

Somatic and mental health service use of children and adolescents in Germany (KiGGS-study)

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Abstract

Only a limited number of national surveys have investigated both somatic and mental health service use in children and adolescents. The current study aimed to assess service use in Germany as based on at least a single contact with a somatic (pediatrician, general practitioner, non-medical practitioner) and/or mental health (psychiatrist, psychologist, youth welfare) care specialist within the last 12 months.

Questionnaire responses of 6,475 children and adolescents aged 11.0–17.9 years and their parents were analyzed based on data ascertained by the German Child and Adolescent Health Survey (KiGGS) conducted between 2003 and 2006. For assessment of mental symptom loading the Strengths and Difficulties Questionnaire (SDQ) was completed by parents, thus allowing the determination of the relationship between symptom loading and service use. ANOVA and logistic regression were performed to determine help-seeking behavior overall and of different health professional groups upon inclusion of the SDQ Total Difficulties score, gender, age and socioeconomic status (SES).

A total of 81.9 % of all children and adolescents had used any kind of service within the past 12 months. Seventy-seven percent and 0.8 % used only the somatic and mental health services, respectively; 4.1 % had frequented both services. Amongst youths with a 'borderline' and 'abnormal' Total Difficulties score, 11.8 and 18.6 %, respectively, sought help from mental health partners. Age, SES and Total Difficulties score were predictors of any service use; the logistic regression model explained 7.6 % of the variance. Use of mental health service was significantly predicted by only age and Total Difficulties score, the respective model explained 26.2 % of the variance.

The comparison of health services use on an international level is rendered difficult by national differences in health-care provision. Nevertheless, several of our findings are similar to results obtained in other nationally representative surveys.

Keywords:

Help-seeking behavior, Service use, National survey, Strengths and Difficulties Questionnaire (SDQ)

Introduction

The 6–12 month prevalence rates for categorically defined psychiatric disorders or dimensionally assessed mental health problems among children and adolescents range between 5 and 40 % in epidemiological studies [e.g. 3, 6, 20, 32, 33, 37]. Based on the Strengths and Difficulties Questionnaire (SDQ), cross-national prevalence rates for mental health problems in 12 European countries ranged from 10 to 23.6 % [31]. In Germany almost 15 % of adolescents were shown to have a score in the ‘borderline’ or ‘abnormal’ range [16].

National surveys show that the proportion of children and adolescents with any kind of psychiatric disorder who seek assistance from mental health services ranges from 5 to 50 % [e.g. 5, 28]. An example for a low annual contact level of 5.1 % with mental health services was reported in an US population-based cohort of 6- to 17-year olds conducted in 1987 within the National Medical Expenditure Survey (NMES) using the International Classification of Diseases (ICD-9) [5]. To our knowledge, the highest rate for seeking help has been recorded in another US national survey conducted between 2001 and 2004 (NHANES), according to which half of those aged 8–15 years, who had received at least one 12-month interview-based DSM-IV diagnosis [28], sought help. Most national [e.g. 1, 2, 10, 34, 45] and regional [e.g. 8, 15] surveys showed that between 15 and 30 % of children and adolescents with psychiatric problems use mental health services.

There are potentially several explanations for these highly variable proportions of help-seeking behavior. The first concerns the different assessment procedures used in defining ‘caseness’. Thus, national surveys have used several different diagnostic procedures including structured interviews (e.g. CIDI, DISC-IV,

DAWBA) and questionnaires (e.g. CBCL, SDQ) that yield categorical or dimensional assessments [1, 9, 28]. A second source of variance is related to broad to narrow definitions of mental health services [2, 28, 34]. In general, mental health services in epidemiological studies have included school services, community nurses, general practitioners and psychiatric service use; obviously, the inclusion of general practitioners [e.g. 34] blurs the boundary between mental and somatic health services. Lastly, national (and potentially regional) differences in the structure of the health-care systems and provision of mental health services are closely related to the aforementioned aspect. Importantly, gatekeepers to the respective services differ by country. Most publications pertaining to national samples of children and adolescents provide only a broad definition of mental health service use or help-seeking hampering reliable comparisons.

Our study aims were to describe help-seeking behavior (both somatic and mental health service use) of German children and adolescents in general and of those with a SDQ Total Difficulties score in the borderline or abnormal range based on the nationally representative KiGGS [16, 17, 22, 35]. We aimed to identify predictors of this behavior. We additionally sought to compare the findings to recent other representative studies.

Methods

Sample

Data stemmed from the “KiGGS”; this German survey assessed socio-demographic, somatic and mental health symptoms/conditions in a representative, randomly selected, nationwide probability sample between 2003 and 2006 [16, 17, 22]. In a first step, local registration offices

were set up in 167 randomly selected communities located throughout Germany. Second, participants were selected by staff of these local registration offices. Third, participants were assessed in examination centers including a personal interview, physical examination and somatic and psychological tests. The total target population consisted of children and adolescents aged 0–17.9 years with a total number of 17,641 participants [6,813 within the age range 11.0–17.9 years; 22]; the response rate was 66.6 % (for 11–13 and 14–17.9 year olds the response rates were 69 and 63 %, respectively), which is well in the range of other national surveys [40]. Within the KiGGS non-participants were asked to answer a brief questionnaire related to socio-demographic and health variables. Approximately, two thirds of the non-participants provided this information, so that the respective data was available for 89 % of the contacted individuals; a comparison of the data obtained from these non-participants with participants revealed that the KiGGS data can be regarded as representative for Germany [16, 17, 22]. Furthermore, the percentage of children and adolescents without German nationality was 8.4 %, which was only slightly less than in the German population during the time period of the Survey (8.8 %; see 35 for details pertaining to narrow and wide definitions of migration background status in KiGGS). For the purpose of this study, we focus on those 6,475 (3,301 males; 50.9 %) participants between 11.0 and 17.9 years with available data on SDQ, socio-economic status, and service use.

Instruments

A single written multiple choice question pertaining to service use related to the past 12-month period. For subjects aged 11.0–13.9 years parents were asked: “Which of the following physicians,

including dentists and psychologists, did your child seek help from within the last 12-month period, and to what extent (including home treatments)?”. Adolescents aged 14.0–17.9 years were asked to answer the following question “Which of the following physicians, including dentists and psychologists, did you seek help from within the last 12 months, and to what extent (including home treatments)?” For the purpose of this study, we limited our analyses to general practitioners (GPs), pediatricians, non-medical practitioners, psychologists, psychiatrists and youth welfare, all of whom were included in the respective checklist.

Mental health problems were assessed by the SDQ, which is a short screening questionnaire commonly employed in epidemiological studies [11–13, 16]. It is a validated instrument with satisfactory to good psychometric properties and its scales are valid for several child psychiatric diagnostic categories [11, 13]. For the purpose of this study we relied on the parental SDQ, because it was available for all subjects within the age range (only adolescents aged >14.0 had also themselves filled in the SDQ).

SDQ utilizes 25 items in 5 scales (Hyperactivity, Emotional Symptoms, Conduct Problems, Peer Problems, and Prosocial). For our analysis the prosocial scale of the SDQ was excluded, because the absence of prosocial behaviors is conceptually different from the presence of psychological difficulties [11]. For missing data, up to two missing items per scale were replaced with the proband’s mean of the respective scale items according to the SPSS syntax algorithm available from <http://www.sdqinfo.com>. The internal consistency (Cronbach’s alpha) of the 20 items used to calculate the Total Difficulties score as based on parental SDQ in subjects aged 11–17.9 years was $\alpha = 0.80$. The original scale

factors had been confirmed in a nationally representative German field study, which also provided normative data for Germany [44, 45].

For 15 of the 20 items of the four problem scales the respective item is scored 0 for “not true”, 1 for “somewhat true”, and 2 for “certainly true”. The remaining five items are scored as follows: 2 for “not true”, 1 for “somewhat true”, and 0 for “certainly true”. The score for each of the four scales was generated by summing the scores for the five items that make up that scale, thereby generating a scale score ranging from 0 to 10. The scores for the four problem scales can be summed to generate a Total Difficulties score ranging from 0 to 40 [11].

To determine the proportions classified as borderline or abnormal in the Total Difficulties score and in the four SDQ problem scales we refer in this study to German normative data as based on parental SDQ [44, 45]: ‘Borderline’ and ‘abnormal’ were defined via SDQ Total Difficulties scores between 13 and 16 and 16 and 25, respectively. Borderline and

abnormal scale scores were defined as (a) Hyperactivity: 6 and 7–10 (b) Emotional Symptoms: 4 and 5–10 (c) Conduct Problems: 4 and 5–10, and (d) Peer Problems: 4 and 5–10, respectively [17, 44, 45].

Socio-economic status (SES) was rated as ‘low’, ‘middle’ and ‘high’ as assessed by the Winkler Index for social strata [24, 43]; this index is based on parental school education plus job qualification, income and current job position; the Index is a statistical construct specifically recommended for epidemiological research in Germany [18]. Rather than representing the factual distributions of poverty and wealth in the population, the index determines the relative position of the participant’s family with respect to social inequalities.

Statistical analysis

Logistic regression analyses and ANOVA were performed to determine help-seeking behavior overall and of different health professional groups including as

Table 1

Service use in relationship to (A) gender, age, socio-economic status (SES) and (B) health-care provider

Service use	n ^a	% ^b (SE %)	95% CI (%)	Male (%)	Female (%)	Age 11–13.9	Range 14–17.9	SES low	SES medium	SES high
(A)										
No service use	1.122	18.1 (0.6)	16.9–19.4	18.4	17.9	13.4	21.3	15.9	16.8	22.9
Any service use	5.353 ^c	81.9 ^{c,d}	80.6–83.1	81.6	82.1	86.6	78.7	84.1	83.2	77.1
Somatic service use only	5.025	77.0 (0.7)	75.6–78.3	76.6	77.4	79.7	75.2	79.1	78.1	72.8
Mental health service use only	44	0.8 (0.1)	0.6–1.0	0.7	0.8	0.8	0.7	0.7	0.7	0.9
Joint services use	284	4.1 (0.3)	3.6–4.7	4.3	3.9	6.1	2.8	4.3	4.4	3.4
(B)										
General practitioner	3.164	51.9 (1.2)	49.4–54.3							
Pediatrician	2.483	34.4 (1.1)	32.2–36.7							
Nonmedical practitioner*	203	3.6 (0.3)	3.0–4.3							
Psychologist	231	3.4 (0.3)	2.9–4.0							
Psychiatrist	77	1.2 (0.2)	0.9–1.5							
Youth welfare	71	2.3 (0.3)	1.8–3.0							

The available n ranged from 6,462 to 6,467; information concerning youth welfare service use was only gathered for 11.0- to 13.9-year olds (n = 2,958)

*E.g. naturopathy

a Unweighted data: b Weighted data: c Multiple service use possible: d % of total of those 5,353 who used any service; multiple service use possible

variables SDQ Total Difficulties score, gender, age and SES. All calculations were performed with a weighting factor, adjusting for sample variation of the German population (reference data 31.12.2004) related to age (in years), gender, region (East/West/Berlin) and nationality. All analyses were calculated with the SPSS-Module “complex samples” because of complex two-step samplings (SPSS 15.0).

To control for potential use of multiple health professionals, we formed four subgroups of service use to verify differences in SDQ Total Difficulties scores and help seeking behavior via variance analysis. The specific subgroups were: (1) ‘no service use’ with subjects not seeking help from any health professional (2) ‘mental health service use only’ including psychiatrists, psychologists and youth welfare (3) ‘somatic health service use only’ including pediatricians, GPs and nonmedical health practitioners and (4) ‘joint services use’ comprising those children and adolescents, who used both somatic and mental health services.

Results

A substantial proportion (81.1 %) of children and adolescents aged 11.0–17.9 years sought somatic health services (somatic service use only + joint services use) during the past 12 months (Table 1). A differentiation according to the respective two major specialists revealed that GPs were frequented most often followed by pediatricians. In contrast, mental health service use applied to 4.9 % (mental health service use only + joint services use) of the total sample; only 0.8 % of the study sample had solely made use of mental health services. Psychologists represented the most frequently consulted professional within the mental health services (3.4 %); 1.2 % of the children and adolescents were reported to have consulted a psychiatrist.

At a descriptive level, gender did not account for differences in types of services used (Table 1). ‘No service use’ was more frequent in the 14.0–17.9 age range and amongst the high SES subgroup. Total mental health service use (mental health service use only + joint services use) was roughly twice as common in the younger age group; it did not differ substantially according to SES subgroup.

The highest mean SDQ Total Difficulties scores (Table 2) applied to subjects attending either mental health service use only or joint services. The weighted mean Total Difficulties scores, although still within the borderline range (score ≥ 13 and < 16) were nearly twice as high as the other mean scores of the youths who had contacted somatic health professionals only or had not shown help-seeking behavior at all. The mean Total Difficulties score of subjects utilizing no services (7.01) was slightly but significantly lower than that of individuals who sought any kind of service [mean 8.15; Wald-F (1,166) = 31.428, $p < 0.001$]. Children and adolescents frequenting only somatic services also had a slightly higher mean score than those without any service use [Wald-F(1,166) = 15.429, $p < 0.001$]. As expected, subjects seeking joint services had a significantly higher mean score than those who sought no help [Wald-F(1,166) = 191.275; $p < 0.001$]. Service use in relationship to Total Difficulties scores in the normal, ‘borderline’, and ‘abnormal’ ranges revealed that 18.6 % of the probands with a score in the ‘abnormal’ range had utilized mental health services (Table 3). This subgroup accounted for approximately a third of all probands who sought mental health services; approximately half of the mental health service use was accounted for by probands with a normal score.

We calculated odds ratios for service use of children and adolescents with borderline and abnormal Total Difficulties

and scale scores using non-users as reference (see Table 4). In general terms, odds ratios were higher for mental health service use only and joint services use,

respectively, than for somatic service use only and increased substantially from borderline to abnormal scores.

Table 2

Mean SDQ Total Difficulties scores in relationship to utilized health professionals

Service use	n ^a	(% ^b)	Mean score ^c	SE 95 %	CI
No service use	1.122	(18.1)	7.01	0.193	6.63–7.39
Any service use	5.353	(81.9)	8.15 ^d	0.079	8.00–8.31
Somatic service use only	5.025	(77.0)	7.81 ^d	0.074	7.67–7.96
Pediatrician	1.934	(26.3)	8.00	0.132	7.74–8.26
General practitioner	2.574	(42.4)	7.62	0.098	7.42–7.81
Non-medical practitioner	35	(0.6)	7.24	0.823	5.61–8.86
Pediatrician and General practitioner	330	(5.1)	8.43	0.338	7.76–9.10
Pediatrician and Non-medical practitioner	39	(0.6)	8.72	0.829	7.09–10.36
General practitioner and Non-medical practitioner	93	(1.7)	8.02	0.509	7.02–9.03
Pediatrician and general Practitioner and Non-medical practitioner	20	(0.3)	7.27	0.859	5.57– 8.96
Mental health service use					
Only	44	(0.8)	13.23 ^d	1.063	11.13–15.33
Psychiatrist	11	(0.2)	17.05	1.796	13.50–20.60
Psychologist	22	(0.4)	11.58	1.633	8.35–14.80
Youth welfare alone and combinations of 2 or 3 Mental health service Providers*	11	(0.2)	12.53	1.521	9.53–15.54
Joint services use	284	(4.1)	13.62 ^d	0.435	12.76–14.48
Pediatrician and Psychiatrist	17	(0.3)	10.37	1.408	7.59–13.15
General practitioner and Psychiatrist	21	(0.4)	11.04	1.204	8.66–13.41
Pediatrician and Psychologist	74	(1.0)	14.44	0.840	12.78–16.09
General practitioner and Psychologist	65	(1.1)	11.87	0.788	10.32–13.43
Psychologist and Non-medical practitioner	3	(<0.1)	12.17	1.026	10.14–14.19
Pediatrician and youth Welfare	18	(0.2)	12.04	2.353	7.40–16.69
General practitioner and Youth welfare	14	(0.2)	15.04	2.206	10.68–19.39
≥3 health professionals from both health systems	72	(0.9)	16.89	0.750	15.41–18.37

* Cells <10 were collapsed within the category mental health service use only.

a Unweighted; b Weighted; c Estimated for total German population; d Significantly different from no service use; all ANOVA calculated p values<0.005

Logistic regression (Nagelkerke) revealed that age, SES, SDQ Total Difficulties score and gender explained 7.6 % of the variance of service use (i.e. no service use, mental health only, somatic only and joint services use; Wald- $F(33,134) = 12.122$, $p < 0.001$; see model 1 in Table 5). Whereas age, SES and SDQ Total Difficulties score were significant predictors, gender did not account for differences in service use. Upon calculation of the same model based on only those 328 subjects, who had used mental health services (only or jointly with somatic services), and the 1,122 subjects as reference who did not show service use, 26.2 % of variance (Nagelkerke) was explained by gender, age, SES and Total Difficulties score. Only age and score were significant predictors (model 2 in Table 5);

however, the B coefficients for SES were similar in both models.

Because service use over the past 12 months had been reported by the parents in the younger age group (11.0–13.9 years) and by the adolescents themselves in the older age group (14.0–17.9 years), we conducted two logistic regression analyses in an attempt to establish if service use is differentially reported. For the younger group ($N = 2,958$), age, SES, SDQ Total Difficulties score and gender explained 7.9 % of variance (data not shown); only age and score were significant predictors of service use. However, for the older age group ($N = 3,517$) age was not a predictor; SES and score were significant predictors of service use. Figure 1a, b reveals the drop in total and mental health service use across the age range.

Table 3

Service use depending on classification based on the SDQ Total Difficulties score in the ‘normal’ (<13), ‘borderline’ ($13 \geq \text{score} < 16$) or ‘abnormal’ (≥ 16) ranges; percentages correspond to each column/row

Service use ^a	Normal ^b (n = 5,332)	Borderline ^b (n = 546)	Abnormal ^b (n = 597)
No service use (n = 1,122)	985 (19.2/87.4 %)	76 (15.3/7.1 %)	61 (11.0/5.4 %)
Any service use (n = 5,353)	4,347 (80.8/81.5 %)	470 (84.7/8.8 %)	536 (89.0/9.7 %)
Somatic service use only (n = 5,025)	4,198 (77.9/83.6 %)	409 (75.3/8.3 %)	418 (70.4/8.2 %)
Mental health service use only (n = 44)	23 (0.5/54.6 %)	7 (0.9/10.5 %)	14 (3.0/34.9 %)
Joint services use (n = 284)	126 (2.4/48.6 %)	54 (8.5/17.6 %)	104 (15.6/33.8 %)

a Total n = 6,475: b All sample related percentages based on weighted estimations

Discussion

In the nationally representative KiGGS [22], German children and adolescents aged 11–17.9 years utilized somatic and/or mental health services to a high extent (81.9 %) within the past 12 months. As expected, somatic services alone were

frequented much more often than mental health services (77.0 vs. 4.9 %); it should be pointed out that approximately 80 % of the subjects with mental health service use additionally frequented somatic health service providers which mainly comprised GPs and pediatricians.

Table 4

**Odds ratios for service use of subjects
with borderline and abnormal SDQ Total Difficulties scores (N = 6,475)**

SDQ-scale	'Borderline'			'Abnormal'		
	Somatic Service use only	Mental health service use only	Joint services use	Somatic Service use only	Mental health service use only	Joint services use
Total difficulties						
OR ^a	1.21	2.36	4.42	1.57	10.30	11.23
95 % CI	0.91–1.61	0.74–7.47	2.79–7.01	1.09–2.27	4.74–22.38	7.03–17.95
Emotional symptoms						
OR	1.24	1.36	4.01	1.35	8.40	8.13
95 % CI	0.93–1.65	0.38–4.96	2.45–6.58	0.98–1.85	3.90–18.11	5.32–12.42
Conduct problems						
OR	1.51	1.55	2.97	1.38	8.07	6.31
95 % CI	1.09–2.09	0.34–7.15	1.75–5.03	0.89–2.13	3.54–18.44	3.77–10.56
Hyperactivity						
OR	1.39	4.33	5.38	1.34	6.22	7.42
95 % CI	0.94–2.08	1.46–12.82	3.17–9.16	0.91–1.98	2.56–15.13	4.57–12.03
Peer problems						
OR	1.19	1.85	3.26	1.06	5.77	6.50
95 % CI	0.86–1.64	0.54–6.34	2.08–5.09	0.77–1.47	2.43–13.70	4.00–10.59

a Reference: no service use: (OR = 1)

Psychologists predominated as mental health service providers followed by psychiatrists (3.4 vs. 1.2 %, Table 1).

We stress that our study only allows delineation of service use according to official providers of somatic and mental health services. Thus, pediatricians and general practitioners also address mental health issues. The extent to which they do so depends on for example their training and experience, the local environment including the distance to mental health-care providers, the quality and quantity of a child's mental health symptomatology and its impact on the respective family.

Our regression models based on age, gender, SES, and SDQ Total Difficulties score revealed that any service use was significantly predicted by age, SES, and SDQ score. In contrast, only SDQ score and age were significant predictors of mental health service use (Table 5). The respective models accounted for 7.6 and 26.2 % of help-seeking behavior. Explained variance for any service use and potentially also for mental health service use would likely increase upon inclusion of chronic somatic and mental disorders in the analyses; however, these

were not the focus of this study and not systematically assessed within KiGGS [16, 17, 22].

Subjects with at least a borderline score utilized any type of service more frequently than those with a 'normal' score (Table 3). Eighty-nine percent and 18.6 % of youths with an abnormal score utilized any type of service and mental health services, respectively.

Only a limited number of nationally representative surveys have assessed general help-seeking behavior among population-based children and adolescents [1, 2, 5, 7, 10, 21, 26–28, 34, 39, 42], some of which particularly focussed on the comparison of utilization rates for those having psychiatric disorders [2, 10, 28] or deviant CBCL total scores [1, 34, 42].

Before we discuss the aforementioned studies in relationship to our own results it is important to reiterate that differences in national health-care services including e.g. health insurance and the type of specialists, who provide these services, need to be taken into account. Obviously, international comparisons are hampered by these differences. In Germany, children and adolescents can seek somatic service use free

Table 5

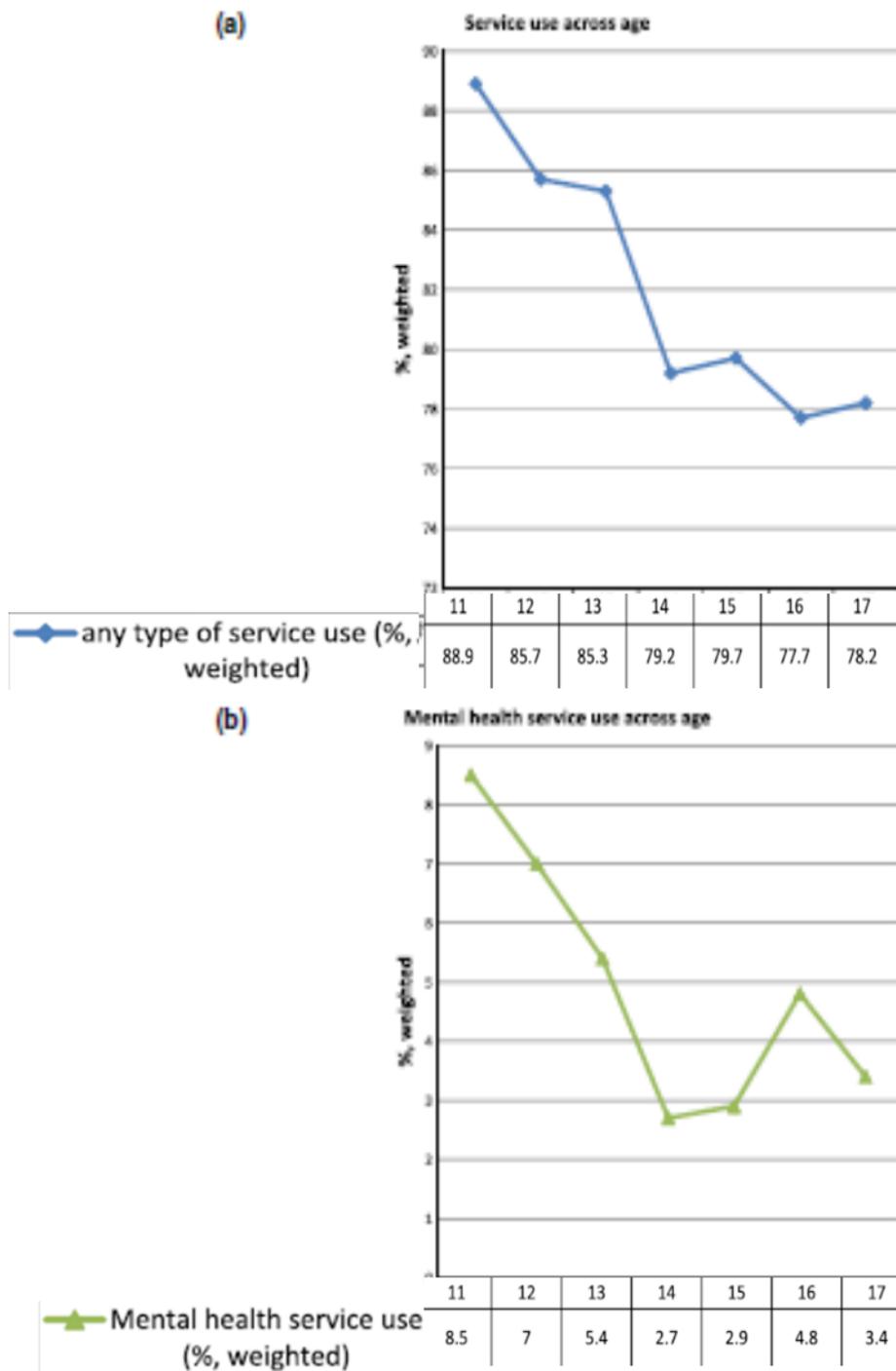
Logistic regression models: influence of age, SES and SDQ Total Difficulties score, and gender on any service use (model 1; no service use, somatic only, mental health only, joint services use; N = 6,475) and on mental health service use (model 2; no service use, mental health service use only, joint services use; N = 1,450; bold type)

(a)	Df1 model 1/2	Df2 model 1/2	Wald-F model 1/2	P model 1/2
Age	18/12	149/155	6.823/7.539	<0.001/<0.001
SES	6/4	161/163	4.115/1.036	0.001/>0.05
Score	6/4	161/163	29.716/27.921	<0.001/<0.001
Gender	3/2	164/165	0.424/2.468	>0.05/>0.05

(b) Service use	Variables	Parameter	B model 1/2	Standard error model 1/2
<u>Somatic service use only</u>		(constant)	1.320	0.214
	Age in years	11	0.791	0.671
		12	0.022	0.698
		13	0.877	0.667
		14	-0.001	0.677
		15	0.155	0.719
		16	0.430	0.634
	SES	Low	0.398	0.105
		Medium	0.364	0.084
	SDQ Total Difficulties score	Normal	-0.356	0.183
		Borderline	-0.230	0.199
	Gender	Male	-0.044	0.075
<u>Mental health service use only</u>		(constant)	-1.295/ -1.221	0.521/ 0.523
	Age in years	11	0.791/ 0.835	0.671/ 0.704
		12	0.022/ 0.059	0.698/ 0.748
		13	0.877/ 0.991	0.667/ 0.688
		14	-0.001/ -0.049	0.677/ 0.709
		15	0.155/ 0.252	0.719/ 0.734
		16	0.430/ 0.436	0.634/ 0.646
	SES	Low	-0.294/ -0.266	0.437/ 0.436
		Medium	-0.195/ -0.126	0.426/ 0.426
	SDQ Total Difficulties score	Normal	-2.393/ -2.492	0.401/ 0.420
		Borderline	-1.478/ -1.520	0.528/ 0.521
	Gender	Male	-0.298/ -0.441	0.355/ 0.359
<u>Joint services</u>		(constant)	-0.229/ -0.058	0.373/ 0.380
	Age in years	11	1.462/ 1.467	0.261/ 0.297
		12	1.078/ 1.067	0.293/ 0.327
		13	0.561/ 0.665	0.277/ 0.310
		14	-0.515/ -0.609	0.344/ 0.376
		15	-0.265/ -0.208	0.335/ 0.380
		16	0.236/ 0.228	0.288/ 0.301
	SES	Low	0.109/ 0.081	0.213/ 0.226
		Medium	0.336/ 0.352	0.197/ 0.208
	SDQ Total Difficulties score	Normal	-2.361/ -2.452	0.246/ 0.252
		Borderline	-0.910/ -0.934	0.258/ 0.268
	Gender	Male	-0.124/ -0.336	0.147/ 0.168

Results (a) and descriptions of the models (b) a Reference category = no service use; for total service use: $R^2 = 0.076$ (Nagelkerke), 0.057 (Cox and Snell), 0.043 (McFadden); for mental health service use; $R^2 = 0.262$ (Nagelkerke), 0.184 (Cox and Snell), 0.167 (McFadden); Model 1: Wald-F(33, 134) = 2.122, $p < 0.001$; Model 2: Wald-F(22, 145) = 11.465, $p < 0.001$.

Fig. 1
Total service (a) and
mental health service
(b) use across the
age span 11.0-17.9 years



of costs based on their inclusion in parental/familial health insurances. Even in the infrequent event that parents/caregivers do not have health insurance, national law foresees coverage of costs for

the treatment of their children. Furthermore, the German health system foresees regular health screening of children and adolescents; of the 11 official health check-ups (a 12th check-up

between ages 16.0 and 17.9 years was instituted in 2010 and thus after the KiGGS) scheduled from birth to age 15, one is scheduled within the age range 13.0–14.9 years [19] and thus within the age range of the probands analyzed in our study. Approximately only one-third of adolescents participate in this screening examination [14]. Thus, considering our total study group aged 11.0–17.9 years, this single health-screening examination within the age spectrum cannot have substantially influenced the high overall use of somatic health services. In Germany, pediatricians and GPs are frequently consulted for minor health problems such as a cold, sore throat, and transient gastrointestinal disorders; psychologists and psychiatrists can usually only be consulted after an initial contact with a pediatrician or GP who refers the patient to the aforementioned mental health-care specialists. This fact presumably accounts for the low rate of children and adolescents who were reported to only utilize mental health services.

In our study, the rate of any health service use of 81.9 % as based on recalls of service use within the past 12 months was higher than that reported in the Medical Expenditure Panel Survey (MEPS) performed in the USA [27]. According to this nationally representative survey conducted in 1996, 74.2 % of US children younger than 18 years (63.7 % in the subgroup of 15–17 year olds, 64.2 % of 10–14 year olds) utilized ambulatory medical care visits. In 1998, this number decreased to a total of 68.9 % [7]. The reasons underlying the difference to our German data presumably reflect differences in insurance coverage, perception of medical needs, socio-economic factors and potentially the average distance to a health professional.

Some surveys have delineated service use for emotional and/or behavioral

problems of children and adolescents in a detailed manner. Nevertheless, the comparison of the respective rates is hampered by the use of different definitions of service use. For example, in a nationally representative Australian survey, 25.4 % of children and adolescents aged 6–17 years were reported (multiple service use was possible) to have sought psychiatric and/or psychological help (private psychologist, social worker, mental health clinic, private psychiatrist, hospital department of psychiatry) within the past 6 months for a Child Behavior Checklist score in the clinical range; contacts to family physicians, pediatricians, outpatient and inpatient mental health services were specifically probed for [34]. In the Great Smoky Mountains Study located within a predominantly rural region of the southeastern United States, the annual use of services was slightly below 20 % [8]. In this study detailed data was provided by parents and youths via the use of the Child and Adolescent Services Assessment that focused on more than 30 types of services including GPs and pediatricians that youths might use to address behavioral, emotional and/or substance use problems. This extensive assessment, which included contacts with education services and the juvenile justice system, went well beyond our rather narrow definition of mental health service use based only on contacts to psychologists, psychiatrists and/or youth welfare.

Similar to our findings, Zwaanswijk et al. [46] showed that 3.1 % of youths aged 11.0–18.0 years used specialized mental health services in the general Dutch population within a 1-year period; such services were accessible only indirectly via the gatekeeping function of a GP. Compared to the Dutch and our own findings, a substantially higher (12.8 %) mental health service use rate was reported by Achenbach et al. [1] in a

sample representative for the USA. However, this higher annual rate is again not directly comparable to the Dutch/German data because the US 'specialized mental health services' included social workers, therapists, counsellors and any other mental health-care professionals in addition to psychiatrists and (school) psychologists.

Our results suggest that in comparison to the USA provision of mental health services is insufficient in Germany. Indeed, most child and adolescent psychiatrists and psychotherapists have long waiting lists for initiation of a diagnostic assessment and treatment. It should also be noted that in Germany mental health nurses and psychologists are not or only very infrequently employed at schools. Thus, low threshold access to mental health-care providers is presumably not as readily possible as in the USA. It should, however, be noted that social workers are employed at German schools (e.g. currently approximately one social worker per school in the German state of North Rhine-Westphalia); unfortunately, social workers were not included in the help-seeking checklist of KiGGS [16, 17, 22].

Children and adolescents who wish to seek help for mental problems need to do so in collaboration with their parents. The initial contact with the medical system is to a GP or pediatrician, who decides if a referral to a child and adolescent psychiatrist or psychologist is appropriate. This underscores the gatekeeping function of GPs and pediatricians for access to providers of mental health services. Determinants of problem recognition by the GP such as child gender, age, past treatment, academic problems, family composition, life events, type of visit, and acquaintance with child have been identified; nevertheless Zwaanswijk et al. [47] concluded that the help-seeking pathway via GPs remains relatively uncharted and therefore needs to be the

focus of future research. A better training of GPs and pediatricians would potentially allow a broader recognition of mental health problems of their patients so that a higher proportion could be referred to specialists.

We are unaware of a study that has looked at service use in relationship to SDQ Total Difficulties score; in contrast, the CBCL to our knowledge was used in three national surveys [1, 34, 42]. In the USA, Simpson et al. [38] screened for mental difficulties in 2003 using an overall SDQ question and substantiated positive parental rankings using five specific SDQ questions. According to these investigators, 44.5 % of 4- to 17-year olds (4.8 % of total sample), who were thus classified as having mental difficulties, had contact with a mental health professional within the previous 12 months. Mental health service use by 28.0 % of those young German subjects of the current study with at least a borderline (17.7 % of the total sample; Table 3) SDQ Total Difficulties score was similar to the utilization rates of mental health professionals reported by Achenbach et al. [1] for US children and adolescents aged 7–16 years with at least a sub-threshold CBCL total score (30.5 % in 1989 and 26.6 % in 1999). However, in the US study mental health professionals included social workers, therapists, counselors, and 'any other mental health professionals' in addition to psychologists and psychiatrists, potentially suggesting that service use of the latter two professions is higher in Germany.

In an Australian study, 16.3 % of 4- to 17-year-old youths with a deviant (sub-threshold and clinical) CBCL total score (14.1 % of total sample) sought help at a private psychologist or psychiatrist [34]. In the Netherlands, Verhulst and van der Ende [42] reported that amongst children and adolescents aged 4.0–18.0 years with a deviant CBCL total score (19.2 % of total sample) 13 % utilized "specialized mental

health services”.

Our own data indicate that in Germany pediatricians and/or GPs are consulted by children and adolescents with an at least borderline SDQ Total Difficulties score more frequently than expected as based on the size of this subgroup (Table 3), thus emphasizing the gatekeeping function of these two medical specialties. However, the referral rate to mental health specialists may be higher in Germany than in the Netherlands thus explaining the lower Dutch use of mental health services. Again, the discrepancy might also partially reflect differences in the types of specialized mental health services queried for. In our study, the younger age group (11.0–13.9 year olds) used any service and mental health services more frequently than the older group (Table 2; Fig. 1a, b). A nationally representative annual household interview survey in the USA revealed that adolescents (compared to children aged 4- to 7-years old) had a higher odds ratio of any mental health professional contact (including psychiatrist, psychologist, clinical social worker or psychiatric nurse) within the last 12 months [38]. Cunninham and Freiman [5] found no association between age and outpatient mental health service use in a representative non-institutionalized civilian US sample of 6- to 17-year-old youths.

Another significant predictor for service use in our study was the SDQ Total Difficulties score. Some regional Scandinavian studies showing an association between mental health service use and a parental Total Difficulties score above the 90th percentile [21, 30] are in accordance with our findings. On a national level, there are, at least to our knowledge, no models for predicting service use with SDQ Total Difficulties score, although associations between SDQ-scale scores (e.g. Hyperactivity or Emotional Symptoms) and mental health service use have been reported in the

literature [4, 29]. In particular, the Hyperactivity score as a good predictor of mental health service use in children and adolescents aged 4–17 years [4] is in accordance with our higher odds ratio for mental health service use of subjects with borderline or abnormal Hyperactivity scores (Table 4).

In contrast to other national surveys, gender was not a significant predictor for service use in our models. A 1994 US nationally representative sample revealed that boys were more likely than girls to receive any type of services (OR = 1.5; any service includes medical, educational or mental health services) or mental health services (OR = 1.8; mental health service was defined as seeing a counsellor, psychiatrist, psychologist or social worker on a regular basis) [39]. A recent US study [28] also described a lower odds ratio (OR = 0.5; reference = male) for mental health service use among females aged 8–15 years with DSM-IV-defined mental disorders.

SES in our regression models only predicted any service use, but not mental health service use (Table 5); due to the similar B coefficients for SES in both models the non-significant finding for mental health service use likely reflects the substantially lower number of subjects included in model 2. This is in contrast to the most Anglo-American findings [5, 34, 39]. In the Netherlands, however, Verhulst and van der Ende [42] and Laitinen-Krispijn et al. [23] also found no influence of SES on mental health service use. Differences in health insurance coverage of children and adolescents might explain these divergent findings: If coverage basically includes all minors, SES is not of major importance for treatment-seeking behavior.

Limitations of our study include the following: (1) Service use was assessed retrospectively based on responses to a specific multiple choice question (see

Materials and Methods) used in the KiGGS. For subjects aged 11.0–13.9 years, parents filled in the respective item; in contrast, adolescents aged 14.0–17.9 answered this question themselves. Our two post-hoc logistic regression analyses revealed that within the younger age group age was a significant predictor of total service use; however, age was not a predictor in the older age group. On a descriptive level, total service use declined over the total age period (Fig. 1a). For mental health service use, a clear drop was discernible in the age period 11.0–13.9 (Fig. 1b); in the older age group a clear cut trend was not evident. In conclusion, we assume that age is a clear predictor; we cannot, however, exclude that the age effect is partially explained by the type of informant. Accordingly, adolescents could report/recall lower service use rates than their parents. (2) We were unable to base our analysis of service use on categorical diagnoses. We relied on the SDQ Total Difficulties score to assess psychopathological loading. As delineated above, the SDQ has to our knowledge not been used in national surveys addressing service use, thus hampering national comparisons. Because a similar mean parental SDQ Total Difficulties score had been reported in 2004 for the representative normative sample of German youths [45], we assume that the KiGGS results are indeed representative of children and adolescents ascertained between 2003 and 2006. (3) We point out that parents are asked to judge a child's behavior over the last 6 months or the current school year upon filling in the SDQ [22]; this time scale is thus smaller than the 1-year period probed for upon assessment of service use. It is thus conceivable that normal scores were obtained for some children and adolescents who no longer had symptom loading in the last 6 months of the past year (e.g. due to stimulant

treatment) but who had shown treatment-seeking behavior in the first 6 months. In addition, children and adolescents whose parents rated their behavior as normal despite having sought mental health services may have had special problems that were not captured adequately with the SDQ (e.g. enuresis, tics, eating problems, obsessive compulsive symptoms). (4) Throughout all age periods parents filled in the SDQ entailing problems related to well-known discrepancies between self-report and parental data [21, 36, 41]. Accordingly, internalizing problems were likely under-reported in adolescents. (5) We have no means to assess to what extent the terms psychiatrist and psychologist were known to parents or adolescents and to what degree the subjects were able to differentiate these two professions. (6) We can only assume that parents and adolescents in our study validly declared mental health service use. The 1.2 % use of psychiatrists determined in the current study is similar to the result of 0.8 % obtained for a regional German study (state of Hesse) of service use behavior. This study included about 55,500 children and adolescents (0 to 18-years old, average age 9.6 years) of an 18.75 % probability sample of a major German health insurance in 2006 [25]. Nevertheless, a methodological difference should be pointed out: The age range of enclosed subjects is not identical. (7) We were not able to differentiate between inpatient and outpatient service use. (8) No measure of symptom impact was used in the KiGGS. Use of such a measure would potentially have led to a higher explanation of the variance of service use in our logistic regression models.

Conclusions

In Germany, we found an overall high annual service use rate of 81.9 % for

children and adolescents within the age range 11.0–17.9 years. GPs and pediatricians were the most frequently contacted physicians. Psychologists, psychiatrists and/or youth welfare were utilized by 4.9 % of the subjects, who to a high percentage also utilized somatic health services during the past year. Importantly, amongst those subjects with an abnormal SDQ Total Difficulties score, only 18.6 % showed mental health service use. This percentage is within the lower range of mental health service use

determined in other national and regional studies. Similar to findings in the Netherlands, only age and Total Difficulties score but not SES predicted mental health service use. We assume that a higher use of mental health services by German youths could be attained by reducing the threshold for seeking help by systematically introducing mental health nurses, and psychologists into the German School system.

Conflict of interest: None.

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