Child and adolescent psychopathology in a developing country: testing the validity of the Strengths and Difficulties Questionnaire (Urdu version)

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Abstract

A study to test the validity of the Urdu version of the Strengths and Difficulties Questionnaire (SDQ) was carried out in Pakistan. The study population consisted of 212 children aged 4 to 16 years presenting to psychiatric (case group: $n = 72$) and paediatric outpatient clinics (comparison group: $n = 140$). Parents of these children were interviewed using the extended version of the SDQ. The case group was further subjected to diagnostic ICD-10 criteria by child psychiatrists, who were blind to SDQ scores.

The Urdu version was able to discriminate between the study groups. The mean difficulties score was higher in the case group (mean = 21.7) than the comparison group (mean = 14.4), the difference (mean difference = 7.3) being statistically significant ($p < 0.01$, 95% CI = 5.3, 9.3) with an effect size of 1.1. Adequate sensitivity ($\geq 61\%$) was obtained for each type of psychiatric disorder in the case group using the abnormal category of the SDQ symptom scores as a cutoff. A simple 'pencil-and-paper' algorithm combining symptom and impact scores further identified children in need of intervention. A ROC curve analysis showed an area under the curve > 0.70 for all scores. The choice of optimal cutoffs for the Urdu version is discussed. Copyright © 2005 John Wiley & Sons, Ltd.

Key words: child psychiatric disorders, questionnaires, validity

Introduction

Prevalence of child psychiatric disorders

Child psychiatric disorders occur frequently in the general population of children. Estimates vary according to survey methodology, diagnostic criterion and the nature of informants. An overview of 49 studies involving more than 240,000 children in many different countries has demonstrated a median 1 year prevalence of 12.3% for overall psychiatric disorders (Graham et al., 2001). In a recent national survey in Great Britain, the 6 month period prevalence of psychiatric disorders was 10% in children and adolescents aged 5–15 years ($n = 10,438$ achieved interviews) (Meltzer et al., 2000).

In developing countries, despite significant degrees of socioeconomic deprivation and morbidity from physical diseases, the prevalence for non-organic child psychiatric problems is similar to those reported in Western studies (Nikapota, 1991; Eapen et al., 1998; Fleitlich-Bilyk and Goodman, 2004). A study was carried out in Brazil to explore the extent of association of social risk factors with psychiatric disorders in developing countries. Significant differences ($p < 0.001$) were observed for the presence of family violence, maternal psychiatric illness and poverty; these family and social adversities being associated with higher rates of psychiatric caseness – probable psychiatric disorder among children and adolescents (Fleitlich and Goodman, 2001).

Child psychiatric disorders in Pakistan

So far, to our knowledge, only one prevalence study for child psychiatric disorders has been carried out in Pakistan. Using the Rutter questionnaire, this study identified a prevalence of 9.3% for emotional and behavioural problems among school children ($n = 225$) (Javed et al., 1992).

Use of measures in child psychiatric research

Several behavioural and emotional screening questionnaires have been used in child psychiatric epidemiological research. In order to identify children's positive aspects in addition to their weaknesses, Goodman developed the Strengths and Difficulties Questionnaire (SDQ) in 1997. The SDQ covers common forms of child and adolescent psychopathology including emotional, hyperactivity and conduct problems. Despite its brevity, the English-language versions of the SDQ have been shown to be of acceptable reliability and validity, performing at least as well as the Rutter Questionnaires and the Child Behaviour Checklist. (Goodman, 1997; Goodman et al., 1998; Goodman and Scott, 1999; Koskelainen et al., 2000; Goodman, 2001). In a large British study ($n = 7984$) of 5–15 year olds in a community setting, multi-informant SDQs (parents, teachers, older children aged 11 or over) detected psychiatric disorders with a specificity of 95% and a sensitivity of 63% (Goodman et al., 2000). Furthermore, the SDQ offers a better coverage of inattention, peer relationships and prosocial behaviour. A single form is suitable for both parents and teachers, which is likely to increase parent-teacher correlations (Goodman, 1997).

Originally published in English, the Strengths and Difficulties Questionnaire has been translated into over 40 languages since then. Translated versions have been shown to function satisfactorily in Sweden (Smedje et al., 1999), Germany (Klasen et al., 2000), Bangladesh (Mullick and Goodman, 2001), the Gaza strip (Thabet et al., 2000) and Finland (Koskelainen et al., 2001).

The present study aimed to test the validity of the Urdu language version of the SDQ in the cultural setting of Pakistan for its subsequent application with this population.

Method*Sample*

The two groups studied were:

- children aged 4–16 years attending psychiatry outpatient clinics – case group;
- children aged 4–16 years attending paediatric outpatient clinics – comparison group.

Given the small throughput of children in the specialist clinic, it was decided to maximize the power of the study by recruiting twice the number of children in the comparison group as in the case group. The final recruitment numbers were: case group $N = 72$; comparison group $N = 140$. This sample size would deliver 90% power to detect a moderate effect size of 0.50 for the mean difference in SDQ scores between the two groups. Although we hypothesized a higher score among cases than among comparison group controls, more conservative two-tailed significance tests were used throughout.

Instrument

The SDQ is a brief behavioural questionnaire that asks about 25 attributes – some positive and others negative. The 25 items are divided into five scales of five items each: emotional symptoms, conduct problems, hyperactivity, peer problems and prosocial behaviour. All but the last of these scales are summed to generate a total difficulties score ranging from 0 to 40 (Goodman, 1997). Either parents or teachers of children and teenagers aged 4 to 16 years can complete the informant-rated versions. The self-report version is for completion by young people 11 to 16 years of age. The 25 items cover the same attributes as the informant-rated SDQ, with the only difference for most items being a grammatical change from third to first person between the informant-rated and self-report versions. Extended versions of the SDQ include an impact supplement, which asks if the respondent thinks that the young person has a problem, and if so, enquires further about chronicity, distress, social impairment and burden for others (Goodman, 1999).

Urdu translation of the SDQ

The P4-16 version of the extended SDQ for parents of 4–16 year olds was translated from English to Urdu with academic rigour. Professional translators carried out the translation and back translation. All scale items of the Urdu translation were kept as close as possible to the English version of the SDQ. At the same time care was taken to retain the conceptual meaning of each item. Furthermore, during translation, words

were selected that are spoken in day-to-day Urdu and are acceptable in the cultural environment of Pakistan. For example item words such as 'steals' and 'lies' were translated in a subtle manner to avoid an immediate negative response from parents while ensuring conceptual equivalence with the English version.

Five interviewers with at least a secondary-school educational qualification were trained to conduct interviews. To ensure consistency in the mode of interviewing, key words that tend to differentiate normal from abnormal behaviour such as 'constantly' in the item 'constantly fidgeting or squirming' were underlined for each of the 25 items of the SDQ.

Data collection

Data were collected over 6 weeks starting from April 2000 in the city of Karachi, Pakistan.

Due to the small number of children presenting to psychiatric clinics, six such clinics were identified as field sites for the case group. Self-completion was not generally feasible because of the low literacy levels of many parents. Instead interviewers administered the SDQ in all instances, with informed consent taken prior to the interview. A child psychiatrist blind to SDQ scores then clinically assessed the child. Overall, 34 children were diagnosed as having an emotional disorder, 18 with hyperactivity disorder, six with conduct disorder and 14 with more than one of these disorders (combined).

For the comparison group, interviews were taken from parents of children presenting with a medical or surgical problem with an onset within the past four weeks. The medical group included children with mild, uncomplicated upper respiratory tract infections. The paediatric surgical group comprised children presenting for follow-up visits for procedures such as herniotomy, ligation of patent processus vaginalis, uncomplicated fractures and ritual circumcision. The assumption made in this study was that children in these clinics are primarily seeking help for a recent medical/surgical problem and are at relatively low risk of an underlying or coexisting psychiatric disorder. Child psychiatry is a scarce resource in Pakistan, therefore it was not possible to evaluate children from the paediatric outpatient group independently for the presence of a psychiatric disorder.

Statistical analyses

Data analyses were carried out using SPSS (version

10.0). To test the discriminative ability of the SDQ in identifying 'caseness', the grouping of its symptom scores into normal, borderline and abnormal categories was used in two ways in Table 1. 'Caseness' occurred where a child was likely to have a psychiatric problem and scored in the borderline or abnormal category on one of the SDQ scales. In the first instance the borderline category was collapsed with the abnormal category to observe the effect of a low cutoff. The second strategy compared the study groups using a high cutoff or the abnormal category only. Sensitivity calculations were obtained using child psychiatric diagnoses as the gold standard. For emotional symptoms, conduct problems and hyperactivity scales, the case group included children diagnosed with the particular disorder. For remaining SDQ scales, the case group comprised children scoring above the threshold for each of these scales who were diagnosed as having either an emotional, conduct, hyperactivity or combined disorder.

A simple 'pencil-and-paper' algorithm was applied for converting the SDQ scores into diagnostic predictions. The algorithm originally developed for a Bangladeshi sample (Mullick and Goodman, 2001) combines symptom scores with impact scores in consonance with current diagnostic criteria (World Health Organization, 1994; American Psychiatric Association, 1994), according to which child psychiatric disorders are best diagnosed from both symptom and impact scores. Compared to using symptom scores only, the symptom-impact score combination thus provides a suitable basis for predicting a psychiatric disorder – for identifying children with a high likelihood of mental health problems. According to this algorithm, at least one informant report (parent or teacher or self-report) is required to predict emotional and conduct disorders. On the other hand due to pervasiveness of symptoms, two or more informants are required for predicting a hyperactivity disorder. Our study used the parent SDQ only, so the original algorithm was modified for hyperactivity disorder using a criterion of at least one informant for predicting this condition. The algorithmic cutoffs obtained from the Bangladeshi sample were used to assess whether the cutoffs were applicable to Pakistani children as well. According to the algorithm for parent-rated version, a child scoring ≥ 2 in the SDQ impact supplement combined with a symptom score of: ≥ 7 for emotional, ≥ 6 for conduct or ≥ 8 for hyperactivity problems is likely

to have an emotional, conduct or hyperactivity disorder respectively.

Receiver operating characteristic (ROC) curve analysis was carried out and locally derived cutoffs were obtained for each scale. The area under an ROC curve (AUC) is an index of the 'goodness' of the test.

The AUC equals the probability that a randomly selected case scores higher than a randomly selected control. Thus an AUC of 0.5 implies independence between the score and the study group. The AUC value of 0.8 and above is considered to be appropriate for interpreting clinically useful predictions. To

Table 1. Discriminative ability of the SDQ between case and comparison groups – Combining borderline with abnormal category (low cut-off) and abnormal category only (high cut-off) using SDQ symptom scores

SDQ scales	Study groups	Borderline and abnormal (%)	Abnormal category only (%)	Criterion [¶]
Emotional Symptoms	Case (sensitivity) n = 34	30 (88.2)	28 (82.3) **	1
	Comparison n = 140	77 (55.0)	55 (39.2)	
Conduct problems	Case (sensitivity) n = 6	6 (100.0)	6 (100.0) ***	2
	Comparison n = 140	74 (52.8)	55 (39.2)	
Hyperactivity	Case (sensitivity) n = 18	15 (83.3)	11 (61.1) **	3
	Comparison n = 139	55 (39.5)	29 (20.8)	
Peer problems	Case n = 72	58 (80.5)	46 (63.8) ***	4
	Comparison n = 140	67 (47.8)	47 (33.5)	
Prosocial behaviour	Case n = 72	37 (51.3)	26 (36.1) ***	4
	Comparison n = 140	6 (4.2)	2 (1.4)	
Total difficulties score	Case n = 72	61 (84.7)	52 (72.2) ***	4
	Comparison n = 139	74 (53.2)	48 (34.5)	
Total impact score	Case n = 72	58 (80.5)	48 (66.6) ***	4
	Comparison n = 139	27 (19.4)	19 (13.6)	

** = $p < 0.01$, *** = $p < 0.001$

[¶] Criterion: Case definitions (ICD-10 code)

1=Emotional disorders with onset specific to childhood: emotional disorders arising in the first 16 years of life in which the signs and symptoms of anxiety and/or depressive states are the predominant clinical characteristics (Code F 93)

2=Conduct disorders: repetitive and persistent pattern of dissocial, aggressive or defiant conduct (Code F 91)

3=Hyperkinetic disorders: early onset; overactivity, poorly modulated behaviour, marked inattention, lack of persistent task involvement; pervasiveness and persistence of behaviour (Code F90)

4=Children with either an emotional, conduct, hyperactivity or combined disorder according to ICD-10 criteria (Codes F93, F91, F90)

generate ROC curves, children diagnosed with an emotional or hyperactivity disorder were compared with children of the comparison group, as in Table 1. The conduct problems scale was excluded as only 6 out of 72 children in the case group were diagnosed to have this disorder.

Results

Gender and age

The proportion of males was higher in the case group (61%, 44/72) than the comparison group (56%, 79/140); the result, however, was statistically non-significant ($p > 0.05$). The minimum age of child in our study was 4 years with the maximum age being 16 years. The mean age (SD) of the case group was 9.6 years (3.2), whereas that of the comparison group was 7.9 years (2.7); the difference being statistically significant ($p < 0.01$). Correlation coefficients were calculated to observe any association between age and the total difficulties score. There was minimal association between these variables for both study groups: for the case group, the correlation between age and total difficulties score was 0.16 ($r = 2.6\%$) and the corresponding correlation was 0.18 ($r = 3.2\%$) for the comparison group.

Discriminative ability between case and comparison groups

The Urdu language version of the SDQ was able to detect a difference between case and comparison

groups based on the mean difficulties score. The mean difficulties score was higher among children of the case group (mean = 21.7) than children of comparison group (mean = 14.4), the difference (mean difference = 7.3) being statistically significant ($p < 0.01$, 95% Confidence intervals 5.3, 9.3) with an effect size of 1.1.

In Table 1, significant differences ($p < 0.01$) between the study groups were observed for each SDQ scale. Using the criterion of a high cutoff, the Urdu SDQ was more sensitive (82.3%) in detecting emotional disorders compared to hyperactivity disorders (61.1%).

Pencil-and-paper algorithm

Table 2 presents the SDQ's discriminative ability using the pencil-and-paper algorithm. By applying the cutoffs, the SDQ scores were converted into diagnostic predictions for emotional, conduct and hyperactivity disorders.

Using the algorithmic cutoffs based on the SDQ impact and symptom scores, the percentage of children in the case group predicting emotional, conduct and hyperactivity disorders was substantially higher than in the comparison group.

The ROC curve analysis

An AUC > 0.70 was observed for all SDQ scales. Optimal cutoffs obtained from ROC curves provided the abnormal range for each score. The abnormal range was comparable with the English version for most scores.

Table 2. Applying the pencil-and-paper algorithm for converting SDQ symptom and impact scores into diagnostic predictions – proportion of children in case and comparison groups meeting the algorithm

Predicting type of psychiatric disorder	Study group	Algorithm applied on parent-rated SDQ scores - % of children
Emotional disorder	Case (sensitivity)	38.2 (13/34)
	Comparison	7.8 (11/140)
Conduct disorder	Case (sensitivity)	83.3 (5/6)
	Comparison	5.7 (8/140)
Hyperactivity disorder (modified)	Case (sensitivity)	33.3 (6/18)
	Comparison	3.5 (5/140)
Any psychiatric disorder	Case (sensitivity)	55.5 (40/72)
	Comparison	8.5 (12/140)

Table 3. Ability of the SDQ scales to discriminate between case and comparison groups^a – Receiver Operating Characteristic (ROC) curve analysis

SDQ scores	Area under curve (SE), [CI]	Optimal cut-offs (abnormal range) ^b	Sensitivity %	Specificity %
Total Difficulties	0.77 (0.03), [.70–.83]	17.5 (18–40)	69	71
Peer problems	0.73 (0.03), [.66–.80]	3.5 (4–10)	64	66
Prosocial behaviour	0.82 (0.03), [.75–.88]	7.5 (0–7)	75	75
Emotional symptoms	0.74 (0.04), [.65–.82]	5.5 (6–10)	59	71
Hyperactivity problems	0.80 (0.06), [.68–.91]	6.5 (7–10)	61	79
Total impact	0.83 (0.03), [.76–.89]	1.5 (2–10)	66	86

^aFor SDQ scores: total difficulties, peer problems, prosocial behaviour and total impact, the case group includes all 72 cases and all 140 children in comparison group (Comparison group: $n=139$ for total difficulties, total impact and hyperactivity scores). For SDQ scores: emotional symptoms and hyperactivity, the case group includes only those cases who have that particular disorder compared with the entire comparison group.

^bRecommended abnormal range is presented for the Urdu version of the SDQ scales. (Refer appendix for the abnormal range of original SDQ scales).

Discussion

To the best of our knowledge, this is the first study to test the translated Urdu version of a child behavioural screening questionnaire in Pakistan. As seen in previous SDQ studies in other languages (Smedje et al., 1999; Klasen et al., 2000; Mullick and Goodman, 2001) the Urdu version was also able to discriminate between the study groups with a large effect size for the mean difficulties score. The sensitivity for each type of psychiatric disorder was fairly good (61% and above for symptom scores). Nevertheless, the accuracy of psychiatric categorization by the SDQ is questionable: our study showed that according to the total difficulties score, 15% of the children belonging to the case group were labelled normal. On the other hand, 53% of the children in the comparison group were categorized as either borderline or abnormal. Although the SDQ scales were able to differentiate between study groups, each scale also labelled a substantial percentage of children (20% to 39%) as abnormal in the comparison group.

Since the comparison group was not further evaluated for ICD-10 diagnostic assessment, this high percentage could indicate a significant number of false positives or a high prevalence of child psychiatric disorders. If the latter supposition holds true this may reflect low levels of awareness for childhood psychiatric problems in the sample studied, with affected children not being recognized and brought in for specialist evaluation. Parents are accustomed to seeking

treatment for physical illness in childhood compared with psychiatric disorders. While there are no independent data from Pakistan, studies from elsewhere indicate that a significant prevalence of mental health problems exists among children attending paediatric clinics. In a British study, children attending paediatric outpatient clinics showed a twofold increase in the risk of emotional and behavioural problems compared with a community sample (Glazebrook et al., 2003). At primary care level there is evidence that as many as 42% of consecutive child and adolescent attendees may have significant psychiatric morbidity. Besides parents, general practitioner recognition is also limited with many such disorders being unrecognized and untreated (Angold et al., 1998; Kramer and Garralda, 1998).

Culture has an important role in influencing health-seeking behaviour. In some cultures, psychological problems may not be perceived commonly as requiring treatment but rather as a situation requiring advice or discipline. Help therefore may be sought from family elders or community leaders rather than health facilities (Nikapota, 1991; Rahman and Hussain, 2001). In developing countries, social stigma is important in discouraging parents from seeking mental health services for their children. Even in immigrant Asian populations, referral rates of children to psychiatry clinics are lower than expected. Asian parents of preschool children are less likely to see difficult behaviour as a problem that can be dealt with

although they may be just as distressed by it (Newth and Corbett, 1993).

In our study, a substantial number of children in the case group scored in the borderline category of the SDQ. The issue arises of how to deal further with this category. Using the SDQ's abnormal category only (high cutoff) is likely to reduce the number of false positives. Adopting such a strategy could reduce costs and the use of scarce child mental health professionals with inadequate diagnostic, treatment and follow-up facilities for newly diagnosed cases. This is true for developing countries in particular. As the Bangladeshi sample (Mullick and Goodman, 2001) illustrated, our results also reflect a sharper distinction between the study groups by applying the algorithm's symptom scores as well as impact scores rather than using symptom scores only. The pencil-and-paper algorithm could therefore benefit children in need of intervention.

With its adequate sensitivity to each disorder and with an abnormal range comparable to the English version for each score, the Urdu SDQ can be used as an efficient measure of psychological morbidity in a clinical setting. In Pakistan, paediatricians and GPs generally form the first line of contact for child health service use. However, problem recognition by the paediatrician or GP still forms an important barrier on the way to psychiatric help (Lavigne et al., 1993; Zwaanswijk et al., 2003). Children with mental health problems therefore continue to remain undetected and consequently untreated. The cutoffs obtained in our study may discriminate best when used as part of a routine assessment in paediatric and mental health clinics with psychiatric referral for children in need of intervention. Furthermore, when translating English child psychiatric questionnaires into other languages, the use of culturally appropriate words can be important for parent acceptability. The items modified during the Urdu translation of the SDQ enabled parents to complete the interview.

Parents report a higher percentage of internalizing problems in Eastern cultures than in the West. Factors such as the threat of parents achieving control over their children's behaviour can result in children being anxious and/or depressed. On the other hand a relative dominance of externalizing problems exists in developed countries, with parents perceiving a greater need for mental health services for children with disruptive

disorders than for those with depression (Wu et al., 1999; Javo et al., 2000). The finding of emotional disorders being most frequent (47%) in our study is consistent with other child psychiatric research in South Asian populations.

In view of the time limitation, a hospital-based comparison group was used in our study instead of a community group. Due to limited trained professionals, the comparison group was not assessed for the International Classification of Diseases (ICD-10) diagnostic ratings, which resulted in an inability to calculate the specificity of the SDQ. For the case group the psychiatric diagnosis was used as the gold standard. It should be noted that this diagnosis was obtained from a routine clinical interview, which was therefore neither structured nor standardized. In behavioural research involving children, it is important to obtain information from different sources. Besides combined symptom-impact scores, the use of multiple informants can enhance validity while screening for child psychiatric problems. Adopting such methods can prove to be cost-effective in a clinical setting, bearing in mind the very limited number of child psychiatrists in developing countries.

Despite limitations, our study has important implications for further child psychiatry research in Pakistan, where a vacuum exists in terms of awareness and service provision for mental health problems. Community studies should further test the screening ability of the Urdu SDQ, with the aim of identifying psychiatric problems among children and adolescents not in contact with health services.

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Appendix.

The author of the SDQ has recommended provisional bandings for SDQ scores so that 80% of children in the community are normal, 10% are borderline and 10% are abnormal. The cut-off points at the 90th percentile for SDQ scores have been used in studies to suggest 'caseness' for symptom scores (Goodman, 1997).

1. Interpreting symptom scores and defining 'Caseness' from symptom scores

Parent completed	Normal	Borderline	Abnormal
Total Difficulties Score	0–13	14–16	17–40
Emotional Symptoms 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 Behaviour Score	6–10	5	0–4

2. Generating and interpreting impact scores

Parent report	Not at all	Only a little	Quite a lot	A great deal
Difficulties upset or distress child	0	0	1	2
Interfere with Home life	0	0	1	2
Interfere with Friendships	0	0	1	2
Interfere with Classroom learning	0	0	1	2
Interfere with Leisure activities	0	0	1	2

A total impact score of 2 or more is abnormal; a score of 1 is borderline; and a score of 0 is normal

3. Pencil-and paper algorithm for converting the Strengths and Difficulties Questionnaire (SDQ) scores (parent-rated) into diagnostic predictions

Type of disorder				
	Emotional	Conduct	Hyperactivity	Any Psychiatric disorder
Parent SDQ	*PE ≥ 7 & PI ≥ 2	PC ≥ 6 & PI ≥ 2	PH ≥ 8 & PI ≥ 2	Meets any of the criteria to the left (modified for hyperactivity disorder)

*First letter: P parent; Second letter: I Impact score, E emotional symptoms score, C conduct problems score, H hyperactivity score