

Emotional and behavioural problems in Singaporean children based on parent, teacher and child reports

Woo B S C, Ng T P, Fung D S S, Chan Y H, Lee Y P, Koh J B K, Cai Y

ABSTRACT

Introduction: This study aims to determine the prevalence of emotional and behavioural problems in a community sample of Singaporean children aged 6-12 years, and its agreement according to parent, teacher and child reports.

Methods: The Child Behaviour Checklist (CBCL), Teacher Rating Form (TRF) and child report questionnaires for depression and anxiety were administered to a community sample of primary school children. 60 percent of the children sampled (n = 2,139) agreed to participate. Parents of a sub-sample of 203 children underwent a structured clinical interview.

Results: Higher prevalence of emotional and behavioural problems was identified by CBCL (12.5 percent) than by TRF (2.5 percent). According to parent reports, higher rates of internalising problems (12.2 percent) compared to externalising problems (4.9 percent), were found. Parent-teacher agreement was higher for externalising problems than for internalising problems. Correlations between child-reported depression and anxiety, and parent and teacher reports were low to moderate, but were better for parent reports than for teacher reports.

Conclusion: The prevalence rates of emotional and behavioural problems in Singaporean children based on CBCL ratings are comparable to those in the West, but the low response rate and exclusion of children with special needs limit the generalisability of our findings. Singaporean children have higher rates of internalising problems compared to externalising problems, while Western children have higher rates of externalising problems compared to internalising problems.

Keywords: behavioural problems, childhood mental health, childhood problems, emotional problems

Singapore Med J 2007; 48(12):1100-1106

INTRODUCTION

Mental health surveys are important for the planning of mental health services for children, which aim to prevent, detect and treat childhood psychiatric morbidity, so as to promote normal development and enable young people to reach their full potential. Early epidemiological surveys in various countries have yielded prevalence estimates of childhood mental health problems, which ranged widely between 5% and 26%, depending on the survey instruments used.⁽¹⁻⁷⁾ More recent studies using DSM-IV (Diagnostic and Statistical Manual of Mental Disorders) criteria and structured clinical interviews for diagnosis yielded rates between 9% and 16%.⁽⁸⁻¹⁰⁾

Assessing emotional and behavioural problems in children can be difficult. Traditional psychiatric and psychological assessment emphasises the need for multiple informants.⁽¹¹⁾ Besides observing the child, most clinicians rely on information from the child's main caregivers, i.e. the parents and teachers. Studies have shown that parents and teachers have disparate views and show little agreement when asked to rate the child's behaviour.^(12,13) A meta-analysis by Achenbach et al⁽¹²⁾ demonstrated that the average correlation between parent and teacher reports was only 0.27. Research has also shown that children often report higher levels of depression than the adults' rating, and that adults do not always know enough about a child's feelings and state of mind.⁽¹⁴⁾ While Western child-rearing practices emphasise the development of independence and individualism, Asian culture stresses the development of interpersonal relationships, collectivism, family closeness and social harmony.⁽¹⁵⁾ Hence, it is possible that Singaporean children may manifest emotional and behavioural problems differently from children in the West. Because domains of emotional and behavioural problems are likely to be detected differentially by parents, teachers or children, the use of multiple reporting sources is preferable.

Department of Child and Adolescent Psychiatry, Institute of Mental Health, Child Guidance Clinic, Health Promotion Board Building, 3 Second Hospital Avenue, #03-01, Singapore 168937

Woo BSC, MBBS, MMed, FAMS
Consultant

Fung DSS, MBBS, MMed, FAMS
Senior Consultant and Chief

Lee YP, BA
Research Assistant

Koh JBK, BSocSci, MSocSci
Research Associate

Cai Y, MBBS, DPM, FAMS
Senior Consultant

Department of Psychological Medicine, Yong Loo Lin School of Medicine, National University of Singapore, 5 Lower Kent Ridge Road, Singapore 119074

Ng TP, MBBS, MFPHM, MD
Associate Professor

Biostatistics Unit, Yong Loo Lin School of Medicine, National University of Singapore, 21 Lower Kent Ridge Road, Singapore 119077

Chan YH, PhD
Head

Correspondence to:
Dr Bernardine SC Woo
Tel: (65) 6435 3868
Fax: (65) 6534 3677
Email: bernardine_woo@imh.com.sg

Singapore is a small island city with an area of about 650 km² lying at the southern-most tip of the Malay Peninsula in Southeast Asia. It has a population of about four million, consisting predominantly of three main ethnic Asian communities: Chinese (75.6%), Malays (13.6%) and Indians (8.7%).⁽¹⁶⁾ Despite the strong cultural influences of each race, English is the official language widely used for communication in schools, business and in the community, placing Singapore in a unique position to study children of different Asian ethnicities using English-language derived rating scales. Children and adolescents attend primary school between the ages of 6 and 12 years, secondary school between the ages of 13 and 16 years, and post-secondary education either at a junior college, polytechnic or technical institute from 17 to 19 years of age.⁽¹⁷⁾ This is the first large-scale mental health survey of children in Singapore. It aims to determine the prevalence and pattern of mental health problems in a community sample of Singaporean children aged 6–12 years according to parent, teacher and child reports, and to assess the level of agreement between the different reporting sources.

METHODS

Approval to conduct the study was obtained from the Singapore National Healthcare Group Domain Specific Review Board. A cross-sectional design with a two-stage sampling technique was employed. A random sample of 18 out of the 178 primary schools in Singapore was obtained using a computerised randomisation programme. Consent was sought from the principals of the respective schools and all 18 schools agreed to participate. A random sample of students proportional to the total number of students in the school was obtained from each school. A total of 3,586 children across 18 schools were sampled. Consent was obtained from the parents of these children and 60% (n = 2,139) agreed to participate in the study. In view of the low response rate (60%), pooled data on the demographic profile of the participants (n = 2,139) and the non-participants (n = 1,447) was obtained from the Ministry of Education, because any differences between the two groups of children would have implications on our findings. Children studying in special education schools for the intellectually disabled, moderately or severely autistic, visually handicapped and hearing-impaired, were excluded from the survey, as it would be difficult to detect mental health problems in these children due to their atypical modes of presentation.

The Child Behaviour Checklist (CBCL/4-18)⁽¹⁸⁾ was the main screening instrument used to study the children's mental health. It provides parent-reported information on a broad range of emotional and behavioural difficulties within the last six months.

It has been widely used throughout the world as well as in Asian countries, and has satisfactory reliability and validity. The CBCL contains 118 items that describe the behaviour of children and adolescents between the ages of 4 and 18 years. It is self-administered, with parents responding to the items on a three-point scale: 0 (not true), 1 (sometimes true), 2 (very true); and it takes about 30 minutes to complete. By summing the scores, eight syndromes (withdrawn, somatic complaints, anxious/depressed, social problems, thought problems, attention problems, delinquent behaviour, aggressive behaviour), two syndrome groups (internalising and externalising problems), and a total problems score, can be computed. Internalising problems include withdrawn behaviour, somatic complaints, anxiety and depression, while externalising problems include aggressive and delinquent behaviour. A higher score represents a higher severity.

The Chinese version of the CBCL has been used on various Chinese populations with acceptable reliability and validity.⁽²⁾ Both the English and Chinese versions of the CBCL have been validated in a clinical sample in Singapore.⁽¹⁹⁾ The CBCL was also translated into Malay and Tamil by professional translators for the purpose of this study. The Chinese, Malay and Tamil versions of the CBCL were used on parents in our study who preferred to respond in their mother tongue. The English version of the CBCL was completed by 64.8% of parents, while 27.0% completed the Chinese version, 7.8% completed the Malay version and 0.4% completed the Tamil version. The Teacher Rating Form (TRF),⁽²⁰⁾ a subsidiary instrument of the CBCL, was used to obtain teacher-reported information on the children's behavioural and emotional problems. It is self-administered and takes about 30 minutes to complete.

As research has shown that parents and teachers are not always aware of the children's feelings,⁽¹⁴⁾ two child self-report questionnaires, the Multidimensional Anxiety Scale for Children (MASC)⁽²¹⁾ and the Children's Depression Inventory (CDI)⁽²²⁾ were used to assess anxiety and depressive symptoms in the children. The MASC is a 39-item, four-point self-report inventory to assess a broad spectrum of anxiety symptoms in children aged 8–19 years, including physical symptoms, social anxiety, harm avoidance and separation anxiety. The CDI is a 27-item, three-point self-report inventory to assess depressive symptoms in children aged 6–17 years within the preceding two weeks, including cognitive, affective and behavioural symptoms. Both instruments have high internal consistency and test-retest reliability.

The CBCL was mailed to the parents to be completed at home and mailed back to the investigators. The TRF was filled up by the teacher who knew the child

best. The MASC and CDI were administered to the children in school. In order to ensure that the younger children in primary one and two, aged 6–8 years, understood the items on the CDI and MASC, research assistants read out the items to them and asked them to indicate their responses on the questionnaire. Parents of 203 children with a mix of high and low scores on the CBCL and the TRF, were asked to undergo a structured clinical interview, the National Institute of Mental Health Diagnostic Interview Schedule for Children-IV (NIMH DISC-IV),⁽²³⁾ to determine if their children had a psychiatric diagnosis and what the diagnosis was, if present. The NIMH DISC-IV is a fully structured diagnostic instrument that assesses 34 common psychiatric diagnoses in children and adolescents using DSM-IV. It has moderate to good diagnostic reliability and good to excellent validity. It takes about one to two hours to administer and can be administered by trained lay interviewers. The interviewers, comprising psychologists and psychology undergraduates, underwent training by an investigator who had been trained in the use of the NIMH DISC-IV, and their initial interviews were performed under the supervision of an experienced interviewer.

Data analysis was performed using the Statistical Package for Social Sciences version 13.0 (Chicago, IL, USA) to confirm the reliability and validity of the CBCL. Receiver operating characteristic analysis was performed to determine optimal cut-off values to determine the prevalence of emotional and behavioural problems in the children. The prevalence rates of clinically significant anxiety and depressive symptoms were calculated based on the recommended clinical cut points in the MASC and CDI manuals. Analysis of variance was used to examine sex differences in mean CBCL and TRF scale scores. Pearson's product-moment correlations were used to assess agreement between parent, teacher and child reports. All analyses were two-tailed, and results were considered statistically significant with a *p*-value of less than or equal to 0.05.

RESULTS

The sociodemographical characteristics of the children in the sample were similar to those shown in the Singapore population census statistics. The majority of the children (76%) were Chinese, and 81% resided in public housing estates. Among their mothers, 8.5% were single, divorced, separated, widowed or deceased (Table I). A significantly higher proportion of the participants lived in private housing and had mothers who were better educated as compared to the non-participants (*p* < 0.05). About 19% of the responders lived in private housing as compared to 14% of the non-responders, and 32% of the responders had

Table I. Sociodemographical characteristics of children in the study sample (n = 2,139).

Characteristics	% (n)
Ethnicity	
Chinese	76.0 (1,626)
Malay	14.5 (310)
Indian/others	9.5 (203)
Gender	
Male	50.1 (1,072)
Female	49.9 (1,067)
Age (years)	
6–8	29.1 (623)
9–10	33.4 (714)
11–12	37.5 (802)
Housing type	
Public housing	80.8 (1,728)
Private housing	19.2 (411)
Mother's marital status	
Married	91.5 (1,957)
Single/divorced/separated/ widowed/deceased	8.5 (182)
Father's educational level	
None or primary	19.0 (406)
Secondary	44.0 (942)
Post-secondary	17.6 (376)
Tertiary	19.4 (415)
Mother's educational level	
None or primary	18.9 (404)
Secondary	49.4 (1,057)
Post-secondary	18.0 (385)
Tertiary	13.7 (293)
Father's occupation and employment	
Managerial and professional	32.3 (690)
Sales	9.1 (195)
Technical and clerical	16.3 (348)
Others: driver, chef, odd job worker, security officer, cleaner, hawker, etc.	42.3 (906)
Unemployed	3.5 (75)
Self-employed	21.2 (453)
Mother's occupation and employment	
Managerial and professional	14.6 (312)
Sales	11.8 (253)
Technical and clerical	13.8 (296)
Others: housewife, factory worker, hawker, childcare teacher, cook, etc.	59.8 (1,278)
Self-employed	6.6 (141)
Primary caregiver	
Parents	73.3 (1,568)
Grandparents	12.0 (257)
Others	14.7 (314)
Child's number of siblings	
0	12.0 (257)
1	46.4 (993)
2	32.0 (684)
≥ 3	9.6 (205)
Language spoken at home	
English	33.2 (710)
Chinese	38.0 (813)
Malay	10.4 (222)
Tamil	2.0 (43)
Other languages/more than one language	16.4 (351)

Table II. Mean CBCL and TRF scale scores by gender.

	CBCL		TRF	
	Boys (n = 1,072) Mean ± SD	Girls (n = 1,067) Mean ± SD	Boys (n = 1,072) Mean ± SD	Girls (n = 1,067) Mean ± SD
Total problems	26.97 ± 20.73*	24.33 ± 20.36*	14.99 ± 19.76**	8.49 ± 12.58**
Internalising problems	6.78 ± 6.89	7.08 ± 6.98	2.82 ± 4.92	2.89 ± 4.58
Withdrawn	2.16 ± 2.44	2.14 ± 2.40	1.15 ± 2.11	1.11 ± 1.90
Somatic complaints	1.31 ± 1.96	1.49 ± 2.02	0.21 ± 1.04	0.16 ± 0.64
Anxious / depressed	3.44 ± 3.83	3.60 ± 3.88	1.54 ± 2.92	1.64 ± 2.78
Social problems	2.58 ± 2.40*	2.30 ± 2.28*	1.30 ± 2.43**	0.83 ± 1.80**
Thought problems	1.03 ± 1.46**	0.73 ± 1.24**	0.35 ± 0.87*	0.23 ± 0.69*
Attention problems	4.29 ± 3.58**	3.36 ± 3.38**	6.32 ± 7.54**	3.08 ± 5.21**
Externalising problems	8.65 ± 7.15**	7.15 ± 6.33**	4.18 ± 7.99**	1.51 ± 3.91**
Delinquent behaviour	1.64 ± 1.90**	1.22 ± 1.70**	0.77 ± 1.60**	0.30 ± 0.85**
Aggressive behaviour	6.94 ± 5.59**	5.90 ± 5.10**	3.40 ± 6.69**	1.21 ± 3.31**

CBCL: child behaviour checklist; TRF: teacher rating form

*p < 0.05; **p < 0.001

Table III. Correlations between CBCL and TRF.

	Correlation	
	r	p-value
Total problems	0.19	< 0.01
Internalising problems	0.09	< 0.01
Withdrawn	0.10	< 0.01
Somatic complaints	0.05	> 0.05
Anxious / depressed	0.06	< 0.05
Social problems	0.20	< 0.01
Thought problems	0.12	< 0.01
Attention problems	0.29	< 0.01
Externalising problems	0.22	< 0.01
Delinquent behaviour	0.21	< 0.01
Aggressive behaviour	0.19	< 0.01

CBCL: child behaviour checklist; TRF: teacher rating form.

mothers who had received post-secondary or tertiary education as compared to 25% of the non-responders.

The 203 participants, whose parents had undergone the NIMH DISC-IV structured clinical interview, were divided into two groups: (1) those diagnosed with a DSM-IV psychiatric disorder (n = 54); and (2) those not diagnosed with a psychiatric disorder (n = 149). Receiver operating characteristic analysis showed that a T-score of 66 on the CBCL Total Problems scale best discriminated between the two groups of children (area under the curve [AUC] = 0.61, sensitivity = 42.6%, specificity = 79.2%, positive predictive value = 42.6%, negative predictive value = 79.2%). AUC for all the TRF subscales and the TRF Total Problems scale were not favourable (0.48–0.55).

Using the cut-off score of 66 on the CBCL Total Problems scale, it was found that 12.5% (95% CI

10.5–14.5) of children scored at or above this level, providing an estimate of the prevalence of emotional and behavioural problems in this group of children according to parent rating. The CBCL estimate was 12.2% (95% CI 10.2–14.2) for internalising problems and 4.9% (95% CI 3.6–6.2) for externalising problems. Applying a similar cut-off score of 66 on the TRF Total Problems scale, we determined that 2.5% (95% CI 1.8–3.2) of the children had emotional and behavioural problems, according to teachers' rating. The TRF estimate was 2.2% (95% CI 1.6–2.8) for internalising problems and 2.4% (95% CI 1.7–3.1) for externalising problems. 9.6% of children scored above the recommended clinical cut-off point T-score of 66 on the MASC, and 17.8% of children scored above the recommended clinical cut-off point T-score of 66 on the CDI.

The mean (± standard deviation [SD]) CBCL Total Problems score was 25.6 ± 20.7 and the mean TRF Total Problems score was 11.8 ± 16.9. There was a significant gender effect, with boys scoring higher on both the CBCL (27.0 versus 24.3; F = 6.61, df = 1, p < 0.05) and the TRF (15.0 versus 8.5; F = 75.19, df = 1, p < 0.001). Table II shows the mean and SDs of the CBCL and TRF scale scores of boys and girls. Boys obtained significantly higher scores on the Social Problems, Thought Problems, Attention Problems, Delinquent Behaviour, Aggressive Behaviour and Externalising Problems scales of the CBCL and the TRF. No significant gender difference was observed for internalising problems as reported either by parents or teachers.

Pearson's correlations were used to assess the agreement between parent and teacher reports. Apart from the Somatic Complaints subscale, all correlations

Table IV. Correlations between parent-reported (CBCL) and teacher-reported (TRF) behavioural syndromes and child-reported depression (CDI) and anxiety (MASC).

	Correlations (r)			
	CDI and CBCL	CDI and TRF	MASC and CBCL	MASC and TRF
Total problems	0.28**	0.24**	0.18**	0.05*
Internalising problems	0.22**	0.14**	0.17**	0.07*
Withdrawn	0.17**	0.13**	0.11**	0.05
Somatic complaints	0.14**	0.08*	0.11**	0.01
Anxious / depressed	0.20**	0.11**	0.18**	0.08*
Social problems	0.22**	0.18**	0.15**	0.09**
Thought problems	0.19**	0.10**	0.11**	0.04
Attention problems	0.27**	0.25**	0.13**	0.04
Externalising problems	0.24**	0.19**	0.12**	0.00
Delinquent behaviour	0.18**	0.18**	0.04	0.00
Aggressive behaviour	0.20**	0.16**	0.10*	0.01

CBCL: child behaviour checklist; TRF: teacher rating form; CDI: children's depression inventory; MASC: manifest anxiety scale for children.

* $p < 0.05$; ** $p < 0.001$

were positive and significant, ranging from 0.06 to 0.29, indicating a significant but low to moderate agreement between parent and teacher reports. The highest agreement was observed for Attention Problems, followed by Externalising Problems, Social Problems and Thought Problems, and the lowest agreement was for Internalising Problems (Table III). Table IV shows that the correlations between child-reported depression and anxiety, and parent- and teacher-reported behavioural syndromes, were low to moderate. For both child-reported depression and anxiety, correlations were higher and more often significant for parent-reported syndromes than for teacher-reported syndromes. The parent-reported syndromes, Anxious/Depressed, Social Problems and Attention Problems, were most strongly related to both child-reported depression and anxiety. Parent-reported Aggressive Behaviour was also significantly related to child-reported depression.

DISCUSSION

The prevalence of mental health problems based on the CBCL ratings observed in our study is a gauge of the volume of problems perceived and reported by parents. Our estimate of 12.5% of the sample having emotional or behavioural problems using the CBCL was comparable to rates found in epidemiological studies in the West and in India,⁽²⁴⁻²⁶⁾ but was higher than rates found in China.⁽²⁾ We found that according to parental reports, Singaporean children had higher rates of internalising problems (12.2%) compared to externalising problems (4.9%), in contrast to studies in the West which either found higher rates of externalising problems compared to internalising problems,^(5,10) or

had approximately equal rates of internalising and externalising problems.^(8,9,25) Cross cultural studies have also shown that Thai and African children exhibit more over-controlled or internalising behaviour while Caucasian American children exhibit more under-controlled or externalising behaviour,^(27,28) suggesting that cultural factors greatly influence children's manifestations of emotional and behavioural problems. This could be because aggression is discouraged in Asian countries, while self-control, emotional restraint and social inhibition are encouraged. Hence, Asian children may more likely internalise rather than externalise their problems.

The mean CBCL Total Problem scores for boys and girls in our sample were comparable to those in children from Western countries, but the mean TRF Total Problem scores in our sample were lower.^(18,20,24,29) Boys had significantly higher mean Total Problem scores than girls on both the CBCL and the TRF, and scored significantly higher on the Social Problems, Thought Problems, Attention Problems, Delinquent Behaviour, Aggressive Behaviour and Externalising Problems scales, in concordance with other studies.^(18,20,24,29) Parents in our study reported higher rates of emotional and behavioural problems in children as compared to teachers, 12.5% versus 2.5%. However, parent-teacher agreement was higher for Attention Problems, Externalising Problems and Social Problems than for Internalising Problems, in keeping with findings by other researchers.^(12,13) Parents and teachers see children in different situations and have different emotional relationships and expectations of the child. While parents may have known the child longer, teachers have the opportunity to compare a

child's behaviour with that of his classmates. Children also behave differently in different situations and contexts. Moreover, externalising behaviour problems, like tantrums and fighting, are more conspicuous and observable than internalising symptoms, like depression and social withdrawal. Based on parent reports, Singaporean children were found to have higher rates of internalising problems than externalising problems. Internalising problems in pupils appear to be less obvious to teachers and thus are less often reported. This suggests that parents are more aware of emotional changes in their children, whereas teachers may be more likely to detect behavioural problems.

Correlations between child-reported depression and anxiety, and parent- and teacher-reported behavioural syndromes, were low to moderate. This agrees with the findings in a previous study that found correlations between child and parent or teacher reports to be small or medium at best.⁽¹⁴⁾ This could be partly because the underlying constructs measured by the CBCL / TRF and the CDI / MASC are different. Parents and children have also been found to focus on different aspects of child psychopathology.⁽³⁰⁾ In our study, correlations with child-reported depression and anxiety were higher and more often significant for the parent-reported syndromes than for teacher-reported syndromes. The extent of agreement of parent and child reports may be an indication of how well parents know their children and how close or trusting their relationship is. In Singapore, teachers have an average of 40 pupils per class and may not know the children as well as their parents. Nonetheless, our results suggest that adults are not always aware of children's feelings and subjective moods.

Our study has several limitations, one being the low response rate of 60%. Pooled data on the demographic profile of the participants (n = 2139) and non-participants (n = 1447) showed that a significantly higher proportion of the participants lived in private housing and had mothers who were better educated, as compared to the non-participants. As low socioeconomic status has been found to be associated with higher rates of mental health problems,⁽³¹⁾ the non-participants are likely to have higher rates of mental health problems compared to the participants. Our sample also did not include children from special schools. Intellectually-disabled children have been shown to have higher rates of emotional and behavioural problems.⁽³²⁾ Furthermore, the ability of the CBCL to discriminate between clinical cases of psychiatric disorders from those without psychiatric disorders appeared to be lower than expected. Studies in the West and in Asia have found the CBCL to have satisfactory to good specificity (71%–90%) and

sensitivity (82%–86%) in discriminating children with psychiatric disorders from those without disorders in both community and referred samples,^(2,33-35) with the exception of one study, which found that the CBCL had high specificity (95%) but low sensitivity (25%) in a referred sample.⁽³⁶⁾ When applied to parents of children in Singapore, it appeared to have satisfactory specificity (79.2%), but poor sensitivity (42.6%) at the optimal cut-off T-score of 66. Hence, our results might underestimate the actual prevalence of mental health problems. Liu et al used a Chinese version of the CBCL and found a relatively lower prevalence of emotional and behavioural problems in Chinese children (10.4%), compared to other studies using the CBCL in the West.⁽²⁾ The CBCL could have poor sensitivity among Singaporean children because Singaporean children may present differently from their Western counterparts, due to different societal norms and expectations. Singaporean parents may also be reluctant to expose their children's behavioural shortcomings because of perceived social stigmatisation and under-report their children's symptoms and behaviour. Hence, marginal behavioural problems could be obscured.

In conclusion, the prevalence rates of mental health problems in Singaporean children based on the CBCL ratings are comparable to those in the West. However, our low response rate and the exclusion of children with special needs limit the generalisability of our findings. Higher rates of internalising problems compared to externalising problems were found, similar to studies in Asia and Africa, but contrary to studies in the West. Parents reported higher rates of emotional and behavioural problems compared to teachers. Parent-teacher agreement was higher for externalising problems than for internalising problems. Correlations between child-reported depression and anxiety, and parent and teacher reports were low to moderate, but were better for parent reports than for teacher reports. Hence, parent and child reports are more likely to be more discriminating when assessing internalising problems, whereas both parent and teacher reports are equally discriminating when assessing externalising problems, underscoring the importance of obtaining reports from multiple informants when assessing a child for emotional and behavioural problems.

ACKNOWLEDGEMENTS

This study is supported by a Singapore National Medical Research Council grant, NMRC 0745-2003. We would like to thank the Ministry of Education and the Ministry of Health for their assistance and support. We are also grateful to the principals, teachers, parents and students of the schools involved for participating in the study.

REFERENCES

1. Costello EJ, Angold A, Burns BJ, et al. The Great Smoky Mountains Study of Youth. Goals, design, methods, and the prevalence of DSM-III-R disorders. *Arch Gen Psychiatry* 1996; 53:1129-36.
2. Liu X, Kurita H, Guo C, et al. Prevalence and risk factors of behavioral and emotional problems among Chinese children aged 6 through 11 years. *J Am Acad Child Adolesc Psychiatry* 1999; 38:708-15.
3. Offord DR, Boyle MH, Racine Y. Ontario Child Health Study: correlates of disorder. *J Am Acad Child Adolesc Psychiatry* 1989; 28:856-60.
4. Prior M, Virasinghe S, Smart D. Behavioural problems in Sri Lankan schoolchildren: associations with socio-economic status, age, gender, academic progress, ethnicity and religion. *Soc Psychiatry Psychiatr Epidemiol* 2005; 40:654-62.
5. Rutter M, Cox A, Tupling C, Berger M, Yule W. Attainment and adjustment in 2 geographical areas: I. the prevalence of psychiatric disorder. *Br J Psychiatry* 1975; 126:493-509.
6. Verhulst FC, Berden GF, Sanders-Woudstra JA. Mental health in Dutch children: II. The prevalence of psychiatric disorder and relationship between measures. *Acta Psychiatr Scand Suppl* 1985; 324:1-45.
7. Weisz JR, Suwanlert S, Chaiyasit W, et al. Epidemiology of behaviour and emotional problems among Thai and American children: parent reports for ages 6-11. *J Am Acad Child Adolesc Psychiatry* 1987; 26:890-7.
8. Canino G, Shrout PE, Rubio-Stipec M, et al. The DSM-IV rates of child and adolescent disorders in Puerto Rico: prevalence, correlates, service use and effects of impairment. *Arch Gen Psychiatry* 2004; 61:85-93.
9. Costello EJ, Mustillo S, Erkanli, Keeler G, Angold A. Prevalence and development of psychiatric disorders in childhood and adolescence. *Arch Gen Psychiatry* 2003; 60:837-44.
10. Ford T, Goodman R, Meltzer H. The British Child and Adolescent Mental Health Survey 1999: the prevalence of DSM-IV disorders. *J Am Acad Child Adolesc Psychiatry* 2003; 42:1203-11.
11. Achenbach TM. What is normal? What is abnormal? Developmental perspectives on behavioural and emotional problems. In: Luthar SS, Burack JA, Jacob A, Lichetti D, Weisz JR, eds. *Developmental Psychopathology: Perspectives on Adjustment, Risk and Disorder*. New York, NY: Cambridge University Press, 1997: 93-114.
12. Achenbach TM, McConaughy SH, Howell CT. Child / adolescent behavioral and emotional problems: implications of cross informant correlations for situational specificity. *Psychol Bull* 1987; 101:213-32.
13. Deng S, Liu X, Roosa MW. Agreement between parent and teacher reports on behavioral problems among Chinese children. *J Dev Behav Paediatr* 2004; 25:407-14.
14. Mesman J, Koot HM. Child-reported depression and anxiety in preadolescence: I. Associations with parent- and teacher-reported problems. *J Am Acad Child Adolesc Psychiatry* 2000; 39:1371-8.
15. Triandis HC. *Individualism and Collectivism*. Boulder, CO: Westview, 1995.
16. Singapore Department of Statistics. *Monthly digest of statistics*. Singapore: Singapore Department of Statistics, 2005.
17. Tan J, Gopinathan S, Ho WK. *Education in Singapore: A Book of Readings*. Singapore: Prentice Hall, 1997.
18. Achenbach TM, Edelbrock C. *Manual for the Child Behaviour Checklist/4-18 and 1991 Profile*. Burlington, VT: University of Vermont, 1991.
19. Fung DSS, Woo BSC, Chan YH, Teo J. Parent and teacher behavioural ratings of Asian children in Singapore. *Ann Acad Med Singapore* 2003; 32 suppl:136.
20. Achenbach TM. *Manual for the Teacher's Report Form and 1991 Profile*. Burlington, VT: University of Vermont, 1991.
21. March J. *Multidimensional Anxiety Scale for Children*. New York, NY: Multi-Health Systems, 1997.
22. Kovacs M. *Children's Depression Inventory Manual*. New York: Multi-Health Systems, 1992.
23. Shaffer D, Fisher P, Lucas C, Dulcan MK, Schwab-Stone ME. NIMH Diagnostic Interview Schedule for Children Version IV: description, differences from previous versions and reliability of some common diagnoses. *J Am Acad Child Adolesc Psychiatry* 2000; 39:28-38.
24. Barkmann C, Schulte-Markwort M. Emotional and behavioral problems of children and adolescents in Germany: an epidemiological screening. *Soc Psychiatry Psychiatr Epidemiol* 2005; 40:357-66.
25. Sawyer MG, Arney FM, Baghurst PA, et al. The mental health of young people in Australia: key findings from the child and adolescent component of the national survey of mental health and wellbeing. *Aust N Z J Psychiatry* 2001; 35:806-14.
26. Srinath S, Girimaji SC, Gururaj G, et al. Epidemiological study of child and adolescent psychiatric disorders in urban and rural areas of Bangalore, India. *Indian J Med Res* 2005; 122:67-79.
27. Weisz JR, Sigman M, Weiss B, Mosk J. Parent reports of behavioral and emotional problems among children in Kenya, Thailand and the United States. *Child Dev* 1993; 64:98-109.
28. Weisz JR, Suwanlert S, Chaiyasit W, et al. Behavioral and emotional problems among Thai and American adolescents: parent reports for ages 12-16. *J Abnorm Psychol* 1993; 102:395-403.
29. Roussos A, Karantanos G, Richardson C, et al. Achenbach's Child Behavior Checklist and Teachers' Report Form in a normative sample of Greek children 6-12 years old. *Eur Child Adolesc Psychiatry* 1999; 8:165-72.
30. Cole DA, Hoffman K, Tram JM, Maxwell SE. Structural differences in parent and child reports of children's symptoms of depression and anxiety. *Psychol Assess* 2000; 12:174-85.
31. Keiley MK, Lofthouse N, Bates JE, Dodge KA, Pettit GS. Differential risks of co-varying and pure components in mother and teacher reports of externalising and internalising behavior across ages 5 to 14. *J Abnorm Child Psychol* 2003; 31:267-83.
32. Dekker MC, Koot HM, van der Ende J, Verhulst FC. Emotional and behavioral problems in children and adolescents with and without intellectual disability. *J Child Psychol Psychiatry* 2002; 43:1087-98.
33. Aschenbrand SG, Angelosante AG, Kendall PC. Discriminant validity and clinical utility of the CBCL with anxiety-disordered youth. *J Clin Child Adolesc Psychol* 2005; 34:735-46.
34. Hudziak JJ, Copeland W, Stanger C, Wadsworth M. Screening for DSM-IV externalizing disorders with the Child Behavior Checklist: a receiver-operating characteristic analysis. *J Child Psychol Psychiatry* 2004; 45:1299-307.
35. Schmeck K, Poustka F, Döpfner M, et al. Discriminant validity of the Child Behaviour Checklist CBCL-4/18 in German samples. *Eur Child Adolesc Psychiatry* 2001; 10:240-7.
36. Biederman J, Monuteaux MC, Kendrick E, Klein KL, Faraone SV. The CBCL as a screen for psychiatric comorbidity in paediatric patients with ADHD. *Arch Dis Child* 2005; 90:1010-5.