Heike Hölling
Bärbel-Maria Kurth
Aribert Rothenberger
Andreas Becker
Robert Schlack

Assessing psychopathological problems of children and adolescents from 3 to 17 years in a nationwide representative sample: results of the German health interview and examination survey for children and adolescents (KiGGS)

■ **Abstract** *Background* Reliable information on the prevalence of mental health problems in children and adolescents in the general population in Germany is scarce. With the German health and examination survey for children and adolescents (KiGGS) data is available for the first time on psychopathological problems for the complete age range from 3 to 17 years. *Objectives* To estimate prevalence rates for several groups with broadly defined psychopa-
thology and to report distributions of psychopathological problems for total and fine-grained subgroups according to age, gender, socioeconomic status (SES), migration of children and adolescents from 3 to 17 years. *Methods* The strengths and difficulties questionnaire (SDQ) parent version was completed for 14,478 children and adolescents from 3 to 17 years. Data was collected from May 2003 to May 2006 from 167 representative sample points all over Germany. Prevalence rates of SDQ scales were calculated. Effects of age, gender, socio-economic status and migration status were determined. *Results* A total of 18.5% of the boys and girls were classified as 'borderline or abnormal' in the total difficulties score and thus determined as risk group for public health policies. Analyses of Variance showed significant effects for age and gender, SES and
migration status. Significant interactions between age and gender were found for the total difficulties, conduct problems, hyperactivity-inattention and the emotional symptoms scores; significant interaction between SES and migration status was found for the prosocial behaviour score. *Conclusions* Prevalence rates of psychopathological problems in children and adolescents are in line with other published findings. Younger age, lower SES and migration are related to more psychopathological problems. While girls display more emotional problems, boys have more externalizing problems.

■ **Key words** SDQ – mental health problems – children and adolescents – KiGGS – age – gender – socio-economic status – migration status – public health

H. Hölling · B.-M. Kurth · R. Schlack (✉)
Dept. of Epidemiology and Health
ReportingRobert Koch Institute
Postbox 650261
13302 Berlin, Germany
Tel.: +49-30/18754-3749
Fax: +49-30/18754-3555
E-Mail: schlackr@rki.de

A. Rothenberger · A. Becker
Dept. of Child and Adolescent Psychiatry
University of Göttingen
Göttingen, Germany

Introduction

Mental health problems in children and adolescents, such as anxieties, depressiveness, conduct problems, hyperactivity-inattention and peer relationship problems, are key health issues in childhood and adolescence and, therefore, are of great public health concern. These problems often seriously burden the individual as well as their social environment and may be associated with functional impairment in the family and at school. The prevalence of mental health problems among children and adolescents is, apart from chronic diseases, discussed to be contributing to

H. Hölling et al.
Psychopathological problems from 3 to 17 years

35

the so called "new morbidity" in childhood and adolescence [18].

Prevalence rates of mental health problems in children and adolescents vary widely not only due to different methods of assessment but also due to different study designs. In a recent review of 29 German studies from the years 1952–2003 a range of 10.3–29.9% of emotional and behavioural disorders was found, with a mean prevalence of 17.2% [2]. In an international review Ihle and Esser [14] reported a median of 18% for periodic prevalence rates of mental disorders in children and adolescents with a range of 6.8–37.4% but with three-quarters of the estimates ranging between 15 and 22%. Previous studies were often restricted and either referred to clinical [3], local or regional samples [10, 29] which could not really be generalized, or examined only a part of the child and adolescent age spectrum [17, 25]. Furthermore, determinants of prevalence rates of mental health problems are to be seen in the heterogeneity and complexity of psychopathological disorders in children and adolescents as well as the developmental psychopathology during the course of the single disorders. Also the various definitions of threshold levels and the variable consideration of multi-informant sources contribute to the range of variation in the literature. The more concordance between different sources (e.g. teacher, parent or self report) is asked the lower are the prevalence estimates. Additional inclusion of functional impairment also lowers the prevalence of mental health problems [cp. 5, 20 in this issue].

The assessment of prevalence rates of mental health problems in children and adolescents raises several methodological problems, particularly in large and population-based epidemiological studies. A diagnostic interview based on classification systems like ICD-10 or DSM-IV performed by a clinician in a representative sample may currently be considered as gold standard. But this is in conflict with time and cost constraints. One way out consists in a screening for psychopathological problems based on written questionnaires with good psychometric properties [1] as conducted in the KiGGS study. However, it has to be taken into account that screenings do not lead automatically to clinically justified diagnoses.

Up to now there was little reliable population-based data on the prevalence of mental health problems in children and adolescents in the general population of Germany for the complete age range from 3 to 17 years. The KiGGS study together with the BELLA study now provides information about the prevalence of psychopathological problems in children and adolescents in a nationally representative sample. KiGGS on the one hand covers the entire age spectrum from 3 to 17 years in a large sample ($n = 14,863$) with a screening for psychopathological problems. The BELLA study ($n = 2,863$) provides further categorical and dimensional assessment of mental health problems for a randomly drawn subsample of KiGGS with a restricted age range (7–17 years) [cp. 19]. So, amongst others, not only the standard strengths and difficulties questionnaire (SDQ) [21] was used, but also the SDQ impact supplement [6, 8], which covers aspects of impairment see [20].

The SDQ [9, 21] is a brief, comprehensive and well recognized screening tool which is easy to administer. It addresses a number of negative and positive behavioural attributes, its subscales and items correspond to the major categories and criteria of the current psychiatric classification systems like ICD-10 or DSM-IV [4]. Some specific psychiatric problems and several mono-symptomatic disorders are not covered by the SDQ. Some of these were also examined in the KiGGS study, e.g. characteristics of eating disorders (assessed with the SCOFF questionnaire) [12] or additional information about ADHD [23], also presented in another paper of this issue [13].

First categorical analyses of the psychopathological screening in the KiGGS study have already been published elsewhere [11]. This paper aims to report mainly prevalence rates of several groups with broadly defined psychopathological problems which may be at risk for child psychiatric disorders and to examine moderating effects of fine-grained subgroups according to gender, age, socio-economic and migration status.

Methods

■ Procedure and sample

The KiGGS study is a nationwide representative cross-sectional health interview and examination survey with a total population of 17,641 children and adolescents aged 0–17 years. The participants were medically and physically examined and tested. Parents and, from 11 years on also the children and adolescents themselves, filled in an extensive self-administered questionnaire including psychological and social testing. The data was collected from May 2003 to May 2006 at 167 representatively selected sample points all over Germany. The aim of the KiGGS study was to ascertain for the first time conjunct data on physical, psychological and social health issues according to the WHO health definition [28] for the entire age range from 0 to 17 years. More details concerning the objectives, design and measurements of the KiGGS study can be found in [16]. The psychopathological screening was effected for age 3–17 years. Of a total of 14,836 children and adolescents from 3 to 17 years, valid parent-rated SDQs (problems screener) were computable for 14,478

participants (7,376 boys and 7,102 girls). An SDQ was counted as valid if all five subscales could be computed according to the SPSS syntax algorithm available from http://www.sdqinfo.com/e6.html.

■ Instruments

The SDQ is a short screening instrument of 25 items that contains five different subscales measuring: emotional symptoms, conduct problems, hyperactivity-inattention, peer relationship problems and prosocial behaviour [9]. Each of the items of the SDQ is scored on a 3-point Likert scale with 0 = not true, 1 = somewhat true or 2 = certainly true, with higher scores indicating greater problems, except for prosocial behaviour, where a higher score indicates more positive behaviour. A total difficulties score (range 0–40) is obtained by summing the scores of the emotional symptoms, conduct problems, inattention-hyperactivity, and peer problems. The psychometric properties of the SDQ are satisfactory to good and its subscales are valid with the corresponding child psychiatric diagnostic categories [1, 4, 7]. For the present analyses, the SDQ parent version was used. The original version is designed for parents of 4- to 16-year-old children. In the KiGGS study this age band was extended to parents of 3- to 17-year-olds. The SDQ has been standardised in several countries. To determine the proportions classified as borderline or abnormal in the total difficulties score and in the five SDQ subscales we refer in this paper to the available German normative data [26, 27]. This differs only slightly from a former description of the sample, where the norms of the large representative sample of the United Kingdom (UK) were applied [11]. German normative data is available for the age range 6–16 years.

Socio-economic status (SES) with the categories 'low', 'middle' and 'high' was assessed with the Winkler Index for social strata [24]. Children with at least one parent not born in Germany or with both parents having a foreign citizenship were defined as migrants [22].

■ Statistical analyses

The statistical analyses are based on the weighted sample data to represent the structure of the German population regarding age, gender, geographical region, and citizenship (reference data 31.12.2004). The number of cases reported in tables is for weighted data and thus might deviate from the number of cases reported in the former description of the sample.

To test the validity of the internal structure of the SDQ, a principal component factor analysis (PCA) with varimax rotation was performed. The number of extracted factors was a priori fixed at five in order to facilitate direct comparisons with the proposed factorial structure.

Descriptive statistics (mean and standard deviation) for the SDQ subscales and the total difficulties score are presented for the total sample and by age groups, gender, socio-economic status and migration status. Since one of the major public health objectives of the KiGGS study was to define risk groups, the categories 'borderline' and 'abnormal' are pooled to 'borderline or abnormal'. Individuals in the pooled category are considered to be 'at risk' for mental health problems. Percentages and confidence intervals were calculated. Differences between groups with 95% confidence intervals that do not overlap are considered significant at the $P < 0.05$ level.

Analysis of variance (ANOVA) modelling was performed to determine the effects of age, gender, socio-economic status and migration status. Interaction of age and gender and interaction of SES and migration background was included in the models. If these terms were not significant ($P \geq 0.05$) they were removed from the models. If a term was significant, 1-way-ANOVA was performed separately for age and gender, for SES and migration status respectively. Post hoc significance for age and socio-economic status was tested with the Scheffé procedure.

All statistical analyses were performed with SPSS 15.0. Confidence intervals were calculated with the SPSS-Module "Complex samples".

Results

■ Factorial validity and reliability

Principal component factor analysis (PCA) (not shown in table) resulted a replication of the five original SDQ subscales after rotation of the five extracted factors with initial eigenvalues greater than 1. The 5-factor solution explained 44.3% of the total variance. The patterns of the rotated loadings corresponded to the original SDQ subscales. Almost all items had their highest loadings on the extracted factors, except item 7 ("Obedient") that had its highest loading on the prosocial behaviour instead the conduct problems subscale. Although containing just five items each, internal consistency was satisfactory to good for most of the SDQ subscales. Assessment of reliability with Cronbach's alpha was 0.80 for the total difficulties score and ranged from 0.53 (conduct problems subscale) to 0.77 (hyperactivity/inattention subscale) for the total sample (for details see [11]).

H. Hölling et al.
Psychopathological problems from 3 to 17 years

37

Table 1 Proportions classified as borderline or abnormal for parent-rated SDQ scores

SDQ (subscale)	Total sample	Boys	Girls
Total difficulties score % [95% KI]	18.5 [17.7–19.3]	22.0 [20.9–23.2]	14.8 [13.9–15.8]
Emotional symptoms % [95% KI]	16.3 [15.6–17.0]	15.5 [14.5–16.5]	17.2 [16.3–18.2]
Conduct problems % [95% KI]	14.8 [14.1–15.6]	17.6 [16.6–18.7]	11.9 [11.1–12.8]
Hyperactivity-inattention % [95% KI]	13.9 [13.2–14.5]	18.2 [17.1–19.3]	9.3 [8.7–10.0]
Peer problems % [95% KI]	11.5 [10.9–12.1]	13.1 [12.1–14.1]	9.9 [9.2–10.6]
Prosocial behavior % [95% KI]	10.7 [10.1–11.3]	13.7 [12.8–14.6]	7.5 [6.9–8.2]

[a]Borderline or abnormal defined as a score for total difficulties ≥13, for emotional symptoms ≥4, for conduct problems ≥4, for hyperactivity-inattention ≥6, for peer problems ≥4, for prosocial behaviour ≤5

■ Percentages and moderating effects

A total of 18.5% children and adolescents were classified borderline or abnormal in the total difficulties score and thus defined as a risk group for mental health problems (Table 1). Boys were significantly more affected than girls. Emotional problems were slightly higher for girls than boys, whereas conduct problems, hyperactivity/inattention, and peer problems were significantly higher for boys. Prosocial behaviour was significantly better for girls.

Age and gender effects are shown in Tables 2 and 3. Significant interactions between gender and age were found for the total difficulties (df = 3; $F = 5.00$; $P = 0.002$), the emotional symptoms (df = 3; $F = 15.86$; $P < 0.001$), the conduct problems (df = 3; $F = 3.56$; $P = 0.014$) and the hyperactivity-inattention (df = 3; $F = 10.38$; $P < 0.001$) score.

Because interactions between gender and age were statistically significant for the indicated scores, 1-way-ANOVA was performed separately for each category. The analyses of gender effects showed a significant influence for all SDQ subscale scores and the total difficulties score. Except for the age group from 3 to 6 years, girls exhibited significantly more emotional symptoms; regarding prosocial behaviour girls showed significantly higher scores (indicating better prosocial behaviour) than boys in all age groups (gender specific analyses layered for age not shown in table). Age too had a significant influence on all SDQ subscale scores and the total difficulties score (Table 3). However, age trends were not monotonous. Older teenagers (aged 14–17 years) had significantly lower total difficulties and hyperactivity-inattention scores than any other age group, whereas the 3- to 6-year-old group differed significantly from the other age groups regarding the conduct problems scale. Post hoc analysis (not presented in table) showed that the peer problems score was significantly higher in the 11–13 year group and the older teenagers than in the younger age groups. The absolute mean differences between the age groups though were marginal.

Table 2 Scale means by gender for parent rated SDQ scores (age range 3–17 years)

Sample size	KiGGS sample			Gender effects (two-tailed)	
	$N = 14,843$ Total sample	$N = 7,597$ Boys	$N = 7,247$ Girls	F-Value[a]	P
Total difficulties score	8.2 (5.1)	8.8 (5.3)	7.6 (4.8)	199.50	<0.001
Emotional symptoms	1.8 (1.8)	1.7 (1.8)	1.9 (1.8)	42.78	<0.001
Conduct problems	1.9 (1.5)	2.1 (1.6)	1.6 (1.4)	152.56	<0.001
Hyperactivity-inattention	3.1 (2.3)	3.5 (2.3)	2.6 (2.1)	524.01	<0.001
Peer problems	1.4 (1.6)	1.6 (1.7)	1.3 (1.5)	76.46[b]	<0.001
Prosocial behavior	7.8 (1.7)	7.5 (1.8)	8.1 (1.6)	339.84[b]	<0.001

Data is presented as mean (SD) unless indicated otherwise
[a]Degrees of freedom = 1
[b]Interaction between age and gender not significant. Term therefore removed from the model

Socio-economic status (df = 2; $F = 336.77$; $P < 0.001$) and migration status (df = 1; $F = 40.28$; $P < 0.001$) had a significant effect on the total difficulties score as well on the hyperactivity-inattention (SES: df = 2; $F = 272.73$; $P < 0.001$; migration status: df = 1; $F = 4.87$; $P < 0.027$) and the peer problems scores (SES: df = 2; $F = 149.11$; $P < 0.001$; migration status: df = 1; $F = 209.01$; $P < 0.001$). Regarding the emotional symptoms score, socio-economic status (df = 2; $F = 94.69$; $P < 0.001$) had a significant influence, whereas migration status (df = 2; $F = 3.49$; $P = 0.062$) did not. The same was seen for the conduct problems score (SES: df = 2; $F = 152.01$; $P < 0.001$; migration status: df = 1; $F = 0.12$; $P < 0.744$). A significant interaction between socio-economic status and migration status was found for the prosocial behaviour score (df = 2; $F = 3.29$; $P = 0.037$). 1-way-ANOVA showed a significant effect for socio-economic status (df = 2; $F = 20.47$; $P < 0.001$) but not for migration status (df = 1; $F = 0.04$; $P = 0.837$). Post hoc analyses showed that SES categories 'high',

Table 3 Scale means by age for parent rated SDQ scores

SDQ (subscale)	Total sample (N = 14,843)	Age groups				Age effects (two-tailed)	
		3–6 years (N = 3,640)	7–10 years (N = 3,761)	11–13 years (N = 2,977)	14–17 years (N = 4,466)	F-Value[a]	P
Total difficulties score	8.2 (5.1)	8.4 (4.6)	8.5 (5.5)	8.6 (5.4)	7.6 (5.0)	31.47	<0.001
Emotional symptoms	1.8 (1.8)	1.7 (1.6)	1.9 (1.9)	1.9 (1.9)	1.7 (1.8)	24.56	<0.001
Conduct problems	1.9 (1.5)	2.1 (1.4)	1.9 (1.6)	2.0 (1.6)	1.9 (1.5)	15.32	<0.001
Hyperactivity-inattention	3.1 (2.3)	3.3 (2.2)	3.3 (2.4)	3.2 (2.3)	2.6 (2.1)	104.92	<0.001
Peer problems	1.4 (1.6)	1.3 (1.5)	1.4 (1.6)	1.5 (1.7)	1.5 (1.6)	14.89[b]	<0.001
Prosocial behavior	7.8 (1.7)	7.7 (1.7)	8.0 (1.7)	7.8 (1.7)	7.7 (1.8)	28.99[b]	<0.001

Data is presented as mean (SD) unless indicated otherwise
[a]Degrees of freedom = 3
[b]Interaction between age and gender not significant. Term therefore removed from the model

'middle' and 'low' differed significantly from each other in every single SDQ subscale and in the total difficulties score (not shown in table). Adjusted means were calculated for each category in the models, but are not presented here. Descriptive mean SDQ subscale scores and the total difficulties score by socio-economic status and migration status are shown in Table 4. Results illustrate that a low socio-economic status goes along with higher ratings on all SDQ subscale scores (except for the prosocial behaviour subscale, where lower scores were obtained) and for the total difficulties score, indicating a higher burden of psychopathological problems. Migrants however exhibited a significantly higher total difficulties mean score and significantly higher means in the scores for hyperactivity-inattention and peer problems. The significant interaction between SES and migration status for the prosocial behaviour indicates that in comparison with non-migrants, migrants with low SES were displaying higher mean scores and migrants with high SES were displaying lower mean scores relative to non-migrants (not shown in table).

Discussion

Mental health problems contribute significantly to the so called "new morbidity" in childhood and adolescence. For both prevention and intervention it is important to know the extent of mental health problems in the general population as well as in defined risk groups. In the present study the parent-rated SDQ was used to assess psychopathological problems in the general child and adolescent population in a large and nationally representative sample. The SDQ had already shown its good psychometric properties in several clinical and community-based samples [1, 3, 4, 6], as confirmed in this study and in the BELLA study sample [21]. In the present study, SDQ parent version data sets of 14,478 participants from 3 to 17 years were under examination.

In a principal component analysis (PCA), the original 5-factor-structure was replicated and thus confirmed the original structure of the instrument. In the total sample, homogeneity of the SDQ total difficulties scale and the subscales (measured with Cronbach's

Table 4 Scale means by socioeconomic status and migration status

	Parent-rated SDQ score					
	Total difficulties	Emotional symptoms	Conduct problems	Hyperactivity-Inattention	Peer problems	Prosocial behavior
Socioeconomic status[a]						
Low (N = 3,970)	9.9 (5.5)	2.1 (1.9)	2.3 (1.7)	3.7 (2.3)	1.9 (1.7)	7.7 (1.8)
Middle (N = 6,749)	8.0 (4.9)	1.7 (1.8)	1.9 (1.5)	3.1 (2.2)	1.3 (1.6)	7.8 (1.7)
High (N = 3,966)	6.7 (4.5)	1.5 (1.7)	1.7 (1.3)	2.4 (2.1)	1.1 (1.5)	7.9 (1.7)
Migration status[b]						
Yes (N = 2,349)	9.6 (5.2)	2.0 (1.9)	2.1 (1.5)	3.4 (2.2)	2.1 (1.7)	7.8 (1.8)
No (N = 12,460)	8.0 (5.1)	1.7 (1.8)	1.9 (1.5)	3.0 (2.3)	1.3 (1.6)	7.8 (1.7)

Data is presented as mean (SD)
[a]159 participants had to be excluded because of incomplete data for socioecomomic status
[b]34 participants had to be excluded because of incomplete data for migration status

H. Hölling et al.
Psychopathological problems from 3 to 17 years

39

alpha) was generally satisfactory to good and comparable to the results found in other clinical and epidemiological samples [3, 7, 11, 26].

Psychopathological problems in the KiGGS study were assessed to determine prevalence rates and thus to define groups at risk for potential psychiatric disorders in the general child and adolescent population. Former analyses of the present sample based on the UK cut-off-values resulted in a prevalence rate of 14.7% of subjects classified borderline or abnormal by the total difficulties score [11]. Using the current German normative data in the present analysis the percentage was with 18.5% almost identical with the German normative sample (18.4%) [26]. This finding is in line with other results, such as the above cited median prevalence of 18% in the review of Ihle and Esser [14] or compared to the mean prevalence of 17.2% in the systematic review of Barkmann and Schulte-Markwort [2].

Beyond the general view, the KiGGS study also provides well based prevalence rates for various braodband psychopathological problem areas. The percentages (emotional symptoms: 16.3%, conduct problems: 14.8% and hyperactivity/inattention: 13.9%) are not far from each other and reflect about equal distributions and constitute an important issue for planning patient care. This is supported by the following. In a validation study of the parent and teacher form in a clinical sample [4] ROC analyses were carried out to assess the predictive accuracy of the total difficulties score and single SDQ subscale scores. From children and adolescents who received a diagnosis on axis I according to the international classification system ICD-10, patient diagnoses were assigned to three core diagnostic sub-categories: emotional disorders, oppositional/conduct disorders and hyperactivity/attention-deficit disorders [4, 15]. In that study, the AUC^1 calculations showed values around 0.7–0.8 indicating that the SDQ is a helpful diagnostic screener for daily clinical practice. However, it has to be taken into account that all SDQ subscales and the total difficulties score have proved sensitive to the influence of age, gender, socio-economic status. Migration status had a moderating effect only on the total difficulties, hyperactivity-inattention and the peer problems score, i.e. externalizing problems are the main issue in migrants, which supports daily practical experience. On the other hand, emotional problems were not moderated by migration status. Either because there is no dif-

ference or because there is a culturally related assessment bias for non-reporting.

Surprisingly, no significant interactions were found between socio-economic status and migration status in all SDQ subscales except the prosocial behaviour where migrants with low socio-economic status—unexpectedly—exhibited better prosocial behaviour than their non-migrant counterparts, while migrants with high socio-economic status exhibited relatively less prosocial behaviour. Whether this might be related to social intentions and/or the differential availability of resources like family coherence remains to be examined in further analyses. Low socio-economic status went along with higher scores for the total difficulties score and all SDQ subscale scores except for the prosocial behaviour score (where the relation was inverse), indicating a higher burden of psychopathological problems. These results agree with the findings of Woerner et al. [26].

Strengths of the KiGGS study include the large and probabilistic sample giving sufficient statistical power and guaranteeing an adequate representative mapping of a heterogeneous population with regard to the variety of potential mental health problems. The use of a validated and internationally accepted screening instrument and the standardized assessment during the field work must also be mentioned. Important limitations lie in assessing psychopathological problems rather than diagnosing psychiatric disorders, and in the lack of additional information e.g. concerning the impact of the symptoms. However, large population-based epidemiological studies cannot achieve everything. More detailed approximations to child and adolescent mental health problems, additional criteria as information on functional impairment were assessed in a randomly drawn subsample of KiGGS, the BELLA-study. Results are presented in other contributions to this issue.

From the high proportion of boys and girls found to be 'at risk' for different mental health problems in the KiGGS study some may have fully-developed psychiatric disorders, some may be at increased risk of doing so in the future, and others may not. As mental health problems in childhood and adolescence burden the subject and their family and social environment and may affect academic achievement and thus have a potentially persistent impact on the life of an individual, strengthened societal efforts for prevention are called for. From a public health point of view, it would be best to implement measures of early detection of psychopathological disorders. One possibility could be to actively look up for children in families at risk. In addition, secondary prevention measures are needed in terms of low-threshold access to effective support and treatment institutions. Further, an increased awareness of parents, child-carers, teachers and health

---

[1] AUC area under the curve. Combined value of sensitivity (percentage of correctly identified cases) and specificity (percentage of correctly defined non-cases). An AUC of 0.5 indicates a discrimination by chance, an AUC of 1.00 indicates a perfect fit of scale score and clinical diagnosis.

care professionals to symptoms of mental health problems may contribute to early detection and intervention, ameliorating the children's chances to restore their mental health conditions in time. Hence the results should help to intensify mental health care efforts for children and adolescents in Germany.

References

1. Achenbach T, Becker A, Döpfner M, Heiervang E, Roessner V, Steinhausen HC, Rothenberger A (2008) Multicultural assessment of child and adolescent psychopathology with ASEBA and SDQ instruments: research findings, applications and future directions. J Child Adolesc Psychiatry 49:251–275

2. Barkmann C, Schulte-Markwort M (2004) [Prevalence of emotional and behavioral disorders in children and adolescents in Germany – a systematic literature review]. Psychiatrische Praxis 31(6):1–10

3. Becker A, Steinhausen H-C, Baldursson G, Dalsgaard S, Lorenzo MJ, Ralston SJ, Döpfner M, Rothenberger A, the ADORE study group (2006) Psychopathological screening of children with ADHD: strengths and difficulties questionnaire in a pan-European study. Eur Child Adolesc Psychiatry 15 [Suppl 1]:I/56–I/62

4. Becker A, Woerner W, Hasselhorn M, Banaschewsky T, Rothenberger A (2004) Validation of the parent and teacher SDQ in a clinical sample. Eur Child Adolesc Psychiatry 13[Suppl 2]: II/–II/16

5. Döpfner M, Breuer D, Wille N, Erhart M, Ravens-Sieberer U, BELLA study group (2008) How often do children meet ICD-10/DSM-IV criteria of attention deficit-/hyperactivity disorder and hyperkinetic disorder? Parent-based prevalence rates in a national sample – results of the BELLA study. Eur Child Adolesc Psychiatry 17(Suppl1): 59–70

6. Goodman R, Renfrew D, Mullick M (2000) Predicting type of psychiatric disorder from strengths and difficulties questionnaire (SDQ) scores in child mental health clinics in London and Dhaka. Eur Child Adolesc Psychiatry 129–134

7. Goodman R (2001) Psychometric properties of the strength and difficulties questionnaire. J Am Child Adolesc Psychiatry 40(11):1337–1345

8. Goodman R, Ford T, Simmons H, Gatward R, Meltzer H (2000) Using the strengths and difficulties questionnaire (SDQ) to screen for child psychiatric disorders in a community sample. Br J Psychiatry 177:534–539

9. Goodman R (1997) The strengths and difficulties questionnaire: a research note. J Child Psychol Psychiatry 38:581–586

10. Haffner J, Esther C, Münch H, Parzer P, Raue B, Steen R, Klett M, Resch F (2002) Verhaltensauffälligkeiten im Einschulungsalter aus elterlicher Perspektive – Ergebnnisse zu Prävalenz und Risikofaktoren in einer epidemiologischen Studie. Prax Kinderpsychol Kinderpsychiatr 51:675–696

11. Hölling H, Erhart M, Ravens-Sieberer U, Schlack R (2007) Behavioral problems in children and adolescents: first results from the German health interview and examination survey for children and adolescents (KiGGS)]. Bundesgesundheitsbl Gesundheitsforsch Gesundheitsschutz 50(5/6):784–793

12. Hölling H, Schlack R (2007) [Eating disorders in children and adolescents: first results from the German health and examination survey for children and adolescents]. Bundesgesundheitsbl Gesundheitsforsch Gesundheitsschutz 50:794–800

13. Huss M, Hölling H, Kurth B-M, Schlack R (2008) How often are German children and adolescents diagnosed with ADHD? Prevalence based on the judgment of health care professionals – results of the German health and examination survey (KiGGS). Eur Child Adolesc Psychiatry 17(Suppl1):52–58

14. Ihle W, Esser G (2002) [Epidemiology of mental disorders in childhood and adolescence: prevalence, course, comorbidity and gender differences]. Psychol Rundsch 53(4):159–169

15. Klasen H, Woerner W, Wolde D, Meyer R, Overmeyer S, Kaschnitz W, Rothenberger A, Goodman R (2000) Comparing the German versions of the strengths and difficulties questionnaire (SDQ-Deu) and the child behaviour checklist. Eur Child Adolesc Psychiatry 9:271–276

16. Kurth B-M, Kamtsiuris P, Hoelling H, Schlaud M, Doelle R, Ellert U, Kahl H, Knopf H, Lange M, Mensinck GBM, Neuhauser H, Schaffrath Rosario A, Scheidt-Nave C, Schenk L, Schlack R, Stolzenberg H, Thamm M, Thierfelder W, Wolf U (2008) The challenge of comprehensively mapping children's

health in a nation-wide health survey: design of the German KiGGS-study. BMC Public Health 8:196

17. Lehmkuhl G, Doepfner M, Plueck J, Berner W, Fegert JM, Huss M, Lenz K, Schmeck K, Lehmkuhl U, und Poustka F (1998) [Prevalence of behavioral problems and somatic complaints of children aged four to ten as rated by their parents]. Zeitschrift für Kinder Jugendpsychiatrie Psychotherapie 26(2):83–96

18. Palfrey JS, Tonniges TF, Green M, Richmond J (2005) Introduction: addressing the millenial morbidity: the context of community pediatrics. Pediatrics 115:1121–1123

19. Ravens-Sieberer U, Kurth B-M, KiGGS study group, BELLA study group (2008) The mental health module (BELLA study) within the German Health Interview and Examination Survey of Children and Adolescents (KiGGS): study design and methods. Eur Child Adolesc Psychiatry 17(Suppl1):10–21

20. Ravens-Sieberer U, Wille N, Erhart M, Bettge S, Wittchen H-U, Rothenberger A, Herpertz-Dahlmann B, Resch F, Hölling H, Bullinger M, Barkmann C, Schulte-Markwort M, Döpfner M as the BELLA study group (2008) Prevalence of mental health problems of children and adolescents in Germany: results of the BELLA study within the National Health Interview and Examination Survey (KiGGS). Eur Child Adolesc Psychiatry 17(Suppl1):22–33

21. Rothenberger A, Becker A, Erhart M, Wille N, Ravens-Sieberer U, the BELLA study group (2008) Psychometric properties of the parent strengths and difficulties questionnaire in the general population of German children and adolescents: results of the BELLA study. Eur Child Adolesc Psychiatry 17(Suppl1):99–105

22. Schenk L, Ellert U, Neuhauser H (2007) [Children and adolescents in Germany with a migration background: methodical aspects in the German health and examination survey for children and adolescents (KiGGS)]. Bundesgesundheitsbl Gesundheitsforsch Gesundheitsschutz 50:590–599

23. Schlack R, Hoelling H, Kurth B-M, Huss M (2007) [The prevalence of attention-deficit-hyperactivity disorder (ADHD) among children and adolescents in

H. Hölling et al.
Psychopathological problems from 3 to 17 years

41

Germany: initial results of the German health and examination survey for children and adolescents (KiGGS)]. Bundesgesundheitsbl Gesundheitsforsch Gesundheitsschutz 50:827–836

24. Winkler J, Stolzenberg H (1999) Der Sozialschichtindex im Bundes-Gesundheitssurvey. Gesundheitswesen 61[Sonderheft 2]:S178–S183

25. Wittchen HU, Nelson CB, Lachner G (1998) Prevalence of mental disorders and psychosocial impairment in adolescents and young adults. Psychol Med 28(1):109–126

26. Woerner W, Becker A, Friedrich C, Klasen H, Goodman R, Rothenberger A (2002) Normierung und Evaluation der deutschen Elternversion des Strengths and Difficulties Questionnaire (SDQ): Ergebnisse einer repräsentativen Felderhebung. Zeitschrift für Kinder Jugendpsychiatrie Psychotherapie 30(2):105–112

27. Woerner W, Becker A, Rothenberger A (2004) Normative data and scale properties of the German parent SDQ. Eur Child Adolesc Psychiatry 13[Suppl 2] :II/3–II/10

28. World Health Organization (WHO) (1948) Preamble to the constitution of the World Health Organization as adopted by the international health conference, New York, 19–22 June 1946. Official records of the World Health Organization 2, WHO, Kopenhagen

29. Ziegert B, Neuss A, Herpertz-Dahlmann B, Kruse W (2002) [Psychic disturbances of children and teenagers in general practice: who needs treatment?] Dtsch Arztebl 99A:1436–1441 [Heft 21]