Children's Development and Child-Rearing Environment : Parenting and the QOL of Children in China

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Abstract

Along with the diversified socioeconomic development status found among provinces, municipalities, and autonomous regions, children's health and development also vary widely with regions in China. The objectives of this study are to examine children's health and development status, particularly their psychological development, to analyze disparities of children's and parents' quality of life among regions and to explore factors affecting those geographical disparities. A total of 546 children and their parents from both urban, rural and minority areas in Shandong Province, Anhui Province, and the Inner Mongolia Autonomous Region were interviewed. As the results, there is a significant difference in Children's and parent's quality of life between the surveyed provinces, between the urban and the rural regions, and between majority and minority populations. There is also a significant correlation between parent's health status and quality of life and children's behavioral and cognitive development and quality of life. Parent's socioeconomic background tends to have an impact on children's developmental outcomes. The results suggest the importance of life environment on children's development and comprehensive interventions targeting the household and the life environment necessary to improve children's development and well-being.

Key words: child development, quality of life, SDQ, China

1. BACKGROUND

As children are the future of our society, their development is regarded as an issue deserving priority. Factors having an impact on their development include various aspects, such as social environment, education, socioeconomic status, etc. So far, in China, most studies have focused on children's physical health; few consider their psychological development.

Surveys on children's health may explore their physical and psychological developmental status. They can also contribute to early identification of diseases and related risk factors. Along with the diversified socioeconomic development status found among provinces, municipalities, and autonomous regions, children's health and development also vary widely with location, so that those in the West regions and rural areas tended to have poorer outcomes in their health and accessibility to healthcare services and social welfare. As a synergy of

socioeconomic development, sociocultural context, and allocation of social resources, children's quality of life in those areas is substantially behind that of those living in the East and in urban areas. Children's health status also reflects the political, economic, and cultural development of a country. Along with rapid economic growth, people's health and lifestyles have experienced great changes. Necessary evidence that supports the policy-making process to improve children's health can be obtained by examining children's health status, particularly their psychological development, analyzing disparities among regions, and exploring factors affecting children's health and geographical disparities.

The quantitative measurement of the quality of life and psychological development of children has been widely applied in Western countries. Until very recently, little information has been available regarding these issues in the Chinese communities. With Asian countries taking a collaborative approach, a baseline study was carried out in multiple provinces in 2009 and the follow-up is ongoing.

2. Methods

2.1. Sampling and Sample Size

1) Urban area: the kindergartens are from Shandong Province, one affiliated to a university, another affiliated to a textile mill; a total of 199 children are included in the urban sample

2) Rural area: two kindergartens are from two towns of Anhui Province; a total of 105 children are included in the rural sample.

3) Minority area: two kindergartens are from the Inner Mongolia Autonomous Region, one from the city, the other from a rural county; a total of 242 children are included in the autonomous region.

Hence, a total of 546 children were included in the sample.

2.2. Study Tools

There is a unified questionnaire for all study sites, first developed in Japanese and then translated into the local language. In this study, we used the Chinese version. The components include demographic, educational, and socioeconomic information of the participating parents and children, children's domestic environment and lifestyle, relationship between children and parents and between spouses, and quality of life of children and parents. In our questionnaire, we applied some standardized psychological and behavioral measurements such as the Strengths and Difficulties Questionnaire (SDQ), the Kiddy-Kindl Questionnaire for measuring health-related quality of life in children and adolescents, and the World Health Organization Quality of Life (WHOQOL-BREF). Self-administrated questions were developed as well.

2.3 Statistical Analysis

Both parametric and nonparametric statistical tests were performed using students' t-test analysis, one-way analysis of variance (ANOVA), and analysis of covariance (ANCOVA) by SPSS 16.0 for Windows.

3. Results

3.1. General Information about Children Index
3.1.1. Gender

In the survey, girls account for 48.5% and boys account for 51.5% of the total sample (Table 1). The number of girls from Shandong, Anhui, and Inner Mongolia was 81 (40.7%), 50 (47.6%), and 134 (55.4%), respectively.

3.1.2. Participation in Extracurricular Classes

In the survey, children who participated in extracurricular classes in Shandong, Anhui, and Inner Mongolia account for 32.7%, 99.0%, and 44.6%, respectively. Accordingly, children who did not participate in extracurricular classes in the three provinces account for 67.3%, 1.0%, and 55.4%, respectively. It seems that more children in Anhui participate in extracurricular classes than in the other two regions.

3.1.3. Children's Health Status

Children's health status in the three regions varies: 2.0% of the children in Shandong province, 0.0% in Anhui province, and 0.8% in the Inner Mongolia Autonomous Region were reported ill at the time of the survey.

3.1.4. One-Child Status

Most families in the three provinces have only one child: 89.9% in Shandong province, 78.1% in Anhui province, and 88.4% in the Inner Mongolia Autonomous Region. It is worthwhile to note that Inner Mongolia, where many families are not conditioned to follow the family planning policy, has a much higherer only-child percentage than Anhui province.

3.1.5. Basic Conditions of Children

Mean ages of children involved in this survey were 5.90 ± 0.33, 6.65 ± 0.53, and 6.09 ± 0.46 years in Shandong, Anhui, and Inner Mongolia, respectively (Table 2). Children in Anhui are relatively older than in the other two regions.

Mean heights of children were 119 ± 6, 96 ± 12, and 116 ± 10 centimeters in Shandong, Anhui, and Inner Mongolia, respectively. Mean weights of children were 25 ± 8, 28 ± 4, and 24 ± 7 kilograms in Shandong, Anhui, and Inner Mongolia, respectively. Children in Anhui are relatively shorter in height.

Mean BMIs of children were 17.68 ± 5.47, 31.29 ± 5.55, and 17.92 ± 6.33 in Shandong, Anhui, and Inner Mongolia, respectively. Children in Anhui tend to be fatter than children in the other two regions.

Mean wake-up times of children were 7 ± 0, 6 ± 0, and 7 ± 0 o'clock in Shandong, Anhui, and Inner Mongolia, respectively. Children in Anhui get up

Table 1 Gender Distribution of Children (%)

	Shandong		Anhui		Inner Mongolia	
	Frequency	%	Frequency	%	Frequency	%
Girls	81	40.7	50	47.6	134	55.4
Boys	118	59.3	55	52.4	108	44.6

relatively earlier than do those in the other two regions.

Mean bedtimes of children were 21 ± 2, 20 ± 0, and 21 ± 1 o'clock in Shandong, Anhui, and Inner Mongolia, respectively. Children in Anhui go to bed relatively earlier than do the children in the other two regions.

3.2. Basic Conditions of Responding Parents
3.2.1 Nationality of Responding Parents

Most subjects were of the Han nationality: 190 (95.5%) subjects in Shandong province, 105 (100.0%) in Anhui province, and 147 (60.7%) in Inner Mongolia Autonomous Region were Han.

3.2.2. Nationality of Spouse

Most spouses of the subjects were of the Han nationality: 193 (97.0%) in Shandong, 105 (100%) in Anhui, and 157 (64.9%) in Inner Mongolia. In the Inner Mongolia Autonomous Region, the rate is much higher than in the other two regions.

3.2.3. Marital Status of Responding Parents

The numbers of married responding parents were 181 (91.0%), 101 (96.2%), and 226 (93.4%) in Shandong, Anhui, and Inner Mongolia, respectively.

3.2.4. Economic Satisfaction

The numbers of those responding parents satisfied with their economic situation were 194 (47.2%) in Shandong province, 66 (62.9%) in Anhui province, and 136 (56.2%) in Inner Mongolia Autonomous Region. The numbers of those parents unsatisfied were 20 (10.0%), 0 (0.0%), and 15 (6.2%) in Shandong, Anhui, and Inner Mongolia, respectively. Responding parents in Shandong have a lower level of satisfaction than do those in the other two regions.

3.2.5 Educational Level of Responding Parents

The numbers of responding parents with middle/high school education were 51 (25.7%), 80 (76.2%), and 73 (34.3%) in Shandong, Anhui, and Inner Mongolia, respectively. Numbers of responding parents with technical/vocational school education were 33 (16.6%), 0 (0.0%), and 35 (14.5%) in the three respective provinces. Numbers of responding parents with college/university education were 112 (56.3%), 7 (8.7%), and 110 (45.5%) in

the three respective provinces. Responding parents in Anhui have relatively low educational attainment.

3.2.15. Other Basic Conditions of Responding Parents

Mean ages of subjects involved in this survey were 35 ± 5, 39 ± 10, and 35 ± 6 years in Shandong, Anhui, and Inner Mongolia, respectively. Subjects in Anhui are relatively older than subjects in the other two regions.

Mean ages of spouses of subjects involved in this survey were 36 ± 5, 39 ± 11, and 35 ± 5 years in Shandong, Anhui, and Inner Mongolia, respectively. Spouses of subjects in Anhui are relatively older than those in the other two regions.

Mean incomes of families involved in this survey were 38,749 ± 30,562; 19,619 ± 14,854; and 30,435 ± 34,627 Chinese Yuanin Shandong, Anhui, and Inner Mongolia, respectively.

3.3. Quality of Life of Parents (WHOQOL)
3.3.1. Regional comparison

A total of 546 persons were surveyed in this program, and three provinces participated in the survey. They are Shandong, Anhui, and Inner Mongolia. In the dimension of physical health, the highest score is Inner Mongolia, the second highest score is Anhui, and the lowest is Shandong province. In the dimension of psychological health, the highest score is Inner Mongolia, the second highest is Anhui, and the lowest is Shandong province. In the dimension of social relationships, the highest score is Inner Mongolia, the second highest is Shandong, and the lowest is Anhui province, and there are statistically significant differences between them. In the dimension of environment, the highest score is Inner Mongolia, the second highest is Shandong, and the lowest is Anhui province, and there are statistically significant differences between them.

3.3.2. Genders

In the dimension of physical health, if the child is a boy, the score is higher; if the child is a girl, the score is lower, and there are statistically significant differences between these scores. In the dimension of psychological health, if the child is a girl, the score is higher; if the child is a boy, the score is lower. In the dimension of social relationships, if the child is a girl, the score is higher; if the child is a

Table 2 Basic Conditions of Children Scores

	Shandong		Anhui		Inner Mongolia	
	MEAN	SD	MEAN	SD	MEAN	SD
Age (yr)	5.90	.33	6.65	.53	6.09	.46
Height (cm)	119	6	96	12	116	10
Weight (kg)	25	8	28	4	24	7
BMI	17.68	5.47	31.29	5.55	17.92	6.33

boy, the score is lower. In the dimension of environment, if the child is a boy, the score is higher; if the child is a girl, the score is lower.

3.3.3. Parents' mother language

In the dimension of physical health, if the parents speak Chinese, the score is lower; if the parents speak minority languages, the score is higher. In the dimension of psychological health, if the parents speak Chinese, the score is lower; if the parents speak minority languages, the score is higher. In the dimension of social relationships, if the parents speak Chinese, the score is lower; if the parents speak minority languages, the score is higher, and there are statistically significant differences. In the dimension of social environment, if the parents speak Chinese, the score is lower; if the parents speak minority languages, the score is higher.

3.3.4 Parents' health status

In the dimension of physical health, parents who self-reported very good health receive the highest score; parents who self-reported good health the second highest; parents who are in general health receive the next highest; and parents who are in poor health receive the least score. There are statistically significant differences between them. In the dimension of psychological health, parents who are in very good health receive the highest score; parents who are in good health receive the second highest; parents who are in general health the next highest; and parents who are in poor health the least. There are statistically significant differences between them. In the dimension of social relationships, parents who are in very good health receive the highest score; parents in good health receive the second highest; parents who are in general health the next highest, and parents who are in poor health the least score. There are statistically significant differences between them. In the dimension of environment, parents who are in very good health receive the highest score, parents who are in good health receive the second highest, parents who are in general health receive the next highest, and parents who are in poor health receive the least score. There are statistically significant differences between them.

3.4. Quality of Life of Children

With its 24 items, the Kiddy-Kindl questionnaire is a short, methodologically suitable, psychometrically sound, and flexible measure to assess health-related quality of life in children. The questionnaire can be completed both by children and adolescents, and also by their parents (Proxy-version). It is available for different age groups and stages: 4–7 years, 8–11 years, 12–16 years, and parents. A paper-pencil version and a computer-assisted version (CAT-SCREEN) are available. The questionnaire exists in different languages, namely German, English, French, Italian, Spanish, Greek, Dutch, Turkish, Norwegian, Swedish, and Russian. It can be used for both healthy and ill children (generic approach) and can be augmented by disease-specific modules: The questionnaire has so far been used and checked in a number of different types of scientific studies involving over 5,000 healthy and chronically ill children as well as their parents, over a period of up to 2 years. It was originally developed by Bollinger in 1994 and revised by Ravens-Soberer & Bollinger in 1998.

3.4.1. Quality of Life of Children in Different Regions

In the survey, the dimensions whose differences in different areas have statistical meaning are Physical status, Self-esteem, Family, School, Total score of 24 items, Total score of 45 items. As shown in Table 3, in the dimension of physical status, the score of Shandong is the highest (86.37), with Anhui the lowest (74.40) and the P value is <0.000. In the dimension of self-esteem, the score of Shandong is the highest (74.47), with Anhui the lowest (68.15), and the P value is 0.011. In the dimension of family, the score of Shandong is the highest (79.52), with Anhui's the lowest (70.06), and the P value is <0.000. In the dimension of school, the score of Inner Mongolia is the highest (79.67), with Anhui's the lowest (75.83), and the P value is 0.048. In the dimension of total score of 24 items, the score of Shandong is the highest (80.11), with Anhui's the lowest (74.36), and the P value is <0.000. In the dimension of total score of 45 items, the score of Shandong is the highest (75.08), with Anhui's the lowest (70.74), and the P value is <0.000.

3.4.2 Quality of Life for Children of Different Gender

In the survey, the dimensions whose differences according to gender have statistical significance are friends, school, total score of 24 items, and total score of 45 items. In the dimension of friends, the score of boys (80.61) is higher than that of girls (76.56), and the P value is 0.001. In the dimension of school, the score of boys (80.21) is higher than that of girls (77.14), and the P value is 0.007. In the dimension of total score of 24 items, the score of boys (79.73) is higher than that of girls (77.84), and the P value is 0.027. In the dimension of total score of 45 items, the score of boys (74.92) is higher than that of girls (73.30), and the P value is 0.018.

3.4.3 Quality of Life for Children of Different Nationalities

In the survey, the dimensions whose differences according to nationalities have statistical significance are physics and school. In the dimension of physical status, the score of other nationalities (85.64) is higher than that of Han (82.53), and the P value is 0.042. In the dimension of school, the score of other nationalities (81.32) is higher than that of Han (77.88), and the P value is 0.032.

Table 3 Quality of Life Scores for Children in Different Areas

Dimension	Area	Mean	S.D	F	P
Physical status	Shandong	86.37	13.439	28.364	<0.000
	Anhui	74.4	16.773		
	Inner Mongolia	84.79	12.483		
	Total	83.37	14.418		
Emotion	Shandong	83.54	13.163	2.891	0.056
	Anhui	79.76	14.15		
	Inner Mongolia	81.59	13.281		
	Total	81.95	13.456		
Self-esteem	Shandong	74.47	16.934	4.570	0.011
	Anhui	68.15	18.025		
	Inner Mongolia	73.61	18.892		
	Total	72.87	18.151		
Family	Shandong	79.52	12.211	21.354	<0.000
	Anhui	70.06	13.613		
	Inner Mongolia	78.36	12.397		
	Total	77.19	13.034		
Friends	Shandong	77.92	13.958	0.619	0.539
	Anhui	77.92	16.216		
	Inner Mongolia	79.29	13.618		
	Total	78.53	14.263		
School	Shandong	78.83	12.989	3.048	0.048
	Anhui	75.83	16.263		
	Inner Mongolia	79.67	12.301		
	Total	78.63	13.442		
Total score of 24 items	Shandong	80.11	9.792	13.361	<0.000
	Anhui	74.36	11.192		
	Inner Mongolia	79.55	9.066		
	Total	78.75	9.988		
Total score of 45 items	Shandong	75.08	8.342	10.386	<0.000
	Anhui	70.74	8.759		
	Inner Mongolia	74.72	8.315		
	Total	74.09	8.555		

Table 4 Quality of Life Scores according to Fathers' Health

Dimension	Health Status*	Mean	D	F	P
Physical status	1	85.66	12.752		
	2	80.16	15.805		
	3	84.21	14.638	6.606	<0.000
	4	56.25	.		
	Total	83.04	14.637		
Emotion	1	81.60	13.240		
	2	82.17	13.932		
	3	83.45	12.561	0.444	0.722
	4	75.00	.		
	Total	82.10	13.424		
Self-esteem	1	73.93	18.501		
	2	71.49	17.593		
	3	73.23	17.784	0.966	0.409
	4	56.25	.		
	Total	72.75	18.012		
Family	1	79.21	12.011		
	2	75.72	13.781		
	3	76.52	13.078	2.742	0.043
	4	75.00	.		
	Total	77.32	13.015		
Friends	1	79.03	13.338		
	2	78.05	14.806		
	3	77.20	15.042	0.378	0.769
	4	75.00	.		
	Total	78.34	14.206		
School	1	79.81	12.704		
	2	77.48	13.923		
	3	77.36	13.906	1.308	0.271
	4	75.00	.		
	Total	78.45	13.425		
Total score of 24 items	1	79.87	9.676		
	2	77.51	10.254		
	3	78.66	9.851	2.369	0.070
	4	68.75	.		
	Total	78.67	9.992		
Total score of 45 items	1	75.04	8.485		
	2	73.21	8.579		
	3	73.69	8.435	2.000	0.113
	4	66.11	.		
	Total	74.05	8.543		

*1 = very good, 2 = good, 3 = bad, 4 = very bad

3.4.4 Quality of Life of Children according to Fathers' Health

In the survey, the dimensions whose differences according to father's health have statistical significance are physical status and family. As shown in Table 4, in the dimension of physical status, the score of group 1 is the highest (85.66), with that of group 4 the lowest (56.25), and the P value is< 0.000. In the dimension of family, the score of group 1 is the highest (79.21), with that of group 2 the lowest (75.72), and the P value is 0.043.

3.4.5 Quality of Life of Children according to Mothers' Health

In the survey, the dimensions whose differences according to mother's health have statistical meaning are physical status, self-esteem, family, school, total score of 24 items, total score of 45 items. As shown in Table 5, in the dimension of physical status, the score of group 1 is the highest (86.59), with that of group 2 the lowest (69.38), and the P value is 0.000. In the dimension of self-esteem, the score of group 1 is the highest (75.74), with that of

group 2 the lowest (69.38), and the P value is 0.003. In family, the score of group 1 is the highest (79.87), with that of group 3 the lowest (73.94), and the P value is 0.001. In the dimension of school, the score of group 4 is the highest (83.33), with that of group 3 the lowest (76.32), and the P value is 0.043. In the dimension of total score of 24 items, the score of group 1 is the highest (81.02), with that of group 4 the lowest (74.65), and the P value is <0.000. In the dimension of total score of 45 items, the score of group 1 is the highest (75.87), with that of group 2 the lowest (72.56), and the P value is <0.000.

3.4.6 Quality of Life of Children according to Fathers' Education

In the survey, the dimensions whose differences according to father's educational attainment have statistical significance are physical status, emotion, self-esteem, family, friends, school, total score of 24 items, and total score of 45 items. As shown in Table 6, in the dimension of physical status, the score of group 4 is the highest (88.13), with that of group 1 the lowest (77.43), and the P value is 0.000. In the dimension of emotion, the score of group 4 is the highest (90.00), with that of group 8 the lowest (67.97), and the P value is <0.000. In the dimension of self-esteem, the score of group 7 is the highest (79.22), with that of group 1 the lowest (65.19), and the P value is 0.000. In the dimension of family, the score of group 4 is the highest (88.13), with that of group 8 the

lowest (70.31), and the P value is <0.000. In the dimension of friends, the score of group 4 is the highest (90.63), with that of group 1 the lowest (74.59), and the P value is 0.005. In the dimension of school, the score of group 4 is the highest (86.25), with that of group 1 the lowest (74.48), and the P value is 0.004. In the dimension of total score of 24 items, the score of group 4 is the highest (86.46), with that of group 1 the lowest (73.96), and the P value is 0.000. In the dimension of total score of 45 items, the score of group 4 is the highest (80.56), with that of group 1 the lowest (70.90), .and the P value is <0.000.

3.4.7 Quality of Life of Children according to Mothers' Education

In the survey, the dimensions whose differences according to mothers' educational attainment have statistical significance are physical status, emotion, self-esteem, family, school, total score of 24 items, total score of 45 items. As shown in Table 7, in the dimension of physical status, the score of group 5 is the highest (87.20), with that of group 1 the lowest (79.26), and the P value is 0.000. In the dimension of emotion, the score of group 6 is the highest (86.66), with that of group 2 the lowest (78.04), and the P value is 0.000. In the dimension of self-esteem, the score of group 6 is the highest (80.22), with that of group 1 the lowest (66.10), and the P value is 0.000. In the dimension of family, the score of group 7 is the highest (81.50), with that of group 1 the lowest (72.35), and the P

Table 5 Quality of Life Scores according to Mothers' Health

Dimension	Health status*	Mean	SD	F	P	Dimension	Health status*	Mean	SD	F	P
Physical status	1	86.59	12.193	9.213	<0.000	Friends	1	79.98	13.642	2.299	0.077
	2	79.54	15.791				2	77.52	14.681		
	3	82.31	15.776				3	75.79	14.289		
	4	75.00	16.536				4	70.83	9.547		
	Total	83.04	14.637				Total	78.34	14.206		
Emotion	1	83.01	13.081	1.495	0.215	School	1	80.89	12.222	4.892	0.002
	2	82.00	13.389				2	76.44	14.282		
	3	79.84	14.531				3	76.32	13.360		
	4	72.92	9.547				4	83.33	15.729		
	Total	82.10	13.424				Total	78.45	13.425		
Self-esteem	1	75.74	18.254	4.636	0.003	Total score of 24 items	1	81.02	9.560	7.903	<0.000
	2	69.38	16.997				2	76.77	9.956		
	3	73.15	18.642				3	76.89	10.055		
	4	70.83	21.949				4	74.65	9.845		
	Total	72.75	18.012				Total	78.67	9.992		
Family	1	79.87	12.042	5.740	0.001	Total score of 45 items	1	75.87	8.383	6.411	<0.000
	2	75.72	13.649				2	72.56	8.204		
	3	73.94	12.633				3	72.60	9.073		
	4	75.00	18.750				4	73.52	8.340		
	Total	77.32	13.015				Total	74.05	8.543		

*1 = very good, 2 = good, 3 = bad, 4 = very bad

Table 6 Quality of Life Scores according to Fathers' Education

Dimension	Education	Mean	SD	F	P
Physical status	1	77.43	15.317	4.270	<0.000
	2	82.18	14.397		
	3	84.33	13.537		
	4	88.13	17.542		
	5	85.95	14.414		
	6	85.09	13.287		
	7	87.16	13.657		
	8	80.47	14.345		
	Total	83.04	14.637		
Emotion	1	79.91	12.505		
	2	77.45	15.162		
	3	82.88	13.271		
	4	90.00	8.937		
	5	82.80	12.420	5.962	<0.000
	6	84.72	12.793		
	7	89.19	11.282		
	8	67.97	16.173		
	Total	82.10	13.424		
Self-esteem	1	65.19	17.656	6.300	<0.000
	2	71.71	17.532		
	3	70.38	18.164		
	4	75.63	15.989		
	5	76.08	17.764		
	6	78.47	16.641		
	7	79.22	15.524		
	8	71.88	20.045		
	Total	72.75	18.012		
Family	1	72.16	13.788		
	2	76.69	12.166		
	3	77.69	12.978		
	4	88.13	11.200		
	5	77.96	13.051	6.495	<0.000
	6	80.45	11.342		
	7	83.28	10.628		
	8	70.31	10.432		
	Total	77.32	13.015		
Friends	1	74.59	14.762	2.976	0.005
	2	80.41	12.342		
	3	78.27	14.786		
	4	90.63	13.258		
	5	77.49	14.806		
	6	80.38	13.200		
	7	79.73	13.614		
	8	78.91	13.749		
	Total	78.34	14.206		
School	1	74.48	15.129		
	2	78.97	12.778		
	3	76.73	13.644		
	4	86.25	11.335		
	5	80.17	12.385	3.045	0.004
	6	80.20	12.218		
	7	81.59	12.582		
	8	81.25	9.449		
	Total	78.45	13.425		
Total score of 24 items	1	73.96	9.527		
	2	77.90	9.599		
	3	78.38	10.425		
	4	86.46	8.187		
	5	80.07	9.336	8.311	<0.000
	6	81.55	9.110		
	7	83.36	9.640		
	8	75.13	9.291		
	Total	78.67	9.992		
Total score of 45 items	1	70.90	7.771		
	2	72.30	8.802		
	3	73.09	8.655		
	4	80.56	5.856		
	5	74.84	7.758	7.679	<0.000
	6	76.72	8.448		
	7	78.90	8.298		
	8	71.87	6.849		
	Total	74.05	8.543		

*(1) Middle school, (2) High school, (3) Technical school, (4) Vocational school, (5) College, (6) University, (7) Postgraduate, (8) Others

value is 0.000. In the dimension of school, the score of group 6 is the highest (82.73), with that of group 1 the lowest (74.62), and the P value is 0.001. In the dimension of total score of 24 items, the score of group 6 is the highest (83.05), with that of group 1 the lowest (74.72), and the P value is 0.000. In the dimension of total score of 45 items, the score of group 6 is the highest (78.09), with that of group 1 the lowest (71.04), .and the P value is 0.000.

Table 7 Quality of Life Scores according to Mothers' Education

Dimension	Level of education*	Mean	S.D	F	P	Dimension	Level of education*	Mean	S.D	F	P
Physical status	1	79.26	15.354	3.891	<0.000	Friends	1	75.99	14.278	1.685	0.110
	2	80.29	14.738				2	77.00	15.814		
	3	83.59	13.752				3	80.47	11.916		
	4	81.25	15.023				4	79.38	15.038		
	5	87.20	13.955				5	79.91	13.893		
	6	86.92	12.306				6	80.48	14.070		
	7	84.00	16.445				7	74.00	13.463		
	8	80.26	15.765				8	80.26	14.622		
	Total	83.04	14.637				Total	78.34	14.206		
Emotion	1	80.02	12.270	3.967	<0.000	School	1	74.62	14.830	3.668	0.001
	2	78.04	15.433				2	76.36	14.445		
	3	81.45	13.907				3	78.81	11.281		
	4	80.00	16.351				4	79.38	11.044		
	5	84.45	10.998				5	80.06	12.097		
	6	86.66	11.433				6	82.73	12.095		
	7	85.00	14.091				7	80.00	12.758		
	8	78.95	19.344				8	80.92	12.922		
	Total	82.10	13.424				Total	78.45	13.425		
Self-esteem	1	66.10	17.391	5.910	<0.000	Total score of 24 items	1	74.72	9.648	7.811	<0.000
	2	70.83	17.232				2	76.18	10.653		
	3	73.44	16.022				3	79.87	9.160		
	4	78.13	16.470				4	78.75	11.004		
	5	74.78	17.340				5	80.94	8.389		
	6	80.22	17.013				6	83.05	8.930		
	7	76.00	17.086				7	80.08	11.029		
	8	70.39	25.159				8	77.91	10.558		
	Total	72.75	18.012				Total	78.67	9.992		
Family	1	72.35	13.774	6.688	<0.000	Total score of 45 items	1	71.04	7.964	8.055	<0.000
	2	74.52	12.203				2	71.22	9.064		
	3	81.45	11.992				3	74.84	7.479		
	4	74.38	14.267				4	73.44	8.433		
	5	79.24	11.849				5	75.59	7.289		
	6	81.31	11.951				6	78.09	8.382		
	7	81.50	10.594				7	76.02	9.190		
	8	76.64	13.794				8	74.12	8.655		
	Total	77.32	13.015				Total	74.05	8.543		

*(1) Middle school, (2) High school, (3) Technical school, (4) Vocational school, (5) College, (6) University, (7) Postgraduate, (8) Other

3.5. Strengths and Difficulties

3.5.1 The impact of parents' nationality on the SDQ score

1) The impact of father's nationality on the SDQ score

On the basis of the father's nationality, the sample was divided into two groups, namely, the Han and other minority. The score of conduct problems of the Han is higher than that of other minority (t = 2.265, P = 0.024). The difference in the SDQ total difficulties score between the Han and other minority in terms of emotional symptoms, hyperactivity/inattention, peer-relationship problems, and prosocial behavior was not statistically significant.

2) The impact of mother's nationality on the SDQ score

On the basis of the mother's nationality, the scores of emotional symptoms (t = 2.350, P = 0.020) and conduct problems (t = 3.834, P < 0.000) reveal that the SDQ total difficulties score (t = 2.486, P = 0.014) of the Han is higher than for other minority. The difference in scores between the Han and other minority in terms of hyperactivity/inattention, peer-relationship problems, and prosocial behavior was not statistically significant.

3.5.2. The impact of everyday language of parents on the SDQ score

On the basis of the everyday language of parents, the sample was divided into two groups, namely, the Han and minority languages. The difference between each subscale's scores for the everyday languages of parents was not statistically significant.

3.5.3. The impact of parents' character on the SDQ score

1) The impact of father's character on the SDQ score

On the basis of the character of the father, the sample was divided into four groups, namely, introversion, extroversion, both introversion and extroversion, not sure. As shown in Table 8, the scores of emotional symptoms in relation to father's character are as follows: the not-sure group has the highest score (2.91 ± 2.440), followed by the introversion group (2.56 ± 2.070), the extroversion group (2.50 ± 2.418), and lastly the both introversion and extroversion group (1.67 ± 1.675); the difference between the scores in relation to the father's character was statistically significant (F = 8.166, P < 0.000). The scores of conduct problems in relation to father's character are as follows: the not-sure group has the highest score (2.27 ± 2.240), followed by the introversion group (2.19 ± 1.711), then the extroversion group (2.17 ± 1.983), and lastly the both introversion and extroversion group (1.47 ± 1.201); the difference between the scores in relation to the father's character was statistically significant (F = 6.639, P < 0.000). The scores of hyperactivity/inattention in relation to father's character are as follows: the introversion group has the highest score (4.65 ± 2.224), followed by the not-sure group (4.22 ± 2.122), then the extroversion group (4.21 ± 1.925), and lastly the both introversion and extroversion group (3.71 ± 1.863); the difference between the scores in relation to father's character was statistically significant (F = 5.129, P = 0.002). The scores of peer relationship problems in relation to father's character are as follows: the not-sure group has the highest score (2.89 ± 1.569), followed by the extroversion group (2.78 ± 1.820), then the introversion group (2.69 ± 1.732), and lastly the both introversion and extroversion group (2.07 ± 1.396); the difference between the scores in relation to the father's character was statistically significant (F = 7.339, P = 0.000). The scores of prosocial behavior in relation to

father's character are as follows: the extroversion group has the highest score (7.66 ± 1.845), followed by the both introversion and extroversion group (7.45 ± 1.923), then the not-sure group (7.37 ± 1.711), and lastly the introversion group (7.18 ± 1.997); the difference between the scores in relation to the father's character was not statistically significant (F = 1.443, P = 0.229). The scores of the SDQ total difficulties in relation to father's character are as follows: the not-sure group has the highest score (12.28 ± 6.496), followed by the introversion group (12.08 ± 5.866), then the extroversion group (11.65 ± 6.530), and lastly the both introversion and extroversion group (8.92 ± 4.211); the difference between the scores was not statistically significant (F = 10.971, P = 0.00).

Table 8 The Impact of the Father's Character on the SDQ score

	Character*	Mean	S.D	F	P
Emotional symptoms	1	2.56	2.070		
	2	2.50	2.418		
	3	1.67	1.675	8.166	.000
	4	2.91	2.440		
	Total	2.30	2.163		
Conduct problems	1	2.19	1.771		
	2	2.17	1.983		
	3	1.47	1.201	6.639	.000
	4	2.27	2.240		
	Total	1.95	1.784		
Hyperactivity/ Inattention	1	4.65	2.224		
	2	4.21	1.925		
	3	3.71	1.863	5.129	.002
	4	4.22	2.122		
	Total	4.14	2.030		
Peer relationship	1	2.69	1.732		
	2	2.78	1.820		
	3	2.07	1.396	7.339	.000
	4	2.89	1.569		
	Total	2.54	1.658		
Prosocial behavior	1	7.18	1.997		
	2	7.66	1.845		
	3	7.45	1.923	1.443	.229
	4	7.37	1.711		
	Total	7.44	1.889		
Total difficulties score	1	12.08	5.866		
	2	11.65	6.530		
	3	8.92	4.211	10.971	.000
	4	12.28	6.496		
	Total	10.92	5.850		

*1 = introversion, 2 = extroversion, 3 = both introversion and extroversion, 4 = not sure

2) The impact of the mother's character on the SDQ score

On the basis of the mother's character, the sample was divided into four groups, namely, introversion, extroversion, both introversion and extroversion, and not sure. As shown in Table 9, the scores of emotional symptoms in relation to mother's character are as follows: the not-sure group has the highest score (3.15 ± 2.629), followed by the introversion group (2.82 ± 2.073), then the both introversion and extroversion group (2.02 ± 2.145), and lastly the extroversion group (1.69 ± 1.869); the difference between the scores in relation to the mother's character was statistically significant (F = 7.969, P = 0.000). The scores of conduct problems in relation to mother's character are as follows: the not-sure group has the highest score (2.55 ± 2.264), followed by the introversion group (2.06 ± 1.769), then the extroversion group (1.86 ± 1.554), and finally the both introversion and extroversion group (1.76 ± 1.749); the difference between the scores in relation to the mother's character was statistically significant (F = 3.535, P = 0.015). The scores of hyperactivity/inattention in relation to mother's character are as follows: the introversion group has the highest score (4.57 ± 2.159), followed by the not-sure group (4.37 ± 2.212), then the extroversion group (4.09 ± 1.889), and lastly the both introversion and extroversion group (3.87 ± 1.980); the difference between the scores in relation to the mother's character was statistically significant (F = 2.905, P = 0.034). The scores of peer relationship problems in relation to mother's character are as follows: the introversion group has the highest score (3.05 ± 1.858), followed by the not-sure group(2.88 ± 1.644), then the extroversion group (2.34 ± 1.584), and lastly the both introversion and extroversion group (2.31 ± 1.545); the difference between the scores in relation to the mother's character was statistically significant (F = 6.609, P = 0.000). The scores of prosocial behavior in relation to mother's character are as follows: the extroversion group has the highest score (7.51 ± 1.950), followed by the both introversion and extroversion group (7.50 ± 1.920), then the not-sure group (7.37 ± 1.626), and lastly the introversion group (7.24 ± 1.905); the difference between the scores in relation to the mother's character was not statistically significant (F = 0.517, P = 0.671). The scores of the SDQ total difficulties in relation to mother's character are as follows: the not-sure group has the highest score (12.95 ± 6.796), followed by the introversion group (12.50 ± 5.884), then the extroversion group (10.25 ± 5.159), and lastly the both introversion and extroversion group (9.96 ± 5.734); the difference between the scores was not statistically significant (F = 7.689, P = 0.000).

3.5.4 The impact of parents' health status on the SDQ score

1) The impact of father's health status on the SDQ

Table 9 The Impact of Mother's Character on the SDQ score

	Character*	Mean	S.D	F	P
Emotional symptoms	1	2.82	2.073		
	2	1.96	1.869		
	3	2.02	2.145	7.969	.000
	4	3.15	2.629		
	Total	2.30	2.163		
Conduct problems	1	2.06	1.769		
	2	1.86	1.554		
	3	1.76	1.749	3.535	.015
	4	2.55	2.264		
	Total	1.95	1.784		
Hyperactivity/ Inattention	1	4.57	2.159		
	2	4.09	1.889		
	3	3.87	1.980	2.905	.034
	4	4.37	2.212		
	Total	4.14	2.030		
Peer relationship	1	3.05	1.858		
	2	2.34	1.584		
	3	2.31	1.545	6.096	.000
	4	2.88	1.644		
	Total	2.54	1.658		
Prosocial behavior	1	7.24	1.905		
	2	7.51	1.950		
	3	7.50	1.920	.517	.671
	4	7.37	1.626		
	Total	7.44	1.889		
Total difficulties score	1	12.50	5.884		
	2	10.25	5.159		
	3	9.96	5.734	7.689	.000
	4	12.95	6.769		
	Total	10.92	5.850		

*1 = introversion, 2 = extroversion, 3 = both introversion and extroversion, 4 = not sure

score

On the basis of the father's health status, the sample was divided into five groups, namely, very good, good, general, bad, very bad. As shown in Table 10, the scores of emotional symptoms in relation to father's health status are as follows: the good group has the highest score (2.86 ± 2.558), followed by the general group (2.00 ± 1.663), then the bad group (2.00 ± 0.000), and lastly the very good group (1.83 ± 1.719); the difference between the scores in relation to father's health status was statistically significant (F = 9.136, P = 0.000). The scores of conduct problems in relation to father's health status are as follows: the good group has the highest score (2.41 ± 2.176), followed by the general group (1.69 ± 1.249), then the very good group (1.59 ± 1.362), and lastly the bad group (1.00 ± 0.000); the difference between the

scores in relation to the father's health status was statistically significant (F = 8.744, P = 0.000). The scores of hyperactivity/inattention in relation to father's health status are as follows: the general group has the highest score (4.39 ± 2.286), followed by the good group (4.14 ± 2.007), then the very good group (4.06 ± 1.967), and lastly the bad group (3.00 ± 0.000); the difference between the scores in relation to the father's health status was not statistically significant (F = 0.609, P = 0.609). The scores of peer relationship problems in relation to father's health status are as follows: the good group has the highest score (2.61 ± 1.758), followed by the general group (2.59 ± 1.782) , then the very good group (2.45 ± 1.512), and lastly the bad group (2.00 ± 0.000); the difference between the scores in relation to the father's health status was not statistically significant (F = 0.410, P = 0.746). The scores of prosocial behavior in relation to father's heath status are as follows: the good group has the highest score (7.67 ± 1.843), followed by the very good group (7.29 ± 1.824), then the general group (7.19 ± 1.156), and lastly the bad group (7.00 ± 0.000); the difference between the scores in relation to the father's health status was not statistically significant (F = 2.017, P = 0.111). The scores of the SDQ total difficulties in relation to father's health status are as follows: the good group has the highest score (12.01 ± 6.965), followed by the general group (10.06 ± 5.211), then the very good group (9.92 ± 4.532), and lastly the bad group (8.00 ± 0.000); the difference between the scores in relation to the father's health status was not statistically significant (F = 4.871, P = 0.002).

3.5.5 The impact of mother's health status on the SDQ score

On the basis of the mother's health status, the sample was divided into four groups, namely, very good, good, general, bad, very bad. As shown in Table 11, the scores of emotional symptoms in relation to mother's health status are as follows: the bad group has the highest score (3.33 ± 2.517), followed by the good group (2.99 ± 2.629), then by the general group (2.18 ± 1.684), and lastly by the very good group (1.69 ± 1.555); the difference between the scores in relation to the mother's health status was statistically significant (F = 14.393, P = 0.000). The scores of conduct problems in relation to mother's health status are as follows: the good group has the highest score (2.45 ± 2.151), followed by the general group (1.90 ± 1.364), then the bad group (1.67 ± 2.887), and lastly the very good group (1.51 ± 1.355); the difference between the scores in relation to the mother's health status was statistically significant (F = 10.796, P = 0.000). The scores of hyperactivity/inattention in relation to mother's health status are as follows: the general group has the highest score (4.49 ± 2.366), followed by the good group (4.24 ± 2.026), then the bad group (4.00 ±

Table 10 The Impact of Father's Health Status on the SDQ score

	Health status*	Mean	S.d	F	P
Emotional symptoms	1	1.83	1.719		
	2	2.86	2.558		
	3	2.00	1.663	9.136	.000
	4	2.00	.		
	Total	2.30	2.163		
Conduct problems	1	1.59	1.362		
	2	2.41	2.176		
	3	1.69	1.249	8.744	.000
	4	1.00	.		
	Total	1.95	1.784		
Hyperactivity/ Inattention	1	4.06	1.967		
	2	4.14	2.007		
	3	4.39	2.286	.609	.609
	4	3.00	.		
	Total	4.14	2.030		
Peer relationship	1	2.45	1.512		
	2	2.61	1.758		
	3	2.59	1.782	.410	.746
	4	2.00	.		
	Total	2.54	1.658		
Prosocial behavior	1	7.29	1.824		
	2	7.67	1.843		
	3	7.19	2.156	2.017	.111
	4	7.00	.		
	Total	7.44	1.889		
Total difficulties score	1	9.92	4.532		
	2	12.01	6.965	4.871	.002
	3	10.68	5.211		

*1 = very good, 2 = good, 3 = bad, 4 = very bad

2.000), and lastly the very good group (3.94 ± 1.911); the difference between scores in relation to the mother's health status was not statistically significant (F = 1.626, P = 0.182). The scores of peer relationship problems in relation to mother's health status are as follows: the bad group has the highest score (5.67 ± 1.528), followed by the good group (2.68 ± 1.793), then the general group (2.58 ± 1.754), and lastly the very good group (2.35 ± 1.442); the difference between scores in relation to the mother's health status was statistically significant (F = 5.138, P = 0.002). The scores of prosocial behavior in relation to the mother's health status are as follows: the bad group has the highest score (8.00 ± 1.732), followed by the good group (7.71 ± 1.778), then the very good group (7.26 ± 1.913), and lastly the general group (7.20 ± 2.061); the difference between scores in relation to the mother's health status was statistically significant (F = 2.658, P = 0.048). The scores of the SDQ total difficulties in relation to mother's health status are as follows: the

Table 11 The Impact of Mother's Health Status on the SDQ score

	Health status*	Mean	S.D	F	P
Emotional symptoms	1	1.69	1.555	14.393	.000
	2	2.99	2.629		
	3	2.18	1.684		
	4	3.33	2.517		
	Total	2.30	2.163		
Conduct problems	1	1.51	1.355	10.796	.000
	2	2.45	2.151		
	3	1.90	1.364		
	4	1.67	2.887		
	Total	1.95	1.784		
Hyperactivity/ Inattention	1	3.94	1.911	1.626	.182
	2	4.24	2.026		
	3	4.49	2.366		
	4	4.00	2.000		
	Total	4.14	2.030		
Peer relationship	1	2.35	1.442	5.138	.002
	2	2.68	1.793		
	3	2.58	1.754		
	4	5.67	1.528		
	Total	2.54	1.658		
Prosocial behavior	1	7.26	1.913	2.658	.048
	2	7.71	1.778		
	3	7.20	2.061		
	4	8.00	1.732		
	Total	7.44	1.889		
Total difficulties score	1	9.48	4.406	9.619	.000
	2	12.35	6.991		
	3	11.15	5.087		
	4	14.67	8.021		
	Total	10.92	5.850		

*1 = very good, 2 = good, 3 = bad, 4 = very bad

bad group has the highest score (14.67 ± 8.021), followed by the good group (12.35 ± 6.991), then the general group (11.15 ± 5.087), and lastly the very good group (9.48 ± 4.406); the difference between the scores in relation to the mother's health status was statistically significant ($F = 9.619$, $P = 0.000$).

3.5.6 The impact of whether parent is suffering chronic disease on the SDQ score

On the basis of whether the father is suffering from a chronic disease, the sample was divided into a chronic disease group and a no-chronic disease group. The score of emotional symptoms of the no-chronic disease group is higher than that of the chronic disease group ($t = -2.772$, $P = 0.010$). The difference between the chronic disease group and the no-chronic disease group in scores of conduct problems, hyperactivity/inattention, peer-

relationship problems, prosocial behavior, and the SDQ total difficulties was not statistically significant. For the sample dependent on whether the mother is suffering from a chronic disease, the difference in scores of five subscales was not statistically significant.

3.5.7 The impact of parents' educational level on the SDQ score

On the basis of the parents' educational level, the sample was divided into eight groups, namely, Middle school, High school, Technical secondary school, Vocational school, University, Graduate, and Other. Besides the score of prosocial behavior that was not affected by the educational level of parents, the scores of emotional symptoms, conduct problems, hyperactivity/inattention, peer relationship problems, and SDQ total difficulties were affected by the educational level of parents.

3.5.8 The impact of residences on the SDQ score

On the basis of residences, the sample was divided into three groups, namely, As shown in Table 12, Shandong Province, Anhui Province, and Inner Mongolia. Anhui Province has the highest score of emotional symptoms (3.65 ± 3.258) and Shandong Province the lowest (1.74 ± 1.531); the difference between the scores in relation to residences was statistically significant ($F = 33.574$, $P = 0.000$). Anhui Province has the highest score of conduct problems (3.33 ± 2.648) and Inner Mongolia the lowest (1.54 ± 1.320); the difference between the scores in relation to residences was statistically significant ($F = 50.446$, $P = 0.000$). Anhui Province has the highest score of hyperactivity/inattention (4.38 ± 1.577) and Shandong Province the lowest (3.97 ± 2.168); the difference between the scores in relation to residences was not statistically significant ($F = 1.455$, $P = 0.234$). Anhui Province has the highest score of peer relationship problems (2.97 ± 1.919) and Shandong Province the lowest (2.11 ± 1.569); the difference between the scores in relation to residences was statistically significant ($F = 10.503$, $P = 0.000$). Anhui Province has the highest score of prosocial behavior (8.18 ± 1.371) and Shandong Province the lowest (7.21 ± 2.043); the difference between the scores in relation to residences was statistically significant ($F = 10.031$, $P = 0.000$). Anhui Province has the highest score of SDQ total difficulties (14.33 ± 8.677) and Shandong Province the lowest (9.42 ± 4.535); the difference between the scores in relation to residences was statistically significant ($F = 29.377$, $P = 0.000$).

4. Discussion

4.1 Factors Influencing Parents' Quality of Life

One of the purposes of this paper was to identify the major factors that affect parents' quality of life using The

Table 12 The Impact of Residences on the SDQ score

	Residences	Mean	S.d	F	P
Emotional symptoms	Shandong	1.74	1.531	33.574	.000
	Anhui	3.65	3.258		
	Inner Mongolia	1.98	1.631		
	Total	2.21	2.134		
Conduct problems	Shandong	1.59	1.189	50.446	.000
	Anhui	3.33	2.648		
	Inner Mongolia	1.54	1.320		
	Total	1.90	1.764		
Hyperactivity/ Inattention	Shandong	3.97	2.168	1.455	.234
	Anhui	4.38	1.577		
	Inner Mongolia	4.06	2.033		
	Total	4.09	2.008		
Peer relationship	Shandong	2.11	1.569	10.503	.000
	Anhui	2.97	1.919		
	Inner Mongolia	2.57	1.488		
	Total	2.48	1.636		
	Shandong	7.21	2.043	10.031	.000
	Anhui	8.18	1.371		
	Inner Mongolia	7.40	1.849		
	Total	7.48	1.874		
Prosocial behavior	Shandong	9.42	4.535	29.377	.000
	Anhui	14.33	8.677		
	Inner Mongolia	10.15	4.364		
	Total	10.69	5.791		

WHOQOL-BREF. This study measured several factors about parents to assess their contribution to the scores of different dimensions. After converting 546 parents' choices into corresponding scores, we found region, character, health status, and their children's gender can affect parents' quality of life in different ways.

4.1.1. Physical Health

Children's gender is an important element that affects parents' physical health. Recent historical trends and current directions in the study of children's gender and relationships are reviewed using Maccoby and Jacklin's (1974) the Psychology of Sex Differences as a reference point (1). In our study, parents who have boys score higher in physical dimensions than do parents who raise a girl. This is mainly because most boys have a high level of autonomy, and much less effort is required of their parents in caring for them. To improve the physical health of parents raising a girl, children's autonomy can be promoted more; this wouldl be good for both parents and children. Parents' character can also influence their physical health. Parents with neutral or outgoing personalities score higher than those who are introverted. Research has shown that a low HRQL of patients with mood or anxiety disorders is not only determined by the

disease or the current health status but is also shaped by personality traits that are relatively stable throughout an individual's lifetime (2). From this, we know that parents' personality can affect their health. A neutral or outgoing personality can help reduce parents' stress in their day-to-day life. So parents should try their best to develop the right character for their physical health. Of course, parents' health status is shown in the scores on domain of physical health.

4.1.2. Psychological Health

Parents' psychological domain can be influenced by their character and health status. Parents with outgoing personalities have the highest score, and parents who are introverted have the lowest score. Parents with outgoing personalities can face life positively, so they usually have good mental health. Introverted parents do not like to express themselves, so they often feel more pressure. Individual differences in personality influence the occurrence, reporting, and outcome of mental health problems across the life course (3). Parents with better health status tend to score higher on the psychological domain. A research on parents of children with cancer has identified factors related to their adjustment and coping, but it is not fully understood why some parents do well and others do not (4). This paper indicates that good health status can contribute to better mood and more satisfaction, which affect one's psychological score heavily. So, health maintenance by parents is very important, since it affects not only their health status, but also their family's happiness, which is mainly determined by parents' psychological condition. Therefore, in studying parents' psychological status, we cannot emphasize mental health alone, but we should also be concerned about their health status and take measures to improve it.

4.1.3. Social Relationships

Social relationships can be affected by almost all the factors we tested in this study. Parents from different provinces score differently on social relationships. Inner Mongolia scores highest among the three provinces, followed by Shandong province and Anhui province. A community based cross-sectional study design, assessing the quality of life, mental, and physical health among parents aged ≥ 60 years living in rural and suburban areas of northern Thailand, shows a result similar to our study's. The subjects from suburban areas had a higher quality of life in respect to physical health (p = 0.011), mental health (p = 0.025), and social relationships (p = 0.012) (5). This is mainly because parents living in developing areas have more simple social relationships and adapt to the society there very well. In contrast, parents who live in developed regions are more concerned about the money they earn and their social

status. Relationships between parents are more complex, which decreases the social relationship scores. It may not mean that parents who live in developing regions feel happier than parents who live in developed areas, but it tells us that when we talk about development among different regions, we must pay more attention to parents' ability to adjust to rapid economic growth and the changes in society. Everyday language also has a great influence on social relationships. People who speak minority languages tend to score higher on this domain than others who speak Chinese. People who speak minority languages often live more closely and have a stronger sense of community. In contrast, people who speak Chinese are scattered, and they are not familiar with each other. The social relationships domain can also be influenced by parents' character and their health status. People with outgoing personalities have the highest score, and parents who are introverted the lowest. There is great interest in environmental effects on the development and evolution of personality traits. However, few studies look beyond dyadic relationships and try to place the personality of individuals in the context of a social network. Social network analysis provides us with many new metrics to characterize the social fine-structure of populations and, therefore, with an opportunity to gain an understanding of the role those different personalities play in groups, communities, and populations regarding information or disease transmission, or in terms of cooperation and policing of social conflicts. The network position of an individual is largely a consequence of his or her interactive strategies. However, the network position can also shape an individual's experiences (especially in the case of juveniles) and, therefore, can influence the way in which it interacts with others in the future. Finally, over evolutionary time, the social fine-structure of populations (as quantified by social network analysis) can have important consequences for the evolution of personalities—an approach that goes beyond the conventional game-theoretic analyses that assumed random mixing of individuals in populations (6,7). From the studies above, we know that people with outgoing personalities are more likely to communicate with each other, which makes the society more harmonious, since they always adapt to the society easily. Introverted parents do not like to talk to others, they may find it difficult to get along well with others, and this makes them view social relationships negatively. Parents with better health status tend to score higher on the domain of social relationships. Good health status of parents can contribute to more harmonious social relationships (8), and then affect the score heavily. People with bad health status often complain about society, which indicates that health status is an important component in the construction of a harmonious society.

4.1.4. Environmental Dimension

Inner Mongolia, Shandong, and Anhui also show different scores in the environment domain. Inner Mongolia scores highest among them, which may be because, as a developing province, the environment there is better than in Shandong and Anhui. This indicates that protecting the environment needs to be an important part of the development process. Environment domain can also be affected by parents' personality and health status. On the one hand, people with outgoing personalities score higher than parents who are introverted. Because WHOQOL-BREF is a tool that assesses people's satisfaction about their status, changes in WHOQOL-BREF scores were positively associated with changes over time in global functioning, social support, and use of health services (9). Parents with outgoing personalities are more satisfied with the environment and living conditions around them. Whereas introverted parents are not very concerned about the environment, they feel lonely and hold a negative view about their living conditions. On the other hand, parents with better health status tend to score higher on the environment domain. Parents with good health status can contribute to relationships between men and nature, and have more opportunities to make a living, so they are more likely to be satisfied with their current situation.

4.1.5. Overall Quality of Life

Mothers' character and parents' health status influence quality of life. Mothers with outgoing personalities push the overall score higher. In a study to explore if there is a difference in the perception and self-reported quality of life between rural-to-urban migrants and urban groups, migrants reported lower quality of life than the urban group both on the global scores as well as in psychological health and the living environment domains. However, migrants reported a higher score on the physical health domain (10). The impact of rural-to-urban migration on quality of life suggests a differential effect within its specific domains. But in China, we found that when parents' health status is better, the overall score is higher. It means that health is the primary factor that affects parents' quality of life in China. Health is the key to improving parents' quality of life. Mothers perform more household tasks than men do, so mothers have more influence on family members' quality of life, especially that of their husbands; an outgoing mother can ensure family members live a better life.

4.2. Factors Influencing Quality of Life of Children

Quality of life was significantly associated with parenting behavior, mothers' life contentment, relationship quality (11), and so on.

The factors that affect a child's physical condition are the region, child's age, father's age, parents' nationality,

parents' daily conversation, parents' character, parents' health status, and parents' level of education. Shandong is the best, mainly because of the higher economic level in Shandong and the good environment for the growth of children; Anhui is the worst, mainly because the economy is lagging behind and the poor quality of life of children. As children grow older, their physical condition gradually deteriorates, mainly because as age increases, children's exposure to health risk factors also increases.

As the father grows older, the child's physical condition shows a gradually improving trend, probably because an older father has more experience of child care. Children whose parents are not of the Han ethnicity and who speak minority languages are in good physical condition, mainly because minority parents have better ways to take care of their children. The child whose parents have outgoing personalities has a better physical condition, mainly because the outgoing parents will make children read cheerful poetry, which is good for their physical state. With the increase of parents' educational level, the child's physical condition correspondingly improves, but when the parents are educated to undergraduate level or above, the child's physical condition begins to decline. With higher education, parents may be more proactive in determining the correct use of health services and making decisions in clinical settings (12); however, these parents are busy working, which reduces the amount of child care.

In general, being in a disadvantaged family, a single-parent family, or a family whose mother had lower levels of education, as well as being children who reported physical health problems, have been factors associated with worse child mental health in most of the SDQ dimension scores (13). In our study, the factors that affect a child's psychological state are paternal ages, parental personalities, and parental level of education. Children's mental state tends to improve with the increase in paternal age, because with aging, fathers learn better ways to educate a child. Children whose parents have slightly higher levels of education have better psychological condition than those with lower ones, mainly because more highly educated parents are better at communicating with their children.

The factors that have an impact on children's self-experiences are region, age of the child, the mother's health, and parental level of education. Shandong is the best in this aspect, probably because of the economic development of Shandong, and there being more opportunity for children to exercise themselves. Anhui is the lowest, which may be due to its relatively poor condition, and children being kept indoors more. With age, the child's self-confidence and satisfaction gradually decreases, mainly because children have more pressure as they grow. With the reduction of maternal health, children's self-experience will deteriorate, mainly because

the worse the mother's physical condition, the greater the negative impact on children. With low levels of parental education, the child's self-feelings are very poor, mainly because parents with less education do not have enough knowledge to develop the child's autonomy and self-reliance. On the other hand, highly literate parents will use their knowledge and their thirst for knowledge to educate their children, developing an indomitable, progressive spirit (14).

The factors that affect the relationship between children and family members are the regions, age of the child, father's personality, parents' health status, and parents' educational level. Shandong is the best in this aspect, probably because of the greater emphasis on family environment and communication in Shandong. Anhui is the lowest, mainly because Anhui is a relatively poor region and parents pay little attention to communication with children. Children whose parents have the best health status and who have an intimate relationship with the family, mainly because of the parents' good health, will not be negatively affected, and the family environment is better. Very low levels of parental education and very high levels of parental education tend be detrimental to children's closeness with their family, mainly because the parents who are less educated do not know how to educate their children in a proper manner, and the parents who are well educated may demand more of their children, so that children do not experience the warmth of family life.

The factors that affect a child's social skills are gender, father's age, and father's educational level. Boys' social skills are better than those of girls, mainly because boys are more active by nature, while girls tend to be quieter. If the father is young, the child's social skills are relatively poor, mainly because the young father does not have much social experience himself, so his education of his children has some deficiencies. The child whose father has a particularly low level of education has poor social skills too, mainly because the poorly educated father does not have enough social skills and is, therefore, unable to educate his child.

The factors that affect a child's school performance are region, gender, ethnicity of parents, maternal health status, and parental educational level. Inner Mongolia is the best in this aspect, possibly because Inner Mongolia has more grassland and a beautiful environment, so that children enjoy school; on the other hand, Anhui and Shandong are relatively poor in this aspect, probably because the school environment cannot generate enough interest in children. Boys have better school performance than girls, mainly because, relatively speaking, boys prefer to express themselves. Other, minority children perform better than Han children in school, mainly because ethnic minority parents have a better method of training children. Particularly poor maternal health status

leads to the worst child performance, mainly because these children are permitted a great deal of autonomy. Children whose parents have particularly low levels of education do not perform well in school, mainly because the parents of these children rarely can be of assistance with schoolwork.

The factors that affect a child's score on both the 24 questions and 45 questions are the region, child's age, gender, mother's ethnicity, parental personality, maternal health, and parental level of education. In Anhui, the quality of life of children is poor, mainly because the economy there is lagging behind, and parents pay little attention to education. With increasing age, children's quality of life declines, which is consistent with the study explored by Salwa G Massad, F Javier Nieto, Mari Palta, Maureen Smith, Roseanne Clark, and Abdel-Aziz Thabet (15), and it is possibly because that, as children grow, their independent thinking is also enhanced, and their inclination to rebel increases. Boys have better quality of life than girls do, mainly because boys are usually more optimistic, unconcerned about everything. As parents have a close interpersonal relationship with their children, they play an important role in changing their children's quality of life and mental health (16). The quality of life of children whose fathers are young is not good, mainly because of a lack of parenting experience. Minority mothers' children have a higher quality of life than do those of Han, mainly because ethnic minorities may lay more emphasis on children's education. A physically active life promotes both physical and mental health, increasing well-being and quality of life. Physical activity (PA) performed outdoors has been found to be particularly good for promoting well-being (17). The child whose mother is in good health has a high quality of life (18), and it is mainly because these mothers have enough time and energy to take care of their children. On the other hand, adverse childhood experiences are major risk factors for the leading causes of illness and death as well as poor quality of life (19). We could expect a reduction of health-related quality of life among the children of parents with less education (20), which is mainly because their lack of education and knowledge affects their ability to care for their child.

The factor that affects a child's score on the 45 questions is also father's age. With the increase in paternal age, the child's quality of life improves, because as fathers age, they learn more ways to educate and take care of a child.

4.3. Factors Influencing Children's Strengths and Difficulties

It is obvious that SDQ has gained increasing popularity in China, though Chinese translation of SDQ has a number of differences compared to the original English SDQ, and some translated words have deviated from the original meaning (21). The result of the study in China is a valid, reliable reflection of reality to a large extent.

Area, age, age of parents, educational level, personality characteristics of parents, and health status of parents were all strongly associated with higher rates of probable psychiatric disorders among 4–8 year olds. Another possibility is that the psychiatric and behavioral problems both arose from unmeasured factors. The higher rate of behavioral problems could be accounted for by the associated poverty, social environment, and family environment; future studies should investigate the possible role of social capital and social networks in buffering the impact of these social adversities (22). The figure shows the univariate results and their significance, as children grow older, enter preschool or school, try to develop their independence, escape parental control, and show a certain degree of cynicism and rebellious behavior. At the same time, they are taken care of and carefully looked after by their parents, which easily gives rise to negative emotions and conflict with their parents (23). The figure shows that there is no significant difference with respect to gender in terms of children's psychological and behavioral problems, although the male gender has been consistently reported in the literature as a predictor of externalizing disorders (24).

Children in infancy and early childhood are in the initial formation stage of their personalities, cognition and thinking are also in the developmental stage; therefore, the family, school, and social environment will inevitably affect the child. At this period, children are self-centered and cannot readily shift to understanding the perspectives of others; thus, the emergence of emotional and behavioral problems is likely. Numerous family factors have been linked to children's mental and behavioral problems; reviews of the literature have documented the substantial impact that a variety of family factors play in the development of mental and behavioral issues in the lives of children, including communication patterns, support, conflict, and stressors such as separation and divorce. Parent-child relationships characterized by warmth and intimacy appear to function as a protective factor against both internalizing and externalizing problem behavior for both males and females (25). The educational level and personality characteristics of parents affect their way of parenting and their cognition, which in turn affects the emotion and behavior of the child. Parents have less time to communicate with their children, which results in children's emotional and behavioral problems to some extent. Parents who are well educated are more like to understand psychology and the behavior of their children, which in turn helps them to master skills in communication with their children; these skills, to some extent, help to reduce the children's negative emotions and behavior. At the same time, when parents are

neither very introverted nor very outgoing but a mixture of both, the negative emotions and behavior of children may be reduced. Public and parental education, to increase parents' knowledge of psychology and of child and infant behavior, will improve parents' communication skills and thus reduce the negative emotional and behavioral problems of children.

The data showed that the health status of parents had an influence on the SDQ score of the children, showing that there were associations between parents' health status and emotional symptoms and the behavioral problems of their children. Besides, mothers' health status also influenced peer relationship problems and prosocial behavior. For fathers who had chronic diseases, the score of children's emotional symptoms was probably higher. We can see from the results that the higher health status of parents was probably attributable to their health awareness and they might have taken much better care of their health. Thus, they would pay much more attention to their children's health. It would take them more time to train their children in good health habits. As we all know, chronic diseases are mainly caused by bad habits such as smoking, drinking, lack of exercise, and so on; that probably was the reason for the higher SDQ score for those children whose fathers had chronic diseases (26).

The results showed associations between parents' education and emotional symptoms, conduct problems, hyperactivity/inattention, and peer relationship problems but not prosocial behavior. We can see from the results that the SDQ score of the children decreased along with the increasing level of parents' education. Thus, if parents had a higher education, they would have a good deal of knowledge and methods in training their children. Once the children suffered a mental health problem, the parents would probably recognize this and take specific steps to deal with the problem. Moreover, there are reports citing the quality of parent-adolescent relationships as an important factor that is known to protect children despite adverse environments. The reports suggest that supportive parent-child relationships, as measured by parental warmth, supervision, support, and involvement, were found to reduce externalizing behavior. Thus, positive family resources coincide with an absence of behavioral problems, whereas an adverse family climate was a main negative contributor to mental health problems in general. The parents' educational level might likely be a positive contributor to mental health problems. Rapid socioeconomic development of regions has changed the social atmosphere, and thus to some extent, had some adverse effects on children's emotions and behavior (27). There is no need for this study to identify the importance of tackling poverty, low educational levels, or social environment, but tackling these problems is likely to have the additional benefit of

improving children's mental and behavioral health.

References

1. Maccoby EE, Jacklin CN. The psychology of sex differences, Stanford University Press, Stanford, CA, 1974.

2. Van Straten A, Cuijpers P, van Zuuren FJ, Smits N, Donker M. Personality traits and health-related quality of life in patients with mood and anxiety disorders. Qual Life Res. 2007; 16(1): 1–8.

3. Abbott RA, Croudace TJ, Ploubidis GB, Kuh D, Richards M, Huppert FA. The relationship between early personality and midlife psychological well-being: Evidence from a UK birth cohort study. Soc Psychiatry Psychiatr Epidemiol. 2008; 43(9): 679-687.

4. Klassen AF, Raina P, McIntosh C, Sung L, Klaassen RJ, O'Donnell M, Yanofsky R, Dix D. Parents of children with cancer: Which factors explain differences in health-related quality of life. Int J Cancer. 2011; 129(5): 1190-1198.

5. Apidechkul, Tawatchai. Comparison of quality of life and mental health among elderly people in rural and suburban areas, Thailand. Southeast Asian Journal of Tropical Medicine and Public Health. 2010; 42 (5): 1282-1292.

6. Réale D, Dingemanse NJ, Kazem AJ, Wright J. Evolutionary and ecological approaches to the study of personality. Philos Trans R Soc Lond B Biol Sci. 2010; 365(1560): 3937-3946.

7. Krause J, James R, Croft DP. Personality in the context of social networks. Philosophical Philos Trans R Soc Lond B Biol Sci. 2010; 365 (1560): 4099-4106.

8. Springer KW, Mouzon DM. Relationship of health status and social support to the life satisfaction of older adults. Tohoku J Exp Med.2002; 198(3): 141-149.

9. Mas-Expósito L, Amador-Campos JA, Gómez-Benito J, Lalucat-Jo L; Research group on severe mental disorder. The World Health Organization Quality of Life Scale Brief Version: A validation study in patients with schizophrenia. Qual Life Res. 2011; 20 (7): 1079-1089.

10. Márquez-Montero G, Loret de Mola C, Bernabé-Ortiz A, Smeeth L, Gilman RH, Miranda JJ. Health-related quality of life among urban and rural to urban migrant populations in Lima, Peru. Rev Peru Med Exp Salud Publica. 2011; 28 (1): 35-41. (in Spanish)

11. Harstick-Koll S, Kuschel A, Bertram H, Naumann S, Hahlweg K, Hautmann C, Dopfner M. Measuring life quality of pre-school children with the Kiddy-KINDL. 2009; (17): 82-93. (in German)

12. Anonymous. Depression: School of Medicine describes research in depression. China Weekly News. 2011; 8(9): 487

13. Rajmil L, López-Aguilà S, Mompart Penina A, Medina Bustos A, Rodríguez Sanz M, Brugulat Guiteras P. Socio-economic inequalities in children's mental health in Catalonia. An Pediatr (Barc). 2001; 73(5): 233-40.

14. P Wei, XM Chen. Analysis on factors affecting primary children's mental health. Anhui Radio Broadcasting and Television University Journal. 2007; 4: 65-69. (in Chinese)

15. Salwa G Massad, F Javier Nieto, Mari Palta, Maureen Smith, Roseanne Clark, Abdel-Aziz Thabet. Health-related quality of life of Palestinian preschoolers in the Gaza Strip: A cross-sectional study. BMC Public Health. 2011; 4(11): 253

16. Mustafa Bolghan-Abadi, Sayed-Ali Kimiaee, Fatemeh Amir. The relationship between parents' child rearing styles and their children's quality of life and mental health. Psychology. 2011; 2(3): 229-233

17. Taufiq Mashal, Takehito Takano, Keiko Nakamura, Masashi Kizuki, Shafiqullah Hemat, Masafumi Watanabe, and Kaoruko Seino. Factors associated with the health and nutritional status of children under 5 years of age in Afghanistan: Family behaviour related to women and past experience of war-related hardships. BMC Public Health. 2008; 8: 301.

18. Anonymous. Quality of life: Study data from University of California updates understanding of quality of life. Pediatrics Week. 2011; 7: 271

19. H Barry Waldman, Steven P Perlman, Debra A Cinotti. Adverse childhood experiences affect later life well-being. The Exceptional Parent (Online). Boston: 2011; 41(2): 27-29.

20. Klatchoian DA, Len CA, Terreri MT, Hilário MO.Quality of life among children from São Paulo, Brazil: The impact of demographic, family and socioeconomic variables. Cad Saude Publica.2010; 3(3): 631-6.

21. Toh TH, Chow SJ, Ting TH, Sewell J. Chinese translation of strengths and difficulties questionnaire requires urgent review before field trials for validity and reliability. Child Adolesc Psychiatry Ment Health, 2008; 2(1): 23.

22. Fleitlich B, Goodman R. Social factors associated with child mental health problems in Brazil: Cross sectional survey. BMJ. 2001; 323(7313): 599-600.

23. Winchester, D. Raising kids in the 21st century: The science of psychological health for children. Choice. 2009; 46(10): 1879.

24. Hussein, S. Dual-informant ratings of emotional and behavioral problems among primary school children. Pakistan Journal of Psychological Research, 2010; 25(2): 165.

25. Gavazzi SM, Bostic JM, Lim JY, Yarcheck CM. Examining the impact of gender, race/ethnicity, and family factors on mental health issues in a sample of court-involved youth. J Marital Fam Ther. 2008; 34(3): 353-368.

26. Stadler C, Feifel J, Rohrmann S, Vermeiren R, Poustka F. Peer-victimization and mental health problems in adolescents: Are parental and school support protective? Child Psychiatry Hum Dev. 2010; 41(4): 371-386.

27. Huisman M, Araya R, Lawlor DA, Ormel J, Verhulst FC, Oldehinkel AJ. Cognitive ability, parental socioeconomic position and internalising and externalising problems in adolescence: Findings from two European cohort studies. Eur J Epidemiol. 2010; 25(8): 569-580.

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