

Effect of Raising Family Cognition on Improving Adherence and Quality of Life of 8–12-Year-Old Children Wearing Orthokeratology Lenses

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Objective: To investigate the effect of raising family cognition on improving adherence and quality of life of 8–12-year-old children wearing orthokeratology lenses. **Methods:** From July 2019 to July 2020, 120 children with orthokeratology lenses of our hospital were selected and randomly divided into two groups. The control group (n = 60) was given routine nursing, while the observation group (n = 60) was given home nursing intervention on the basis of the control group. To observe the treatment compliance, family cognition degree, sleep quality and quality of life in the two groups. **Results:** Compared with the control group, the patients in the observation group had higher treatment compliance and family cognition degree, lower scores of times to fall asleep, sleep duration, sleep disturbance and daytime function, and higher scores of physiological function, mental health, social function and emotional function ($P < 0.05$). **Conclusion:** Strengthening home nursing intervention for patients wearing orthokeratology lenses can improve the cognition level of family members on the one hand, improve the compliance of children on the other hand, and improve the sleep quality and quality of life at the same time.

Key words: Home nursing interventions; Raising family cognition; Wearing orthokeratology lenses; Compliance; Sleep quality; Quality of life

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Myopia is mainly caused by excessive use of eyes and long-term viewing of electronic products. It mainly occurs in adolescents aged 8-12 years. The clinical manifestations include blurred vision, fatigue of vision and diplopia. Improper treatment may cause complications such as strabismus, amblyopia or glaucoma, which may affect the normal

life of children ¹. Orthokeratology lens is an instrument commonly used in clinical control of myopia. It has been proved that this instrument can correct myopia. However, due to low knowledge about orthokeratology lens and lack of supervision by nursing staff after discharge from hospital, it is very easy for the child to wear the product not following the doctor's advice, which may affect the

final correction result ². Therefore, it is necessary to continuously carry out nursing intervention to the child and his/her family members after the child is discharged from the hospital, and guide the child through improving the family cognition degree and joint supervision of family members, so that the vision correction effect of the child can be improved ³. Family nursing intervention is mainly through the way of whole-course nursing from hospital to home, so that children can get normative and scientific nursing intervention after returning to home, which can play an important role in improving patients' compliance ⁴. Based on this, 120 children (July 2019-July 2020) wearing orthokeratology lenses in our hospital were selected for study to improve their family cognition through routine nursing and continuous nursing respectively, and the application value of the two nursing methods in influencing their compliance and quality of life was compared and analyzed. The report is as follows.

DATA AND METHODS

General data

A total of 120 children wearing orthokeratology lenses who were diagnosed and treated in our hospital from July 2019 to July 2020 were selected as subjects. Subjects were grouped by the method of random number table. The number of cases in the control group was 60, gender: male 32, female 28; age: 8 ~ 12 years, mean: (10.23 ± 0.25) years; eye axis: 23 ~ 27 mm, mean: (25.32 ± 0.28) mm; degree of myopia: 200 ~ 600 degrees, mean: (400.51 ± 50.36) degrees. In the observation group, there were 60 cases, gender: male 31 cases, female 29 cases; age: 8.5 ~ 12 years, mean: (10.36 ± 0.21) years; eye axis: 23.4 ~ 27 mm, mean: (25.38 ± 0.15) mm; myopia degree: 250 ~ 600 degrees, mean: (400.62 ± 50.12) degrees. There was no significant difference in gender, eye axis and other general data between the included cases ($P > 0.05$). This study was conducted in compliance with the "Declaration of Helsinki" as amended in 2013.

Inclusion criteria and exclusion criteria

Inclusion criteria: patients who meet the

diagnostic criteria for refractive error in "Surgery. 8th Edition" ⁵; patients with significantly reduced contrast sensitivity; patients with diplopia and limited eye rotation; aged 8 ~ 12 years.

Exclusion criteria: patients with acute inflammation of the eye; incomplete eyelid closure; patients with immune diseases; patients with abnormal cornea of the eye; patients with recent corneal surgery of the eye; patients with poor vision correction caused by optic nerve and visual pathway diseases.

METHODS

Control group: Patients received routine nursing care. The child patient shall receive professional examination at admission to ensure that there is no contraindication, and shall be given appropriate lens fitting according to the examination results. The child patient and his/her family members shall be provided with relevant instructions after satisfactory wearing. The child patient and his/her family members shall improve the cognition of wearing method and time of wearing orthokeratology lenses, and the child patient's family members shall be instructed to urge the child patient to wear orthokeratology lenses correctly on a daily basis. Before discharge, the nursing staff shall also strengthen the health education for the child and his family members, instruct the child to keep eye hygiene, make regular follow-up visits and regularly care for the lenses. Follow-up care was only performed by telephone after discharge from the hospital.

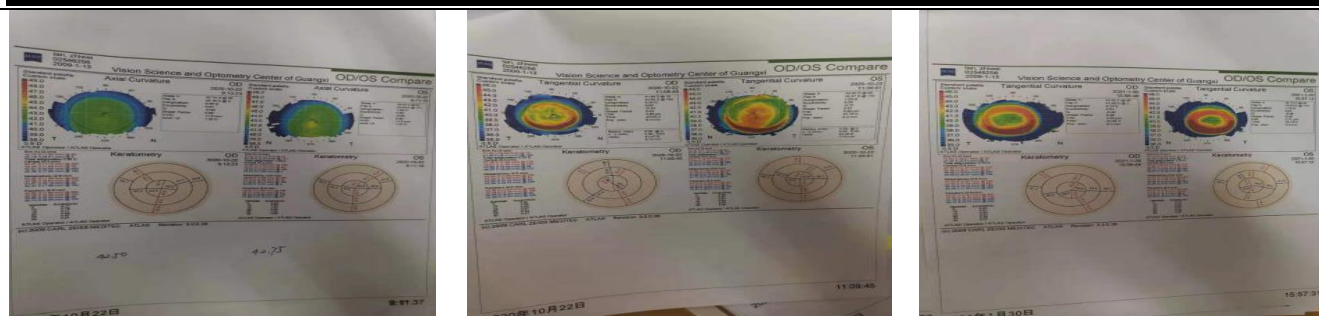
Observation group: Family nursing intervention was strengthened on the basis of the control group. (1) Video education: After the nursing staff has consulted the relevant data of orthokeratology lenses, the data are integrated and made into video. The video content includes the wearing principle of orthokeratology lenses, the principle of myopia correction, the purpose of inspection before wearing orthokeratology lenses, wearing method, hand cleaning method, wearing time, the items needed for wearing, the preservation and nursing method of orthokeratology lenses, the time for regular re-examination, the re-examination method

and procedure as well as the method for prevention of complications. Each content shall be accompanied by a literal explanation for a period of approximately 30 min. Before the first wearing of the orthokeratology lenses, the child and his/her family members were asked to watch the video, during which the child was assisted in disinfecting the lenses. When playing the video, the nursing staff shall accompany the child in the whole process, and carry out demonstration according to the video content, at the same time, answer questions for the child and his/her family members, and finally copy the video to the child's family members, so that the child's family members can watch it at home repeatedly, so as to improve their cognitive degree. (2) Sleep nursing: The child's family members were instructed to pay more attention to the daily care of the child and care about the sleep condition of the child. For the children who sleep less than 8-10h, family members can make appropriate exercise according to the physical and mental state of the child, and create a comfortable sleep environment

for the child to ensure the quality of the child's sleep. Ensure that the child wears the orthokeratology lenses for about 8-10h. (4) Daily nursing: The family members of the child were instructed to communicate with the child more often, accompany the child more frequently, strengthen the encouragement to the patient, at the same time, fully understand the health problems of the child at different stages, let the child eat more foods containing vitamin A every day, and maintain good eye habits. It is recommended that the child should not read in bed or in dark light every day. After reading for 40 min each time, the child should rest for 20 min. The time for playing cell phone or other electronic products should not exceed 20 min each time. Let the child patient watch more green plants and protect his/her vision. For the children with physical discomfort (cold, fever, etc.), the wearing should be suspended to avoid corneal infection caused by decreased immunity. See Figures 1 ~ 3 before and after wearing orthokeratology lenses.

Figure 1.

Before wearing orthokeratology lenses Figures 2 and 3 After wearing orthokeratology lenses for 30s



Observational indexes

The treatment compliance of the two groups was analyzed, and the family cognition degree of the two groups was assessed before and 3 months after nursing. (1) Compliance: complete compliance: It is feasible to wear orthokeratology lenses consciously without the guidance of family members or nurses; basic compliance: It is feasible to properly wear orthokeratology lenses after urged by family members or nurses; non-compliance: completely not wear orthokeratology lenses and resist treatment⁶. Overall compliance rate =

complete compliance rate + basic compliance rate.

(2) Family cognition degree: According to the self-made cognition degree survey in the hospital, the total score is 100, and the higher the score is, the higher the cognition degree will be. (2) Pittsburgh Sleep Quality Index (PSQI) was used before and 3 months after nursing. The scores of every item including time to fall asleep, sleep duration, sleep disturbance and daytime function were 0-3 points, ranging from 0-21 points, and the higher the score is, the worse the quality of sleep will be⁷. (3) The quality of life of the two groups

was assessed with quality-of-life rating scale (SF-36) before and 3 months after nursing by means of follow-up. The measured dimensions included physiological function, mental health, social function and emotional function. The scores of each dimension were 0-100 points, and the scores were in direct proportion to quality of life ⁸.

Statistical methods

The processing tool was SPSS 22.0 statistical software. t-test for comparison of measurement data and χ^2 test for comparison of counting data. The difference between the two groups had

statistical significance ($P < 0.05$).

RESULTS

Comparison of treatment compliance and family cognition degree between the two groups

Before nursing, there was no significant difference between the two groups in treatment compliance and family cognition degree ($P > 0.05$). After nursing, the treatment compliance and the cognitive degree of family members in observation group were higher than that in control group ($P < 0.05$). See Table 1.

Table 1. Comparison of children's compliance and family cognition degree between the two groups [$\pm s$, n (%)]							
Group	n	Treatment compliance				Family cognition degree (points)	
		Full compliance	Partial compliance	Non-compliance	Total compliance cases	Before nursing	After nursing
Control group	60	30 (50.00)	21 (35.00)	9 (15.00)	51 (85.00)	77.22 \pm 5.36	65.24 \pm 5.35
Observation group	60	33 (55.00)	25 (41.67)	2 (3.33)	58 (96.67)	77.54 \pm 5.36	56.25 \pm 5.12
t/ χ^2 value	-				4.904	0.327	9.404
P value	-				0.027	0.744	0.000

Comparison of sleep quality before and after nursing between the two groups

There was no difference in sleep quality between the two groups before nursing ($P > 0.05$). After

nursing, the sleep quality of the observation group was lower than that of the control group ($P < 0.05$). See Table 2.

Table 2. Comparison of sleep quality before and after nursing between the two groups ($\bar{x} \pm s$, points)									
Group	n	Time to fall asleep		Sleep duration		Sleep disorder		Daytime function	
		Before nursing	After nursing	Before nursing	After nursing	Before nursing	After nursing	Before nursing	After nursing
Control group	60	2.36 \pm 0.12	0.89 \pm 0.07	2.18 \pm 0.11	0.92 \pm 0.08	2.32 \pm 0.12	0.95 \pm 0.05	2.41 \pm 0.12	0.89 \pm 0.05
Observation group	60	2.32 \pm 0.15	0.52 \pm 0.05	2.15 \pm 0.14	0.55 \pm 0.04	2.35 \pm 0.11	0.56 \pm 0.04	2.42 \pm 0.14	0.51 \pm 0.07
t value	-	1.613	33.317	1.305	32.043	1.427	47.179	0.420	34.217
P value	-	0.109	0.000	0.194	0.000	0.156	0.000	0.675	0.000

Comparison of quality of life before and after nursing between the two groups

There was no significant difference in the quality of life before nursing between the two groups ($P > 0.05$). The quality of life in the observation

group was higher than that in the control group after nursing, and the difference had statistical significance ($P < 0.05$). See Table 3.

Table 3. Comparison of quality of life before and after nursing between the two groups ($\bar{x} \pm s$, points)					
Group	n	Physiological function	Mental health	Social functioning	Emotional functioning

		Before nursing	After nursing	Before nursing	After nursing	Before nursing	After nursing	Before nursing	After nursing
Control group	60	58.14±5.65	78.55±5.36	59.36±5.24	79.25±5.12	58.47±5.17	78.69±5.28	58.36±5.24	79.36±5.17
Observation group	60	58.16±5.58	84.36±5.45	59.37±5.12	85.31±5.47	58.45±5.36	85.36±5.71	58.34±5.39	86.32±5.24
t value	-	0.020	5.887	0.101	6.265	0.021	6.643	0.021	7.324
P value	-	0.985	0.00	0.992	0.000	0.983	0.000	0.984	0.000

DISCUSSION

Myopia is a common disease among adolescents in China, and its pathogenesis is relatively replicative, which is mainly related to genetic, environmental and ocular axis abnormalities⁹. Orthokeratology lens is one of the methods commonly used in clinical treatment of myopia, with significant therapeutic effect. However, due to long treatment cycle of orthokeratology lens, it is difficult for nursing staff to regularly urge them to wear orthokeratology lenses after discharge, which may greatly affect the overall therapeutic effect¹⁰. Therefore, it is necessary to strengthen the nursing intervention for children and their families, improve their cognition, and strengthen the nursing intervention for children by uniting with their families, so as to further improve the compliance of children. In the previous study¹¹, routine nursing intervention was mainly performed for the children wearing orthokeratology lenses and their families, although it had certain effect, the routine nursing was mostly in-hospital nursing, and the nursing intervention was not continuously strengthened after the children were discharged, resulting in the separation of nursing, with limited effect.

Home nursing intervention is an extended nursing after the children wearing orthokeratology lenses are discharged from hospital. By improving the cognition degree of the children's family members, the family members of the children shall instruct the children to wear orthokeratology lenses correctly every day, which helps to promote the early recovery of the children¹². In this study, after nursing, the family members of the observation group had higher cognitive degree, and the treatment compliance of the children was as high as 96.67%. It is indicated that family nursing intervention can not only improve the family

cognition of wearing orthokeratology lenses, but also improve the children's compliance to some extent. The reasons are as follows: Before the first wearing of orthokeratology lenses, the child's family members are informed about the knowledge and importance of wearing orthokeratology lenses through video education, and the child's family members are asked to copy the video and watch it again and again, which can improve the cognition degree of the child's family members to some extent. There is irreplaceable emotional link between the family member and the child, after the child is discharged from the hospital, let the child's family member personally supervise and instruct the child to wear orthokeratology lenses on time every day, which can provide the child with safety, not only reduce the child's resistance mood, but also reduce the psychological burden, which helps to further improve the child's treatment compliance¹³. The results of this study showed that the sleep quality score of the observation group was lower than that of the control group ($P<0.05$). The results showed that strengthening the home nursing intervention for the children with orthokeratology lenses could improve the sleep quality of the children. The reason is to let the child's family create a comfortable sleep environment for the child, on the one hand, it can effectively strengthen the child's safety, so that it can eliminate the resistance to wearing the orthokeratology lenses; on the other hand, it can let the child fall asleep early, so that he can maintain sufficient sleep¹⁴. After continuous nursing intervention, the quality of life of the patients in the observation group was higher than that in the control group ($P<0.05$). It can be seen that home nursing intervention can help children improve their own quality of life. The reasons are as follows: before discharge, raise the awareness of the children's family to wear orthokeratology lenses,

and strengthen the nursing intervention together with the family members after discharge; on the one hand, keep the children in good use of eye habits; on the other hand, timely understand the changes of the child's condition, so that the nursing staff can adjust the nursing contents according to the changes of the child's condition, which helps to accelerate the recovery of the child and increases their quality of life ¹⁵.

In conclusion, for the children wearing orthokeratology lenses, ask the family members of the child strengthen the family nursing intervention for the child, so as to improve the cognition of the family members, improve the child's sleep and quality of life, and help to further improve the child's compliance.

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