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CHILDHOOD PSYCHOPATHOLOGY MEASUREMENT SCHEDULE: DEVELOPMENT AND STANDARDIZATION*

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SUMMARY

Development and standardization of an instrument Childhood Psychopathology Measurement Schedule (CPMS) to assess psychopathology in children is reported. CPMS is standardized on Indian population and is applicable to children of both sexes in the age range of 4-14 years. It measures overall psychopathology in the form of a total scores and also the type of psychopathology in the form of eight factorially derived syndromes which have satisfactory reliability and validity. CPMS is proposed to be used as a screening instrument in population surveys to identify disturbed children as well as a research tool involving measurement of childhood psychopathology and its classification.

Introduction

Research on child psychopathology has suffered a great deal due to the lack of standardized, reliable and well validated systems of measuring it. Various approaches that have been described for the assessment of child psychopathology are projective, dimensional and target symptoms analysis. Dimensional approach as advocated by Eysenck (1961) utilizes multivariate statistical technniques, mostly factor analysis, to arrive at the dimensions which are relatively independant, objective and reliable. O'Leary (1972) summarises, that factor analytic approaches to the assessment of childhood psychopathology have aided greatly in reducing a myriad of deviant behaviours to a small number of relatively reliable and consistent dimensions. Many workers have attempted to develop taxonomies of child behaviour disorders through multivariate analysis of symptom checklists (Dreger et al 1964, Achenbach 1966, Miller 1967, Connors 1970, Arnold & Smeltzer 1974, Achenbach 1978a, 1979).

Achenbach and Edelbrock (1978b, 1979) devised Child Behaviour Checklist (CBCL) consisting of 118 behaviour problem items and 20 social competence items. Behaviour problem items reported for between 5% and 95% of clinic children were subjected to second order principal component-varimax analysis, which yielded two broad band factors, labelled Internalizing and Externalizing. First order factors called as narrow hand syndromes labelled somatic complaints, withdrawl, hyperactive, agressive and delinquent were consistently found for all the groups of different age and sex which were separately analysed.

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The review of literature suggests that most popular multivariate statistical method used has been the factor analysis. Despite great diversity in instruments, subjects, raters and statistical methods, empirical efforts have produced a number of syndromes with considerable consistency and reliability. There is pursuasive evidence for the generality of the aggressive, deliquent, hyperactive and schizoid syndromes and a good evidence for anxious, depressed, social withdrawal and somatic complaints syndromes as summarised by Achenbach and Edelbrock (1978). Other workers have named them differently, though there are considerable similarities in the constellation of these empirical syndromes.

Most of the instruments that were used to assess psychopathology did not have a direct cross-cultural applicability. Self-administered rating scales or checklist forms in English language could not be administered to illiterate population in India. Moreover, regional linguistic counterparts for many words/symptoms had to be considered. A comprehensive, reliable and valid instrument to measure psychopathology in Indian child population did not exist. Child Behaviour Checklist (CBCL) of Achenbach (1978b, 1979) was chosen for adaptation on Indian population and in Hindi language, bacause it was found to be comprehensive, well standardized with established validity and reliability in various clinical samples.

Adaptation

Only behaviour problem scale of CBCL was taken for adaptation. The items were recorded in a question form to make it as semi-structured interview which could be used as a guide to clinical interviewing or as a self administered questionnaire. Use of minor elaborations/probes were allowed to elicit desired information. Some of the items that did not apply or could not be translated (e.g. behaves like opposite sex, bragging and boasting) were deleted. Scoring was done in yes '1' or no '0' answers.

Thus, 85 items schedule named as Childhood Psychopathology Measurement Schedule (CPMS) was devised and tried on the mothers of 10 children coming to the child Guidance Clinic (COC) of the department of Psychiatry of the Postgraduate Institute of Medical Education and Research, Chandigarh. Mainly qualitative analysis was done to examine the format and the wording of questions was suitably modified.

Item Analysis

In the first tryout CPMS was administered to the mothers of 50 children in the age range of 4-14 years attending the CGC. Frequency count of items showed that one item i.e. sexual problems got the score of '0' for all the children and hence was deleted. All other items were scored positive for at least 5% of the sample.

CPMS (84 items), thus modified, was further administered in the second tryout to the mothers of 100 emotionally disturbed children (excluding moderate to severe mental retardation and psychoses). Item-factor analysis was done. Factors with eigen value greater than one were extracted using principal component analysis-varimax rotation. Items with factor loadings of $<.30$ were discarded (9 in number). 29 factors emerged accounting for 79.58% of total variance. Items which did not overlap and showed high loadings (≥ 0.70) were considered as the marker of defining variables.

Table 1
CPMS Second order factor Matrix (Varimax rotation)

Ist order factors	1	2	3	4	5	6	7	8	9
1			−.871						
2						−.697			
3	.574								
4					−.787				
5									.730
6	.675		−.410						
7		.772							
8					−.464	−.603			
9									
10				.810					
11		.491							
12			−.551		−.400				
13							.775		
14		.832							
15	.764								
16									
17					−.763				
18					−.505				
19	.463								
20				.797					
21			−.830						
22	.752								
23							.774		
24			−.795						
25		.780							
26						−.597			
27									.791
28	.764								
29								.735	
Eigen Value	3.43	2.69	3.31	1.67	2.56	1.90	1.55	1.67	1.65
Variance	11.82	9.29	11.41	5.75	8.84	6.55	5.34	5.75	5.70
									Total: 70.45%

Factor loadings ≥ ± .4 are shown

Factor scores were computed for 29 first order factors and subjected to second order factor analysis using the same statistical criteria as for first order factorization.

This table shows the results of second order factor analysis of 75 CPMS items. Nine factors emerged accounting for 70.45% of variance. Loadings of ± .40 or more were considered significant and factors with at least four items were retained which excluded factor no. 7 that comprised of only two items. Finally, eight factors were retained and interpreted accounting for 65.11% of variance. Item constellation of each factor is given in the appendix. These factors represent the psychopathology dimensions upon which children with psychiatric disorders can be classified. These represent both quantitative as well as qualitative assessment.

Table II
comparison of CPMS scores in the two groups

Psychopathology Factors	Emotionally disturbed (N=100)		Normal Control (N=100)		't' ratio
	Range	Mean (S.D.)	Range	Mean (S.D.)	
1. Low Intell. with beh. problems.	0–14	4.78 (3.48)	0–7	1.13 (1.50)	9.61*
2. Conduct Dis.	0–16	6.27 (3.99)	0–9	2.34 (2.42)	9.68*
3. Anxiety	0–5	1.39 (1.36)	0–3	0.30 (0.66)	7.17*
4. Depression	0–10	2.62 (2.16)	0–4	0.64 (0.90)	8.43*
5. Psychotic symptoms	0–6	0.87 (1.19)	0–3	0.16 (0.49)	5.50*
6. Special symptoms	0–3	0.46 (0.80)	0–1	0.09 (0.29)	4.35*
7. Physical illness with emotional problems	0–3	0.84 (0.85)	0–3	0.31 (0.60)	5.10*
8. Somatization	0–6	1.74 (1.45)	0–4	0.49 (0.89)	7.35*

* >.01

Reliability

Two measures of reliability were studied, test-retest and inter-rater on 20 subjects each. Correlation values for test-retest reliability after two weeks interval ranged between +.78 to +.91 and for inter-rater reliability it was +.88 to +.96 for all the items. These correlation values are statistically highly significant.

Validity

Construct validity: CPMS was administered to 100 emotionally disturbed children and 100 normal healthy children, group matched for age, sex and rural-urban states. Comparative scores as shown in Table II reveal that the sick group scored significantly higher on all the factors as compared to normals.

Criterion validity: scores on eight CPMS factors were calculated for various ICD-9 diagnoses assigned to 100 psychiatrically disturbed children on the basis of clinical examination and are shown in Table III.

This table shows the mean scores on the eight CPMS factors in various clinical diagnostic categories (ICD-9). Group of children diagnosed clinically as mental retardation scored significantly higher on factor 1 (Low Intelligence with Emotional Problems) as compared to all other diagnostic categories.

Similarly, patients with clinical diagnosis of conduct disorders and neurosis scored highest on factors II & III respectively, supporting the criterion validity of these three factors. On all other factors, although the scores are significantly higher as compared to normal subjects but not very different across the various diagnostic categories.

The description and analysis of these factors shows that they have criterion as well as construct validity. Moreover, since these are factorially derived syndromes there is also satisfactory factorial validity.

Norms

Frequency count of the CPMS scores of 100 emotionally disturbed and 100 normal children was tabulated.

Table III
Comparison of scores on Psychopathology factors in different clinical diagnositc groups and normal children

Clinical Diagnosis	No.	Low Intell. with Emotional problems	Conduct Disorder	Anxiety	Depre-ssion	Psychotic symptoms	Special symptoms	Physical disorder with Emotional problem	Somati-zation
1. MR with Beh. Prob.	26	7.15 (3.56)	6.58 (3.88)	1.54 (1.53)	2.88 (2.35)	2.0 (2.68)	0.50 (0.99)	0.88 (0.76)	1.81 (1.67)
2. Neuroses	12	2.16 (2.24)	5.83 (4.41)	3.50 (1.56)	2.58 (2.06)	1.42 (1.08)	0.08 (0.29)	0.66 (0.98)	1.75 (0.96)
3. Special Symptoms	12	3.16 (2.21)	4.50 (4.10)	1.50 (1.44)	2.50 (2.35)	1.08 (1.62)	0.83 (0.94)	0.75 (0.75)	1.58 (1.31)
4. Conduct Disorder	29	4.83 (3.50)	9.21 (3.51)	1.34 (1.32)	2.62 (2.09)	0.86 (0.92)	0.38 (0.68)	1.07 (0.92)	1.69 (1.63)
5. Disturbs of Emotion specific to childhood	15	4.13 (2.95)	6.73 (3.82)	1.47 (1.19)	2.87 (2.26)	0.80 (0.86)	0.53 (0.74)	0.60 (0.63)	1.80 (1.15)
6. Hyperkinetic Syndrome	6	6.33 (1.63)	9.17 (3.60)	1.66 (1.60)	1.66 (1.17)	0.83 (0.75)	1.33 (1.15)	0.83 (1.17)	1.83 (1.72)
Normal		1.13 (1.50)	2.34 (2.42)	0.30 (0.66)	0.64 (0.90)	0.16 (0.49)	0.09 (0.29)	0.31 (0.60)	0.49 (0.89)

Table IV
Distribution of CPMS scores in the emotionally disturbed and the normal control group

CPMS Score	Normal Control N=100	Emotionally Disturbed N=100	
0–10	87	18	Cut off at score 10
11–20	13	41	Sensitivity –82%
21–30	–	30	Specificity –87%
31–50	–	11	

This table shows the distribution of scores in the two groups. Taking the cut off at score - 10, the CPMS picked out 82 cases in the emotionally disturbed group as positive indicated as sensitivity (82%), and 13 cases in the normal group were false positive shown as specificity (87%).

Application

The CPMS in its final form comprising of 75 items; both in Hindi and English languages, to be rated as 'yes' – 'no' responses; can be used as an interview schedule, as a self administered questionnaire; as well as guide to clinical interviewing; applicable to children of both sexes in the age range of 4-14 years. It can be used as a screening instrument to identify disturbed children in population surveys. Children who score 10 are likely to be disturbed psychiatrically. It can be used to study the nature of psycho-pathology exhibited by emotionally disturbed children in the form of profiles and also to classify them on the basis of the factorially derived dimensions. Depending upon the purpose for which CPMS will be used, it can be

asked whether these symptoms had been present during the past one month, or six months or any time or most of the times during the illness. The informant should be a parent, preferably mother, or a parent surrogate. Scores of the items on each of the eight factors are summed to give factor scores that comprise of varying number of items (4 to 17) and represent reliable and valid empirical categories.

Discussion

CBCL (Achenbach 1979) comprises of 118 behaviour problem items and standardized into separate editions of the profiles for each sex in the age ranges of 4-5, 6-11, and 12-16 years. Items are scored on a three point scale (0,1,2) and ratings pertain to child's behaviour during past 12 months. The scores were subjected to second order factorization and normalized T-scores were computed for both the narrow-band as well as the broad band syndromes. Thus, child behaviour profiles are developed which have both a computerized as well as a hand scored version for each of the editions.

CPMS though based upon CBCL for the source of items, further method of standardization adopted was very different for various reasons. Analysis and profile generation of CBCL was cumbersome; separate editions' for each sex in three age ranges were practically difficult to handle; and three point rating was found arbitrary rather than based upon real differences in severity in actual practice. Moreover, it was a practical necessity to develop a simple method of assessment of psychopathology which could even be used by less trained personnel and scoring and analysis should also be simple and easy. Moreover, CPMS has been devised to be additionally useful as a screening instrument.

Comparison of the factors of CBCL and CPMS indicate that CPMS factors designated as Conduct Disorder, Anxiety, Depression, and Somatization have similarities with CBCL narrow band syndromes of delinquent, anxious-obsessive, depressed withdrawl and somatic complaints respectively. However, CPMS factors of Low Intelligence with behaviour problems, special symptoms, psychotic symptoms and physical illness with emotional problems did not have any comparable scale of CBCL. This difference may not be surprising because the two instruments are quite different and population under study as well as method of analysis is different.

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