

Using the Strengths and Difficulties Questionnaire (SDQ) to screen for child mental health status in Mongolia

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Abstract

Objectives: To determine emotional and behavioral problems among adolescents and to define risk factors for these emotional and behavioral problems.

Methods: A cross-sectional study was conducted among selected and qualified middle and high school children, their parents and teachers. The "Strength and Difficulties Questionnaire" (SDQ) was employed with the intention to measure psychosocial problems and strengths [prosocial behavior] in children between the ages of 4-10 and adolescents ages 11-17, through a multi-informant methodology. The questionnaire consists of 25 items equally divided across five scales measuring: 1) emotional symptoms; 2) conduct problems; 3) hyperactivity-inattention; 4) peer problems; and 5) prosocial behavior. Except for the prosocial scale, the combined scale (Total Score) reflects total difficulties, indicating the severity and content of the psychosocial problems. The prosocial scale indicates the amount of prosocial characteristics a child displays.

Results: In the SDQ questionnaires answered by parents, we obtained the following scores: 27.4% for emotional symptoms, 28.2% for conduct disorders, 20.4% for hyperactivity, 81.4% for interpersonal relationships, and 43.3% as the Total Score. In the SDQ questionnaires answered by teachers, we obtained high scorings such as 8.9% for emotional symptoms, 20.2% for conduct disorders, 13.4% for hyperactivity, 47.6% for interpersonal relationships, and a Total Score of 33.4%. In the SDQ questionnaires answered by the adolescents themselves, we obtained scorings such as: 10.0% for emotional symptoms, 10.2% for conduct disorders, 18.8% for hyperactivity, 14.6% for interpersonal relationships, and 16.3% as the Total Score.

Conclusion: Mongolian adolescents have emotional and behavioral problems as confirmed by the Total Scores of parents 43.3%, by teachers 33.4% and self-reports 16.3%. The SDQ confirmed that an adolescent's age, gender, family environment and living areas will influence their emotional and behavioral well-being.

Keywords: Emotions; Adolescent; Mental health; Adolescent behavior

Introduction

Mental health problems in children are common throughout the world. According to estimates provided by the World Health Organization, 20% or one-fifth of children worldwide suffer with mental and behavioral disorders. Most are adolescents between the ages of 10-19.

World Health Report-2001 showed the prevalence of anxiety was 13.0%, behavioral disorders 10.3%, and emotional disorders 6.2% among children ages 9-17. At minimum, 3% of school-age children complain of severe depression, suicidal thoughts, psychosis and attention-deficit hyperactivity disorders.

Epidemiological studies demonstrate that 13-25% of adolescents will meet the criteria for a mental disorder during their lifetime. Adolescence is an important period in the life of a child. Adolescent mental health problems often go unnoticed. Therefore, "screening" tools can aid early detection of these problems to facilitate early intervention and a child's access to effective treatments [1].

According to a British study conducted by R. Goodman. et al. among 10438 children aged 5-15 the Strength and Difficulties Questionnaires (SDQ) identified individuals with a psychiatric diagnosis with a specificity of 94.6% and a sensitivity of 63.3%. The SDQ identified over 70% of individuals with emotional and behavioral problems. Approximately, 10% these children and adolescents reported having

psychiatric disorders. However, only about 20% were in contact with a specialist from the mental health service [2,3]. According to the British school-based survey results, 18-22% of participants were diagnosed with mental health problems including 5-8% diagnosed with severe emotional disorders [4-6].

According to the results of a study by the Global School based Student Health Survey 2013 in Mongolia, 23% of 5393 students aged 12-17 were seriously considering suicidal behavior; and 9.6% did attempt suicide within the past year. Girls attempt at suicide were more frequent than boys.

In the World Health Organization Report Instrument for Mental Health Systems /WHO-AIMS/ 2006 reported; "Mongolia does not offer child and adolescence mental health services. Furthermore,

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special attention needs to be given to develop competent professional services in the area of child and adolescent mental health in Mongolia” [2]. The purposes of this study were: 1) determine results of emotional and behavioral problems of adolescents and 2) define risk factors for emotional and behavioral problems among adolescents.

Method

Study population

Our study was a cross-sectional study of 22 schools selected from Ulaanbaatar City and 50 schools from rural areas. Total sample sizes were: 2250 adolescents, 2250 parents and 72 teachers. Participants signed consent forms after introduction and discussion of ethical issues and had to meet the inclusion criteria of the survey. Inclusion criteria are: 1) School children of middle and high school; 2) Access to school children’s parents and their teachers; 3) Agreements of school children and their parents and teachers to participate in the survey; 4) School children, parents and teachers must be able to understand and provide answers to the SDQ.

Data collection was done during the period of 1st February to 30th March 2013, among 22 schools of 7 districts in Ulaanbaatar and

in urban areas among 50 schools of 8 aimags during the period of 1st September to 30th November.

Instruments

We used various versions of the Strengths and Difficulties Questionnaire (SDQ) applicable for children, adolescents, parents and teachers (S11-17, P11-18, T11-17). SDQs for self-assessment by adolescents asked the same 25 questions, though the wording was slightly different (Goodman et al.). This self-assessment version is suitable for young people ages 11-17--depending on their level of understanding and literacy. These 25 items are divided into 5 scales: 1) hyperactivity/inattention; 2) emotional symptoms; 3) conduct problems; 4) peer relationship problems; and 5) prosocial behavior. Each item can be answered as ‘Certainly True’, ‘Somewhat true’, ‘Not true’ being weighted using a 0 to 2 score depending on the template (Table 1). The Total Score of difficulties typically ranging from 0 to 40, with higher scores indicating more difficulties.

The prosocial scale score is not incorporated in the Total Score of difficulties, as the absence of prosocial behaviors is conceptually different from the presence of psychological difficulties

Items	SDQs 5 scales	Not True	Somewhat True	Certainly True
Emotional problems Scale				
ITEM 3:	Often complains of headaches... (<i>I get a lot of headaches...</i>)	0	1	2
ITEM 8:	Many worries... (<i>I worry a lot</i>)	0	1	2
ITEM 13:	Often unhappy, downhearted... (<i>I am often unhappy...</i>)	0	1	2
ITEM 16:	Nervous or clingy in new situations... (<i>I am nervous in new situations...</i>)	0	1	2
ITEM 24:	Many fears, easily scared (<i>I have many fears...</i>)	0	1	2
Emotional problems Scales score range		0-10 score		
Conduct problems Scale				
ITEM 5:	Often has temper tantrums or hot tempers (<i>I get very angry</i>)	0	1	2
ITEM 7:	Generally obedient... (<i>I usually do as I am told</i>)	2	1	0
ITEM 12:	Often fights with other children... (<i>I fight a lot</i>)	0	1	2
ITEM 18:	Often lies or cheats (<i>I am often accused of lying or cheating</i>)	0	1	2
ITEM 22:	Steals from home, school or elsewhere (<i>I take things that are not mine</i>)	0	1	2
Conduct problems Scales score range		0-10 score		
Hyperactivity scale				
ITEM 2:	Restless, overactive... (<i>I am restless...</i>)	0	1	2
ITEM 10:	Constantly fidgeting or squirming (<i>I am constantly fidgeting....</i>)	0	1	2
ITEM 15:	Easily distracted, concentration wanders (<i>I am easily distracted</i>)	0	1	2
ITEM 21:	Thinks things out before acting (<i>I think before I do things</i>)	2	1	0
ITEM 25:	Sees tasks through to the end... (<i>I finish the work I am doing</i>)	2	1	0
Hyperactivity scales score range		0-10 score		
Peer problems scale				
ITEM 6:	Rather solitary, tends to play alone (<i>I am usually on my own</i>)	0	1	2
ITEM 11:	Has at least one good friend (<i>I have one good friend or more</i>)	2	1	0
ITEM 14:	Generally liked by other children (<i>Other people my age generally like me</i>)	2	1	0
ITEM 19:	Picked on or bullied by other children... (<i>Other children or young people pick on me</i>)	0	1	2
ITEM 23:	Gets on better with adults than with other children (<i>I get on better with adults than with people my age</i>)	0	1	2
Peer problems scales score ranges		0-10 score		
Total difficulties score: This is generated by summing scores from all the scales except the prosocial scale. The resultant score ranges from 0 to 40.				
Prosocial scale				
ITEM 1:	Considerate of other people's feelings (<i>I try to be nice to other people</i>)	0	1	2
ITEM 4:	Shares readily with other children... (<i>I usually share with others</i>)	0	1	2
ITEM 9:	Helpful if someone is hurt... (<i>I am helpful is someone is hurt...</i>)	0	1	2
ITEM 17:	Kind to younger children (<i>I am kind to younger children</i>)	0	1	2
ITEM 20:	Often volunteers to help others... (<i>I often volunteer to help others</i>)	0	1	2

Table 1: Scoring symptom scores on the SDQ for 4-17 year olds.

Scoring the Strengths and Difficulties Questionnaire for age 4-17

The 25 items in the SDQ comprise 5 scales of 5 items each. It is best to score all 5 scales first before calculating the Total (difficulties) Score. ‘Somewhat True’ is always scored as 1, but the scoring of ‘Not True’ and ‘Certainly True’ varies with the item, as shown below scale by scale. For each of the 5 scales the score can range from 0 to 10 if all items were completed (Table 1).

We used the same cut-off points published in the literature and available in the Internet at www.sdqinfo.com to define ‘normal’, ‘borderline’ and ‘abnormal’ scores.

Cut-points for SDQ scores: original three-band solution

Although SDQ scores can be used as continuous variables, it is sometimes convenient to categories scores. The initial bandings presented for the SDQ scores were ‘normal’, ‘borderline’ and ‘abnormal’ (Table 2).

Completed SDQ	Original three-band categorization		
	Normal	Borderline	Abnormal
Parent SDQ			
Total difficulties score	0-13	14-16	17-40
Emotional problems score	0-3	4	5-10
Conduct problems score	0-2	3	4-10
Hyperactivity score	0-5	6	7-10
Peer problems score	0-2	3	4-10
Prosocial score	6-10	5	0-4
Teacher SDQ			
Total difficulties score	0-11	12-15	16-40
Emotional problems score	0-4	5	6-10
Conduct problems score	0-2	3	4-10
Hyperactivity score	0-5	6	7-10
Peer problems score	0-3	4	5-10
Prosocial score	6-10	5	0-4
Self-assessment SDQ			
Total difficulties score	0-15	16-19	20-40
Emotional problems score	0-5	6	7-10
Conduct problems score	0-3	4	5-10
Hyperactivity score	0-5	6	7-10
Peer problems score	0-3	4-5	6-10
Prosocial score	6-10	5	0-4

Table 2: Categorizing SDQ scores for 4-17 year olds.

Statistical Analysis

Data analysis included the SDQs completed by 1959 adolescents, 1959 parents and 72 teachers.

Information was analyzed using SPSS 22.0 for statistical analysis. Descriptive statistical analysis was performed to reveal the prevalence of emotional and behavioral problems among adolescents and calculated with 95 percent confidence intervals (95% CI). After identifying variables to analyze the correlation between parameters we employed the Pearson correlation coefficient and Chi square test. A p-value of less than 0.05 was judged to be statistically significant. Correlations between emotional and behavioral problems among adolescents and their risk factors were calculated by correlation analysis and linear regression to determine confidence intervals (Figures 1-3).

Results

In the rural areas most participants had only elementary educations, an incomplete secondary education or no education. Participants from urban areas had higher education levels including: Master’s degrees and higher.

Regarding employment of participating parents, in urban areas, 25.6% were self-employed, 22.8% production workers, and 22.4% office staff (Figure 4).

Of the marital status: In urban areas most parents were: married, divorced or single. In the rural areas, most parents were cohabitating or widowed (Figure 5).

Regarding housing, in urban areas, most parents live in apartments. In the rural areas, parents living in private houses or gers were most common (Figure 6).

Mean urban household monthly income is approximately 600000 tugriks (about 240 US dollars). Comparing urban areas to rural areas, a rural area household monthly income is less than 200000 tugriks (about 80 US dollars).

Evaluation of parent’s responses determined that hyperactive problems are common in all age groups and genders of school children but most common in boys. Conduct problems prevailed mostly among boys. Emotional symptoms among 17 year old male adolescents (p<0.05), conduct problems among 14 year old male adolescents (p<0.001), hyperactivity problems of male adolescents between 12 and 13 (p<0.05), conduct problems among 14 year old male adolescents

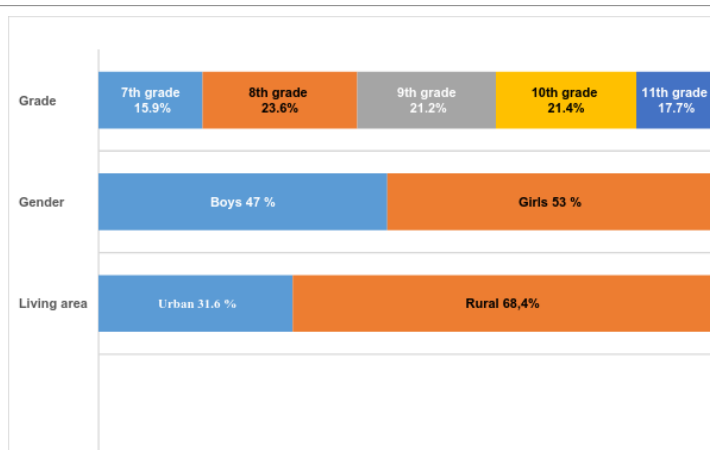


Figure 1: Demographic indications of participants.

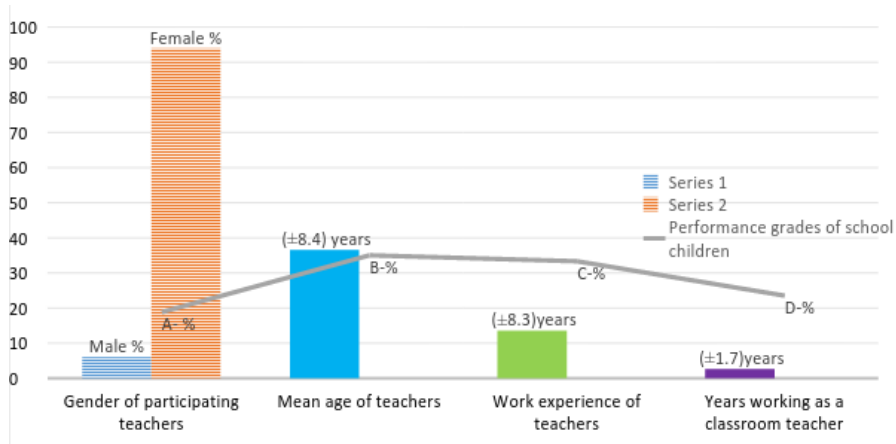


Figure 2: Demographic indications of teachers.

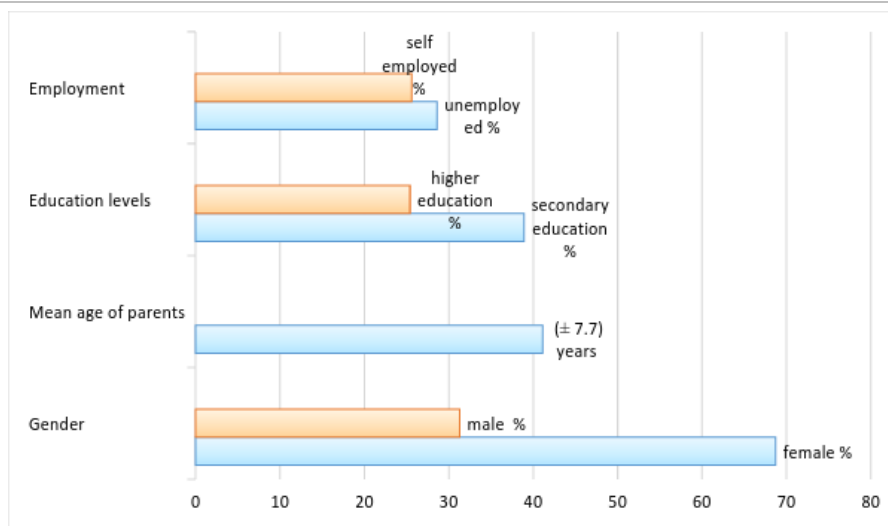


Figure 3: Demographic indications of parents.

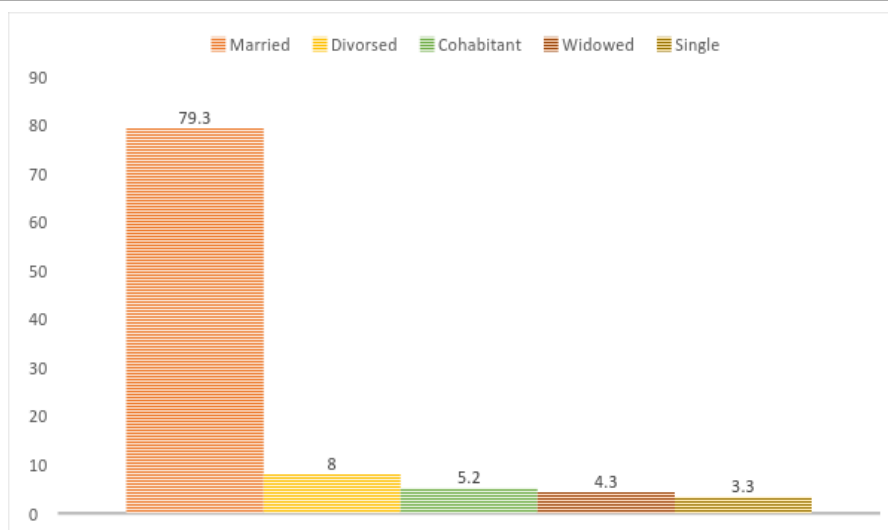


Figure 4: Demographic indications of marital status.



Figure 5: Housing indications of parents.

Age	Gender	n	Emotional	Conduct	Hyperactive	Peer	Prosocial
			Mean ± SD	Mean ± SD	Mean ± SD	Mean ± SD	Mean ± SD
11	Male	17	3.05 ± 1.85	2.70 ± 1.26	5.17 ± 1.33	4.82 ± 1.13	7.41 ± 1.54
	Female	12	2.25 ± 2.13	2.5 ± 1.24	5.25 ± 1.76	4.58 ± 1.08	8.16 ± 1.85
12	Male	150	3.33 ± 1.81	2.86 ± 1.44	5.44 ± 1.61*	4.8 ± 1.35	7.2 ± 1.73*
	Female	124	3.63 ± 2.02	2.94 ± 1.15	4.98 ± 1.67	4.61 ± 1.34	7.70 ± 1.76
13	Male	208	3.41 ± 2.11	3.01 ± 1.58	5.62 ± 1.62*	4.66 ± 1.56	7.47 ± 1.88*
	Female	248	3.50 ± 2.05	2.83 ± 1.25	5.27 ± 1.55	4.54 ± 1.40	7.83 ± 1.72
14	Male	176	3.14 ± 1.88	3.16 ± 1.53**	5.15 ± 1.54	4.61 ± 1.39	7.49 ± 2.02
	Female	207	3.44 ± 2.04	2.68 ± 1.45	5.08 ± 1.56	4.64 ± 1.39	7.79 ± 1.82
15	Male	197	3.02 ± 1.93	3.04 ± 1.52	5.30 ± 1.73*	4.50 ± 1.31	7.60 ± 1.93
	Female	209	3.27 ± 2.03	2.95 ± 1.27	4.96 ± 1.45	4.73 ± 1.27	7.93 ± 1.94
16	Male	107	3.19 ± 1.88	3.22 ± 1.44	5.19 ± 1.69	4.47 ± 1.42	7.74 ± 1.95
	Female	148	3.58 ± 2.17	2.98 ± 1.32	4.83 ± 1.64	4.68 ± 1.35	8.04 ± 1.82
17	Male	50	2.64 ± 1.63*	2.8 ± 1.22	4.9 ± 1.74	4.46 ± 1.71	7.32 ± 1.82
	Female	71	3.50 ± 2.26	2.88 ± 1.29	4.59 ± 1.62	4.52 ± 1.47	7.64 ± 1.73
18	Male	15	2.46 ± 1.88	2.66 ± 1.23	5.33 ± 1.71	4.26 ± 1.53	8 ± 1.77
	Female	19	3.21 ± 1.96	3 ± 1.20	5 ± 1.66	4.31 ± 1.00	8 ± 1.37

*p<0.05, **p<0.001, ***p<0.0001.

Table 3: Parent's report of emotional and behavioral symptoms of school children by the age and gender.

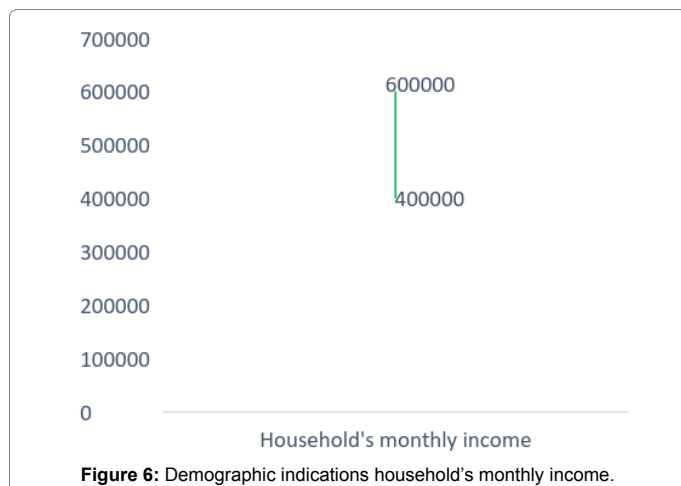


Figure 6: Demographic indications household's monthly income.

(p<0.05) were more common compared with females (Tables 3-6). According to the parents and teachers SDQs we evaluated, three ranges: normal, borderline and abnormal. The ranges by parent's SDQs the Total Score was 43.3%, emotional symptoms 27.4%, conduct problems 28.2%, hyperactivity problems 20.4%, peer relationship problems 81.4% and prosocial behavior was 5.4% among participants (Table 7).

Results of multifactorial linear regression revealed urban and rural areas, gender, age, family environment affected to adolescent's emotional and behavioral problems (Table 8).

Discussion

According to the results of our study, hyperactivity abnormality was more distinct among younger adolescents when compared to survey results in UK, Norway and China [3,7-10].

As to gender, emotional abnormality was more distinct among female participants and conduct abnormality was more distinct among

Age	Gender	n	Emotional	Conduct	Hyperactive	Peer	Prosocial
			Mean ± SD	Mean ± SD	Mean ± SD	Mean ± SD	Mean ± SD
11	Male	17	2.76 ± 1.44	2.65 ± 0.93	5.88 ± 1.62**	5.24 ± 0.97**	7.24 ± 1.86*
	Female	12	1.75 ± 1.22	2.42 ± 0.90	4.33 ± 1.15	4.25 ± 0.87	8.50 ± 1.24
12	Male	150	2.53 ± 1.56*	2.57 ± 1.49**	4.92 ± 1.53**	4.73 ± 1.29	6.78 ± 1.97**
	Female	124	2.15 ± 1.54	2.11 ± 0.89	4.42 ± 1.37	4.59 ± 1.29	8.06 ± 1.95
13	Male	208	2.52 ± 1.91	2.75 ± 1.39	5.14 ± 1.69**	4.27 ± 1.32	7.26 ± 2.14**
	Female	248	2.53 ± 1.96	2.51 ± 1.36	4.42 ± 1.53	4.41 ± 1.29	7.92 ± 2.00
14	Male	176	2.60 ± 1.80	2.90 ± 1.87**	4.84 ± 1.57**	4.44 ± 1.37	7.23 ± 2.38**
	Female	207	2.41 ± 1.96	2.44 ± 1.47	4.43 ± 1.37	4.40 ± 1.16	8.00 ± 2.02
15	Male	197	2.96 ± 2.19	2.93 ± 1.69	4.98 ± 1.62	4.68 ± 1.42	7.06 ± 2.32**
	Female	209	3.09 ± 2.18	2.75 ± 1.77	4.79 ± 1.58	4.56 ± 1.50	7.75 ± 2.07
16	Male	107	2.80 ± 2.05	2.59 ± 1.59	5.07 ± 1.58	4.41 ± 1.50	7.20 ± 1.92
	Female	148	2.93 ± 1.85	2.64 ± 1.65	4.78 ± 1.39	4.41 ± 1.38	7.50 ± 2.13
17	Male	50	2.38 ± 1.89	2.78 ± 1.58**	4.62 ± 1.84*	4.34 ± 1.30	6.74 ± 2.15**
	Female	71	2.25 ± 1.85	2.10 ± 1.00	4.03 ± 1.42	4.35 ± 1.21	7.76 ± 1.65
18	Male	15	2.87 ± 2.23	2.87 ± 1.41	4.93 ± 1.71	4.20 ± 1.01	6.40 ± 2.41
	Female	19	2.42 ± 1.84	2.53 ± 1.02	3.95 ± 1.47	3.74 ± 1.05	6.74 ± 2.35

*p<0.05, **p<0.001, ***p<0.0001.

Table 4: Teacher's report of emotional and behavioral symptoms of school children by the age and sex.

Parent's report	Total	Urban	Rural
	Mean ± SD	Mean ± SD	Mean ± SD
Emotional symptoms			
Male	3.18 ± 1.93	3.46 ± 2.01**	3.04 ± 1.88
Female	3.45 ± 2.08	3.63 ± 2.00	3.37 ± 2.11
Total	3.32 ± 2.01	3.55 ± 2.01**	3.22 ± 2.01
Conduct problems			
Male	3.03 ± 1.50	3.23 ± 1.50**	2.93 ± 1.49
Female	2.87 ± 1.31	3.13 ± 1.47***	2.75 ± 1.21
Total	2.94 ± 1.40	3.18 ± 1.48***	2.83 ± 1.35
Hyperactivity problems			
Male	5.34 ± 1.65	5.38 ± 1.77	5.32 ± 1.59
Female	5.02 ± 1.58	4.97 ± 1.61	5.05 ± 1.57
Total	5.17 ± 1.62	5.16 ± 1.70	5.17 ± 1.58
Peer relationship problems			
Male	4.61 ± 1.43	4.65 ± 1.50	4.59 ± 1.40
Female	4.63 ± 1.36	4.74 ± 1.38	4.57 ± 1.35
Total	4.62 ± 1.39	4.70 ± 1.43	4.58 ± 1.37
Total score			
Male	16.71 ± 4.60	15.88 ± 4.34**	16.15 ± 4.44
Female	16.47 ± 4.12	15.74 ± 4.10**	15.97 ± 4.12
Total	16.59 ± 4.36	15.81 ± 4.21***	16.05 ± 4.27
Prosocial behaviour			
Male	7.49 ± 1.90	7.38 ± 2.00	7.55 ± 1.84
Female	7.86 ± 1.81	7.67 ± 1.87*	7.94 ± 1.77
Total	7.69 ± 1.86	7.53 ± 1.94*	7.76 ± 1.82

*p<0.05, **p<0.001, ***p<0.0001.

Table 5: Parent's report of emotional and behavioral symptoms of school children by gender and urban and rural areas.

male participants. These results are identical to survey results of UK, Iran and China (Figures 7-9) [3,10,11].

Compared to Brazilian survey results of our study seemed higher in total score but evaluations by parents and teachers their high scored problems were approximate [8].

Our study is valuable because this is the first time the SDQ was used in Mongolia for detecting normal and abnormal conditions of adolescents' emotions and behavior, and determining risk factors.

Teacher's report	Total	Urban	Rural
	Mean ± SD	Mean ± SD	Mean ± SD
Emotional symptoms			
Male	2.67 ± 1.92	2.89 ± 2.12*	2.57 ± 1.81
Female	2.60 ± 1.96	2.61 ± 2.09	2.59 ± 1.90
Total	2.63 ± 1.94	2.74 ± 2.11	2.58 ± 1.85
Conduct problems			
Male	2.77 ± 1.60	3.11 ± 1.84***	2.61 ± 1.45
Female	2.49 ± 1.45	2.62 ± 1.59*	2.42 ± 1.38
Total	2.62 ± 1.53	2.85 ± 1.73***	2.51 ± 1.42
Hyperactivity problems			
Male	4.99 ± 1.63	4.82 ± 1.65*	5.06 ± 1.61
Female	4.51 ± 1.47	4.26 ± 1.53***	4.63 ± 1.43
Total	4.73 ± 1.56	4.53 ± 1.61***	4.83 ± 1.53
Peer relationship problems			
Male	4.50 ± 1.37	4.59 ± 1.41	4.46 ± 1.35
Female	4.44 ± 1.31	4.72 ± 1.41***	4.31 ± 1.25
Total	4.47 ± 1.34	4.66 ± 1.41***	4.38 ± 1.30
Total score			
Male	14.93 ± 4.23	15.41 ± 4.64*	14.70 ± 4.01
Female	14.04 ± 4.13	14.22 ± 4.71	13.95 ± 3.83
Total	14.45 ± 4.20	14.78 ± 4.71*	14.30 ± 3.93
Prosocial behavior			
Male	7.08 ± 2.18	6.58 ± 2.26***	7.32 ± 2.10
Female	7.83 ± 2.02	7.66 ± 2.09	7.91 ± 1.98
Total	7.48 ± 2.13	7.14 ± 2.24***	7.64 ± 2.06

*p<0.05, **p<0.001, ***p<0.0001

Table 6: Teacher's report of emotional and behavioral symptoms of school children by gender and urban and rural areas.

By implementing early detection SDQs of adolescents' emotional and behavior abnormalities in the school environment, it can be significantly helpful for early detection of abnormal behavior and may be useful for prevention of pathological behaviors.

The findings of this study suggest that SDQs should be considered for community-wide screening programs to improve the detection and treatment of a child's mental health problems. The SDQs identified that two-thirds of the questioned children and adolescents have psychiatric disorders.

	Parent-report		Teacher-report		Self-report	
	Ranges	95% CI	Ranges	95% CI	Ranges	95% CI
Total score						
Normal	28.3%	24.5-32.0	23.7%	19.9-27.6	52.6%	49.6-55.7
Borderline	28.4%	24.6-32.1	42.9%	39.5-46.2	31.1%	27.4-34.8
Abnormal	43.3%	40.0-46.6	33.4%	29.8-37.0	16.3%	12.2-20.3
Emotional symptoms						
Normal	55.2%	52.2-58.2	83.9%	82.1-85.6	82.0%	80.1-83.9
Borderline	17.4%	13.3-21.4	7.2%	2.9-11.5	8.1%	3.8-12.3
Abnormal	27.4%	23.7-31.2	8.9%	4.7-13.2	10.0%	5.8-14.2
Conduct problems						
Normal	40.9%	37.5-44.3	60.0%	57.2-62.8	76.1%	74.0-78.3
Borderline	30.9%	27.3-34.6	19.8%	15.8-23.8	13.6%	9.5-17.8
Abnormal	28.2%	24.4-31.9	20.2%	16.3-24.2	10.2%	6.0-14.4
Hyperactivity problems						
Normal	59.2%	56.4-62.0	71.1%	68.7-73.4	62.2%	59.4-64.9
Borderline	20.4%	16.4-24.3	15.6%	11.5-19.6	19.1%	15.1-23.0
Abnormal	20.4%	16.5-24.4	13.4%	9.3-17.5	18.8%	14.8-22.8
Peer relationship problems						
Normal	5.3%	1.0-9.6	21.5%	17.6-25.5	33.1%	29.5-36.8
Borderline	13.3%	9.2-17.5	30.9%	27.2-34.6	52.2%	49.2-55.3
Abnormal	81.4%	79.4-83.3	47.6%	44.4-50.8	14.6%	10.5-18.7
Prosocial behavior						
Normal	86.8%	85.2-88.4	80.2%	78.3-82.2	85.6%	84.0-87.3
Borderline	7.8%	3.5-12.0	12.1%	7.9-16.2	9.5%	5.3-13.7
Abnormal	5.4%	1.1-9.7	7.7%	3.4-11.9	4.9%	0.5-9.2

Table 7: Results of normal, borderline and abnormal ranges of SDQ.

Parent	Slope quotient	Standardized quotient	T statistics	p-value	Fixed R ² (p-value)
Emotional symptoms					
Urban, rural	-0.43	-0.10	-4.34	<0.0001	0.15 (<0.0001)
Gender	0.29	0.07	3.22	0.001	
Age	-0.08	-0.06	-2.72	0.01	
Households	-0.14	-0.08	-3.69	<0.0001	
Marriage	-0.23	-0.05	-2.03	0.043	
Conduct problems					
Urban, rural	-0.36	-0.12	-5.16	<0.0001	0.14 (<0.0001)
Gender	-0.16	-0.06	-2.50	0.013	
Age	0.01	0.01	0.25	0.802	
Households	-0.07	-0.06	-2.71	0.007	
Marriage	-0.07	-0.02	-0.95	0.342	
Hyperactivity problems					
Urban, rural	-0.08	-0.02	-1.01	0.314	0.16 (<0.0001)
Gender	-0.30	-0.09	-4.18	<0.0001	
Age	-0.09	-0.09	-3.78	0.0002	
Households	-0.12	-0.09	-3.98	<0.0001	
Marriage	-0.16	-0.04	-1.77	0.076	
Peer relationship problems					
Urban, rural	-0.15	-0.05	-2.14	0.032	0.09 (0.005)
Gender	0.02	0.01	0.33	0.744	
Age	-0.04	-0.05	-2.13	0.033	
Households	0.01	0.01	0.30	0.765	
Marriage	-0.24	-0.07	-3.07	0.002	
Prosocial behavior					
Urban, rural	0.29	0.07	3.15	0.002	0.13 (<0.0001)
Gender	0.34	0.09	4.11	<0.0001	
Age	0.07	0.06	2.48	0.013	
Households	0.05	0.04	1.61	0.107	
Marriage	-0.02	0.00	-0.15	0.877	
Total score					
Urban, rural	-1.02	-0.11	-4.83	<0.0001	0.16 (<0.0001)
Gender	-0.15	-0.02	-0.78	0.435	
Age	-0.21	-0.08	-3.33	0.001	
Households	-0.31	-0.09	-4.04	<0.0001	
Marriage	-0.70	-0.07	-2.95	0.003	

Table 8: Some risk factors effected to emotional and behavioral problems.

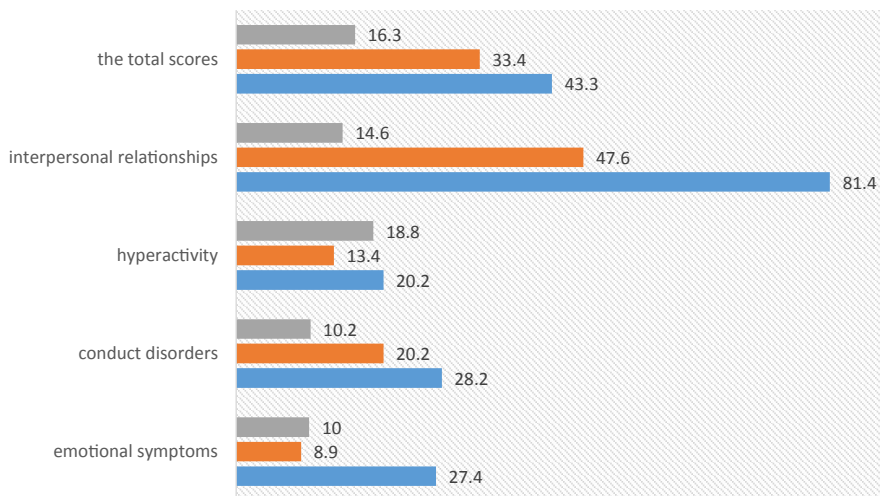


Figure 7: The by parents, teachers and self-assessments SDQs results of Mongolia.

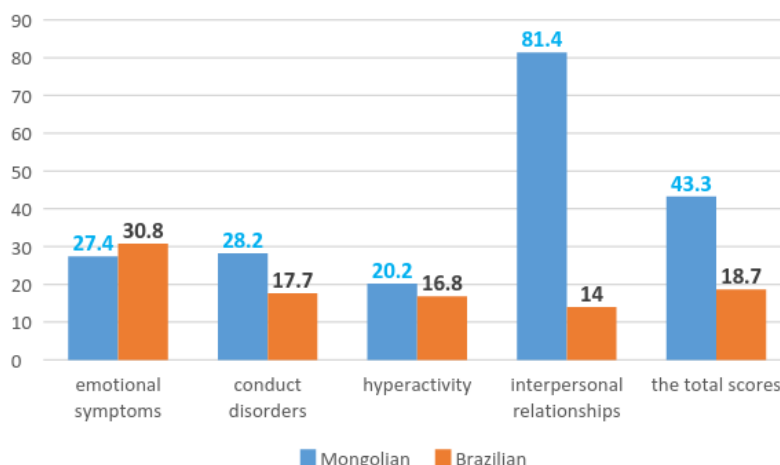


Figure 8: The parents results of comparing Mongolian survey with Brazilian survey.

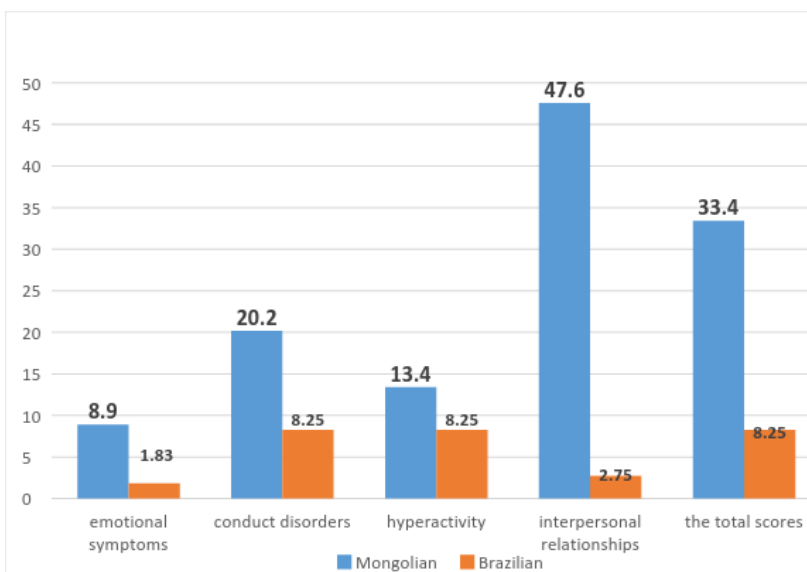


Figure 9: The teachers results of comparing Mongolian survey with Brazilian survey.

There were several limitations in our study.

First, the SDQ was translated into the Mongolian language then retranslated to English another psychiatrists after then retranslated into Mongolian by psychiatrists because a Mongolian language SDQ was not available. Further studies need to use SDQ via an official Mongolian version in relevant website [7].

In conclusion, Mongolian adolescent's emotional and behavioral problems are prevalent as confirmed by parents 43.3%, by teachers 33.4% and the by self-assessment 16.3%. Adolescents' age, gender, family environment and living areas influenced to their emotional and behavioral problem.

Conflict of Interest

The authors declare no conflict of interest.

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