•Original article•

Results of the parent-rated Strengths and Difficulties Questionnaire in 22,108 primary school students from 8 provinces of China

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Background: A valid screening tool for behavioral and emotional problems in children and adolescents is needed to promote psychological wellbeing and to prevent mental disorders in China's children.

Aim: Assess the use of the Chinese version of the internationally recognized Strengths and Difficulties Questionnaire (SDQ) – which assesses emotional symptoms, conduct problems, hyperactivity/inattention, peer relationship problems and prosocial behaviors – in a large sample of urban and rural children from different parts of China.

Methods: The Chinese version of the parent-reported SDQ was administered to legal guardians (primarily parents) of a stratified random sample of 22,108 primary school children 5 to 13 years of age from eight provinces in China. The association between SDQ scores and socio-demographic characteristics was assessed and the percentile cutoff scores for 'abnormal', 'borderline' and 'normal' results in China were compared with those for Japan and the United Kingdom.

Results: The internal consistency of the 4 of the 5 SDQ subscales were satisfactory but that for the 'peer relationships problems' subscale was quite poor (alpha=0.22). Guardians reported that boys were more likely than girls to have hyperactivity/inattention problems and that girls were more likely than boys to have problems with emotional symptoms. For both boys and girls hyperactivity/inattention problems decreased with age while peer relationship problems increased with age. Emotional symptoms, conduct problems and peer relationship problems were more common in children from rural areas and in children whose identified guardian was not a parent (i.e., a grandparent or other relative). The 90th percentile cutoff score for abnormal results was higher in Chinese children than the cutoff scores reported for children in Japan and the United Kingdom.

Conclusions: This study suggests that prevention programs for hyperactivity/inattention problems in boys need to start before the age of 10 and that training in methods of reducing the stress associated with peer relationships should start in early adolescence. Further work is needed to improve the cultural validity of the SDQ in China and to determine its sensitivity and specificity for identifying children who are in need of mental health services.

1. Introduction

Over the past three decades China's economic boom has been associated with substantial improvements in the physical health of children but the rapid economic development has been associated with increased competitiveness in schools and with massive rural-to-urban migration that may have had negative effects on the psychological wellbeing of children. This hypothesized relationship of rapid development and mental health problems in children is supported by the apparent increase in the prevalence of common behavioral and emotional problems among school-age children over recent decades.[1-4] Some of these common psychological problems can be treated relatively easily or even prevented if recognized early, so the development of screening tools that can identify high-risk children is an important part of the effort to protect the psychological wellbeing of the nation's children and adolescents.

The Strengths and Difficulties Questionnaire (SDQ) is a brief psychopathology screening tool administered to parents or teachers that assesses the emotional symptoms, conduct problems, peer relationships and other psychological characteristics of children and adolescents.[5] It has been extensively evaluated and widely used around the world to screen children

for psychopathology.[6-8] Previous studies in China have found that the SDQ has good psychometric properties,[9,10] but there have been no studies that use the SDQ in both urban and rural children or that involve multiple provinces. Moreover, no cutoff scores for identifying high-risk children who merit further clinical evaluation have been established for China.

In the current study, we administered the parent-rated version of the SDQ to the parents of a large community sample (n=22,108) of urban and rural primary school students from eight provinces of China, assessed the relationship of the SDQ subscale scores to various demographic factors, and used the results to recommend cutoff scores for identifying high-risk children in China.
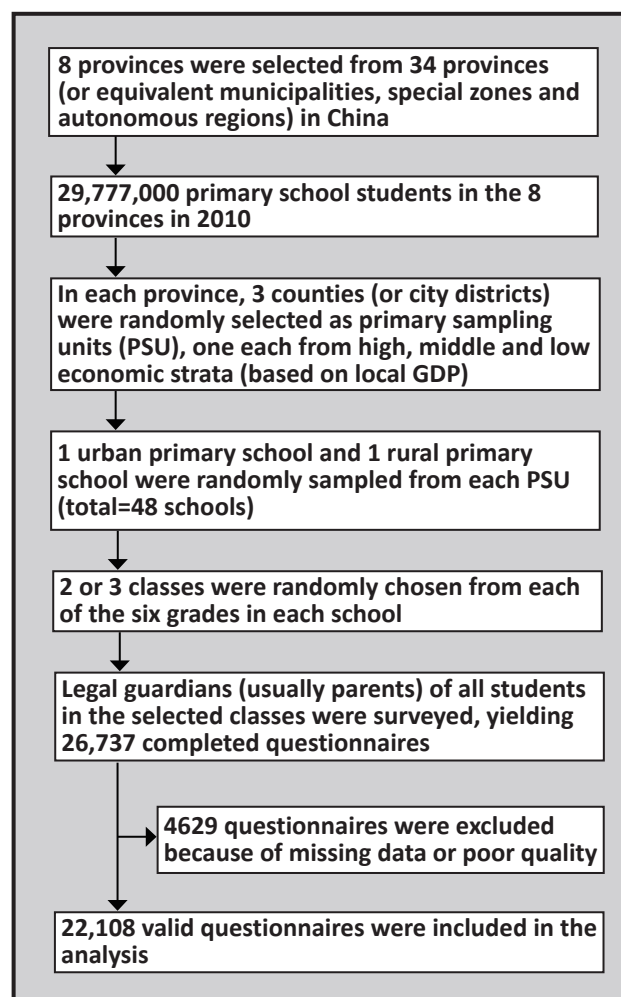
2. Method

2.1 Subjects

The data used in this report are from the study entitled: 'Intervention Model for Chronic Diseases among School Children in China.' This study was funded by the Chinese Center for Disease Control and Prevention Research Foundation and was conducted in 2010 in eight provinces: Inner Mongolia, Jiangsu, Anhui, Shandong, Hunan, Guangxi, Chongqing and Gansu. As shown in Figure 1, a multi-stage cluster sampling method was used. The per capita GDP of all counties and urban districts (i.e., 'primary sampling units' [PSUs]) in each of the eight provinces was obtained from the China Statistical Information Network and the provincial Statistical Information Network. The PSUs in each province were evenly divided into three economic strata: high, medium and low per capita GDP. In each of the eight provinces one PSU was randomly selected from each stratum. Then in each selected PSU, one urban primary school and one rural primary school were randomly sampled. Using this method, 24 urban and 24 rural schools were sampled. In each school two or three classes were randomly selected from each of the six grades (i.e., grade 1 to grade 6) to ensure a sample size of at least 80 students from each grade. In one of the selected rural schools, there were less than 80 students in every grade, so classes of the same grades from a nearby school were recruited to achieve the required sample of 80 students. The survey was administered by trained investigators to the legal guardians of all students in selected classes during parent-teacher conferences. (In China, virtually all parents attend these conferences.) A total of 26,737 questionnaires were completed and returned; questionnaires that had multiple un-answered items or in which all the answers were the same (suggesting poor quality) were excluded; this left a final sample of 22,108 (82.7%) successfully completed surveys.

All respondents signed informed consent before the survey. The study was approved by the Institutional Review Board of the Chinese Center for Disease Control and Prevention.

Figure 1. The identification of participants

8 provinces were selected from 34 provinces (or equivalent municipalities, special zones and autonomous regions) in China

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29,777,000 primary school students in the 8 provinces in 2010

↓

In each province, 3 counties (or city districts) were randomly selected as primary sampling units (PSU), one each from high, middle and low economic strata (based on local GDP)

↓

1 urban primary school and 1 rural primary school were randomly sampled from each PSU (total=48 schools)

↓

2 or 3 classes were randomly chosen from each of the six grades in each school

↓

Legal guardians (usually parents) of all students in the selected classes were surveyed, yielding 26,737 completed questionnaires

↓

4629 questionnaires were excluded because of missing data or poor quality

↓

22,108 valid questionnaires were included in the analysis

2.2 Assessments

Basic demographic information collected as part of the survey included the relationship of the respondent with the target child and the target child's gender and age. The urban versus rural location of the PSU and the economic strata of the PSU (high, medium or low) in which each child's school was located were also recoded.

The SDQ is a 25-item scale with five subscales that each have 5 items. Each item is rated on a 3-point Likert scale: not true (0), somewhat true (1) and certainly true (2). Thus, the subscale scores range between 0 and 10. Four of the SDQ subscales measure difficulties that the child has, including emotional problems, problems of conduct, hyperactivity or inattention, and peer relationship problems. The total difficulties score is the sum of these four subscale scores ranging from 0 to 40, with higher scores indicating more difficulties. The fifth subscale measures positive (i.e., prosocial) attributes of the individual, such as the willingness to help others and to share. A previous study using the Chinese version of the parent-rated SDQ reported that the internal

consistency of the full scale was satisfactory (Cronbach's α=0.60).[9] Another study in China reported that the correlation between item scores and subscale total scores ranged from 0.32 to 0.77 and that the test-retest correlation of items ranges from 0.43 to 0.79.[10] And the SDQ scores in China correlate with the scores on the Chinese version of the Achenbach's Child Behavior Checklist (CBCL).[11]

We used the percentile banding method suggested by Goodman[12] to identify cutoff scores for the total difficulty score associated with 'abnormal', 'borderline' and 'normal' results. Total parental SDQ scores above the 90th percentile were classified as abnormal, those in the 80th to 90th percentile range as 'borderline', and those below the 80th percentile as 'normal'.

2.3 Statistical analysis

Data were independently double entered using EPI Data 3.0. All statistical analyses were carried out using SPSS software version 17.0. Descriptive statistics were used to describe the demographic variables, SDQ scores and threshold values. The internal consistency of SDQ was assessed using Cronbach's alpha. Independent sample t-tests were used to compare the SDQ scores by gender (male v. female) and residence (urban v. rural). Pearson correlation coefficients were calculated to measure the correlation between age and SDQ scores. Multivariate linear regression was used to identify factors that were independently associated with the SDQ subscale scores. Results were considered statistically significant when $p<0.05$.

3. Results

3.1 General information

The demographic characteristics of the sample are shown in Table 1. Among the 22,108 children, 11,863 (53.7%) were male and 10,245 (46.3%) were female. A total of 11,431 (51.7%) lived in urban areas and 10,677 (48.3%) in rural areas. Their age ranged from 5 to 13 years with a mean (sd) age of 9.3 (1.8) years. Among the informants who completed the survey, 19,749 (89.3%) were parents and 2359 (10.7%) were other relatives.

3.2 Internal consistency

The internal consistency of the SDQ subscales were as follows: emotional symptoms (Cronbach's α=0.57), conduct problems (Cronbach's α=0.50), hyperactivity/inattention (Cronbach's α=0.62), peer relationship problems (Cronbach's α=0.22), and prosocial behaviors (Cronbach's α=0.65). Cronbach's α for the total difficulties scale (i.e. the sum of the first four subscale scores) was 0.69 and Cronbach's α for all 25 items (using reverse coding for the prosocial behavior items) was 0.73.

3.3 Distribution of the SDQ scores in Chinese students

The male-female differences of SDQ scores stratifying by age are shown in Table 2. There were no statistically

Table 1. Characteristics of the 22,108 surveyed primary school students and their informants from 8 provinces in China

Demographic characteristics of the children	
age in years, mean(sd)	9.3 (1.8)
male, n(%)	11863 (53.7%)
urban resident, n(%)	11431 (51.7%)
Relationship between informant and the child[a]	
mother, n(%)	10725 (48.5%)
father, n(%)	8996 (40.7%)
grandparent, n(%)	1200 (5.4%)
other relative, n(%)	959 (4.4%)

[a] In 200 cases the relationship between the informant and child was unspecified.

significant differences between any of the subscale scores at age 5 and only one significant difference existed at age 13 (higher hyperactivity/inattention in boys). In the intervening years of 6 through 12, girls had more prosocial behaviors while boys had higher scores on the hyperactivity/inattention subscale, the conduct problems subscale and on the total difficulties score.

The correlation between age and SDQ scores is shown in Table 3, and the mean scores of each SDQ subscale by age for boys and girls are shown in Figures 2 and 3. In both boys and girls hyperactivity/inattention decreased with age, while peer relationship problems became more common with increasing age. There was also an increase in reports of emotional problems with age in girls and, to a lesser extent, in boys.

The rural-urban comparison of SDQ scores stratified by gender are shown in Table 4. As reported by their guardians, compared to urban children rural children (both boys and girls) had more emotional symptoms, more conduct problems, more peer relationship troubles and less prosocial behaviors. The total difficulty scores were significantly higher among children from rural areas (t=13.66 $p<0.001$). On the other hand, boys who lived in urban areas tended to have more hyperactivity/inattention symptoms compared to boys from rural areas, but this was not the case for urban girls versus rural girls.

As shown in Table 5, these urban-rural differences remained statistically significant for all SDQ subscales even after adjusting for gender, age, type of informant (parent v. other relative) and economic strata of the community within the province (high, medium or low per capita GDP). Interestingly, the economic strata of the community also had a significant association with all SDQ subscale scores even after adjusting for the rural versus urban variable: compared to children from high-income counties or urban districts, students from medium- or low-income communities had higher levels of emotional symptoms, more conduct problems, more peer relationship problems, less prosocial behavior and

Table 2. Scores on the parent-rated Strengths and Difficulties Questionnaire (SDQ) of 22,108 primary school children from 8 provinces in China

Age (in years)	Gender	n	Emotional symptoms mean (sd)	Hyperactivity/ inattention mean (sd)	Conduct problems mean (sd)	Peer problems mean (sd)	Total difficulties mean (sd)	Prosocial behavior mean (sd)
5	male	92	2.6 (2.2)	4.8 (2.2)	2.4 (1.5)	3.5 (1.8)	13.3 (5.1)	5.7 (2.2)
	female	107	2.3 (1.8)	4.5 (2.2)	2.2 (1.7)	3.2 (1.7)	12.2 (5.5)	6.2 (2.1)
6	male	1430	2.2 (1.9)	4.8 (2.2)[b]	2.1 (1.6)[a]	3.1 (1.7)	12.3 (4.8)[b]	6.0 (2.0)
	female	1319	2.3 (1.9)	4.2 (2.1)	1.9 (1.6)	3.1 (1.7)	11.6 (4.9)	6.4 (2.0)[b]
7	male	1913	2.3 (1.9)	4.8 (2.2)[b]	2.2 (1.6)[a]	3.2 (1.7)	12.5 (4.9)[b]	6.1 (2.1)
	female	1565	2.3 (1.9)	4.3 (2.1)	2.0 (1.6)	3.2 (1.7)	11.8 (5.0)	6.3 (2.1)[a]
8	male	1891	2.2 (1.9)	4.7 (2.2)[b]	2.2 (1.7)[b]	3.3 (1.7)	12.5 (4.9)[b]	6.1 (2.1)
	female	1572	2.4 (1.9)[a]	4.2 (2.2)	2.0 (1.6)	3.3 (1.7)	11.9 (4.9)	6.5 (2.1)[b]
9	male	1868	2.3 (2.0)	4.7 (2.3)[b]	2.2 (1.6)[a]	3.4 (1.7)	12.6 (4.9)[b]	6.1 (2.1)
	female	1760	2.4 (2.0)	4.0 (2.2)	2.0 (1.6)	3.4 (1.7)	11.8 (5.2)	6.5 (2.1)[b]
10	male	2146	2.3 (2.0)	4.4 (2.2)[b]	2.1 (1.7)[b]	3.4 (1.8)	12.3 (5.0)[b]	6.2 (2.1)
	female	1855	2.3 (2.0)	3.9 (2.2)	1.9 (1.5)	3.3 (1.7)	11.4 (5.0)	6.5 (2.1)[b]
11	male	1712	2.3 (2.0)	4.3 (2.3)[b]	2.1 (1.6)[b]	3.4 (1.7)	12.2 (4.9)[b]	6.2 (2.1)
	female	1453	2.4 (1.9)	3.7 (2.1)	1.9 (1.6)	3.4 (1.7)	11.4 (4.9)	6.6 (2.1)[b]
12	male	702	2.4 (2.1)	4.1 (2.1)[b]	2.2 (1.8)[a]	3.7 (1.7)	12.5 (5.1)[a]	5.9 (2.1)
	female	534	2.6 (2.0)	3.6 (2.0)	2.0 (1.6)	3.7 (1.7)	11.8 (4.7)	6.3 (2.1)[a]
13	male	109	2.6 (2.4)	4.0 (2.2)[a]	2.0 (1.8)	4.1 (1.8)	12.7 (5.6)	6.0 (2.2)
	female	80	2.8 (2.3)	3.3 (2.0)	1.9 (1.7)	4.0 (1.7)	11.9 (5.3)	6.4 (1.9)

[a] The score is higher than that of the other gender at the 0.05 significance level.
[b] The score is higher than that of the other gender at the 0.001 significance level.

Table 3. Correlation of age with scores on the parent-rated Strengths and Difficulties Questionnaire (SDQ) for male and female schoolchildren from 8 provinces in China

Subscales	Correlation with age among boys (n=11,863)		Correlation with age among girls (n=10,245)	
	r	p	r	p
Emotional symptoms	0.019	**0.041**	0.024	**0.013**
Conduct problems	-0.005	0.612	-0.022	**0.023**
Hyperactivity/Inattention	-0.100	**<0.001**	-0.113	**<0.001**
Peer relationship problems	0.075	**<0.001**	0.075	**<0.001**
Total difficulties	-0.013	0.154	-0.020	**0.040**
Prosocial behavior	0.016	0.081	0.028	**0.004**

Figure 2. Parent-rated Strengths and Difficulties Questionnaire (SDQ) scores by age among boys
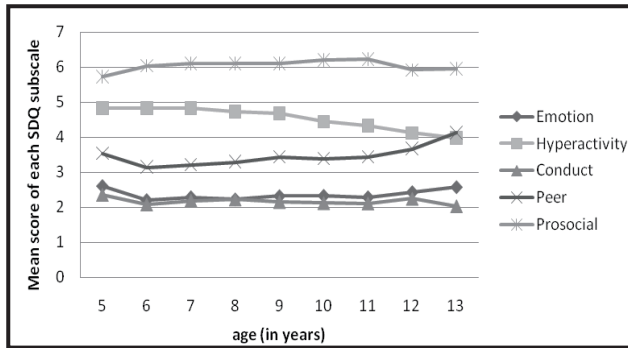

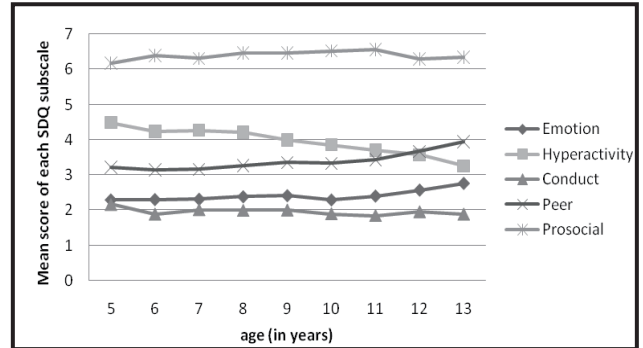**Figure 3. Parent-rated Strengths and Difficulties Questionnaire (SDQ) scores by age among girls**

Table 4. Urban-rural comparison of the subscale scores of the parent-rated Strengths and Difficulties Questionnaire (SDQ) in a random sample of 22,108 children from 8 provinces in China

Subscales	Total n=22,108 mean (sd)	Rural areas n=11,431 mean (sd)	Urban areas n=10,677 mean (sd)	*t*	*p*
Emotional symptoms					
male	2.3 (2.0)	2.5 (2.0)	2.1 (1.9)	11.46	<0.001
female	2.4 (2.0)	2.6 (2.0)	2.2 (1.9)	10.34	<0.001
total	2.3 (2.0)	2.5 (2.0)	2.1 (1.9)	15.42	<0.001
Conduct problems					
male	2.2 (1.7)	2.3 (1.7)	2.1 (1. 6)	6.46	<0.001
female	2.0 (1.6)	2.0 (1.7)	1.9 (1.5)	5.29	<0.001
total	2.1 (1.6)	2.2 (1.7)	2.0 (1.5)	8.38	<0.001
Hyperactivity/Inattention					
male	4.6 (2.2)	4.5 (2.2)	4.7 (2.3)	-6.32	<0.001
female	4.0 (2.1)	4.0 (2.1)	4.1 (2.2)	-1.67	0.095
total	4.3 (2.2)	4.2 (2.1)	4.4 (2.3)	-5.65	<0.001
Peer relationship problems					
male	3.4 (1.7)	3.6 (1.7)	3.1 (1.7)	15.77	<0.001
female	3.3 (1.7)	3.6 (1.7)	3.1 (1.7)	14.52	<0.001
total	3.3 (1.7)	3.6 (1.7)	3.1 (1.7)	21.45	<0.001
Total difficulties					
male	12.4 (4.9)	12.8 (5.0)	12.0 (4.8)	9.34	<0.001
female	11.6 (5.0)	12.2 (5.0)	11.2 (4.9)	9.96	<0.001
total	12.1 (5.0)	12.5 (5.0)	11.6 (4.9)	13.66	<0.001
Prosocial behavior					
male	6.1 (2.1)	5.9 (2.1)	6.3 (2.1)	-11.05	<0.001
female	6.5 (2.1)	6.2 (2.1)	6.7 (2.1)	-12.49	<0.001
total	6.3 (2.1)	6.0 (2.1)	6.5 (2.1)	-16.61	<0.001

Table 5. Multiple linear regression of demographic characteristics associated with subscale scores on the parent-rated Strengths and Difficulties Questionnaire (SDQ) among 21,108 children from 8 provinces in China

	Regression coefficient (β)	Standardized regression coefficient (Beta)	t	p	Adjusted R^2 (p-value)
Emotional symptoms					0.015 (<0.001)
female gender	0.07	0.02	2.67	0.008	
age	0.02	0.02	2.32	0.020	
non-parents as informants	0.32	0.05	7.56	<0.001	
rural resident	0.37	0.10	14.19	<0.001	
regional economic level[a]					
medium	0.17	0.04	5.30	<0.001	
low	0.14	0.03	4.24	<0.001	
Hyperactivity/Inattention					0.030 (<0.001)
female gender	-0.59	-0.13	-20.00	<0.001	
age	-0.12	-0.10	-15.52	<0.001	
non-parents as informants	-0.06	-0.01	-1.17	0.244	
rural resident	-0.14	-0.03	-4.86	<0.001	
regional economic level[a]					
medium	-0.07	-0.02	-1.97	0.049	
low	-0.17	-0.04	-4.88	<0.001	
Conduct problems					0.010 (<0.001)
female gender	-0.20	-0.06	-9.38	<0.001	
age	-0.01	-0.02	-2.40	0.016	
non-parents as informants	0.18	0.03	5.03	<0.001	
rural resident	0.17	0.05	7.56	<0.001	
regional economic level[a]					
medium	0.06	0.02	2.27	0.023	
low	0.14	0.04	5.24	<0.001	
Peer relationship problems					0.037 (<0.001)
female gender	-0.04	-0.01	-1.62	0.105	
age	0.06	0.07	10.01	<0.001	
non-parents as informants	0.34	0.06	9.05	<0.001	
rural resident	0.45	0.13	19.40	<0.001	
regional economic level[a]					
medium	0.26	0.07	9.44	<0.001	
low	0.32	0.09	11.63	<0.001	
Total difficulties					0.019 (<0.001)
female gender	-0.76	-0.08	-11.39	<0.001	
age	-0.06	-0.02	-3.28	0.001	
non-parents as informants	0.78	0.05	7.20	<0.001	
rural resident	0.84	0.08	12.56	<0.001	
regional economic level[a]					
medium	0.42	0.04	5.20	<0.001	
low	0.42	0.04	5.22	<0.001	
Prosocial behavior					0.027 (<0.001)
female gender	0.32	0.08	11.47	<0.001	
age	0.03	0.03	4.33	<0.001	
non-parents as informants	-0.29	-0.04	-6.35	<0.001	
rural resident	-0.43	-0.10	-15.32	<0.001	
regional economic level[a]					
medium	-0.27	-0.06	-7.82	<0.001	
low	-0.40	-0.09	-11.60	<0.001	

[a] High economic level is the reference group

lower levels of hyperactivity/inactivity. One unexpected finding was that children for whom a non-parent guardian (usually a grandparent or other relative) completed the survey had significantly more difficulties and significantly less prosocial behavior that children for whom a parent completed the survey.

3.4 Recommended SDQ cutoff scores in China and comparison with cutoff scores used in other countries

The cutoff scores for classifying results as 'abnormal', 'borderline' and 'normal' (see methods section for method of doing this), are presented in Table 6 along with the corresponding cutoff scores used in Japan[13] and the United Kingdom.[14] For total difficulties, hyperactivity/inattention and peer relationship problems, the cutoff scores for borderline and abnormal ranges in China were higher than those in Japan and the United Kingdom. For prosocial behavior, the cutoff scores were lower in China compared to those in Japan and the United Kingdom. For conduct problems, the cutoff scores in China and the United Kingdom were similar, but both of these scores were higher than those employed in Japan. For the emotional symptoms subscale, all three countries used similar cutoff scores.

4. Discussions

4.1 Main Findings

Parents and guardians of 6 to 12 year-old boys reported more hyperactivity/inattention issues, more conduct

problems, higher total difficulties scores and less prosocial behaviors than parents of girls. Parental reports of the prevalence of emotional symptoms were similar in boys and girls at most ages, but girls 8 years old had more emotional symptoms than boys at the same age. We also found that among children 5 to 13 years old scores of hyperactivity/inattention decreased with age, but scores of emotional symptoms increased with age. These findings are similar those reported previously in China and elsewhere,[15,16] and fit with current understanding of the psychological development and socialization of primary school aged children.

We found that psychological and behavioral problems reported by guardians were significantly more severe among children from rural areas than among children from urban areas. Children living in rural communities had more emotional symptoms, more conduct problems, more peer interaction problems, higher total difficulties scores and less prosocial behaviors. These differences might be due to socio-economic factors such as lower family income, lower parental level of education and parental unemployment.[15] Another factor that may be related to this result is that in rural China a large number of children are 'left behind' when their parents migrate to cities for work. In a survey conducted in rural Hunan province using SDQ to compare 'left behind' children and children living with their parents, 'left behind' children had significantly higher total difficulty scores and significantly lower prosocial behavior scores.[17] In our study, even though we cannot be certain that all the children without

Table 6. Comparison of cutoff scores of the parent-rated Strengths and Difficulties Questionnaire (SDQ) among primary school age children from China[a], Japan[b] and the United Kingdom[c]

	Normal range cutoffs (exact %)			Borderline range cutoffs (exact %)			Abnormal range cutoffs (exact %)		
	China	Japan	United Kingdom	China	Japan	United Kingdom	China	Japan	United Kingdom
Emotional problems	0-3 (75%)	0-3 (84%)	0-3 (81%)	4 (11%)	4 (7%)	4 (8%)	5-10 (14%)	5-10 (9%)	5-10 (11%)
Conduct problems	0-3 (83%)	0-3 (84%)	0-2 (76%)	4 (9%)	4 (9%)	3 (11%)	5-10 (9%)	5-10 (7%)	4-10 (13%)
Hyperactivity/ Inattention	0-6 (84%)	0-5 (84%)	0-5 (78%)	7 (8%)	6 (7%)	6 (7%)	8-10 (9%)	7-10 (10%)	7-10 (15%)
Peer relationship problems	0-4 (75%)	0-3 (90%)	0-2 (78%)	5 (14%)	4 (6%)	3 (10%)	6-10 (11%)	5-10 (4%)	4-10 (12%)
Total difficulties	0-16 (81%)	0-12 (80%)	0-13 (82%)	17-18 (8%)	13-15 (10%)	14-16 (8%)	19-40 (11%)	16-40 (10%)	17-40 (10%)
Prosocial behavior	5-10 (81%)	6-10 (71%)	8-10 (80%)	4 (10%)	5 (16%)	7 (10%)	0-3 (9%)	0-4 (13%)	0-6 (11%)

[a] 22,108 children 5 to 13 years old; 53.7% boys and 46.3% girls.

[b] 2,899 children 4 to 12 years old; 50.5% boys and 49.5% girls.

[c] 10,298 children 5 to 15 years old; 50.0% boys and 50.0% girls.

parents as informants were not living with their parents, the fact that there were more psychological problems in children who did not have parents come to the parent-teacher meetings echoes previous findings and highlights the need to pay increased attention to the psychological health of these 'left-behind' children.

However, another possible explanation for these urban-rural differences is that rural respondents are less sensitive to the stigmatizing effect of reporting emotional and behavioral problems in their children than urban residents. If that is the case, their report of more prevalent problems may not reflect true differences in the behavior of rural versus urban children. Similarly, the more common reports of hyperactivity/inattention problems in urban versus rural boys may reflect different levels of awareness about the importance of this as a 'problem' between urban versus rural communities; it does not necessarily mean that there are significant differences in the prevalence of these problems. Future studies are needed to explore the reasons for these observed urban-rural differences.

Using the percentile method of categorizing results as 'abnormal', 'borderline' and 'normal' as described by Goodman,[12] we found that the cutoff scores in Chinese children were different from those reported for Japan and the United Kingdom.[13,14] The cutoff scores we recommend in China for total difficulties, hyperactivity/inattention, peer relationship problems and conduct problems among Chinese children were higher than those used in Japan and the United Kingdom, but the cutoff scores for emotional symptoms and prosocial behaviors were lower. These results suggest that difficulties in attention, discipline and peer interaction were more common among children in China while prosocial behaviors such as helping, sharing and caring were less common in Chinese children. There are several possible explanations for these differences. (a) Our sample included a higher proportion of boys (53.7% versus 50.5% in the Japan study and 50.0% in the United Kingdom study). Boys tend to have higher difficulty scores and lower prosocial behavior scores so this could have resulted in greater difficulties and less prosocial behaviors in the Chinese sample. (b) Our finding of a higher prevalence of psychological problems in children from rural areas and from economically deprived communities suggests that the lower level of urbanization and economic development in China compared to that in Japan and the United Kingdom may be a factor in the higher levels of reported psychological problems in children in China. (c) Cross-cultural differences in parental expectation may also be a factor. In collectivistic cultures like China and Japan, children are usually encouraged to be modest and disciplined, while in individualistic cultures children are encouraged to be independent and self-confident. Parents in China and Japan may have more demanding standards when assessing the psychological and behavioral performance of their children and, thus, tend to report more difficulties instead of strengths. Similarly, the Japanese culture highly emphasizes politeness, obedience and collectivism; this may contribute to the lower cutoff scores in Japan compared to China on hyperactivity/inattention and peer relationship problem subscales. Future studies are needed to understand these cross-cultural differences.

4.2 Limitations

The current study has the following limitations. (a) Data from 17.3% of the surveyed participants were excluded because of missing data or indications of compromised quality (e.g. same answers to all questions). It is possible that these children have different profiles than those in which the guardians appropriately completed the survey. Some evidence suggests that children from families in which parents are less capable of completing the questionnaires might be at a higher risk of psychological and behavioral problems.[15] (b) Only a parent-rated SDQ was used in this study; other studies have combined parental ratings with those of teachers and, occasionally, older siblings.[18] We were, therefore, unable to compare the categorization based on parental SDQ scores to those of other informants. (c) No 'gold standard' diagnostic assessment was conducted so it is not possible to determine the sensitivity and specificity of the proposed cut off score – which is based on the arbitrary decision that 10% of children are 'abnormal' – for identifying mental disorders. (d) The questionnaires were filled out by the guardians of the children who attended the parent-teacher conferences. It is possible that the person who filled out the questionnaire did not know the child very well; if this was the case it would undermine the validity of the assessment. (e) The internal consistency of the peer relationship subscale was very low (alpha=0.22). This suggests that this subscale score is a sub-optimal measure for peer relationship in China and that more work will be needed to revise this subscale for use in China. (f) We did not conduct test-retest assessments of SDQ in this study so the stability of the measures over time is unknown. (g) Despite being the largest such study using SDQ yet conducted in China, the sample was not nationally representative so there may be unknown biases in the study. (h) Finally, the very large sample was one of the strengths of the study, but with such a large study very small differences in mean scores between groups can easily achieve statistical significance. Thus some of the differences identified between groups, though statistically significant, may not be of practical importance.

4.3 Significance

This study identified a stratified random sample of over 20,000 schoolchildren 5 to 13 years of age in 8 provinces of China – a sampling frame that covered more than 30 percent of all children in this age group in the country. Though not nationally representative, it is the largest such study conducted in China to date so it provides

a detailed overview of the types of psychological problems experienced by children attending primary school. This information is essential for developing teacher-training programs about children's psychological problems, for planning screening campaigns for mental disorders, and for developing treatment services for children with mental disorders. For example, this study indicates that screening for hyperactivity/inattention problems in boys should start before the age of 10 and coaching in developing and maintaining good peer relationships should start in the early teen years. If the rural-urban differences identified in the study are confirmed in more detailed studies, there will be a clear need to develop intervention strategies to enhance rural children's mental health. Further work is also needed to determine whether or not the cutoff scores identified for the Chinese version of the SDQ actually identify a high-risk group of children that are in need of clinical services. If the SDQ proves to have good sensitivity and specificity for identifying children who meet formal diagnostic criteria of mental disorders, mechanisms for providing these services in ways that will be acceptable both to the parents and to the children will need to be developed and tested.

Conflict of interest

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•论著•

长处与困难问卷（父母版）在中国八个省份 22,108 名小学生中的调查结果

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摘要

背景：我国儿童心理问题不断增多，因此能够快速有效评估儿童的行为和情绪问题的筛查工具对于促进我国儿童身心健康和预防儿童精神疾病有重要的意义。

目的：在来源于中国不同地区城市和农村的大样本儿童中对国际公认的长处和困难问卷（SDQ）中文版的使用进行评估，包括情绪症状、品行问题、多动 / 注意缺陷、同伴交往问题和亲社会行为。

方法：采用分层随机抽样选取八省 22,108 名 5~13 岁小学生，请其的监护人（主要为父母）填写 SDQ 进行评估。本研究探讨了 SDQ 得分与其他社会人口学特征的关系，并将所得到的筛查界值与日本和英国相关研究的筛查界值进行了比较。

结果：在中文版 SDQ（父母版）的五个分量表中，四个分量表的内部一致性尚可，但是"同伴关系"分量表的内部一致性效度较差（α=0.22）。依据监护人的报告，男孩比女孩的多动 / 注意力缺陷问题更突出，而女孩比男孩的情绪问题更突出。对于 5~13 岁的男孩女孩，多动 / 注意力缺陷问题随着年龄增长而减少，同伴交往困难随着年龄增长而增多。农村地区和监护人不是父母（即祖父母或其他亲属）的孩子中，情绪症状、品行问题和同伴交往问题较为普遍。我国儿童的 SDQ 困难总分的划界异常值（90% 百分位）为 19~40，高于日本和英国的划界分。

结论：此项研究提示，对男孩的多动 / 注意缺陷问题应在十岁之前开始预防，并且在青春期早期就要开始训练如何减轻与同伴交往带来的压力。进一步的研究需要注重于提高 SDQ 在中国文化背景下的信效度，并确定 SDQ 对达到临床诊断标准的精神疾病是否具有良好的筛查敏感性和特异性。