The Effectiveness of Brief Psychosocial Screening in Identifying Behavioral Problems in Children

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Background: *Using screening tools to enhance early detection of psychosocial problems can lead to timely intervention and appropriate referral to general practices.*
Objective: *To assess whether the Thai version of Pediatric Symptom Checklist (PSC) is suitable for screening of psychosocial dysfunction.*
Material and Method: *A cross sectional study was conducted among 160 children aged 6-11 years seeking care at Queen Sirikit National Institute of Child Health from November 2006 to December 2007. Parents were asked to complete the Thai version of the Pediatric Symptom Checklist (PSC) questionnaire and the Thai Youth Behavior Checklist (TYC). Sensitivity, specificity, positive and negative predictive value were analyzed and reported.*
Results: *The area under the receiver operation characteristic (ROC) curve, using the TYC as a gold standard, was 0.895. The cut-off score of 16 was appropriate for early detection of the psychosocial dysfunction. At this cut-off score, the sensitivity was 83.51%, the specificity was 79.37%, the positive predictive value was 86.17% and the negative predictive value for detecting psychosocial dysfunction among children was 75.76%.*
Conclusion: *The authors' findings suggested that the Thai version, parent completed, PSC may be a useful psychosocial screening tool for the children aged 6-11 years with the recommended cut-off score of 16.*

Keywords*: Brief psychosocial screening, Thai version pediatric symptom checklist (PSC), Behavioral problems in children, Psychosocial dysfunction*

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Politics, economics and cultural changes lead to stress which may affect children's and family's psychosocial well-being[1]. Concerning stress in the family, children can be affected directly by stress they see in their parents or, indirectly, by anxiety over problems they hear and read about in the media[2]. Furthermore, during the school period children can acquire stress and anxiety from school and their peers. Some of them have behavioral problems, learning problems and physical conditions that are caused by psychosocial factors[1-3]. For general pediatrician, it is not easy to detect the problems since the interviewing process is time-consuming and requires skillful techniques[4,5]. In Thailand, there is a standard questionnaire to detect behavioral problems in school-aged children called the Thai Youth Checklist (TYC) which was developed in 1989 and completed in 1997 based on the translation of the checklist items of Achenbach and Edelbrock Child Behavioral Checklist[6,7]. Although the TYC is helpful and valid, it takes about 30 minutes to complete the questionnaire, the TYC is not suitable for a busy outpatient department or pediatric clinics. One approach to help pediatricians as well as the children to receive appropriate care is to apply a valid and sensitive screening tool in order to identify those with significant psychosocial dysfunction for further evaluation and referral[8-11]. The Pediatric Symptom Checklist (PSC) is a psychosocial screening tool designed to facilitate the recognition of cognitive, emotional and behavioral problems. There is a parent-completed version (P-PSC)

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for parents of 6-16-year-old children and the youth self-report (Y-PSC) for adolescents aged 11 and up[12-14]. This screening tool can be used in out-patient settings as well as in in-patient settings. An existing report has shown that it serves to heighten physicians' awareness of psychosocial concerns and facilitate parent-physician discussion of pediatric mental health issues[15]. The present study aimed to assess whether the Thai version of parent-completed, 35-item, Pediatric Symptom Checklist (PSC) was valid and suitable for the detection of psychosocial dysfunction and to find out the optimal cut-off score.

Material and Method

Setting

A cross-sectional study design was conducted at Queen Sirikit National Institute of Child Health from November 2006 to December 2007. The parents of 172 children aged 6-11 years who attended the psychiatric department and inpatient department were included in the present study.

Instruments

The Thai version Pediatric Symptom Checklist (PSC) and the Thai Youth Checklist (TYC) are two instruments used in the present study. The Pediatric Symptom Checklist (PSC) is a 35-item questionnaire; each item is rated as "Never", "Sometimes" or "Often" present and scored 0, 1 and 2, respectively. The total score is calculated by adding together the score for each of the 35 items. Items that are left blank are ignored. If four or more items are left blank the questionnaire is considered invalid. The Thai Youth Checklist (TYC) contains 143 items and modified from Achenbach and Edelbrock Child Behavioral Checklist[15]. Each item is rated as "Never", "Sometimes" or "Often" present and scored 0, 1 and 2, respectively. The scoring method is different for boys and girls. If the point score is equal to or less than 48 in boys and 47 in girls, it is considered to be in normal range. If point score is between 49-57 in boys and 48-56 in girls, it is considered to be in the mild risk group. If point score is between 58-66 in boys and 57-65 in girls, it is considered to be in the moderate risk group. If point score is more than 67 in boys and 66 in girls, it is considered to be the clinical range group. The TYC can classify children to have externalizing and internalizing problems and categorize symptoms including withdrawn, somatic complaints, anxious/depressed mood, social problems, attention problems, delinquent behavior and manifestation of aggressive behavior.

Statistical analysis

Thai version Pediatric Symptom Checklist (PSC) and Thai Youth Behavior Checklist (TYC) were completed by the parents after the objectives and details of the present study were explained and consent forms signed. If the checklists were not fulfilled for the criteria, they were excluded from the study. ROC curve analysis was conducted to determine the diagnostic performance of the PSC, using the TYC as a reference standard. Sensitivity, specificity, positive and negative predictive values of PSC were estimated.

Results

During the study period 172 children aged 6-11 years were enrolled in the present study, 12 participants did not complete both the Thai version PSC and the TYC questionnaires. One hundred and sixty questionnaires (93%) were included in the analysis. Sixty percent of the participants were recruited from the child psychiatry department and 39.4% were from the inpatient department. Sixty-three percent were male. The sample demographic characteristics are shown in the Table 1. Based on the standard scoring system of the TYC, the authors found that the proportion of children recruited from psychiatric clinic scores of patients had scores on the TYC in the clinical range more than the group of hospitalized children as shown in Table 2.

Comparing the scores from the TYC and the PSC, it was found that the Thai version PSC score between 9-15 was compatible with normal ranges; the score between 16-19 was compatible with the mild problem range; and the score between 19-26 was compatible with the moderate problem range; the score of 26 or higher was compatible with the clinical range as shown in Table 3.

The three cut-off scores of Thai version PSC are shown in Table 4. At the cut-off score of 16, the sensitivity, specificity, positive predictive and negative predictive values were 83.51%, 79.37%, 86.17% and 75.76%, respectively. At cut-off score of 20, the sensitivity, specificity, positive predictive value and negative predictive value were 58.76%, 93.75%, 93.44%, and 59.59%, respectively. At cut-off score of 27, the sensitivity, specificity, positive predictive value and negative predictive value were 27.37%, 98.46%, 98.30%, and 48.12%, respectively.

The diagnostic performance of the Thai version PSC using the TYC as the reference criterion standard was demonstrated in the Fig. 1. The authors' finding indicated that the area under the ROC curve

was 0.895.

Discussion

Demographic data of the present study showed that the majority of the patients were in low socioeconomic status. This data represents the real situation of the patients who sought care at Queen Sirikit National Institute of Child Health. It is generally known that poverty is associated with increased risk of psychosocial problems in children[2]. The prevalence of psychosocial dysfunction based on the Thai Youth Checklist criteria was as high as 60.63% among the study group. This prevalence is higher than the other studies conducted among community populations ranging from 5 to 15%[12,13,17] and 24.7%[3] among general pediatric practice. The main reason for the high prevalence of the present study is the fact that the data were obtained from patients attending a psychiatry unit and those who were hospitalized in the hospital. Both groups were likely to be in a stressful situation, thus likely to have a higher rate of psychosocial dysfunction than the general population.

The PSC was designed to help pediatricians screen for a child who may need further evaluation. Jellinek and Murphy who developed this screening tool suggest that for children ages 6 through 16, a cut-off score of 28 or higher indicates psychological impairment. For children ages 4 and 5 the PSC cut off score is 24 or higher. The sensitivity and specificity are 95% and 68%, respectively. The sensitivity and specificity at the recommend cut-off score among other ethnic groups in the United States are 71.7% and 93.0%, respectively[12,13,17]. The PSC can be used in the in- and outpatient settings, community settings and health supervision visit[17-20]. It is also useful for behavioral screening among disadvantaged children[21]. The PSC can be downloaded and used free of charge[22]. Apart from the English version, the PSC has been translated into many languages such as Chinese, French, Japanese and Spanish. All forms of the PSC are scored in the same way although different cutoff scores have been recommended for certain translated versions. For the

Table 1. Characteristics of the study population

Demographic data	n
Age group of the children	
6 years	29 (18.1%)
7 years	30 (18.8%)
8 years	28 (17.5%)
9 years	22 (13.8%)
10 years	27 (16.9%)
11 years	24 (15.0%)
Total	160 (100%)
Occupation of the mothers	
Housewife	46 (28.8%)
Private business	35 (21.9%)
Employee	48 (30.0%)
Government officer	13 (8.1%)
Agriculture	8 (5%)
Not specified	10 (6.2%)
Total	160 (100%)
Occupation of the fathers	
Private business	24 (15.0%)
Employee	6 (3.8%)
Government officer	24 (15.0%)
Agriculture	6 (3.8%)
Not specified	23 (14.4%)
No job	7 (4.8%)
Total	160 (100%)
Family income(bath/month)	
< 5,000	5 (3.1%)
5,000-9,999	56 (35%)
10,000-14,999	30 (18.8%)
15,000-19,999	17 (10.6%)
>20,000	43 (26.9%)
Not specified	9 (5.7%)
Total	160

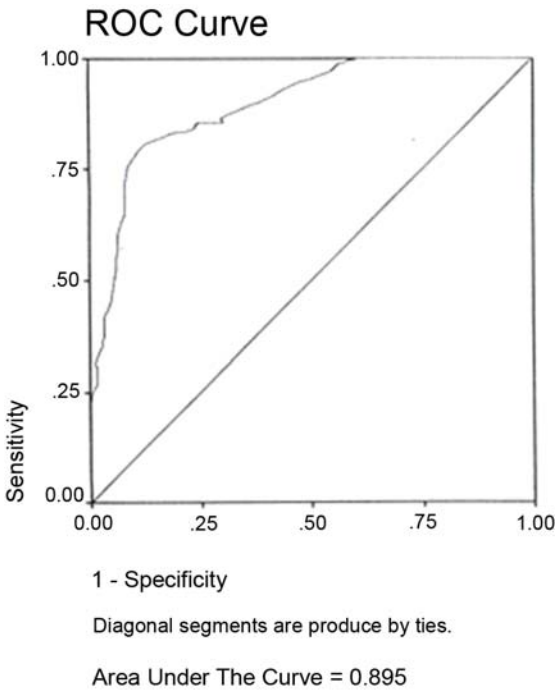

Fig. 1 Receiver Operating Characteristic (ROC) curve

Table 2. Groups of the problems classified by the TYC

Group of the problems classified by the TYC	Patients attended to psychiatry department	Patients admitted to inpatient ward	Total
	n	n	
Normal	31 (31.9%)	32 (50.8%)	63
Mild problem range	14 (14.4%)	10 (15.9%)	24
Moderate problem range	9 (9.3%)	11 (17.4%)	20
Clinical range	43 (44.3%)	10 (15.9%)	53
Total	97 (100%)	63 (100%)	160

Table 3. Scoring from Thai version PSC compare with Groups of the problems classified by the TYC

Group of the problems classified by the TYC	n	Scoring from Thai version PSC				SD	Standard error of mean
		Mean	Median	Min	Max		
Normal	63	9.6	9.0	0	27.0	5.9	0.8
Mild problem range	24	15.3	16.0	7.0	25.0	5.4	1.0
Moderate problem range	20	18.9	19.5	8.0	33.0	6.6	1.5
Clinical range	53	26.0	26.0	10.0	40.0	6.8	0.9
Total	160	17.0	17.0	0.0	40.0	9.4	0.7

Japanese version of the parent reported PSC-35, a cutoff score of 17 is recommended. For the German version, the optimal cutoff has been found to be 24. For the Dutch version, a cutoff of 25 is recommended. For the Spanish and English versions of the pictorial PSC, the cutoff scores are the same as for the standard parent form. For the PSC-Y in English and Spanish, a cutoff score of 30 is recommended[22].

In 2003, there was a study in a low-income Mexican-American population examining the diagnostic performance of the PSC as a screening test using the Child Behavior Checklist (CBCL) as a reference standard. Receiver operator characteristic analysis demonstrates that the PSC cutoff score of 12 yielded the highest diagnostic accuracy for classifying children with and without behavioral problems (sensitivity, 0.74; specificity, 0.94)[19]. In 2007, a study in the United States was conducted to examine whether an adaptation of the Pediatric Symptom Checklist using visual aids was valid and suitable for the early detection of psychosocial problems among a sample of Mexican children and adolescents using the Child Behavior Checklist (CBCL) as the reference criterion standard. Sensitivity and specificity at the standard cut-off scores were 69.6% and 95.2% for children 4-5 years old and 61.8% and 91.8% for children 6-16 years old, respectively[23]. In Thailand, there was a study comparing the diagnostic performance of PSC with Achenbach and Edelbrock Child Behavioral Checklist (CBCL). The results suggested optimal cut-off score of 20 with sensitivity of 51.38% and specificity of 89%[24].

The area under the curve of 0.895 based on the ROC analysis indicates that the Thai version PSC has an acceptable diagnostic performance as a screening tool[25]. The cut-off scores of 16 and 20 appeared to be the appropriate cut-off score. For early detection of psychosocial dysfunction, the appropriate cut-off score should be 16, since it has high sensitivity and acceptable specificity. In mild cases, the patients can be treated by general pediatricians by using psychosocial approaches[5]. Scientific evidence indicates that the appropriate identification and treatment of mental disorders in childhood can reduce symptoms of child psychopathology, improve adaptive functioning, and sometimes serve as a buffer to further long-term impairment[26]. Thus, if the results of the PSC screening test yield scores ranging from 16-19, pediatricians should be aware of the early and/or mild psychosocial problems and take time to explore the potential causes and provide guidance for the parents.

Table 4. The cut-off scores with sensitivity, specificity, positive predictive value, and negative predictive value

TYC/PSC scoring	Problem range group	Normal range group	Total
Score =16 or more	81	13	94
Score <16	16	50	66
Total	97	63	160
At cut-off score of 16	Sensitivity = 83.51%, Specificity = 79.37% Positive predictive value = 86.17%, Negative predictive value = 75.76%		
TYC/PSC scoring	Problem range group	Normal range group	Total
Score = 20 or more	57	4	61
Score < 20	40	59	99
Total	97	63	160
At cut-off score of 20	Sensitivity = 58.76%, Specificity = 93.75% Positive predictive value = 93.44%, Negative predictive value = 59.59%		
TYC/PSC scoring	Problem range group	Normal range group	Total
Score = 27 or more	26	1	27
Score < 27	69	64	133
Total	95	65	160
At cut-off score of 27	Sensitivity = 27.37%, Specificity = 98.46% Positive predictive value = 98.30%, Negative predictive value = 48.12%		

If the scores are equal to or more than 20, pediatricians should consider referral for further investigation. The scores equal to or above 27 are suggestive of clinical range of the psychosocial dysfunction.

In conclusion, the Thai version, parent completed, PSC may be a useful psychosocial screening tool for the children aged 6-11 years. The recommended optimal cut-off score for early detection of psychosocial dysfunction is 16, and the cut-off score for referral and/or further investigation is 20.

Potential conflicts of interest

None.

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ความสามารถของแบบคัดกรองจิตสังคมอย่างสั้นในการค้นหาเด็กที่มีปัญหาพฤติกรรม

รัตโนทัย พลับรู้การ, กาญจนา อำลอย, วิบูลย์ กาญจนพัฒนกุล

ภูมิหลัง: *การใช้แบบคัดกรองจิตสังคมช่วยให้กุมารแพทย์สามารถค้นหาปัญหาพฤติกรรม และปัญหาจิตสังคมในเด็กได้ง่ายขึ้นส่งผลให้ได้รับการดูแลรักษาในเบื้องต้น หรือส่งต่อผู้ป่วยไปยังผู้เชี่ยวชาญทำได้อย่างอย่างรวดเร็วขึ้น*

วัตถุประสงค์: *เพื่อประเมินแบบคัดกรองพฤติกรรม Pediatric Symptom Checklist ฉบับภาษาไทยที่ให้ผู้ปกครองทำมีประโยชน์ในการคัดกรองปัญหาพฤติกรรมในเด็กได้มากน้อยเพียงใด*

วัสดุและวิธีการ: *ศึกษาแบบตัดขวางในเด็ก 160 คน ที่มีอายุระหว่าง 6-11 ปี ที่มาตรวจรักษาที่สถาบันสุขภาพเด็กแห่งชาติมหาราชินีระหว่างเดือน พฤศจิกายน พ.ศ. 2549 ถึงธันวาคม พ.ศ. 2550 โดยให้พ่อ แม่ กรอกแบบคัดกรองพฤติกรรม Pediatric Symptom Checklist (PSC) ฉบับภาษาไทย และ Thai Youth Behavior Checklist (TYC) จากนั้นนำคะแนนที่ได้จากแบบสอบถามทั้ง 2 ชนิด มาวิเคราะห์ ความไว ความจำเพาะ ค่าร้อยละของการเป็นโรคเมื่อได้ผลบวก และค่าร้อยละของการไม่เป็นโรคเมื่อได้ผลลบ*

ผลการศึกษา: *เมื่อใช้ TYC เป็นมาตรฐาน พบว่ามีพื้นที่ใต้ ROC เท่ากับ 0.895 จากการวิเคราะห์หาคะแนนที่ใช้เป็นจุดตัดพบว่าจุดตัดที่เหมาะสมอยู่ที่คะแนน 16 เป็นการค้นหาปัญหาที่เพิ่งเริ่มต้น มีอาการค่อนข้างน้อย และสามารถให้การดูแลได้เองโดยกุมารแพทย์ โดยมีความไว 83.51% ความจำเพาะ 79.37% และมีค่าร้อยละของการเป็นโรคเมื่อได้ผลบวกเท่ากับ 86.17% และค่าร้อยละของการไม่เป็นโรคเมื่อได้ผลลบ เท่ากับ 75.76%*

สรุป: *จากการศึกษาในครั้งนี้แบบคัดกรองพฤติกรรม Pediatric Symptom Checklist ฉบับภาษาไทยที่ให้ผู้ปกครองทำสามารถใช้คัดกรองปัญหาจิตสังคมและปัญหาพฤติกรรมในเด็กอายุระหว่าง 6-11 ปี ได้โดยจุดตัดที่ควรใช้ในการคัดกรองปัญหาในระยะเริ่มแรกอยู่ที่ 16 คะแนน*