Magnitude and Correlates of Symptomatic, Global Illness, and Social Functioning Response; Out-of-Home Placement; and Length of Stay in 1,189 Consecutively Hospitalized Children and Adolescents With Mental Disorders

Viktor B. Nöhles, MA; Charlotte Jaite, PhD; Kerstin Rubarth, PhD; Fabiola H. Heuer, MSc; Katja Bödeker, PhD; Laura Golz, MSc; Sibylle M. Winter, MD; and Christoph U. Correll, MD

Abstract

Objective: To identify outcome predictors in hospitalized youth with mental disorders.

Methods: This retrospective analysis of systematically recorded clinical parameters in youth hospitalized for psychiatric treatment in 2004–2015 assessed magnitude and correlates of symptom response (SR), global illness response (GIR), social functioning (SF), out-of-home placement (OOHP), and length of stay (LOS). Backward elimination regression analyses were performed to identify independent baseline correlates of each of the 5 outcomes, with R^2 representing the variance explained by the independent correlates retained in the final model.

Results: Across 1,189 youth (median age = 14.4 years; interquartile range = 11.6,16.1 years; range, 5–19 years; females = 61.5%), frequencies of coprimary outcomes were as follows: SR = 57.5% (statistically significant correlates = 13, $R^2 = 0.154$), GIR = 30.0% (correlates = 5, $R^2 = 0.078$), SF = 19.0% (correlates = 8, $R^2 = 0.207$), OOHP recommendation = 35.2% (correlates = 13, $R^2 = 0.275$), and mean ± SD LOS = 65.0 ± 37.5 days (correlates = 11, $R^2 = 0.219$). In multivariable analyses, 11 factors were statistically significantly ($P < .05$) associated with > 1 poor outcome: 4 with 4 outcomes (disturbed social interaction, substance abuse/dependence symptoms; sole exception for both = LOS; disturbed drive/attention/impulse control, sole exception = OOHP; higher admission BMI percentile [but shorter LOS], sole exception = GIR), 3 with 3 outcomes (higher admission age [but good SF and shorter LOS], more abnormal psychosocial circumstances, more mental health diagnoses), and 4 with 2 outcomes (intelligence level [IQ] < 85, obsessive-compulsive disorder symptoms, disturbed social behavior, somatic findings). Additionally, 17 correlates were statistically significantly ($P < .05$) associated with 1 outcome, ie, SR = 6, OOHP = 5, LOS = 5, SF = 1.

Conclusions: Higher admission BMI percentile, disturbed social interaction, disturbed drive/attention/impulse control, and substance abuse/dependence symptoms were independently associated with multiple poor outcomes in mentally ill youth requiring inpatient care. Knowledge of global and specific correlates of poor inpatient treatment outcomes may help inform treatment decisions.

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Author affiliations are listed at the end of this article.

Approximately 10%–20% of children and adolescents ("youth") worldwide have mental disorders, with considerable variation across individual populations and studies.[1,2] Altogether, 35% of mental disorders occur before age 14 years, 48% before age 18 years.[3] Psychiatric inpatient treatment (PIT) is used for youth when ambulatory care is insufficient due to relevant symptoms—eg, suicidality, self-harm, psychosis, aggressive behavior—and/or functional impairment—eg, social isolation, school refusal.[4–6] Various studies[7–10] have shown that PIT of youth with mental disorders has steadily increased across countries over the last decades. Moreover, PIT is associated with the highest costs in psychiatry.[11,12] Therefore, evidence-based, cost-effective treatment is important that either avoids PIT, shortens length of stay (LOS), and/or yields positive and sustainable outcomes preventing readmission.

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Clinical Points

- Identifying the variables affecting relevant clinical outcomes in hospitalized youth with mental disorders, such as symptom response, global illness response, social functioning, out-of-home placement, and length of stay, can guide management decisions.
- Several clinical factors present at admission—including higher body mass index percentile, disturbed social interaction, disturbed drive/attention/impulse control, and substance abuse/dependence symptoms—concurrently negatively affected 4 of the 5 treatment outcomes in hospitalized youth with mental disorders targeted in this study.
- Knowledge of moderators affecting multiple clinically relevant outcomes can help focus clinical attention to patient subgroups and specific symptom domains to improve inpatient treatment outcomes in youth with mental illness.

To examine the success of PIT, several different outcomes have been investigated, each with clinical relevance for patients and families. These include symptom change,[13–26] global illness outcome,[27,28] functioning,[12,13,27,29–33] LOS,[13,27,29,34–40] and need for out-of-home placement (OOHP).[41–46] Studies have included youth with at least one mental disorder, but the number of outcomes assessed concurrently and the number of different exploratory or explanatory predictors have mostly been limited.

Nevertheless, several predictors have been replicated in youth. Statistically significantly greater symptom improvement was associated with older age in samples with mixed mental disorders[26] and depression,[14] with opposite results for eating disorders.[15,16] Lower depressive symptoms at admission were associated with significantly greater improvement in suicidality[18] and depression,[14] with conflicting results for eating disorders[16,17,19] and with opposite results for substance abuse treatment.[20] Furthermore, symptom improvement has been associated with greater patient treatment motivation[19,22–24] and lack of prior PIT[15,16] in eating disorders, and with less self-criticism in patients with suicidality[18] and personality disorders.[21] Also, in samples of mixed mental disorders and of eating disorders, higher baseline Health of the Nation Outcome Scales for Children and Adolescents (HoNOSCA)[47] scores (indicating worse overall mental health symptoms) have been associated with greater HoNOSCA score improvement.[13,25]

Regarding global illness outcome, available data are fewer and are without clear replicated significant correlates.[27,28] In mixed mental disorder samples, functional outcome, ie, greater Children's Global Assessment Scale (CGAS)[48] score improvement, was significantly associated with lower baseline CGAS scores (indicating worse functioning),[13,27,29–32] longer LOS,[12,27,29,30] and older age.[30,32] However, conflicting results exist regarding the diagnosis of schizophrenia in mixed mental disorder studies, predicting both greater and lesser CGAS score change.[13,30,32] Furthermore, studies have reported isolated correlates of functioning requiring further study.[12,27,29,32,33]

Higher risk of OOHP in mixed mental disorder populations treated in PIT-equivalent residential care, day-treatment settings, or PIT has been associated with various forms of child abuse[41–45] and parental substance abuse.[43,45] Moreover, OOHP in youth with mixed mental disorders or schizophrenia in day-treatment or PIT settings was associated with longer LOS.[44–46] Otherwise, studies reported isolated correlates of OOHP requiring further study.[41–45]

Finally, longer LOS has been associated in mixed youth mental disorder samples with male sex,[34–37] lower admission CGAS scores,[27,38] schizophrenia-spectrum disorder[35,39] or conduct disorder,[36,37] absence of adjustment disorder,[35–38] and previous PIT.[36,37,40] Moreover, studies reported isolated correlates of LOS also requiring further study.[13,27,29,34,35,37–39]

Despite many investigations in youth with individual and mixed mental disorders, few studies have assessed multiple global illness and functional outcomes across different mental disorders and many outcome predictors. Identifying clinical factors, including individual diagnoses that are associated with broad-based or specific outcomes in youth with mental disorders, can provide clinicians with early intervention targets aiming at improving PIT outcomes. Therefore, we conducted a study of PIT outcomes in youth consecutively admitted for psychiatric treatment, hypothesizing that certain factors would be transoutcome predictors while others would be restricted to single outcomes.

METHODS

Design, Setting, and Population

This retrospective study incorporated an admission and discharge data documentation system for youth aged 5–19 years who were consecutively hospitalized between 2004 and 2015 at the Department of Child and Adolescent Psychiatry, Psychosomatic Medicine and Psychotherapy, Charité—Universitätsmedizin Berlin, Germany. Inpatient admissions came predominantly from outpatient care providers or self-referral via a wait list, or directly from other institutions, but rarely directly via the emergency department, as the University department did not have mandatory catchment area coverage. Data were collected as part of a quality control initiative, and the study was approved by the institutional ethics committee without need for individual consent.

Assessments

Structured clinician data collection occurred as part of routine clinical care on admission and discharge (for details, see Supplementary Appendix 1).

Key Outcomes

We focused on 5 coprimary outcomes: 4 dichotomous variables, ie, symptom response (SR), global illness response (GIR), psychosocial functioning (SF), and OOHP, each assessed at discharge, plus 1 continuous outcome, LOS. These outcomes were categorized as follows: (i) SR and GIR: completely or significantly improved versus nonresponders (ie, slightly improved, unchanged, or worsened); (ii) SF: good functioning (excellent and satisfactory social adjustment or mild social impairment) versus impaired functioning (ie, moderate, significant, overarching, continuous, profound, serious, or requiring considerable/constant care); (iii) OOHP: recommendation/initiation of discharge into group home/assisted living, therapeutic living group, boarding school, or foster care/adoption versus home placement or day care; and (iv) LOS: duration from admission to discharge.

Our primary objective was to scrutinize the univariate as well as independently significant multivariable correlates across all 5 outcomes to discern comprehensive predictors of PIT success in youth with mental disorders.

Data Analysis

Mental health diagnoses, classified according to the *International Statistical Classification of Diseases, 10th Revision* (*ICD-10*),[50] were organized and subsequently defined as primary mental health diagnoses within the following hierarchical disorder domains, ranging from (i) to (viii): (i) schizophrenia, schizotypal, or delusional disorder; (ii) any eating disorder; (iii) (recurrent) depressive disorder or dysthymia; (iv) autism spectrum disorders or attachment disorder; (v) oppositional defiant/conduct disorder; (vi) dissociative or somatoform disorders; (vii) attention-deficit/hyperactivity disorder (ADHD) or hyperkinetic disorder; and (viii) phobia and other anxiety disorders.

Analyses included descriptive statistics and correlational analyses between year of admission and each outcome to investigate presence of a potential time effect. To examine relationships between independent variables and the 5 outcomes, univariate analyses were performed. To identify independent correlates of each of the 5 outcomes, 4 logistic stepwise backward elimination regression analyses and 1 linear backward elimination regression analysis were conducted starting with all baseline variables (see Supplementary Table 1), removing statistically nonsignificant variables until only statistically significant variables remained in the final model. Since higher BMI percentile was associated with worse outcomes, we conducted post hoc sensitivity univariate analyses between baseline BMI percentile and the 5 outcomes, stratified by inclusion/exclusion of patients with eating disorders who had overall better outcomes. Finally, we compared qualitatively which of the quantitatively derived independent correlates of each of the 5 outcomes were significant for > 1 outcome, calling this a transoutcome correlate.

All calculations were 2-sided, performed with SPSS 27 (SPSS, Inc), and with $\alpha = .05$. Due to the exploratory nature of the study, no adjustment for multiplicity was conducted. Hence, *P* values and confidence intervals are interpreted in an exploratory, hypothesis-generating manner (for further information, see Supplementary Appendix 2).

RESULTS

Population

Data were collected in 1,189 youth (median age = 14.4 years; interquartile range [IQR] = 11.6, 16.1 years; range, 5–19 years; females = 61.5%). Of these, 1,058 youth had the following primary diagnoses in descending order of severity/significance trumping any other comorbidity: schizophrenia, schizotypal, or delusional disorder (n = 22); any eating disorder (n = 354); depressive disorder or dysthymia (n = 231); autism spectrum disorders (n = 48); oppositional defiant/conduct disorder (n = 231); dissociative or somatoform disorders (n = 70); ADHD/hyperkinetic disorder (n = 47); and phobic anxiety disorder and other anxiety disorders (n = 55) (Table 1). In 104 patients (8.7%), none of the aforementioned diagnoses were given, and only other, more mild and secondary diagnoses were reported, with missing diagnostic information for 27 patients (2.3%) (Table 1, Supplementary Table 2).

Univariate Associations of Baseline Variables With Primary Outcomes

Univariate associations of patient, illness, and treatment variables with the 5 primary outcomes are displayed in Tables 2–4 and Supplementary Table 3. The outcomes were not highly intercorrelated (Pearson correlation: 0.010 [LOS vs OOHP] to 0.441 [SR vs GIR]). There was no significant time effect for any of the outcomes except for GIR (*P* value for Pearson correlation < .001) and OOHP (*P* value for Pearson correlation = .001).

Multivariable Associations of Baseline Variables With Primary Outcomes

Symptom response (SR). The final backward elimination regression model of SR included 433 responders (57.5%) and 320 nonresponders (42.5%). Independent positive predictors of response to PIT included comorbid diagnosis of mental/behavioral disorder due to psychotropic substances (OR = 8.08; 95% CI, 1.75 to 37.33), comorbid tic disorders (OR = 3.03; 95% CI, 1.20 to 7.66), comorbid enuresis/encopresis (OR = 2.40; 95% CI, 1.29 to 4.48), phobia/other anxiety

Table 1.

Baseline Characteristics and key Outcomes of Psychiatrically Hospitalized Children and Adolescents

Characteristic	Total (n = 1,189)[a]	Schizophrenia, Schizotypal, or Delusional Disorder[b] (n = 22)	Any Eating Disorder[b] (n = 354)	(Recurrent) Depressive Disorder or Dysthymia[b] (n = 231)	Autism-Spectrum Disorders or Attachment Disorder[b] (n = 48)	Oppositional Defiant/Conduct Disorder[b] (n = 231)	Dissociative or Somatoform Disorders[b] (n = 70)	Attention-Deficit/ Hyperactivity Disorder or Hyperkinetic Disorder[b] (n = 47)	Phobic Anxiety Disorder and Other Anxiety Disorders[b] (n = 55)
Baseline Characteristics at Hospital Admission									
Demographic variables									
Age at inpatient admission, median (IQR), y [n = 1,189]	14.4 (11.6, 16.1)	16.3 (14.8, 17.0)	15.3 (13.8, 16.6)	15.6 (14.1, 16.7)	9.3 (7.5, 12.3)	11.6 (8.8, 14.6)	14.1 (12.4, 15.9)	10.7 (8.4, 13.9)	13.7 (11.1, 15.7)
Sex, female, n (%) [n = 1,189]	731 (61.5)	8 (36.4)	325 (91.8)	139 (60.2)	25 (52.1)	64 (27.7)	44 (62.9)	17 (36.2)	34 (61.8)
Complications/risk factors during pregnancy, birth or postpartum period, n (%) [n = 1,060]	433 (40.8)	7 (33.3)	135 (40.8)	80 (39.2)	15 (44.1)	88 (43.6)	26 (43.3)	22 (50.0)	14 (28.6)
Intelligence level, n (%) [n = 1,132]									
≥ 115	241 (21.3)	0 (0.0)	128 (38.3)	44 (19.9)	1 (2.1)	25 (10.9)	16 (23.5)	3 (6.7)	6 (10.9)
85–114	747 (66.0)	17 (85.0)	187 (56.0)	161 (72.9)	28 (59.6)	160 (69.9)	46 (67.6)	32 (71.1)	38 (69.1)
< 85	144 (12.7)	3 (15.0)	19 (5.7)	16 (7.2)	18 (38.3)	44 (19.2)	6 (8.8)	10 (22.2)	11 (20.0)
Home environment, , n (%)									
Mental disorder in family [n = 1,050]	681 (64.9)	14 (77.8)	199 (60.5)	154 (74.4)	27 (71.1)	133 (66.2)	33 (53.2)	28 (68.3)	29 (59.2)
Non-mental disorder in family [n = 1,034]	360 (34.8)	5 (26.3)	110 (34.6)	76 (37.3)	13 (38.2)	70 (34.8)	24 (39.3)	13 (33.3)	15 (30.6)
Associated abnormal psychosocial factors									
Bullying experience by student or scapegoat by teacher, n (%) [n = 1,121]	130 (11.6)	2 (10.0)	13 (3.9)	21 (9.5)	8 (17.0)	59 (26.2)	9 (13.8)	9 (19.6)	3 (5.6)
Physical abuse in the family, n (%) [n = 1,101]	58 (5.3)	2 (10.5)	6 (1.8)	11 (5.0)	11 (23.4)	16 (7.4)	2 (3.2)	3 (6.7)	0 (0.0)
Sexual abuse in or outside the family, n (%) [n = 1,099]	45 (4.1)	0 (0.0)	7 (2.1)	13 (6.0)	4 (8.9)	13 (6.0)	1 (1.6)	1 (2.2)	1 (1.9)
No. of abnormal psychosocial factors, mean ± SD [n = 1,161]	2.2 ± 1.6	2.0 ± 1.5	1.7 ± 1.5	2.2 ± 1.5	2.9 ± 1.5	2.7 ± 1.6	2.2 ± 1.5	2.2 ± 1.4	2.0 ± 1.5
Somatic status									
BMI percentile at admission, median (IQR) [n = 1,077]	38.2 (6.7, 81.6)	42.1 (14.6, 75.8)	1.1 (0.1, 17.8)	46.0 (19.8, 86.4)	56.0 (21.2, 76.6)	61.8 (30.9, 89.9)	61.8 (27.4, 91.1)	48.0 (15.9, 75.0)	46.0 (21.7, 80.2)
Any neurologic abnormality, n (%) [n = 1,085]	230 (21.2)	9 (47.4)	34 (10.8)	23 (10.8)	16 (34.8)	77 (35.0)	17 (26.6)	14 (30.4)	8 (15.7)
Any medical abnormality, n (%) [n = 1,091]	453 (41.5)	8 (42.1)	174 (54.7)	85 (39.9)	15 (31.9)	77 (34.8)	21 (32.3)	14 (30.4)	16 (31.4)
Comorbid mental health diagnosis (*ICD-10*, Axis I), n (%)									
Personality disorders [n = 1,162]	133 (11.4)	0 (0.0)	40 (11.3)	52 (22.5)	1 (2.1)	10 (4.3)	6 (8.6)	1 (2.1)	5 (9.1)
Enuresis and encopresis [n = 1,162]	104 (9.0)	0 (0.0)	1 (0.3)	6 (2.6)	15 (31.3)	36 (15.6)	2 (2.9)	16 (34.0)	8 (14.5)
Persistent other/nonspecified affective disorder [n = 1,162]	77 (6.6)	1 (4.5)	20 (5.6)	0 (0.0)	1 (2.1)	16 (6.9)	9 (12.9)	7 (14.9)	2 (3.6)
Obsessive-compulsive disorders [n = 1,162]	72 (6.2)	3 (13.6)	34 (9.6)	3 (1.3)	4 (8.3)	4 (1.7)	1 (1.4)	3 (6.4)	1 (1.8)

(continued)

Table 1 (continued).

Characteristic	Total (n = 1,189)[a]	Schizophrenia, Schizotypal, or Delusional Disorder[b] (n = 22)	Any Eating Disorder[b] (n = 354)	(Recurrent) Depressive Disorder or Dysthymia[b] (n = 231)	Autism-Spectrum Disorders or Attachment Disorder[b] (n = 48)	Oppositional Defiant/Conduct Disorder[b] (n = 231)	Dissociative or Somatoform Disorders[b] (n = 70)	Attention-Deficit/ Hyperactivity Disorder or Hyperkinetic Disorder[b] (n = 47)	Phobic Anxiety Disorder and Other Anxiety Disorders[b] (n = 55)
Adjustment disorder and acute stress disorder [n = 1,162]	62 (5.3)	0 (0.0)	11 (3.1)	11 (4.8)	2 (4.2)	5 (2.2)	4 (5.7)	3 (6.4)	1 (1.8)
Attachment disorder [n = 1,162]	47 (4.0)	0 (0.0)	2 (0.6)	0 (0.0)	3 (6.3)	9 (3.9)	4 (5.7)	11 (23.4)	1 (1.8)
Tic disorder [n = 1,162]	38 (3.3)	1 (4.5)	2 (0.6)	3 (1.3)	3 (6.3)	14 (6.1)	3 (4.3)	3 (6.4)	1 (1.8)
Mental and behavioral disorders due to psychotropic substance use [n = 1,162]	24 (2.1)	0 (0.0)	2 (0.6)	9 (3.9)	1 (2.1)	5 (2.2)	2 (2.9)	0 (0.0)	0 (0.0)
Emotional disorders in childhood [n = 1,162]	7 (0.6)	0 (0.0)	2 (0.6)	3 (1.3)	0 (0.0)	1 (0.4)	0 (0.0)	0 (0.0)	0 (0.0)
Total number of *ICD-10*, Axis I mental health diagnoses [n = 1,172]	1.9 (0.7)	1.8 (0.8)	1.9 (0.7)	2.1 (0.7)	2.4 (0.7)	1.7 (0.7)	1.9 (0.7)	2.3 (0.6)	1.6 (0.7)
Circumscribed developmental disorder (*ICD-10*, Axis II), n (%)									
Circumscribed developmental disorder of motor functions [n = 1,146]	107 (9.3)	4 (20.0)	6 (1.7)	7 (3.1)	15 (32.6)	44 (19.6)	3 (4.4)	12 (26.1)	6 (11.1)
Disorders of school skills [n = 1,146]	105 (9.2)	2 (10.0)	9 (2.6)	18 (7.9)	5 (10.9)	38 (17.0)	10 (14.7)	9 (19.6)	7 (13.0)
Speech or language disorder [n = 1,146]	67 (5.8)	2 (10.0)	8 (2.3)	5 (2.2)	11 (23.9)	21 (9.4)	0 (0.0)	2 (4.3)	5 (9.3)
Presence of at least slight psychopathology, n (%)									
Disturbance of mood and affect [n = 1,158]	1001 (86.4)	20 (95.2)	315 (91.0)	222 (97.8)	35 (72.9)	178 (78.8)	53 (80.3)	31 (67.4)	48 (87.3)
Disturbance of social interaction [n = 1,159]	819 (70.7)	19 (90.5)	203 (59.2)	161 (71.2)	41 (87.2)	187 (81.3)	41 (62.1)	35 (76.1)	42 (76.4)
Disturbance of drive, attention, and impulse control [n = 1,162]	729 (62.7)	17 (81.0)	149 (43.2)	165 (72.4)	34 (70.8)	195 (85.2)	30 (45.5)	40 (87.0)	30 (54.5)
Disturbance of social behavior [n = 1,151]	482 (41.9)	10 (52.6)	54 (15.8)	73 (32.4)	32 (66.7)	194 (84.7)	19 (28.8)	22 (47.8)	19 (34.5)
Eating disorder symptoms [n = 1,145]	474 (41.4)	2 (10.5)	335 (96.8)	44 (19.6)	5 (10.9)	39 (17.5)	11 (16.7)	6 (13.0)	5 (9.1)
Functional and somatoform disorder symptoms [n = 1,145]	414 (36.2)	9 (47.4)	70 (20.5)	105 (46.9)	13 (27.7)	67 (29.5)	49 (74.2)	21 (45.7)	28 (50.9)
Anxiety disorder symptoms [n = 1,143]	406 (35.5)	11 (57.9)	96 (28.2)	83 (36.6)	16 (34.0)	70 (31.1)	31 (47.7)	15 (32.6)	47 (87.0)
Disturbance of psychomotor behavior [n = 1,150]	252 (21.9)	11 (52.4)	56 (16.4)	50 (22.2)	19 (41.3)	61 (26.9)	7 (10.6)	18 (39.1)	7 (13.0)
Disturbance of speech and language [n = 1,148]	225 (19.6)	7 (35.0)	29 (8.5)	41 (18.3)	26 (55.3)	53 (23.5)	9 (13.6)	15 (32.6)	15 (27.8)
Psychotic symptoms [n = 1,151]	187 (16.2)	13 (68.4)	51 (14.8)	43 (19.0)	8 (17.0)	23 (10.1)	10 (15.2)	10 (21.7)	4 (7.3)
Obsessive-compulsive disorder symptoms [n = 1,138]	146 (12.8)	3 (16.7)	73 (21.3)	13 (5.9)	9 (20.0)	11 (4.9)	4 (6.3)	5 (10.9)	5 (9.4)
Substance abuse/dependence symptoms [n = 1,140]	86 (7.5)	3 (16.7)	19 (5.6)	29 (12.9)	0 (0.0)	23 (10.2)	1 (1.5)	1 (2.2)	2 (3.7)
Impaired memory, orientation, consciousness, or alertness [n = 1,142]	74 (6.5)	6 (31.6)	16 (4.7)	17 (7.6)	6 (12.8)	10 (4.4)	4 (6.3)	4 (8.7)	4 (7.3)

(continued)

Table 1 (continued).

Characteristic	Total (n = 1,189)[a]	Schizophrenia, Schizotypal, or Delusional Disorder[b] (n = 22)	Any Eating Disorder[b] (n = 354)	(Recurrent) Depressive Disorder or Dysthymia[b] (n = 231)	Autism-Spectrum Disorders or Attachment Disorder[b] (n = 48)	Oppositional Defiant/Conduct Disorder[b] (n = 231)	Dissociative or Somatoform Disorders[b] (n = 70)	Attention-Deficit/ Hyperactivity Disorder or Hyperkinetic Disorder[b] (n = 47)	Phobic Anxiety Disorder and Other Anxiety Disorders[b] (n = 55)
Key Outcomes									
Treatment duration, mean ± SD, d [n = 1,184]	65.0 ± 37.4	62.3 ± 37.7	85.9 ± 46.5	58.1 ± 28.0	54.3 ± 22.9	53.9 ± 26.2	54.7 ± 20.4	61.9 ± 23.5	53.9 ± 24.4
Complete or significant symptom improvement, n (%) [n = 1,115]	601 (53.9)	6 (30.0)	195 (58.4)	123 (55.9)	20 (42.6)	99 (44.8)	35 (53.8)	31 (67.4)	36 (66.7)
Complete or significant global illness improvement, n (%) [n = 1,117]	308 (27.6)	2 (10.0)	113 (33.8)	57 (25.8)	15 (31.9)	44 (19.8)	20 (30.8)	13 (28.9)	18 (33.3)
No more than mild social impairment, n (%) [n = 1,079]	191 (17.7)	0 (0.0)	88 (27.1)	38 (18.0)	2 (4.3)	14 (6.6)	11 (17.7)	7 (16.7)	9 (17.3)
Recommended out-of-home placement and day care, n (%) [n = 1,177]	432 (36.7)	8 (36.4)	96 (27.4)	94 (40.9)	31 (64.6)	112 (48.5)	18 (25.7)	11 (23.4)	18 (32.7)

[a]n = 104 without a main diagnosis and n = 27 without information.
[b]Diagnoses ordered from left to right according to diagnostic primacy in case of comorbidity with other "primary" diagnoses.
Abbreviations: *ICD-10 = International Statistical Classification of Diseases and Related Health Problems, Tenth Revision*; IQR = interquartile range.

disorders (OR = 2.10; 95% CI, 1.26 to 3.52), depressive disorders/dysthymia (OR = 2.07; 95% CI, 1.41 to 3.04), and ADHD (OR = 1.84; 95% CI, 1.07 to 3.16); negative predictors of response included substance abuse/dependence symptoms (OR = 0.35; 95% CI, 0.17 to 0.72), more mental health diagnoses (OR = 0.52; 95% CI, 0.40 to 0.68), disturbed drive/attention/impulse control (OR = 0.58; 95% CI, 0.41 to 0.82), obsessive-compulsive disorder symptoms (OR = 0.61; 95% CI, 0.38 to 0.96), disturbed social interaction (OR = 0.63; 95% CI, 0.45 to 0.90), more abnormal psychosocial circumstances (OR = 0.89; 95% CI, 0.80 to 0.99), and higher admission BMI percentile (OR = 1.00; 95% CI, 0.99 to 1.00) (n = 753, $R^2 = 0.154$, $P < .001$) (Table 5).

Global illness response (GIR). The final backward elimination regression model included 226 responders (30.0%) and 528 nonresponders (70.0%). The single independent positive predictor of GIR was intelligence level < 85 (OR = 1.72; 95% CI, 1.04 to 2.83); negative predictors included substance abuse/dependence symptoms (OR = 0.37; 95% CI, 0.16 to 0.84), disturbed social interaction (OR = 0.69; 95% CI; 0.48 to 0.97), disturbed drive/attention/impulse control (OR = 0.70; 95% CI, 0.50 to 0.97), and more abnormal psychosocial circumstances (OR = 0.78; 95% CI, 0.70 to 0.88) (n = 754, $R^2 = 0.078$, $P < .001$) (Table 5).

Social functioning (SF). The final backward elimination regression model included 138 youth (19.0%) with good functioning and 589 (81.0%) with impaired functioning. The lone independent positive predictor of SF was higher admission age (OR = 1.18; 95% CI, 1.09 to 1.28); negative predictors included substance abuse/dependence symptoms (OR = 0.22; 95% CI, 0.05 to 0.94), intelligence level < 85 (OR = 0.32; 95% CI, 0.12 to 0.83), comorbid personality disorder (OR = 0.36; 95% CI, 0.14 to 0.91), disturbed social interaction (OR = 0.53; 95% CI, 0.35 to 0.80), disturbed drive/attention/impulse control (OR = 0.58; 95% CI, 0.38 to 0.88), more mental health diagnoses (OR = 0.67; 95% CI, 0.50 to 0.90), and higher admission BMI percentile (OR = 0.99; 95% CI, 0.99 to 1.00) (n = 727, $R^2 = 0.207$, $P < .001$) (Table 5).

Out-of-home placement (OOHP). The final backward elimination regression model included 268 youth (35.2%) with OOHP recommendation and 494 (64.8%) without OOHP recommendation. Independent correlates of OOHP recommendation included autism-spectrum disorders (OR = 3.63; 95% CI, 1.41 to 9.31), physical abuse in the family (OR = 3.06; 95% CI, 1.21 to 7.77), substance abuse/dependence symptoms (OR = 2.07; 95% CI, 1.06 to 4.05), mental disorder in family (OR = 1.93; 95% CI = 1.32 to 2.80), disturbed social behavior (OR = 1.77; 95% CI, 1.19 to 2.63), disturbed social interaction (OR = 1.74; 95% CI, 1.16 to 2.60), neurologic findings (OR = 1.58; 95% CI, 1.03 to 2.44), somatic findings (OR = 1.45; 95% CI, 1.03 to 2.05), more abnormal psychosocial circumstances (OR = 1.34; 95% CI, 1.19 to 1.51), more

Table 2.

Outcomes of Univariate Analyses of Dichotomous Baseline Variables by Demographic, Physical, and Social Characteristics of Psychiatrically Hospitalized Children and Adolescents

Characteristics	Symptom Response				Global Illness Outcome Response				Good Psychosocial Functioning at Discharge				Recommended Out-of-Home-Placement Except Day Care				Length of Stay		
	Total n	n (%)		*P* Value	Total n	n (%)		*P* Value	Total n	n (%)		*P* Value	Total n	n (%)		*P* Value	Total n	Mean ± SD, d	*P* Value
		Yes	No			Yes	No			Yes	No			Yes	No				
Demographic Variables																			
Sex	1,115			.158	1,117			.614	1,079			<.001	1,177			.031	1,184		<.001
Female		378 (62.9)	302 (58.8)			192 (62.3)	491 (60.7)			146 (76.4)	516 (58.1)			248 (57.4)	475 (63.8)			70.1 ± 41.2	
Male		223 (37.1)	212 (41.2)			116 (37.7)	318 (39.3)			45 (23.6)	372 (41.9)			184 (42.6)	270 (36.2)			55.7 ± 41.2	
Complications/risk factors during pregnancy, birth, or postpartum period	1,011			.517	1,013			.846	978			.040	1,049			.705	1,059		.508
Yes		224 (40.4)	194 (42.5)			115 (40.8)	303 (41.5)			60 (34.1)	341 (42.5)			152 (40.3)	279 (41.5)			65.3 ± 34.8	
No		330 (59.6)	263 (57.5)			167 (59.2)	428 (58.5)			116 (65.9)	461 (57.5)			225 (59.7)	393 (58.5)			66.9 ± 40.1	
Home Environment																			
Mental disorder in family	998			.0479	1,001			.002	969			.034	1,039			<.001	1,048		.281
Yes		352 (63.8)	294 (65.9)			165 (57.5)	484 (67.8)			105 (58.3)	526 (66.7)			284 (75.7)	391 (58.9)			66.8 ± 39.4	
No		200 (36.2)	152 (34.1)			122 (42.5)	230 (32.2)			75 (41.7)	263 (33.3)			91 (24.3)	273 (41.1)			64.2 ± 35.0	
Non-mental disorder in family	984			.0799	986			.081	954			.811	1,023			.361	1,033		.452
Yes		191 (34.9)	156 (35.7)			87 (31.1)	261 (37.0)			63 (36.0)	273 (35.0)			120 (32.9)	235 (35.7)			66.7 ± 39.5	
No		356 (65.1)	281 (64.3)			193 (68.9)	445 (63.0)			112 (64.0)	506 (65.0)			245 (67.1)	423 (64.3)			64.8 ± 36.8	
Somatic Status																			
Abnormality, overall neurologic assessment	1,050			.623	1,051			.543	1,021			.001	1,082			.004	1,084		.644
Yes		118 (20.5)	103 (21.7)			65 (29.4)	156 (70.6)			21 (11.8)	190 (22.5)			103 (25.9)	126 (18.4)			63.5 ± 37.0	
No		458 (79.5)	371 (78.3)			227 (77.7)	603 (79.4)			157 (88.2)	653 (77.5)			295 (74.1)	558 (81.6)			64.8 ± 35.8	
Abnormality, overall somatic assessment	1,055			.114	1,057			.554	1,026			.824	1,088			.020	1,090		.002
Yes		229 (39.6)	212 (44.4)			118 (26.8)	323 (73.2)			76 (42.5)	352 (41.6)			184 (46.0)	267 (38.8)			68.6 ± 38.2	
No		349 (60.4)	265 (55.6)			175 (59.7)	441 (57.7)			103 (57.5)	495 (58.4)			216 (54.0)	421 (61.2)			61.7 ± 34.4	
Associated Abnormal Psychosocial Factors																			
Physical abuse in the family	1,067			.122	1,070			.656	1,033			.111	1,096			<.001	1,099		.326
Yes		23 (3.9)	29 (6.0)			14 (4.6)	40 (5.2)			5 (2.7)	46 (5.4)			42 (10.3)	15 (2.2)			60.7 ± 28.8	
No		560 (96.1)	455 (94.0)			292 (95.4)	724 (94.8)			183 (97.3)	799 (94.6)			366 (89.7)	673 (97.8)			65.7 ± 37.5	
Sexual abuse in or outside the family	1,072			.548	1,074			.742	1,036			.184	1,099			.011	1,103		.167
Yes		4 (0.7)	5 (1.0)			3 (1.0)	763 (99.2)			0 (0.0)	8 (0.9)			7 (1.7)	2 (0.3)			48.2 ± 26.8	
No		579 (99.3)	484 (99.0)			302 (99.0)	6 (0.8)			186 (100.0)	842 (99.1)			402 (98.3)	688 (99.7)			65.4 ± 37.1	
Bullying experience by student or scapegoat by teacher	1,087			.350	1,089			.349	1,051			.002	1,116			.381	1,210		.004
Yes		64 (10.8)	63 (12.7)			31 (10.2)	96 (12.2)			9 (4.8)	110 (12.7)			53 (12.7)	77 (11.0)			56.2 ± 27.7	
No		526 (89.2)	434 (87.3)			273 (89.8)	689 (87.8)			179 (95.2)	753 (87.3)			363 (87.3)	623 (89.0)			66.2 ± 38.0	
Trauma experience	1.091			.103	1,094			.109	1.056			<.001	1.123			<.001	1,126		.002
Yes		98 (16.5)	101 (20.3)			47 (15.4)	154 (19.5)			18 (9.5)	172 (19.9)			104 (24.7)	104 (14.8)			58.0 ± 27.7	
No		496 (83.5)	396 (79.7)			259 (84.6)	634 (80.5)			172 (90.5)	694 (80.1)			317 (75.3)	598 (85.2)			66.6 ± 38.6	

Table 3.

Outcomes of Univariate Analyses of Dichotomous Baseline Variables by Illness Characteristics and Key Outcomes of Psychiatrically Hospitalized Children and Adolescents

	Symptom Response				Global Illness Outcome Response				Good Psychosocial Functioning at Discharge				Recommended Out-of-Home-Placement Except Day Care				Length of Stay		
	Total	n (%)		*P*	Total	n (%)		*P*	Total	n (%)		*P*	Total	n (%)		*P*	Total	Mean ± SD,	*P*
Characteristic	n	Yes	No	Value	n	Yes	No	Value	n	Yes	No	Value	n	Yes	No	Value	n	d	Value
Primary Mental Health Diagnosis (*ICD-10*, Axis I)																			
Schizophrenia. schizotypal, or delusional disorder	1,101			.030	1,102			.082	1,064			.024	1,157			.951	1,158		.740
Yes		6 (1.0)	14 (2.8)			2 (0.7)	18 (2.3)			0 (0.0)	20 (2.3)			8 (1.9)	14 (1.9)			62.3 ± 37.7	
No		588 (99.0)	493 (97.2)			301 (99.3)	781 (97.7)			188 (100)	856 (97.7)			420 (98.1)	715 (98.1)			64.9 ± 37.0	
Any eating disorder	1,101			.052	1,102			.002	1,064			<.001	1,157			<.001	1,158		<.001
Yes		195 (32.8)	139 (27.4)			113 (37.3)	221 (27.7)			88 (46.8)	237 (27.1)			96 (22.4)	255 (35.0)			85.9 ± 46.5	
No		399 (67.2)	368 (72.6)			190 (62.7)	578 (72.3)			100 (53.2)	639 (72.9)			332 (77.6)	474 (65.0)			55.6 ± 27.3	
(Recurrent) depressive disorder or Dysthymia	1,101			.352	1,102			.827	1,064			.162	1,157			.602	1,158		.015
Yes	1,101	196 (33.0)	154 (30.4)	.352	1,102	95 (31.4)	256 (32.0)	.827	1,064	68 (36.2)	271 (30.9)	.162	1,157	139 (32.5)	226 (31.0)	.602	1,158	68.8 ± 39.8	.015
No		398 (67.0)	353 (69.6)			208 (68.6)	543 (68.0)			120 (63.8)	605 (69.1)			289 (67.5)	503 (69.0)			63.1 ± 35.5	
Autism spectrum disorder	1,101			.044	1,102			.588	1,064			.004	1,157			<.001	1,158		.334
Yes		21 (3.5)	31 (6.1)			16 (5.3)	36 (4.5)			2 (1.1)	49 (5.6)			32 (7.5)	21 (2.9)			60.1 ± 50.0	
No		573 (96.5)	476 (93.9)			287 (94.7)	763 (95.5)			186 (98.9)	827 (94.4)			396 (92.5)	708 (97.1)			65.1 ± 36.3	
Oppositional defiant/conduct disorder	1,101			<.001	1,102			.001	1,064			<.001	1,157			<.001	1,158		<.001
Yes		118 (19.9)	147 (29.0)			52 (17.2)	214 (26.8)			14 (7.4)	243 (27.7)			137 (32.0)	139 (19.1)			54.1 ± 26.4	
No		476 (80.1)	360 (71.0)			251 (82.8)	585 (73.2)			174 (92.6)	633 (72.3)			291 (68.0)	590 (80.9)			68.2 ± 39.2	
Dissociative or somatoform disorder	1,101			.367	1,102			.177	1,064			.970	1,157			.092	1,158		.009
Yes		58 (9.8)	58 (11.4)			26 (8.6)	91 (11.4)			20 (10.6)	94 (10.7)			38 (8.9)	88 (12.1)			56.8 ± 27.1	
No		536 (90.2)	449 (88.6)			277 (91.4)	708 (88.6)			168 (89.4)	782 (89.3)			390 (91.1)	641 (87.9)			65.9 ± 37.9	
Attention-deficit/hyperactivity disorder or hyperkinetic disorder	1,101			.234	1,102			.307	1,064			.102	1,157			.525	1,158		.230
Yes		72 (12.1)	50 (9.9)			38 (12.5)	83 (10.4)			14 (7.4)	101 (11.5)			43 (10.0)	82 (11.2)			61.1 ± 23.1	
No		522 (87.9)	457 (90.1)			265 (87.5)	716 (89.6)			174 (92.6)	775 (88.5)			385 (90.0)	647 (88.8)			65.3 ± 38.3	
Phobic anxiety disorder and other anxiety disorder	1,101			.207	1,102			.070	1,064			.785	1,157			.378	1,158		.017
Yes		78 (13.1)	54 (10.7)			45 (14.9)	87 (10.9)			23 (12.2)	101 (11.5)			46 (10.7)	91 (12.5)			57.8 ± 28.9	
No		516 (86.9)	453 (89.3)			258 (85.1)	712 (89.1)			165 (87.8)	775 (88.5)			382 (89.3)	638 (87.5)			65.8 ± 37.9	
Comorbid Mental Health Diagnosis (*ICD-10*, Axis I)																			
Personality disorders	1,101			<.001	1,102			.004	1,064			.007	1,157			<.001	1,158		.198
Yes		48 (8.1)	78 (15.4)			21 (6.9)	105 (13.1)			11 (5.9)	112 (12.8)			79 (18.5)	54 (7.4)			61.0 ± 35.0	
No		546 (91.9)	429 (84.6)			282 (93.1)	694 (86.9)			177 (94.1)	764 (87.2)			349 (81.5)	675 (92.6)			65.4 ± 37.3	
Obsessive-compulsive disorder	1,101			.772	1,102			.905	1,064			.996	1,157			.979	1,158		<.001
Yes		35 (5.9)	32 (6.3)			18 (5.9)	49 (6.1)			12 (6.4)	56 (6.4)			26 (6.1)	44 (6.0)			82.6 ± 50.8	
No		559 (94.1)	475 (93.7)			285 (94.1)	750 (93.9)			176 (93.6)	820 (93.6)			402 (93.9)	685 (94.0)			63.7 ± 35.6	

(continued)

Table 3 (continued).

Characteristic	Symptom Response				Global Illness Outcome Response				Good Psychosocial Functioning at Discharge				Recommended Out-of-Home-Placement Except Day Care				Length of Stay		
	Total n	n (%)		*P* Value	Total n	n (%)		*P* Value	Total n	n (%)		*P* Value	Total n	n (%)		*P* Value	Total n	Mean ± SD, d	*P* Value
		Yes	No			Yes	No			Yes	No			Yes	No				
Tic disorder	1,101			.175	1,102			.290	1,064			.183	1,157			.507	1,158		.686
Yes		24 (4.0)	13 (2.6)			13 (4.3)	24 (3.0)			3 (1.6)	31 (3.5)			16 (3.7)	22 (3.0)			67.3 ± 30.5	
No		570 (96.0)	494 (97.4)			290 (95.7)	775 (97.0)			185 (98.4)	845 (96.5)			412 (96.3)	707 (97.0)			64.8 ± 37.2	
Enuresis and encopresis	1,101			.146	1,102			.346	1,064			.025	1,157			.745	1,158		.145
Yes		62 (10.4)	40 (7.9)			24 (7.9)	78 (9.8)			9 (4.8)	87 (9.9)			40 (9.3)	64 (8.8)			59.8 ± 20.4	
No		532 (89.6)	467 (92.1)			279 (92.1)	721 (90.2)			179 (95.2)	789 (90.1)			388 (90.7)	665 (91.2)			65.4 ± 38.2	
Adjustment disorder and acute stress disorder	1,101			.453	1,102			.155	1,064			.794	1,157			.101	1,158		.057
Yes		28 (4.7)	29 (5.7)			11 (3.6)	46 (5.8)			9 (4.8)	46 (5.3)			29 (6.8)	33 (4.5)			56.1 ± 36.9	
No		566 (95.3)	478 (94.3)			292 (96.4)	753 (94.2)			179 (95.2)	830 (94.7)			399 (93.2)	696 (95.5)			65.4 ± 37.0	
Mental and behavioral disorder due to use psychotropic substances	1,101			.767	1,102			.221	1,064			.152	1,157			.078	1,158		.003
Yes		12 (2.0)	9 (1.8)			3 (1.0)	18 (2.3)			1 (0.5)	20 (2.3)			13 (3.0)	11 (1.5)			50.8 ± 50.9	
No		582 (98.0)	498 (98.2)			300 (99.0)	781 (97.7)			187 (99.5)	856 (97.7)			415 (97.0)	718 (98.5)			65.2 ± 36.6	
Emotional disorders in childhood	1,101			.423	1,102			.669	1,064			.614	1,157			.108	1,158		.428
Yes		2 (0.3)	4 (0.8)			2 (0.7)	4 (0.5)			2 (1.1)	5 (0.6)			5 (1.2)	2 (0.3)			56.3 ± 32.0	
No		592 (99.7)	503 (99.2)			301 (99.3)	795 (99.5)			186 (98.9)	871 (99.4)			423 (98.8)	727 (99.7)			64.9 ± 37.1	
Attachment disorder	1,101			.697	1,102			.470	1,064			.413	1,157			.669	1,158		.181
Yes		25 (4.2)	19 (3.7)			10 (3.3)	34 (4.3)			5 (2.7)	38 (4.3)			16 (3.7)	31 (4.3)			57.8 ± 23.5	
No		569 (95.8)	488 (96.3)			293 (96.7)	765 (95.7)			183 (97.3)	838 (95.7)			412 (96.3)	698 (95.7)			65.2 ± 37.5	
Persistence other/nonspecified affective disorder	1,101			.633	1,102			.811	1,064			.388	1,157			.067	1,185		.196
Yes		39 (6.6)	37 (7.3)			20 (6.6)	56 (7.0)			16 (8.5)	59 (6.7)			21 (4.9)	56 (7.7)			59.6 ± 32.7	
No		555 (93.4)	470 (92.7)			283 (93.4)	743 (93)			172 (91.5)	817 (93.3)			407 (95.1)	673 (92.3)			65.2 ± 37.3	
Circumscribed Developmental Disorder																			
Speech or language disorder	1,091			.370	1,093			.832	1,059			.339	1,141			.062	1,145		.080
Yes		33 (5.5)	34 (6.9)			18 (5.9)	49 (6.2)			9 (4.8)	58 (6.7)			32 (7.6)	35 (4.9)			57.4 ± 26.3	
No		562 (94.5)	462 (93.1)			288 (94.1)	738 (93.8)			179 (95.2)	813 (93.3)			391 (92.4)	683 (95.1)			65.6 ± 37.8	
Disorders of school skills	1,091			.882	1,093			.979	1,059			.027	1,141			.988	1,145		.514
Yes		56 (9.4)	48 (9.7)			29 (9.5)	75 (9.5)			9 (4.8)	86 (9.9)			39 (9.2)	66 (9.2)			62.8 ± 27.8	
No		539 (90.6)	448 (90.3)			277 (90.5)	712 (90.5)			179 (95.2)	785 (90.1)			384 (90.8)	652 (90.8)			65.3 ± 38.1	
Circumscribed developmental disorder of motor functions	1,091			.512	1,093			.081	1,059			.012	1,141			.944	1,145		.034
Yes		61 (10.3)	45 (9.1)			22 (7.2)	84 (10.7)			9 (4.8)	94 (10.8)			40 (9.5)	67 (9.3)			57.8 ± 18.2	
No		534 (89.7)	451 (90.9)			284 (92.8)	703 (89.3)			179 (95.2)	777 (89.2)			383 (90.5)	651 (90.7)			65.8 ± 38.6	

(continued)

Table 3 (continued).

Characteristic	Symptom Response				Global Illness Outcome Response				Good Psychosocial Functioning at Discharge				Recommended Out-of-Home-Placement Except Day Care				Length of Stay		
	Total n	n (%)		P Value	Total n	n (%)		P Value	Total n	n (%)		P Value	Total n	n (%)		P Value	Total n	Mean ± SD, d	P Value
		Yes	No			Yes	No			Yes	No			Yes	No				
Presence of at Least Slight Psychopathology																			
Disturbance of social interaction	1,107			<.001	1,110			<.001	1,075			<.001	1,148			<.001	1,155		.007
Yes		385 (64.1)	394 (77.9)			194 (63.0)	587 (73.2)			101 (52.9)	652 (73.8)			355 (82.9)	459 (63.8)			63.2 ± 36.1	
No		216 (35.9)	112 (22.1)			114 (37.0)	215 (26.8)			90 (47.1)	232 (26.2)			73 (17.1)	261 (36.3)			69.7 ± 40.5	
Disturbance of social behavior	1,104			<.001	1,106			.005	1,071			<.001	1,140			<.001	1,148		<.001
Yes		204 (34.1)	255 (50.5)			107 (34.9)	353 (44.2)			35 (18.4)	411 (46.7)			235 (55.3)	246 (34.4)			55.8 ± 31.8	
No		395 (65.9)	250 (49.5)			200 (65.1)	446 (55.8)			155 (81.6)	470 (53.3)			190 (44.7)	469 (65.6)			71.3 ± 39.9	
Disturbance of drive, attention, and impulse control	1,108			<.001	1,110			<.001	1,076			<.001	1,151			<.001	1,160		.183
Yes		336 (55.9)	355 (70.0)			168 (54.5)	524 (65.3)			83 (43.7)	587 (66.3)			303 (70.6)	416 (57.6)			63.9 ± 37.9	
No		265 (44.1)	152 (30.0)			140 (45.5)	278 (34.7)			107 (56.3)	299 (33.7)			126 (29.4)	306 (42.4)			67.0 ± 36.9	
Disturbance of psychomotor behavior	1,103			.416	1,105			.277	1,071			.067	1,139			.016	1,148		.100
Yes		125 (20.8)	115 (22.9)			60 (19.5)	180 (22.6)			32 (16.9)	203 (23.0)			109 (25.6)	139 (19.5)			68.5 ± 37.7	
No		475 (79.2)	388 (77.1)			247 (80.5)	618 (77.4)			157 (83.1)	679 (77.0)			317 (74.4)	574 (80.5)			64.1 ± 37.6	
Disturbance of speech and language	1,102			.697	1,105			.254	1,071			.011	1,137			.136	1,145		.441
Yes		115 (19.3)	102 (20.2)			54 (17.5)	164 (20.6)			25 (13.2)	187 (21.2)			93 (22.0)	131 (18.3)			63.3 ± 34.6	
No		482 (80.7)	403 (79.8)			254 (82.5)	633 (79.4)			165 (86.8)	694 (78.8)			330 (78.0)	583 (81.7)			65.5 ± 38.4	
Anxiety disorder symptoms	1,096			.106	1,098			.071	1,063			.966	1,132			.912	1,141		.401
Yes		223 (37.4)	163 (32.7)			120 (39.3)	266 (33.5)			65 (34.4)	302 (34.6)			149 (35.3)	253 (35.6)			63.9 ± 36.3	
No		374 (62.6)	336 (67.3)			185 (60.7)	527 (66.5)			124 (65.6)	572 (65.4)			273 (64.7)	457 (64.4)			65.9 ± 38.1	
Disturbance of mood and affect	1,102			.401	1,105			.011	1,070			.916	1,147			.170	1,154		.002
Yes		509 (85.4)	441 (87.2)			250 (82.0)	703 (87.9)			164 (86.3)	757 (86.0)			378 (88.1)	612 (85.2)			66.5 ± 38.8	
No		87 (14.6)	65 (12.8)			55 (18.0)	97 (12.1)			26 (13.7)	123 (14.0)			51 (11.9)	106 (14.8)			56.3 ± 26.3	
Obsessive-compulsive disorder symptoms	1,087			.116	1.089			.672	1,056			.247	1,127			.952	1,136		<.001
Yes		68 (11.5)	73 (14.7)			37 (12.3)	104 (13.2)			30 (16.0)	111 (12.8)			54 (12.8)	89 (12.6)			81.4 ± 44.6	
No		523 (88.5)	423 (85.3)			265 (87.7)	683 (86.8)			158 (84.0)	757 (87.2)			369 (87.2)	615 (87.4)			62.9 ± 36.0	
Eating disorder symptoms	1,095			.021	1,097			<.001	1,066			<.001	1,134			<.001	1,143		<.001
Yes		264 (44.4)	188 (37.5)			151 (49.7)	301 (38.0)			102 (53.7)	335 (38.2)			145 (34.5)	322 (45.1)			79.1 ± 44.7	
No		330 (55.6)	313 (62.5)			153 (50.3)	492 (62.0)			88 (46.3)	541 (61.8)			275 (65.5)	392 (54.9)			55.3 ± 27.7	
Functional and somatoform disorder symptoms	1,101			.478	1,103			.357	1,068			.018	1,134			.116	1,144		<.001
Yes		210 (34.9)	185 (37)			104 (33.8)	292 (36.7)			54 (28.6)	331 (37.7)			166 (39.3)	247 (34.7)			59.9 ± 29.8	
No		391 (65.1)	315 (63)			204 (66.2)	503 (63.3)			135 (71.4)	548 (62.3)			256 (60.7)	465 (65.3)			68.0 ± 41.1	
Impaired memory, orientation, consciousness, or alertness	1,097			.102	1,099			.884	1,066			.609	1,131			.541	1,140		.252
Yes		33 (5.5)	40 (8)			21 (6.8)	52 (6.6)			11 (5.8)	60 (6.8)			30 (7.1)	44 (6.2)			60.3 ± 36.9	
No		564 (94.5)	460 (92)			287 (93.2)	739 (93.4)			178 (94.2)	817 (93.2)			391 (92.9)	666 (93.8)			65.4 ± 37.7	

(continued)

Table 3 (continued).

Characteristic	Symptom Response				Global Illness Outcome Response				Good Psychosocial Functioning at Discharge				Recommended Out-of-Home-Placement Except Day Care				Length of Stay		
	Total n	n (%)		*P* Value	Total n	n (%)		*P* Value	Total n	n (%)		*P* Value	Total n	n (%)		*P* Value	Total n	Mean ± SD, d	*P* Value
		Yes	No			Yes	No			Yes	No			Yes	No				
Substance abuse/dependence symptoms	1,093			<.001	1,095			.003	1,061			.002	1,129			<.001	1,138		.002
Yes		25 (4.2)	54 (10.8)			11 (3.6)	69 (8.8)			4 (2.1)	75 (8.6)			55 (13.1)	31 (4.4)			53.0 ± 39.2	
No		570 (95.8)	444 (89.2)			297 (96.4)	718 (91.2)			183 (97.9)	799 (91.4)			365 (86.9)	678 (95.6)			66.2 ± 37.3	
Psychotic symptoms	1,100			.066	1,102			.175	1,068			.014	1,140			.162	1,149		.920
Yes		83 (13.9)	90 (17.9)			41 (13.3)	132 (16.6)			19 (10.1)	152 (17.3)			77 (18.1)	107 (15.0)			64.8 ± 40.2	
No		515 (86.1)	412 (82.1)			267 (86.7)	662 (83.4)			170 (89.9)	727 (82.7)			348 (81.9)	608 (85.0)			65.1 ± 37.1	
Key Outcomes																			
Complete or significant symptom improvement	…			…	1,114			<.001	1,065			<.001	1,115			<.001	1,112		<.001
Yes		…	…			275 (89.6)	326 (40.4)			162 (85.7)	414 (47.3)			180 (43.5)	421 (60.1)			72.2 ± 30.8	
No		…	…			32 (10.4)	481 (59.6)			27 (14.3)	462 (52.7)			234 (56.5)	280 (39.9)			57.4 ± 41.0	
Complete or significant global illness improvement	1,114			<.001	…			…	1,065			<.001	1,117			<.001	1,113		<.001
Yes		275 (45.8)	32 (6.2)			…	…			107 (56.0)	179 (20.4)			89 (21.4)	219 (31.2)			72.5 ± 29.9	
No		326 (54.2)	481 (93.8)			…	…			84 (44.0)	697 (79.6)			327 (78.6)	482 (68.8)			62.6 ± 38.5	
No more than mild social impairment	1,065			<.001	1,067			<.001	…			…	1,079			<.001	1,076		.002
Yes		162 (28.1)	27 (5.5)			107 (37.4)	84 (10.8)			…	…			34 (8.4)	157 (23.3)			72.7 ± 33.9	
No		414 (71.9)	462 (94.5)			179 (62.6)	697 (89.2)			…	…			370 (91.6)	518 (76.7)			63.5 ± 37.1	
Recommended out-of-home placement and day care	1,115			<.001	1,117			<.001	1,079	<.001							1,172		.856
Yes		180 (30.0)	234 (45.5)			89 (28.9)	327 (40.4)			34 (17.8)	370 (41.7)		…	…	…	…		65.3 ± 36.7	
No		421 (70.0)	280 (54.5)			219 (71.1)	482 (59.6)			157 (82.2)	518 (58.3)			…	…			64.5 ± 37.7	

Table 4.
Outcomes of Univariate Analysis of Continuous Baseline Variables by Demographic, Physical, and Social Characteristics as Well as Key Outcome of Psychiatrically Hospitalized Children and Adolescents

Characteristic	Symptom Response				Global Illness Outcome Response				Good Psychosocial Functioning at Discharge				Recommended Out-of-Home-Placement Except Day Care				Length of Stay			
	Total n	OR	95% CI	*P* Value	Total n	OR	95% CI	*P* Value	Total n	OR	95% CI	*P* Value	Total n	OR	95% CI	*P* Value	Total n	B	95% CI	*P* Value
Demographic Variables																				
Age (y) at inpatient admission	1,115	0.97	0.93 to 1.01	.112	1,117	1.00	0.96 to 1.05	.919	1,079	1.15	1.09 to 1.22	<.001	1,177	1.08	1.03 to 1.12	<.001	1,184	0.24	−0.45 to 0.94	.494
Intelligence Level																				
Intelligence level (IQ)	1,078				1,080				1,045				1,127				1,131			
> 114		1.57	1.16 to 2.13	.004		1.69	1.23 to 2.32	.001	…	1.83	1.28 to 2.61	.001		0.83	0.61 to 1.13	.236		−9.46	−15.88 to −3.05	.004
85–114 (reference)		…	…	…		…	…	…		…	…	…		…	…	…		…	…	…
< 85		0.99	0.68 to 1.42	.942		1.36	0.91 to 2.03	.131		0.36	0.18 to 0.72	.004		1.56	1.09 to 2.23	.016		17.08	11.86 to 22.30	<.001
Somatic Status																				
BMI percentile at admission	1,032	1.00	0.99 to 1.00	.012	1,034	1.00	0.99 to 1.00	.012	1,001	0.99	0.98 to 0.99	<.001	1,074	1.01	1.00 to 1.01	<.001	1,076	−0.29	−0.35 to −0.24	<.001
BMI percentile at admission (without eating disorder patients)	713	1.00	1.00 to 1.00	.720	715	1.00	1.00 to 1.01	.997	689	0.99	0.99 to 1.00	.036	739	1.00	1.00 to 1.01	.151	808	−0.04	−0.09 to 0.02	.226
Associated Abnormal Psychosocial Factors																				
No. of abnormal psychosocial factors	1,106	0.91	0.84 to 0.98	.010	1,109	0.80	0.73 to 0.88	<.001	1,075	0.79	0.71 to 0.89	<.001	1,156	1.44	1.32 to 1.56	<.001	1,158	−1.89	−3.26 to −0.53	.007
Key Outcome																				
Length of stay	1,112	1.01	1.01 to 1.02	<.001	1,113	1.01	1.00 to 1.01	<.001	1,076	1.01	1.00 to 1.01	.002	1,172	1.00	1.00 to 1.00	.728	…	…	…	…

Abbreviations: B = regression coefficient, BMI = body mass index, OR = odds ratio.

mental health diagnoses (OR = 1.31; 95% CI, 1.03 to 1.67), higher admission age (OR = 1.20; 95% CI, 1.13 to 1.28), and higher admission BMI percentile (OR = 1.01; 95% CI, 1.00 to 1.101); the sole negative correlation was somatoform/dissociative disorder (OR = 0.51; 95% CI, 0.28 to 0.93) (n = 762, R^2 = 0.275, P < .001) (Table 5).

Length of stay (LOS). Mean ± SD LOS was 65.0 ± 37.5 days. Independent positive predictors of longer LOS included eating disorders (β = 19.86; 95% CI, 13.60 to 26.12), obsessive-compulsive disorder symptoms (β = 9.34; 95% CI, 2.81 to 15.87), disturbed psychomotor behavior (β = 7.55; 95% CI, 1.76 to 13.33), disturbed mood/affect (β = 7.50; 95% CI, 0.84 to 14.15), disturbed drive/attention/impulse control (β = 7.35; 95% CI, 2.22 to 12.48), intelligence level ≥ 115 (β = 6.61; 95% CI, 0.96 to 12.26), somatic findings (β = 6.29; 95% CI, 1.61 to 10.98), and being female (β = 5.55; 95% CI, 0.24 to 10.86); negative predictors included disturbed social behavior (β = −8.75; 95% CI, −14.07 to −3.44), higher admission age (β = −1.71; 95% CI, −2.35 to −0.89), and higher admission BMI percentile (β = −0.14; 95% CI, −0.21 to −0.07) (n = 761, R^2 = 0.219, P < .001) (Table 5).

Transoutcome Correlates

Among 28 statistically significant factors, 4 correlates were associated with 4 outcomes: disturbed social interaction, substance abuse/dependence symptoms (sole exclusion for both = LOS), disturbed drive/attention/impulse control, (sole exclusion = OOHP), and admission BMI percentile (sole exclusion = GIR). Three correlates were associated with 3 outcomes: abnormal psychosocial circumstances, (SR, GIR, OOHP), more mental health diagnoses (SR, SF, OOHP), and admission age (SF, OOHP, LOS). Four correlates were associated with 2 outcomes: intelligence level < 85 (GIR, SF), obsessive-compulsive disorder symptoms (SR, LOS), disturbed social behavior (OOHP, LOS), and somatic findings (OOHP, LOS). Additionally, 17 correlates were statistically significantly associated with 1 outcome, ie, SR = 6, OOHP = 5, LOS = 5, SF = 1 (Table 5).

Post Hoc Sensitivity Analysis Stratified by Eating Disorders

The significant association between higher BMI percentile and worse outcomes,

Table 5.

Final Multivariable Regression Models of Independently Correlates That Are Significantly Associated of Each of the 5 key Outcomes

Characteristic	Correlates Associated With Symptom Response[a]			Correlates Associated With Global Illness Outcome Response[b]			Correlates Associated With Good Psychosocial Functioning at Discharge, Ranging From Only Mild Impairment to Excellent Adjustment[c]			Correlates Associated With Any Recommended out of Home Placement Except Day Care[d]			Correlates Associated With Treatment Duration[e]	
	β[f]	OR	95% CI	β[f]	OR[g]	95% CI	β[f]	OR[g]	95% CI	β[f]	OR[g]	95% CI	β[f]	95% CI
Disturbance of social interaction	−0.46	0.63	0.45 to 0.90	−0.38	0.69	0.48 to 0.97	−0.64	0.53	0.35 to 0.80	0.55	1.74	1.16 to 2.60		
Substance abuse/dependence symptoms	−1.05	0.35	0.17 to 0.72	−1.00	0.37	0.16 to 0.84	−1.53	0.22	0.05 to 0.94	0.73	2.07	1.06 to 4.05		
Disturbance of drive, attention, and impulse control	−0.54	0.58	0.41 to 0.82	−0.36	0.70	0.50 to 0.97	−0.55	0.58	0.38 to 0.88				7.35	2.22 to 12.48
BMI percentile at admission	−0.01	1.00	0.99 to 1.00				−0.01	0.99	0.99 to 1.00	0.01	1.01	1.00 to 1.01	−0.14	−0.21 to −0.07
No. of abnormal psychosocial circumstances	−0.12	0.89	0.80 to 0.99	−0.24	0.78	0.70 to 0.88				0.29	1.34	1.19 to 1.51		
No. of mental health diagnoses	−0.65	0.52	0.40 to 0.68				−0.40	0.67	0.50 to 0.90	0.27	1.31	1.03 to 1.67		
Age (y) at inpatient admission							0.16	1.18	1.09 to 1.28	0.18	1.20	1.13 to 1.28	−1.71	−2.53 to −0.89
Intelligence level (IQ) < 85				0.54	1.72	1.04 to 2.83	−1.15	0.32	0.12 to 0.83					
Obsessive-compulsive disorder symptoms	−0.50	0.61	0.38 to 0.96										9.34	2.81 to 15.87
Disturbance of social behavior										0.57	1.77	1.19 to 2.63	−8.75	−14.07 to −3.44
Abnormality in overall somatic assessment										0.37	1.45	1.03 to 2.05	6.29	1.61 to 10.98
Comorbid diagnosis in mental and behavioral disorder due to psychotropic substances	2.09	8.08	1.75 to 37.33											
Comorbid tic disorders	1.11	3.03	1.20 to 7.66											
(Recurrent) depressive disorders and dysthymia	0.73	2.07	1.41 to 3.04											
Comorbid enuresis and encopresis	0.88	2.40	1.29 to 4.48											
Phobic anxiety disorders and other anxiety disorders	0.74	2.10	1.26 to 3.52											
Attention-deficit/hyperactivity disorder or hyperkinetic disorder	0.61	1.84	1.07 to 3.16											
Comorbid personality disorder							−1.02	0.36	0.14 to 0.91					
Autism spectrum disorders										1.29	3.63	1.41 to 9.31		
Physical abuse in the family										1.12	3.06	1.21 to 7.77		
Mental disorder in family										0.66	1.93	1.32 to 2.80		
Abnormality in overall neurologic assessment										0.46	1.58	1.03 to 2.44		
Somatoform and dissociative disorders										−0.67	0.51	0.28 to 0.93		
Eating disorders													19.86	13.60 to 26.12
Disturbance of psychomotor behavior													7.55	1.76 to 13.33
Disturbance of mood and affect													7.50	0.84 to 14.15
Intelligence level (IQ) ≥ 115													6.61	0.96 to 12.26
Female													5.55	0.24 to 10.86

[a]n = 433 of 753 (57.5%), $r^2 = 0.154$, $P < .001$.
[b]n = 226 of 754 (30.0%), $r^2 = 0.078$, $P < .001$.
[c]n = 138 of 727 (19.0%), $r^2 = 0.207$, $P < .001$.
[d]n = 268 of 762 (35.2%), $r^2 = 0.275$, $P < .001$.
[e]n = 761, $r^2 = 0.219$, $P < .001$.
[f]Value > 0: increase the chance for symptom responder, global illness outcome responder, recommendation of out of home placement and longer length of stay.
[g]Value > 1: increase the chance for symptom responder, global illness outcome responder, recommendation of out of home placement and longer length of stay.
Abbreviations: β = regression coefficient, BMI = body mass index, OR = odds ratio.

except for shorter LOS, disappeared when focusing on all mental disorders, but excluding eating disorders, except for a continued statistically significantly association with poor SF. Conversely, eating disorders were associated with better outcomes, except for longer LOS (Table 4).

DISCUSSION

This study had the following main results: (i) 58% of youth were symptom responders; (ii) 30.0% were global illness responders; (iii) 19.0% had good SF; (iv) 35% received OOHP recommendation; (v) the mean ± SD LOS was 65.0 ± 37.5 days; (vi) 5–13 correlates were independently associated with the outcomes of interest; and (vii) among 28 statistically significant factors, 11 were associated with > 1 outcome, including 4 being associated with 4 outcomes, 3 with 3 outcomes, and 4 with 2 outcomes.

A little more than half of our patients (58%) were symptom responders. Almost all other studies examined symptom change from admission to discharge instead of responder status. However, in the few studies of youth with mixed diagnoses reporting on responder status using different symptom assessments, response ranged from 57.1% to 87.0%.[25,51,52] Similar responder rates ranging from 47.7% to 71.4% were also reported for eating disorders, depressive disorders, and conduct disorder,[19,53–55] ie, disorders that represented the largest diagnostic groups in our sample. The often higher reported response rates may be due to higher baseline symptom severity via direct admissions from the emergency department in other studies, with greater room for improvement,[25,51,52,56,57] while our admissions were mainly from the wait list.

Furthermore, in our study, less than one-third of patients (30%) had GIR, while around one-fifth (19%) had good SF. These rates are lower than in studies of hospitalized youth with mixed psychiatric diagnoses, in whom GIR rates were approximately 2-fold (43.4%–85.0%)[27,58–60] and good functioning levels, including SF, were up to 3-fold (53.5%–65.0%)[29,52,57,61] higher than in our sample. Differences in these outcomes may be due to heterogeneous patient samples, outcome measures and definitions, or different expectations for good GIR or SF.[27,29]

The OOHP recommendation in 35% of youth in our sample is higher than in two studies of hospitalized youth with mixed mental disorders, in which 26.5% of 1,850 youth received OOHP within 4 years after inpatient care[42] and as few as 12.5% of 347 youth received OOHP at discharge.[41] However, the lower frequency in those studies could be explained by the fact that actual and new OOHP were reported, whereas our outcome included actual, recommended, and returning into OOHP. This hypothesis is supported by the fact that the only other study (n = 74) that used the same OOHP definition had a similar OOHP frequency (39.2%).[45]

The mean LOS of 65 days needs to be placed into the context of LOS across diverse treatment settings and environments, with numbers as diverse as 4–335 days according to a systematic review in youth.[62] In Europe, PIT seems to be longer than in the US, Canada, or Australia, possibly due to open units, wait list admissions, and lesser focus on brief crisis interventions in Europe.[27,56,63–66] In Germany, the treatment duration in youth decreased from ~126 days to 36 days between 1991 and 2014.[67] Assuming a linear decline, our result for 2004–2015 roughly corresponds to the mean timepoint value.

Regarding correlates of PIT outcomes, we found more statistically significant correlates (ie, 5–13 per outcome) than in prior studies.[19,23–27,29–31,33,35,37,42] This relatively high number of examined and statistically significant correlates for 5 main outcomes, including the examination of transoutcome correlates, provides targets for improving outcomes. Two of the 4 correlates that were associated with 4 outcomes included disturbed social interaction (poor outcome correlate for SR, GIR, SF, OOHP) and disturbed drive/attention/impulse control (poor outcome correlate for SR, GIR, SF, LOS). This finding is consistent with those of other studies in which disruptive behavior and conduct disorder led to poorer symptom and functional outcome,[27,68,69] leading to negative interactions and lower therapeutic alliance.[12,13,31,70,71]

Substance abuse/dependence symptoms were also associated with 4 poor outcomes (SR, GIR, SF, OOHP). This finding is consistent with data in youth showing an association between smoking and alcohol use with bullying,[72] cannabis plus alcohol consumption with self-harming behavior,[73] and impulsivity with addiction-related behavior.[74] However, a comorbid diagnosis of mental/behavioral disorder due to psychotropic substances was also associated with better SR during PIT, possibly due to the recognized disorder becoming a treatment focus, whereas substance use symptoms may be inappropriately targeted during PIT. Additionally, the fourth correlate related to 4 outcomes was higher admission BMI percentile (poor outcome for SR, SF and OOHP; good outcome for LOS). However, the low BMI percentile eating disorder group was associated with a good outcome for SR, SF, and OOHP, but longer LOS, which confounded this finding. With exclusion of the eating disorder group in the univariate analysis, BMI percentiles in 4 of the 5 outcomes lost statistical significance; significance remained only for SF.

Taken together, the identified poor outcome correlates can help clinicians focus on specific patient subgroups in their multimodal PIT. However, although we identified more individual correlates (28) than did prior studies, those prior studies reported a greater percent variance explained by the identified correlates, ie, for SR ($R^2 = 0.25–0.75$)[16,17,19,24,25] and functioning ($R^2 = 0.36–0.59$),[29–32] than in our study (SR: $R^2 = 0.154$; SF: $R^2 = 0.207$). Nevertheless, these studies either

reported results from univariate analyses or retained even statistically nonsignificant variables in the final model.

This study has several limitations. First, data were based on clinicians' perspectives; we lacked patient and caregiver ratings. Second, there was no formal clinician training for outcome ratings. Third, data were assessed only at baseline and discharge. Fourth, the degree of response depends on initial illness severity/room for improvement. Therefore, like for IQ < 85, a seemingly paradoxical finding can emerge, ie, a positive association with greater GIR but concurrently worse SF at discharge. Fifth, no data were available regarding outcome trajectories post-discharge. Sixth, we focused on an inpatient sample with mixed mental health diagnoses, not single/few disorders, examining transoutcome correlates. Seventh, relevant information was missing, including socioeconomic status, continuous psychopathology measures, treatment motivation, and therapeutic alliance. Eighth, routine clinical data were collected at one site only. Ninth, data were collected during an 11-year timeframe. Nevertheless, there was no significant time effect, except for GIR and OOHP. Finally, medication treatment data at admission were not part of the routine care standardized assessment. Nevertheless, this study assessed 5 major PIT outcomes concurrently, at least partly addressing previously highlighted shortcomings in PIT outcome correlate studies,[35,75] which may inform clinical care.

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Author Affiliations: Charité Universitätsmedizin—Berlin, corporate member of Freie Universität Berlin and Humboldt-Universität zu Berlin, Department of Child and Adolescent Psychiatry, Psychosomatic Medicine and Psychotherapy, Berlin, Germany (Nöhles, Jaite, Heuer, Bödeker, Golz, Winter, Correll); Department of Clinical Psychology and Psychotherapy in Childhood and Adolescence, University of Hildesheim, Hildesheim, Germany (Jaite); Charité Universitätsmedizin—Berlin, corporate member of Freie Universität Berlin and Humboldt-Universität zu Berlin, Institute of Medical Informatics, Berlin, Germany (Rubarth); Charité Universitätsmedizin—Berlin, corporate member of Freie Universität Berlin and Humboldt-Universität zu Berlin, Institute of Biometry and Clinical Epidemiology, Berlin, Germany (Rubarth); Psychiatry Research, The Zucker Hillside Hospital, Northwell Health, Glen Oaks, New York (Correll); Department of Psychiatry and Molecular Medicine, Zucker School of Medicine at Hofstra/Northwell, Hempstead, New York (Correll).

Corresponding Author: Christoph U. Correll, MD; Charité—Universitätsmedizin Berlin, Department of Child and Adolescent Psychiatry, Psychosomatic Medicine and Psychotherapy, Augustenburger Platz 1, 13353 Berlin, Germany (christoph.correll@charite.de).

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ORCID: Christoph U. Correll: https://orcid.org/0000-0002-7254-5646; Charlotte Jaite: https://orcid.org/0000-0003-3086-3897; Kerstin Rubarth: https://orcid.org/0000-0002-6174-6346; Fabiola H. Heuer: https://orcid.org/0000-0003-2798-580X; Katja Bödeker: https://orcid.org/0000-0003-4795-5077; Laura Golz: https://orcid.org/0009-0006-5133-9823; Sibylle M. Winter: https://orcid.org/0000-0001-8549-6284; VB Nöhles: https://orcid.org/0000-0002-6083-8468.

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Supplementary Material

Article Title: Magnitude and Correlates of Symptomatic, Global Illness and Social Functioning Response, Out-Of-Home Placement, and Length of Stay in 1,189 Consecutively Hospitalized Children and Adolescents With Mental Disorders

Author(s): Viktor B. Nöhles, MA; Charlotte Jaite, PhD; Kerstin Rubarth, PhD; Fabiola H. Heuer, MSc; Katja Bödeker, PhD; Laura Golz, MSc; Sibylle M. Winter, MD; Christoph U. Correll, MD

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LIST OF SUPPLEMENTARY MATERIAL FOR THE ARTICLE

DISCLAIMER

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Supplementary Table 1: Baseline predictors in the initial model of the backward regression analysis with each of the 5 outcomes

Demographics	Sex
	Age
Home environment	Mental disorder in family
	Non-mental disorder in family
Pregnancy	Complication/ risk factors during pregnancy, birth or postpartum period
Psychopathology	Disturbance of social interaction
	Disturbance of social behavior
	Disturbance of drive, attention and impulse control
	Disturbance of psychomotor behavior
	Disturbance of speech and language
	Anxiety disorder symptoms
	Disturbance of mood and affect
	Obsessive-compulsive disorder symptoms
	Eating disorder symptoms[a]
	Functional and somatoform disorder symptoms
	Impaired memory, orientation, consciousness or alertness
	Substance abuse/ dependence symptoms
	Psychotic symptoms
Somatic status	BMI-percentile at admission
	Abnormality overall neurological assessment
	Abnormality overall somatic assessment
Primary mental health diagnosis, (ICD-10, axis 1)	Number of mental health diagnoses
	Schizophrenia. schizotypal or delusional disorder
	Any eating disorder
	(Recurrent) depressive disorder or Dysthymia
	Autism-spectrum disorder
	Oppositional-defiant/conduct disorder
	Dissociative or somatoform disorder
	Attention- deficit/hyperactivity disorder or hyperkinetic disorder
	Phobic anxiety disorder and other anxiety disorder
Comorbid mental health diagnosis, (ICD-10, axis 1)	Personality disorders
	Obsessive-compulsive disorder
	Tic disorder
	Enuresis and encopresis
	Adjustment disorder and acute stress disorder
	Mental and behavioral disorder due to use psychotropic substances
	Emotional disorders in childhood
	Attachment disorder
	Persistence other/ non-specified affective disorder
Circumscribed developmental disorder	Speech or language disorder
	Disorders of school skills
	Circumscribed developmental disorder of motor functions
Intelligence	> 114
	< 85
Associated abnormal psychosocial factors	Number of abnormal psychosocial factors
	Physical abuse in the family
	Sexual abuse in or outside the family
	Bullying experience by student or scapegoat by teacher

a) Excluded, since Pearson´s correlation with "any eating disorder" was >0.700

Supplementary Table 2: Treatment characteristics of psychiatrically hospitalized children and adolescents

Characteristic	Total (n=1,189)[a]	Schizophrenia. schizotypal or delusional disorder[b] (n=22)	Any eating disorder[b] (n=354)	(Recurrent) depressive disorder or Dysthymia[b] (n=231)	Autism-spectrum disorders[b] (n=48)	Oppositional-defiant/conduct disorder[b] (n=231)	Dissociative or somatoform disorders[b] (n=70)	Attention-deficit/hyperactivity disorder or hyperkinetic disorder[b] (n=47)	Phobic anxiety disorder and other anxiety disorders[b] (n=55)
Treatment Characteristics									
Psychotherapy n (%)									
Type of psychotherapy [n=985]									
Cognitive behavioral	608 (61.7)	12 (80.0)	185 (60.3)	107 (57.8)	24 (60.0)	114 (58.8)	35 (64.8)	23 (59.0)	38 (74.5)
Psychodynamic	279 (28.3)	3 (20.0)	77 (25.1)	62 (33.5)	12 (30.0)	66 (34.0)	15 (27.8)	11 (28.2)	10 (19.6)
Cognitive behavioral and psychodynamic	98 (9.9)	0 (0.0)	45 (14.7)	16 (8.6)	4 (10.0)	14 (7.2)	4 (7.4)	5 (12.8)	3 (5.9)
Number of psychotherapeutic sessions [n=1,177]									
does not apply	31 (2.6)	1 (4.5)	4 (1.1)	5 (2.2)	0 (0.0)	5 (2.2)	4 (5.7)	1 (2.1)	0 (0.0)
1-5 sessions	331 (28.1)	8 (36.4)	167 (47.6)	52 (22.6)	9 (18.8)	36 (15.6)	12 (17.1)	10 (21.3)	9 (16.4)
6-25 sessions	815 (69.2)	13 (59.1)	180 (51.3)	173 (75.2)	39 (81.3)	190 (82.3)	54 (77.1)	36 (76.6)	46 (83.6)
>25 sessions	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)

[a] n=104 without a main diagnosis and n=27 without information; [b] diagnoses ordered from left to right according to diagnostic primacy in case of comorbidity with other "primary" diagnoses

Supplementary Table 3: Outcomes of univariate Analyses of dichotomies variables by treatment characteristics of children and adolescents at time of psychiatric hospitalization

Characteristics		Symptom response				Global illness outome response				Good psychosocial functioning at discharge				Recommended out-of-home-placement except day care				Length of stay		
		Total	n (%)		p-value	Total	n (%)		p-value	Total	n (%)		p-value	Total	n (%)		p-value	Total	$\bar{x}$ (SD)	p-value
			Yes	No			Yes	No			Yes	No			Yes	No				
Psychotherapy																				
Psychotherapeutic treatment	Yes	1,115	601 (100.0)	502 (97.7)	<0.001	1,117	308 (100.0)	797 (98.5)	0.026	1,079	190 (99.5)	880 (99.1)	0.710	1,177	426 (98.6)	720 (96.6)	0.042	1,172	65.0 (36.7)	0.212
	No		0 (0.0)	12 (2.3)			0 (0.0)	12 (1.5)			1 (0.5)	8 (0.9)			6 (1.4)	25 (3.4)			55.9 (58.4)	
Type of psychotherapy																				
Cognitive behavioral		960	343 (62.3)	244 (59.7)	0.564	962	179 (65.6)	409 (59.4)	0.099	923	115 (65.7)	454 (60.7)	0.427	985	187 (54.4)	421 (65.7)	<0.001	984	63.9 (35.0)	0.002
Psychodynamic			151 (27.4)	125 (30.6)			65 (23.8)	212 (30.8)			43 (24.6)	219 (29.3)			109 (31.7)	170 (26.5)			66.6 (34.1)	
Both			57 (10.3)	40 (9.8)			29 (10.6)	68 (9.9)			17 (9.7)	75 (10.0)			48 (14.0)	50 (7.8)			77.7 (42.3)	

Characteristics	Symptom response				Global illness outcome response				Good psychosocial functioning at discharge				Recommended out-of-home-placement except day care				Length of stay			
	Total	OR	95%CI	p-value	Total	OR	95%CI	p-value	Total	OR	95%CI	p-value	Total	OR	95%CI	p-value	Total	β	95%CI	p-value
Psychotherapeutic Treatment Characteristics																				
Number of psychotherapeutic sessions																				
0-5 sessions (reference)	1,115	-	-	-	1,117	-	-	-	1,079	-	-	-	1,177	-	-	-	1,172	-	-	-
6-25 sessions		16.91	6.75 to 42.34	<0.001		8.95	2.79 to 28.70	<0.001		7.16	1.74 to 29.57	0.006		1.42	0.93 to 2.17	0.103		29.13	23.08 to 35.19	<0.001
>25 sessions		26.99	10.49 to 69.45	<0.001		13.6	4.17 to 44.53	<0.001		13.3	3.17 to 55.77	<0.001		1.63	1.01 to 2.61	0.044		73.33	66.47 to 80.18	<0.001

Abbreviations: β = regression coefficient; CI = confidence interval; SD=standard deviation; OR = odds ratio; $\bar{x}$=mean

Appendix 1

Assessments

Structured data collected and entered by the clinical staff as part of routine clinical care included information on sociodemographic variables, past medical and psychosocial/developmental history (including complications during pregnancy, birth, postpartum period or/ and kindergarten, residential place/status, etc), family history (parents alive or deceased, parental mental health history, children in the family, sibling position, etc), psychopathology (disturbance of social interaction, social behavior, mood and affect, etc), somatic-neurological findings, mental health diagnoses, treatment modalities (psychotherapeutic, medication, etc), treatment outcomes (symptom changes, global changes, social functioning) and recommendations at discharge (location, medication, psychotherapy, etc).

In 2009, several variables of the standardized data capture system were removed or modified. Information from the two periods (2004-2008 and 2009-2015) regarding the same variables/dimensions were combined, and various variables or their coding were merged to harmonize measures. Body mass index (BMI) percentiles were calculated according to Kromeyer-Hausschild.[49]

Appendix 2

Statistical Analyses

Analyses included descriptive statistics for sample characteristics of the total as well as subsamples of all primary diagnostic groups. Univariate analyses of dichotomous dependent outcomes (SR, GIR, SF, OOHP) were performed with Pearson's chi-square test for nominal scaled independent variables and logistic regression for ordinal-scaled (creating a dummy variable) or interval-scaled independent variables. For the interval-scaled dependent outcome (LOS), t-test was performed for dichotomous independent variables, analysis of variance for nominal independent variables and linear regression for ordinal-scaled (creating a dummy variable) or interval-scaled independent variables.

Five separate multivariable, backward elimination regression analyses were conducted within the initial model including all independent variables, except those which multicolloniarity defined as Pearson correlation >0.7. The only eating disorder diagnosis and eating disorder symptoms had a Persons correlation >0.7 and we excluded eating disorder symptoms.

All calculations were performed with SPSS 27, with two-sided tests, alpha=0.05, and without correction for multiplicity due to independent interest in each of the 5 outcomes and correction for effects of the other variables contained in the final model by using regression analysis.