.(0.127/0.370). The total score of social support has an effect of 0.138 on the total score of mental resilience, and the total score of mental resilience has an effect of 0.709 on the total score of negative coping style. The total

score of mental resilience has a partial mediating effect between social support and negative coping style, with a mediating effect of 0.098 (P<0.05) and a mediating effect of 46.89%(0.098/0.209). See Table 6, Figure 1 and Figure 2 for details.

Table 6. The Mediating Effect of Psychological Resilience on Coping Styles and Social Support Among Parents of Children with Hemangioma.

Effect	Path	Bootstrap Analysis Findings		95% Lower Bound	95% Upper Bound	*P*
		B	*SE*			
Direct effect	X→Y1	0.243	0.081	0.084	0.402	0.003
	X→Y2	0.111	0.090	-0.065	0.288	0.217
Indirect effect	X→M→Y1	0.127	0.053	0.023	0.231	0.016
	X→M→Y2	0.098	0.037	0.025	0.171	0.009
Total effect1		0.370	0.063	0.246	0.494	0.000
Total effect2		0.209	0.094	0.025	0.393	0.026

Note: X = Social Support; M = Psychological Resilience; Y1 = Positive Coping Style; Y2 = Negative Coping Style.

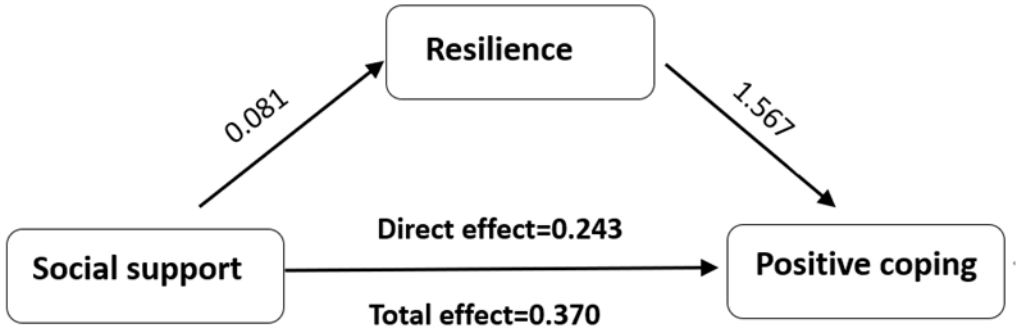


Figure 1. The Mediating Effect of Psychological Resilience on Social Support and Positive Coping Style in Parents of Children with Hemangioma.

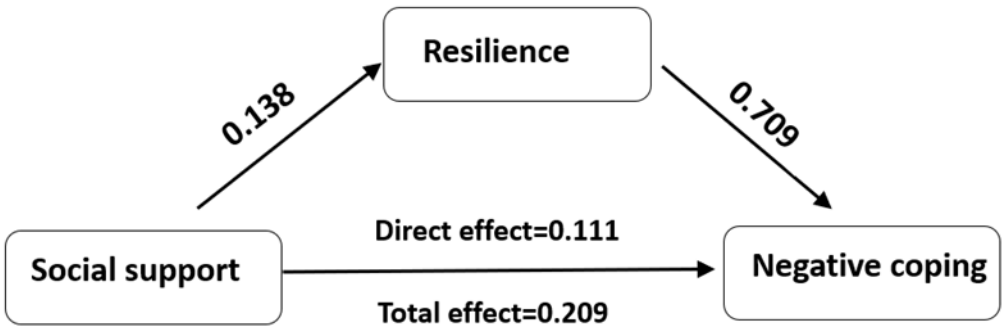


Figure 2. The Mediating Effect of Psychological Resilience on Social Support and Negative Coping Style in Parents of Children with Hemangioma.

3 Discussion

3.1 Coping styles, social support and psychological resilience of parents of children with hemangioma

The total score of coping styles of parents of 203 children with hemangioma in this study was (33.29±8.69), of which, the score of positive coping style was (23.50±6.16) points, negative coping style score was (9.79±4.44), positive coping score was higher than negative coping score, indicating that parents of children with hemangioma tended to adopt positive coping style. Medical institutions are improving their diagnosis and follow-up system for children with hemangioma. Medical staff will provide professional nursing guidance to parents during diagnosis and treatment to help them establish positive coping strategies. In addition, social support may also play an important role. Emotional support and practical help from relatives and friends can help relieve parents 'care pressure and enhance their coping ability.

The results of this study showed that the total score of social support of parents of children with hemangioma was (36.91±6.03) points, indicating that their social support level is at a moderate level, similar to the study results of Nilopa et al [15]. The reason may be that hemangioma, as a disease with strong visibility, is easy to attract the attention of social people, so parents get certain emotional and material support. Meanwhile, with the development of community medicine, parents are more likely to obtain experience sharing and psychological comfort from similar families, thus enhancing their perception of social support. In addition, parents of children in this

study scored 0 (59.68±15.11) points, indicating that their mental toughness level is above average, consistent with the results of Gu Hepeng et al [16]. The analysis may be that parents gradually accumulate experience in dealing with disease challenges in the process of caring for children, and enhance self-efficacy; social support provides emotional buffer and resource guarantee to help parents maintain psychological stability; Some parents, through positive cognitive restructuring, regard caring experiences as growth opportunities, thus enhancing psychological adaptability [17].

3.2 Analysis of influential factors on coping style of parents of children with hemangioma

Multiple linear regression analysis of this study showed that gender, medical payment form and understanding of the disease were the influencing factors of parents 'positive coping style in children with hemangioma.The detailed analysis is as follows:

3.2.1 Women are more likely to adopt positive coping styles to deal with childhood illness

The univariate analysis showed that the score of positive coping style was (23.75±5.95), male positive coping style score was (19.09±8.34), indicating that women are more inclined to adopt positive coping styles to face the disease of children. Based on Maslow's hierarchy of needs theory, women tend to be more active in emotional expression and social support seeking, and can relieve the stress caused by the disease of children through effective communication, emotional regulation and resource integration [18]. In the face of the special care needs of children with

hemangioma, female parents often show strong psychological resilience and improve their coping ability through peer support, professional learning and family collaboration [19]. Therefore, medical staff should pay attention to the positive characteristics of female parents in the process of coping with children's diseases, and further improve the professional coping ability and emotional adaptation level of male parents by organizing psychological counseling, establishing mutual help groups and providing continuous education and training, so as to reduce male negative coping styles and improve the nursing quality of children [20].

3.2.2 Parents of children who use medical insurance to pay for medical expenses score higher on positive coping styles

The results of this study indicate that the form of medical payment is an influential factor in the positive coping style of parents of children with hemangioma ($P<0.05$). The score of positive coping style of parents using medical insurance was (24.21±6.22), while self-paying parents scored (21.84±5.73) points, indicating that parents of children with medical insurance are more inclined to take positive coping methods to face children's diseases. The analysis reasons are: medical insurance reduces the medical burden and family burden of children's families to a certain extent, so that parents can focus on emotional support and resource integration and other coping methods, and promote parents to correctly understand children's diseases, timely discover relevant symptoms and seek medical treatment [21]. Therefore, in the face of multiple challenges posed by illness, parents with health insurance tend to show greater psychological security and coping confidence, seek professional support

more actively, participate in mutual aid organizations, and actively cooperate with treatment decisions [22, 23].

3.2.3 The more they know about the disease, the more active their parents are in coping with it.

The results of this study suggest that knowledge of the disease is an important factor influencing the positive coping style of parents of children with hemangiomas The score of positive coping style of parents who knew the disease well (25.97±6.56) points, higher than partial understanding of disease (23.01±6.01) points, indicating that parents with more comprehensive knowledge of disease tend to adopt positive coping strategies in the face of children's disease. The analysis may be that parents with children with more comprehensive knowledge of disease can correctly understand the disease characteristics, treatment process and prognosis of children's disease, and reduce fear caused by asymmetric information [24]. When parents have a clear and scientific understanding of the disease, they can enhance their self-efficacy in caring for their children, so that they can actively cooperate with treatment, implement scientific family care, and actively seek social support and professional resources [25]. Therefore, medical staff should strengthen disease knowledge education to parents of children through health education lectures, popular science manuals, new media platforms and other ways to improve their cognitive level and coping ability to diseases, so as to promote the rehabilitation of children and the improvement of family life quality.

3.3 Correlation Analysis of Coping Style, Social Support and Psychological Resilience among Parents of Children with Hemangioma

Pearson correlation analysis showed that positive/negative coping styles were positively correlated with social support and mental toughness ($P<0.05$). The reasons may be: firstly, positive coping style is positively correlated with social support and psychological resilience, indicating that the higher the level of social support, the more help parents get, and the stronger their ability to adopt positive strategies to cope with difficulties. This research result is consistent with previous research results [26]. A high level of mental resilience helps parents to show stronger adaptability and resilience in the face of uncertainty and challenges in the treatment of hemangioma, thus reducing negative coping behaviors such as avoidance and self-blame [27]. Good social support itself is also an important protective factor for mental resilience, which can provide parents with necessary resources and buffers to help them maintain a positive attitude [28]. Secondly, negative coping style was positively correlated with social support and mental toughness, which may be due to the fact that parents 'worry about children's illness was intensified when they received social support, which led to negative emotions such as escape and self-blame, thus triggering negative coping style; while parents with strong mental toughness might selectively use negative coping style. In addition, positive coping styles and negative coping styles of parents were positively correlated ($r=0.325$, $P<0.01$). The reason may be that parents 'emotion and coping style fluctuated when they faced the great pressure of children's disease. At the same time, parents might adopt positive strategies such as "seeking support"

316 and "making plans", accompanied by negative emotional reactions such as "escape"
317 and "self-blame". These two patterns coexist and constitute the overall strategy of
318 individual coping with pressure. Thus, high levels of social support and resilience
319 may allow individuals to flexibly use multiple ways, including certain negative
320 strategies, in a dynamic process to cope with long-term care stress. This study
321 suggests that we should pay attention to both positive and negative aspects in future
322 clinical psychological intervention, and guide them how to regulate emotions more
323 effectively under the protection of social support and psychological resilience, and
324 finally realize the strategic transformation from negative coping to positive coping.

325 **3.4 Mediating Effects of Coping Style, Social Support and Psychological**
326 **Resilience on Children with Hemangioma**

327 Bootstrap test was used to analyze the mediating effects of coping style, social
328 support and psychological resilience of parents of children with hemangioma. The
329 results showed that social support of parents of children with hemangioma could
330 directly affect their positive coping style (β=0.243, $P<0.05$), social support had little
331 effect on mental resilience (8.1%), but mental resilience had significant effect on
332 positive coping style (156.7%). Meanwhile, resilience plays a mediating role between
333 social support and negative coping styles, with mediating effect value of 0.098,
334 accounting for 46.89% of the total effect. Based on the above results, we suggest that
335 the following intervention measures should be taken to improve the psychological
336 resilience of parents of children with hemangioma: 1) Strengthen the social support
337 system: Expand the social support network of parents by establishing parent support

groups, providing professional counseling and peer education, and help them obtain more emotional and material support. 2) Promote positive coping strategies: 3) Provide psychological education: Strengthen health education on hemangioma-related knowledge, reduce parents 'cognitive burden and uncertainty, and enhance their confidence in caring and psychological adaptability.

4 Conclusion

Gender, medical payment form and understanding of disease were the main influencing factors of positive coping style of parents of children with hemangioma, and psychological resilience had significant mediating effect between social support and positive/negative coping style, suggesting that medical staff could change coping style by enhancing psychological resilience of parents of children with hemangioma and guiding them to effectively regulate emotion. However, this study only selected parents of children from one hospital for study, and the included influencing factors were limited, which could not represent all parents of children with hemangioma. Further multicenter and large-sample studies could be carried out in the future to improve the universality and reliability of the results.

Declarations

Ethics approval and consent to participate

The study was conducted in accordance with the Declaration of Helsinki, and approved by the Ethics Committee of The First People‘s Hospital of Nanning (approval number: KY2024-意

359 见-022; date of approval: 6 March 2024). Informed consent was obtained from all subjects
360 involved in the study. For participants under 18 years of age, written informed consent was
361 obtained from their parents or legal guardians.

362 **Consent for publication**

363 Not applicable. This manuscript does not contain any individual person's data in any form
364 (including any individual details, images or videos).

365 **Availability of data and materials**

366 The datasets generated and/or analysed during the current study are not publicly available due
367 to privacy or ethical restrictions (they contain information that could compromise the privacy
368 of study participants) but are available from the corresponding author on reasonable request.

369 **Competing interests**

370 The authors declare that they have no competing interests.

371 **Funding**

372 This work was supported by the Guangxi Medical and Health Appropriate Technology
373 Research and Development Project under Grant Z-A20240977. The funder had no role in the
374 study design, data collection, analysis, decision to publish, or preparation of the manuscript.

375 **Authors' contributions**

376 Conceptualization, J.Z. and H.X.; methodology, J.Z.; validation, J.Z. and H.X.; formal
377 analysis, C.H. and H.X.; investigation, J.Z.; resources, H.X.; data curation, J.Z.;
378 writing—original draft preparation, J.Z.; writing—review and editing, H.X.; visualization,
379 C.H.; supervision, H.X.; project administration, H.X. All authors have read and agreed to the
380 published version of the manuscript.

Acknowledgements

The authors thank all the patients and their families for their participation and cooperation in this study. We also acknowledge the support of the medical and nursing staff of the Interventional Department of Nanning First People's Hospital for their assistance with data collection.

Authors' information

Not applicable.

Clinical trial number

Not applicable.

References:

1. Matic, A. and M. Matic, Infantile Hemangiomas in Very and Extremely Preterm Infants: Incidence and Main Characteristics. Clin Exp Dermatol, 2025.

2. Cakmak, H.M., I. Kiliccioglu and G. Dulger, Dynamic serum biomarkers in infantile hemangioma: the role of VEGF-B, AKT, and eNOS in lesion regression. Eur J Pediatr, 2025. 184(8): p. 476.

3. Resic, A., et al., The Evaluation, Diagnosis, and Management of Infantile Hemangiomas-A Comprehensive Review. J Clin Med, 2025. 14(2).

4. Hoger, P.H. and H. Hamm, [Infantile hemangioma : Clinical manifestation, treatment, and differential diagnoses]. Dermatologie (Heidelb), 2023. 74(5): p. 331-339.

5. Yue Xin, Hu Guangzhen, Li Miaomiao, et al. Effect of evidence-based nursing combined with shared decision-making model on infant hemangioma and its family members [J]. Journal of Chronic Diseases, 2025. 26(03): P. 374-376.

6. Wang Qi, Li Jingbing. Effect of empathic feedback combined with story-theory-oriented early warning care on laser treatment of children with head and face hemangioma [J]. Journal of Women and Children Health, 2025. 4(05): P. 164-167.

7. Zhang Y. Effect of propranolol on infantile hemangioma and its molecular mechanism, 2025, Ningxia Medical University.

8. Price, A.M., et al., Child and caregiver mental health during 12 months of the COVID-19 pandemic in Australia: findings from national repeated cross-sectional surveys. BMJ Paediatr Open, 2022. 6(1).

9. Lai FP, Lai SM, Chen HT, et al. Mediating effect of coping style on pregnancy stress and pre-pregnancy health care behavior in high-risk pregnant women [J]. General practice nursing, 2025. 23(13): p. 2528-2533.

10. Ma Q H, Guan Y X, Wang M Z, et al. Investigation of psychological resilience and analysis of influencing factors in patients with advanced lung cancer [J]. Cancer progression, 2022. 20(06): p. 636-640.

11. Guerra, C., N. Pereda and G. Guilera, Poly-Victimization and Coping Profiles: Relationship With Externalizing Symptoms in Adolescents. J Interpers Violence, 2021. 36(3-4): p. 1865-1882.

12. Xie Yaning. Preliminary study on reliability and validity of simple coping style scale [J]. China Journal of Clinical Psychology, 1998(02): p. 53-54.

13. Xiao Shuiyuan. Theoretical basis and research application of Social Support Rating Scale [J]. Journal of Clinical Psychiatry, 1994(02): p. 98-100.

14. Yu Xiaonan, Zhang Jianxin. Comparison of self-resilience scale and Connor-Davidson

425 resilience scale [J]. Psychological Science, 2007(05): p. 1169-1171.
426 15. Nilopa, Alipati T, Wang M N, et al. Correlation analysis of stigma, coping style and
427 social support among parents of children with autism spectrum disorders [J]. Sichuan Mental
428 Health, 2023. 36(04): p. 354-358.
429 16. Gu HP. Relationship between social support and psychological stress in parents of
430 children with autism spectrum disorders: mediating role of psychological resilience [D]:
431 Shenyang Normal University.
432 17. An, Y., et al., Trajectory and relation between posttraumatic stress disorder on resilience
433 in adolescents following the Yancheng tornado. Personality and Individual Differences, 2020.
434 164.
435 18. Ma XP, Li DT, Ying LR. Coping styles of parents of neonatal hyperbilirubinemia and its
436 related influencing factors [J]. Clinical and educational practice of general medicine, 2022.
437 20(07): p. 639-641.
438 19. Grover, S., et al., Correlates of Positive Aspects of Caregiving Among Family
439 Caregivers of Patients with Acute Myeloblastic Leukaemia. Indian J Hematol Blood
440 Transfus, 2018. 34(4): p. 612-617.
441 20. Li JJ, Chen X, Zhou Tingting. A study on the correlation between psychological
442 resilience and social support and coping style of parents of premature neonates [J].
443 Psychological Journal, 2025. 20(09): p. 67-69.
444 21. Islam, M.Z., S. Farjana and S.S. Efa, Impact of childhood cancer on the family: evidence
445 from Bangladesh. Heliyon, 2021. 7(2): p. e06256.
446 22. Zhan C, Cui W, Liu F. Investigation of family tenacity and analysis of influencing

447 factors in children with retinopathy of prematurity [J]. Medical innovation in China, 2025.
448 22(11): p. 161-165.
449 23. Li Wanjun. Study on influencing factors and action paths of primary caregivers 'caring
450 ability of children with primary nephrotic syndrome based on ABC-X family stress theory
451 model [D]: Xinjiang Medical University, 2024.
452 24. DANG Xiao, Yin Lina, Zhang Xiaoning, et al. Effect of staged health education on
453 recovery of children with febrile convulsion and psychology of their families [J]. Journal of
454 Shanxi Health Vocational College, 2023. 33(05): p. 77-79.
455 25. Lin H, Ye YL, Huang R, et al. The effect of uncertainty on family resilience in
456 caregivers of epileptic children: a chain mediated effect of positive coping and personal
457 control [J]. General practice nursing, 2024. 22(23): p. 4525-4528.
458 26. Alipati T, Chen J R, Niu M R, et al. Path analysis of social support, coping style and
459 self-efficacy on mental resilience of family caregivers of schizophrenic patients in community
460 [J]. Practical preventive medicine, 2023. 30(07): p. 800-805.
461 27. Tan, X., et al., Knowledge, attitudes, and practices on hemangioma among parents of
462 infantile hemangioma patients in South China. Sci Rep, 2025. 15(1): p. 15350.
463 28. Tan X.A study on nursing adaptation and influencing factors of caregivers of children
464 with hematological tumors, 2023, Central South University.